



THE HASHEMITE KINGDOM OF JORDAN

**ANNUAL OF THE
DEPARTMENT OF ANTIQUITIES
OF JORDAN**

Volume 57

**AMMAN
2013**

Chief Editor

Dr. Monther Jamhawi

Editorial Board

Jehad Haron

Arwa Masa'deh

Hanadi Al-Taher

Osama Eid

English Text Revised by

Dr. Alexander Wasse

Annual Subscription

20 Jordanian Dinars (For Hashemite Kingdom of Jordan)

30 US Dollars (Elsewhere, plus registered mail fees)

Opinions expressed in the articles do not necessarily represent the policies of the department

All articles submitted for publication should follow the "Notes for Contributors", which are printed in this volume

Address

Annual of the Department of Antiquities of Jordan

Department of Antiquities, P.O. Box 88

Amman 11118, Jordan

E-mail: publication@doa.gov.jo

Fax: +962 6 4615848

Notes for Contributors

The Annual of the Department of Antiquities of Jordan is devoted primarily to studies of archaeological fieldwork. The deadline for submission of contributions is 31 May for publication in the volume of the same year.

Contributions should be sent to: Editor, ADAJ, Department of Antiquities of Jordan, P.O.Box 88, Amman, Jordan; and if sent by courier Tel (4644336). Queries may be addressed to the editor by Fax (+962 6 4615848), or e-mail (publication@doa.gov.jo).

– **Language:** Contributions may be in Arabic or English.

– **Preparation of the Manuscript:**

The manuscript should be no more than 15,000 words (around 30 pages) excluding bibliography, illustrations and figures captions. Please include name(s) and address(es) of the author(s) as you would like the to appear in the publication at the end of the manuscript. The order of the manuscript should be:

1. Title of the contribution and name(s) of author(s);
2. Body of text;
3. Address(es) of author(s);
4. Bibliography/references;
5. Footnotes (if any);
6. Captions of figures.

– **Submission of the Text:**

Should be on computer diskettes, Macintosh or PC compatible, as well as double spaced hard copy. For Macintosh diskettes include a copy of the document saved as “text only” on your diskette. For PC compatible diskettes include a copy saved as “Rich Text Format”. The manuscript should be submitted in final form with no substantive changes expected later.

– **Illustrative Material:** should accompany the manuscript at the time of submission. All illustrations (drawings as well as photographs) should be referred to in the text as “Fig.” in consecutive order.

Figures should not exceed 17×22cm in size. Illustrations in electronic form may be submitted, preferably in (jpg) format (figures scanned into Word documents are not acceptable).

The resolutions should be 250 pixels/in for photographs and 600 pixels/in for line drawings.

– **Foreign Words and Italicized Words:**

Should be indicated by underlining in the manuscript. To avoid misleading orthography, Arabic words and site names used in an article in another language of transliteration from Arabic and transcribed with diacritical signs and translated in terms of the system by hand on the hard copy and need not be included on the diskette.

– **Footnotes:**

Length footnotes are not to be avoided and where at all necessary kept at a minimum. Bibliographically references are not to be included in brackets in the text, e.g. (Brown 1989: 32-35).

– **Bibliography/References:** should appear at the end of the contribution in alphabetical order. The following format should be utilized:

For articles:

Quintero, L.A. and Wilke, P.J.

1998 Archaeological Reconnaissance in the Al-Jafr Basin, 1997. *ADAJ* 42: 113-122.

For collective volumes:

Gebel, H.G.K. and Bienert, H.-D.

1997 Ba’ja: ALPPNB Regional Center Hidden in the Mountains North of Petra, Southern Jordan. Results from the 1997 Investigations. Pp. 221-262 in H.G.K. Gebel, Z. Kafafi and G. O. Rollefson (eds.), *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.

For monographs:

Peacock, D. P. S.

1988 *Pottery in the Roman World: An Ethnoarchaeological Approach*. London and New York, Longman.

– **Copyrights:**

Remains with the individual author(s).

System of Transliteration from Arabic

Consonents

ء	' (except where initial)	ض	ḍ
ب	b	ط	ṭ
ت	t	ظ	<u>dh</u>
ث	th	ع	‘
ج	j	غ	gh
ح	ḥ	ف	f
خ	kh	ق	q
د	d	ك	k
ذ	dh	ل	l
ر	r	م	m
ز	z	ن	n
س	s	هـ	h
ش	sh	و	w
ص	ṣ	ي	y
ة	a or at	هـ	a or ah

Long Vowels

ا، ي	ā
و	ū
ي	ī

Short Vowels

ـَ	a
ـُ	u
ـِ	i

Common Nouns

تل	Tall	دير	Dayr
جبل	Jabal	عين	‘Ayn
خربة	Khirbat	وادي	Wādī

List of Abbreviations

AA	Archäologischer Anzeiger
AAAS	Les Annales Archéologiques Arabes Syriennes
AASOR	Annual of the American Schools of Oriental Research
ADAJ	Annual of the Department of Antiquities of Jordan
AfO	Archiv für Orientforschung
AJA	American Journal of Archaeology
AUSS	Andrews University Seminary Studies
BA	Biblical Archaeologist
BAR	British Archaeological Reports
BASOR	Bulletin of the American Schools of Oriental Research
CRAI	Comptes Rendus de l'Académie des Inscriptions et Belles Lettres
JAOS	Journal of the American Oriental Society
JMA	Journal of Mediterranean Archaeology
JNES	Journal of Near Eastern Studies
JPOS	Journal of the Palestine Oriental Society
JRA	Journal of Roman Archaeology
JRS	Journal of Roman Studies
LA	Liber Annuus
LIMC	Lexicon Iconographicum Mythologiae Classicae
MA	Mediterranean Archaeology
PEFQS	Palestine Exploration Fund Quarterly Statement
PEQ	Palestine Exploration Quarterly
QDAP	Quarterly of the Department of Antiquities of Palestine
RB	Revue Biblique
SHAJ	Studies in the History and Archaeology of Jordan
WA	World Archaeology
ZDPV	Zeitschrift des Deutschen Palästina-Vereins

Table of Contents

Preliminary Registration Report of the Second Season of the Danish-German Jarash Northwest Quarter Project 2012 <i>Achim Lichtenberger, Rubina Raja, and Annette Højten Sørensen</i>	9
Preliminary Report of the Second Season of the Danish-German Jarash North-West Quarter Project 2012 <i>Georg Kalaitzoglou, Achim Lichtenberger, and Rubina Raja</i>	57
A Preliminary Report of the Tulul adh-Dhahab (Wadi az-Zarqa) Survey and Excavation Seasons 2005-2011 <i>Thomas Pola, Hannelore Kröger, Bernd Rasink, Jochen Reinhard, Mohammad Al-Balawnah and Mohammad Abu Abila</i>	81
Tulul adh-Dhahab (Wadi az-Zarqa) Lead Sling Bullets from Terrace I <i>Boris Dreyer</i>	97
Brown University Petra Archaeological Project: The 2011 and 2012 Petra Area and Wadi Silaysil Survey <i>Alex R. Knodell, and Susan E. Alcock</i>	105
East of Jawa: Chalcolithic / Early Bronze Age Settlement Activity in al-Harra (North-East Jordan) <i>Bernd Müller-Neuhof, with Lorraine Abu-Azizeh, Wael Abu-Azizeh, and Julia Meister</i>	125
The Hellenistic-Nabataean Crypt in Tower Tomb 303, at ath-Thughrah in Petra: Results of the Archaeological and Multi-Disciplinary Studies <i>Isabelle Sachet, Nathalie Delhopital, Charlène Bouchaud and Carine Tomé Carpentier</i>	141
The Ceramic Assemblage from the Later Phases at Tomb 303: Settlement in Wadi ath-Thughrah During the Islamic Period <i>Micaela Sinibaldi</i>	167
Qasr Mushash Survey: First Results of Archaeological Fieldwork in 2011 and 2012 <i>Karin Bartl, Ghazi Bisheh, and Franziska Blochand Tobias Richter</i>	179
Ghawr as-Safi Excavations 2011-2012 <i>Konstantinos D. Politis</i>	195
The International Aslah Project (IAP) 2011-2012: Report on the Second and Third Seasons <i>Laurent Gorgerat and Robert Wenning with a Note by Laila Nehmé</i>	201
Preliminary Report on the Eighth (2012) Season of Excavation by “La Sapienza” University of Rome at Khirbat al-Batrawi (Upper Wadi az-Zarqa) <i>Lorenzo Nigro and Maura Sala</i>	217
The 2011 Season of the Late Antique Jarash Project: Results from the Survey Southwest of the Umayyad Congregational Mosque <i>Louise Blanke, Hugh Barnes, Marie Broendgaard Jensen, Rune Rattenborg, and Elise Thing</i>	229
Recycling the Valley, Preliminary Report of the 2012 Excavations at Tall Damiyah <i>Lucas Petit</i>	239
The Funerary Topography of Petra Project (FTPP): Preliminary Report on the 2011 Season <i>Lucy Wadeson</i>	247
Patterns of Settlement, Abandonment and Re-Use During the Bronze and Iron Ages in Central Jordan: An Analysis of the Occupational Histories of Individual Sites Using “Mega-Jordan” <i>Mark D. Green</i>	269
Tall Abu al-Kharaz: The Swedish Jordan Expedition 2012, Fifteenth Season Preliminary Excavation Report <i>Peter M. Fischer and Teresa Bürge</i>	285
Tall Abu al-Kharaz: The Swedish Jordan Expedition 2013, Sixteenth Season Preliminary Excavation Report <i>Peter M. Fischer, and Teresa Bürge, with Contributions by A. Lindqvist, B. Stolle, and D. Kofel</i>	293

The Middle Islamic Palace at Karak Castle: A New Interpretation of the Grand Qa'a (Reception Hall)	
<i>Robin M. Brown</i>	309
'Awja Sites: Supplementary Investigations of Neolithic Open Sanctuaries in Southernmost Jordan	
<i>Sumio Fujii, Takuro Adachi, Hitoshi Endo and Masatoshi Yamafuji</i>	337
Preliminary Report of the Shawbak North Archaeological Project (SNAP): 2012-2013	
<i>Sumio Fujii, Masatoshi Yamafuji, Takahiro Odaka and Yui Arimatsu</i>	359
Excavations at Wadi Nadiya 2 and Supplementary Investigations of the Jafr Neolithic Barrage System	
<i>Sumio Fujii, Takuro Adachi, Hitoshi Endo, Masatoshi Yamafuji, Yui Arimatsu and Kazuyoshi Nagaya</i>	373
Petra North Ridge Project: The 2012 Season	
<i>S. Thomas Parker and Megan A. Perry</i>	399
Preliminary Results of the First Spanish-Italian Excavation Season at the Jabal al-Mutawwaq Dolmen Field: August-September 2012	
<i>Valentin Alvarez, Juan Muniz, and Andrea Polcaro</i>	409
Qusayr 'Amra World Heritage Site: Preliminary Report on Documentation, Conservation and Site Management Activities in 2012-2013	
<i>Giovanna De Palma, Gaetano Palumbo, Asma Shhaltoug, Ignacio Arce, Chiara Arrighi, Angela Atzori, Carlo Birrozzi, Giulia Sara De Vivo, Stefania Di Marcello, Wesam Esaid, Maria Carolina Gaetani, Romel Ghraib, Jihad Haron, Hossam Hjazeen, Hussein Khirfan, Ahmed Lash, Marie-José Mano, Francesca Mariani, Alessandra Meschini, Alex Sarra, and Cristina Tomassetti</i>	425
Qatanah: Rescue Excavation	
<i>Jihad Haron, Ahmad Lash, and Abdalla Nabulsi</i>	441
Three Seasons of Excavations at Khirbat Iskandar: 2007, 2010 and 2013	
<i>Suzanne Richard, Jesse C. Long (Jr), Rikke Wulff-Krabbenhøft, and Susan Ellis</i>	447
2013 Archaeological Survey in Wadi Qusayba and the Mandah Plateau, Irbid Region, Jordan	
<i>E.B. Banning, P. Hitchings, K. Abu Jarryab, Steven Edwards, Rasha Elendari, Kevin Gibbs, Darren Jablonkay, Hossein Al-Jarrah, B. Letham, Salim Razzaz, Isaac Ullah, and Rebecca Weston</i>	463
Once More unto the Beach: New Archaeological Research into Jordan's Port on the China Sea	
<i>Kristoffer Damgaard (University of Copenhagen) and Michael D. Jennings (University of Chicago)</i> With Contributions by Patrick Lorien, Lena Tambs, Aiysha Abu-Laban, Sara Jerichau, and Christina Seye	477
Jarash, Spring 2013	
<i>Rafe' Harahshah, and Jacques Seigne</i>	503
The Iron I Pottery of Khirbat al-Lahun	
<i>Margreet L. Steiner</i>	519
There Is No Middle Bronze Glacis at Tall Safut: An Examination of the Middle Bronze III Remains	
<i>Owen Chesnut</i>	535
The 2012 Season of Excavations in the Ancient Khirbat as-Samra Cemetery	
<i>A. J. Nabulsi, A. Husan, and P. Schönrock-Nabulsi</i>	551

Arabic Section

Dhahr as-Saro Roman Tomb	
<i>Rafe' Harahshah</i>	7
Amman al-Balqa' in the End of Mamluk Period and Beginning of the Ottoman Period in the Light of the Excavations of Umm Zuwaytinah	
<i>Basem al-Mahamid and Hanadi al-Taher</i>	15
Nabateans and Petra in Arabic Resources	
<i>Ahmad Lash</i>	21

PRELIMINARY REGISTRATION REPORT OF THE SECOND SEASON OF THE DANISH-GERMAN JARASH NORTHWEST QUARTER PROJECT 2012

Achim Lichtenberger, Rubina Raja, Annette Højen Sørensen

Introduction

During the 2012 campaign of the Danish-German Jarash Northwest Quarter project three trenches (A-C) were laid out.¹ This report concerns the finds from these excavations.²

The team sorted and total registered app. 120.000 pottery fragments during the 6 week-long campaign. Of these more than 4.300 sherds were registered (i.e. described, measured, drawn and photographed). Furthermore, the team sorted and registered other types of finds: stone and metal objects, coins and architectural elements.

This report and the associated catalogue will present an overview of selected potterywares, shapes, as well as other object types and the chronological frame of the finds from the 2012 campaign. Out of the total number of registered objects 167 representative objects have been selected for the present catalogue as well as a limestone sculpture found in 2011 (Addendum).

The finds of the 2012 campaign date from the Neolithic period until modern times. However, the majority of the material dates from the period between the later Roman and Umayyad periods, that is the late 3rd to 8th centuries AD.

The earliest discernible object within the pottery repertoire is a fragment of a Hellenistic Black Glazed fish plate (cat. no. 1) and the youngest seems to be the Handmade Geometric Painted Ware (HMGPW) of the Ayyubid/Mamluk period (cat. nos. 36-44).

The general nature of the pottery found during the campaign is dominated by the ribbed undecorated cooking pots, jugs and jars – so-called plain household wares. Furthermore, a large amount of reduced ribbed Grey ware amphorae and jars was present. Of the coarser and thicker vessels a large amount of handmade Grey ware storage jars was found.

The most comprehensive study of Byzantine-Umayyad pottery from Jarash was published by Uscatescu in 1996 and presents a typology of the pottery from the Spanish excavation of the Macellum in Jarash.³ Apart from Uscatescu's monograph Clark and Falkner also presented a ware typology in connection with the excavation of the North Theatre.⁴ Their typology covered the 8th century AD material from the theatre and is of a preliminary character. Schaefer published two kilns and wasters' deposits dat-

1. See field report in this volume of *ADAJ* for trench reports and team members

2. We would like to thank Leif Erik Vaag and John Lund for invaluable input on the Roman wares. Furthermore, we thank Stephen McPhilips for references and input on the Islamic period pottery. Frauke Kenkel also shared insight into the chronology of the ceramic finds. We would also like to thank Jodi Magness who made us aware of important comparanda for the incense burner found in trench A and Benton Kidd for providing an illustration of the material in the Museum of Art and Archaeology, University of Missouri. A large thanks also go to Moesgaard Museum's conservation department, in particular conservator Helle Strehle and director of the conservation department Peter Hambro Mikkelsen, for taking time to analyse and discuss the ash samples with us. Furthermore Lars Jørgensen and

the natural sciences department at the National Museum in Copenhagen also offered their expertise, which we are grateful for and Helge Hansen and Christian Prinds from Teknologisk Institut, Aarhus analysed our samples from trench A. We appreciated his expertise very much. At the *ICHAJ* conference in Berlin Carmelo Pappalardo and Baseema Harmerneh both offered helpful advice. We also thank the Department of Antiquities in Amman and Jarash for letting us take out the ash samples of Jordan for further analyses. Last but not least Holger Schwarzer contributed with his knowledge about glass wares. Signe Bruun Kristensen has with great care prepared all the plates for publication, which we would like to thank her for as well.

3. Uscatescu 1996.

4. Clark and Falkner 1986: 247-251.

ing to the Umayyad period also from the North Theatre.⁵In the area of the Artemis temple pottery kilns which dated to the Umayyad period were discovered.⁶Of a more recent date is an article on the potters' workshops in the Hippodrome of the Late Roman and Byzantine period.⁷It is evident from the number of ceramic production areas found in Jarash and dating to the Byzantine and Umayyad periods that a high number of ceramic vessels were produced locally in these periods. The work of Watson from primarily Pella⁸ as well as her study of the Jarash Bowls⁹is still of importance in relation to the ware types of the 5th-8thAD centuries in Northern Jordan and are thus also taken into consideration here.

Many of the catalogued objects in this publication have found parallels in the material from Jarash published by the Spanish, Polish and French/Australian teams while other objects are of types without published parallels from the site but most of which have found parallels on both sides of the Jordan Valley.

It should be noted that coins have been excluded from this year's report and will be dealt with in detail in the 2013 report.

General Characteristics of Trench A

Trench A provides us with an important context of later Roman pottery. In the Eastern part of the trench, a rock-cut room was excavated which had been rapidly backfilled in antiquity. In the fill, three intentionally deposited cooking pots have been excavated and the content has been analysed. Charcoal from each cooking pot provides a C14 date before 300 AD. Therefore everything below ev. 10 has this date as a terminus ad quem.¹⁰ This chronological positioning of the layers improves our knowledge of the ceramic chronology of Jarash.

From a typological point of view there does not seem to be material evidence dating to later than the Byzantine period in these lower layers in trench A. A change in the ceramic material was detected in the plain household wares of ev.19 where a paler yellowish-red occasionally

self-slipped ware with wider ribs was located. A further characteristic of trench A is the low frequency of fine ware pottery of the Byzantine period. The fine wares, which were attested, were almost exclusively made up of Eastern Sigillata A (ESA) ware (cat. no. 2) of the Early Roman Period but a local ARS Form 50 type B bowl or alternatively a crude version of type A (cat. no.8) as well as an imported ARS body sherdware also located in ev. 19.¹¹ The few ESA pieces, found in the upper modern fill layers but also in ev. 19 below the cooking pots discussed below, are further more quite small and do not seem to be of chronological significance to the trench since most of the shapes are unknown due to the fragmentary state of the material and it is thus not possible to date the pieces to a specific period within the long period of production of ESA. Another chronological marker such as the Jarash Lamps of the late Byzantine-Umayyad period was not present in the trench. One Grey ware body fragment was registered in ev. 22, but it could be seen as an intrusion as this sherd is the only Grey ware reported below ev. 13.

The upper most evidences of trench A consisted of small and much worn fragments of pottery covered in lime crust. Almost all the material from these strata bears witness to redeposition from another location. The modern fill (ev. 1 and 4) produced very few diagnostic sherds. The diagnostic pieces were among others bases of the same type of flask/unguentarium as cat no. 73 of a Late Byzantine date.

The typical bi-ansulate, rounded cooking pots of the gritty reddish/red brown ware, ribbed body, and slightly s-curved neck have been found in a few almost intact examples in the trench and make up some of the most interesting and puzzling finds from the campaign (cat. nos. 96-98) (cf. the field report in this *ADAJ* volume). The fill in the cooking pots date to the Roman period (3rd century AD).¹² Two of the pots were found deposited in ev.16 (cat. nos. 97-98). The surrounding fill in general consisted of much more worn and lime covered fragments than the deposited pots.

5. Schaefer 1986.

6. Pierobon 1986.

7. Kehrberg 2009; Bessard 2009, 58f.

8. Watson 1992. Watson indicates that Pella did not have a pottery production but imported from Jarash from the beginning of the 7th century onwards (1992, p. 237).

9. Watson 1989.

10. Cf. Kalaitzoglou, Lichtenberger and Raja in this volume and for the cooking pot deposits Lichtenberger and Raja (in press).

11. Hayes 1972, 13-14.

12. Cf. Lichtenberger and Raja (in press).

One of the pots was a fragmented base of a bi-ansulate cooking pot (cat.no.96)with joining sherdsfound in the fill of ev. 13.The upper part of the potwas lying in ev. 6 sector f. A well-preserved Late Roman (mid-4th century AD) lamp was also found in this evidence (cat. no. 46) and the typical Byzantine Jarash Bowls were attested in evidence 6 sector f by one small fragment and may be regarded as part of the slight disturbance of the fill in antiquity (cf. the field report in this ADAJ volume).The cooking pot (no. 96) showed no signs of use over an open fire. It contained an extremely fine ash which was sampled and analysed under microscope.¹³ Micro-flotation showed that the ash consisted of a very finely “grinded-looking” ash mix containing many traces of water dissolvable salt sorts, gypsum crystals and very small charcoal particles.

A cooking pot (cat. no. 97)was found lying in ev. 16. It had a few traces of fire on the interior of the lower part of the vessel. The gritty ware had been fired dark brownish-black on the exterior. A tile/brick of the same type as in cat.no. 135 was found in association with the pot and is likely tooriginally have covered it. Part of the missing rim and one handle were located in ev. 13 and body sherds of similar type were found in ev. 19.The pot was almost completely filled with a mix of soil and ash. The fill in the pot was divided into top and bottom filling and sampled. The top filling sample showed traces of salt sorts, ashes including ash lumps as well as pieces of charcoal measuring from 0.1 to 0.5 cm in diameter. The bottom filling sample did not contain as much ash as the top filling. The charcoal pieces were smaller and only measured up to 0.1 cm. The bottom filling, however, contained bone fragments, one of which was diagnostic and turned out to be a toe-bone of an adult goat or sheep. The bone fragment had not been exposed to fire.¹⁴

The bi-ansulate cooking pot (cat. no. 98)is of the similar shape as cat. no. 97 and shows clear

signs of use over open fireon both the interior and exterior surfaces.The pot contained ashes. The analyses showed that the ash consisted of very rounded/worn small particles, charcoal pieces, pieces of lime stone and/or plaster.¹⁵ The few bone fragments in the pot wereidentified as bird and sheep/goat bones. The fill also contained 2 fragments of glass with traces of soot resemblingthe glass fragments with similar traces in ev.19 and likewise inside the pot a few pieces of joining body fragments of a ribbed amphora fired dark brown were found. The cooking pot was covered by a fragmentof a brick ortile (cat. no. 135). The same type of brick/tile was also found in the ancient fill.¹⁶

The globular ribbed bi-ansulate cooking pot shape was in use for a long period and 2nd-3rd century AD cooking pot rims from e.g. Petra and Roman-Byzantine specimens from Tall Zar‘a have some of the same qualities.¹⁷ Parallels to these pots are also found in the local Late Byzantine material from the Macellum in Jarash.¹⁸ 14C dates of charcoal from the two pots in ev. 19 however gave dates securely placed in the 3rd century AD.¹⁹ They underline the fact that these cooking pot types were in use for centuries and only changed very little over time and that a refined typology is difficult to achieve.

In ev. 19 below the deposited pots a range of objects were recovered. A Nabataean coin (Rabbel II) and an ESA rim are the most ancient finds from this evidence while an ARS body sherd and a red slipped ARS form 50 type A or B rim (cat. no. 8) seem to comprise the youngest. Fragments of awheelmade lid of an incense burner decorated with inciseddecoration cutin a triangular pattern (cat. no. 56) was also found. Comparanda to the decoration and shape of this piece have been found and indicate a Roman/ Byzantine date.²⁰ Pieces of pale yellowish-red occasionally self-slipped wares were also found in this evidence. A fragmented miniature altar

13. Lichtenberger and Raja (in press).

14. Both top and bottom filling samples were magnified from 7 to 70 times under microscope. On average the samples was magnified between 20 and 30 times.

15. Magnified from 7 to 70 times under microscope. On average the sample was magnified between 20 and 30 times.

16. The upper part of the ancient fill consists of ev. 6, 7, 8 and 10. Parts of these evidences may be disturbed and mixed with the modern fill. Evidences 13, 16, 19 and

25 are surely undisturbed as well as the lower parts of the ancient fill.

17. Gerber 2005, Fig. 1; Kenkel 2012, Taf. 24 KT12.

18. Uscatescu 1996, fig. 83, no. 510.

19. Lichtenberger and Raja (in press).

20. Bonifay 2004, fig. 168, p. 301 (2.3.9) (7th century AD); Saller 1957, pl. 124.5; Pinard 1952 for Byzantine examples from Carthage. Further examples include: inv. no. 74.105, Museum of Art and Archaeology, University of Missouri.

(cat. no. 165) and a fragmented trefoil rim jug were also located in ev. 19 (cat. no. 78). The nature of the ev. 19 was somewhat mixed in respect to the range of datable objects and the youngest datable objects seem to stem from the later Roman period. Under the fill (ev. 19) the floor of the room was reached (ev. 22). On the floor body, handle and base fragments of a large hand-made pithos with a slightly pointed base were located (cat. nos. 118-119). The rim of the pithos was not recovered in the trench. On the floor a rather well preserved wheel thrown casserole with cut-off rim, mottled surface and a horizontal handle was also found (cat. no. 90). The cut-off rim is attested from the Roman period onwards.²¹ Parallels are found in Pella and Jarash and date to the Late Byzantine through early Umayyad periods but it cannot be excluded that cat. no. 90 dates from an earlier phase.²² A small trefoil rim jug with a mottled surface and a side handle were also found on the floor (cat. no. 79). The low frequency of well dated fine wares or other closely dated objects as well as the nature of the lower levels seem to prevent a more precise date for these evidences, but a date later than the later Roman period can be ruled out on the basis of the 14C-dates.

Relevant objects for the dating of the stratigraphy of trench A are the objects lying on the floor, which ante-date the filling in of the room. These include the casserole (cat. no. 90) and the jug (cat. no. 79). The identifiable shapes have broad dating frames. Thus they do not deliver conclusive evidence for the date of the abandonment of the room. Therefore the most important dates remain the 14C dates from the charcoal of the cooking pots, hinting at a backfill of the room before AD 300.

This is also supported by the absence of Jarash Bowls, Jarash lamps and Grey ware (only one intrusion) and the appearance of paler plain wares within the lower fill layers of trench A. This indicates a date of the deposits prior to the invention of these typical wares in Jarash during the Byzantine period. The joined cooking pot fragments of cat. nos. 96 and 97 indicate some disturbance of the upper part of the deposits of these particular pots but the fill of the rock cut

room as well as the deposition of the cooking pots seem to have happened at the same time.

General Characteristics of Trench B

The amount of material unearthed in trench B was exceptionally high and quite homogenous. Throughout the layers Jarash Bowls (6th – 7th century AD, cat. no. 11 – 27 and 29 – 33) and Jarash lamps (Late Byzantine-Umayyad, cat. nos. 50 – 53) were found mixed with large amounts of common household wares of primarily the Late Byzantine-Umayyad period. Interrelations between the strata were found within the pottery repertoire as several joins could be made between sherds from different evidences of the same fill. This underlines the fact that these portions of the fill belong together. Amphora sherds from ev. 30 and ev. 31 seemed also to be from the same vessel found in ev. 32, however, no direct joins were made. Between ev. 35 and ev. 42 joining sherds were likewise observed and the Jarash Bowl with a human figure (cat. no. 11) was equally made up from sherds found in ev. 42 and ev. 46. Fragments from a decorated Jarash Bowl were found scattered in ev. 50 and 55 (cat. no. 20), just as joining Jarash Bowl sherds were found in ev. 2, ev. 52 and ev. 54 (cat. no. 19). Furthermore, joins were made between ev. 56 and ev. 62.

Due to the large amount of pottery processed during the campaign little time was available to join more pottery. The majority of the assemblages – Byzantine-Umayyad period – was mixed with a smaller amount of Roman Red Slipped wares and later Mamluk pottery. In trench B HMGPW of the Ayyubid/Mamluk period was found in at least ev. 2, 4 (cat. no. 37), 7, 12, 22, 25 and 28. These Mamluk pieces stem from later intrusions (a part from ev. 4 which is a debris from a house), which do not have anything to do with the original oil press installation.

Roman red slipped pottery wares (cat. no. 3 and 5) were located in several evidences but clearly always only indicate the mixed contents of the strata and predate the remaining pottery in the contexts. They occur in small numbers and are generally covered in more lime and were more worn than the remaining fill.

21. Homés-Fredericq and Franken 1986.

22. McNicoll *et al.* 1992, pl. 98 no. 9; Uscatescu 1996,

fig. 73 no. 387.

In ev. 34 large parts of a bi-ansulateribbed cooking pot with strap handles attached at the rim and a rounded base were found (cat. no. 99). The ware was not uncommon in trench B but the larger parts of the material in the trench stems from storage vessels (basins, amphorae, jugs, jars). The pot showed traces of use over open fire and was thus in use prior to its deposition. The same holds true for bases of cooking pots located in ev. 42, ev. 43 and ev. 46.

In ev. 28 a shift within the plain reddish ware could be observed. There is a tendency towards a lighter yellowish red ware with a buff self-slipped surface on the exterior (cf. above). The evidence did, however, still contain among other finds of the Byzantine period such as Jarash Bowls and Grey ware as well as HMGPW of the Ayyubid-Mamluk period.

The general picture in trench B indicates a rather homogenous and contemporary dump consisting largely of a repertoire of storage and transport vessels from the Late Byzantine and partly Umayyad periods. The characteristic Abbasid pottery with the *Kerbschnitt*-decoration or the easily recognizable Umayyad-Abbasid-channel-nozzle²³ lamp types were not found in the trench. The many joints made between the evidences furthermore point to a more or less contemporary non-modern dump.

The material dating the fill of the trench stems from a period in which a distinction between Late Byzantine and Umayyad material culture is difficult. Further study of the material is necessary and for now we must accept a preliminary date in the 7th century AD. The relevant object for the dating of the latest use of the oil press is a 7th century AD bottle/jug base (cat. no. 112).

General Characteristics of Trench C

Trench C generally presented a much lower quantity of finds than trench B. The find assemblages consisted of rather small ceramic sherds covered in lime crust, which were in a much worn state. An exception to this general trend was ev. 32, which seemed to consist of a Late Byzantine to early Umayyad assemblage. This was better preserved than the remaining material and comparable to the material in trench B.

Further more the assemblage seemed older than the general backfill in the cistern. The backfill in the cistern (ev. 42, ev. 50, ev. 52, ev. 53) counted a Late Hellenistic Black Glazed fragment probably of a fish plate (cat. no. 1), which is the earliest datable ceramic find from the 2012 campaign. The youngest material was made up by several pieces of HMGPW pottery (cat. no. 36 and 38 – 44, cf. also cat. no. 131 – 134 for unpainted specimens). Trench C presented the highest frequency of Ayyubid/Mamluk pottery found during the 2012 campaign and the fill of the cistern seems to have been undertaken during the Ayyubid-Mamluk period.

In ev. 40 a coin with Arabic letters was found which might date to the 7th or 8th century AD (cf. field report, trench C in this *ADAJ* volume). A fragment of a large plate or bowl of a red slipped type resembles African Red Slip form 93 type A dating between the 5th to the 7th century AD (cat. no. 10) was further more located within this assemblage and attests to the nature of this fill.

An almost complete Byzantine glass bottle (cat. no. 144) was found in a natural hollow which was sealed before the construction of the cistern. The relation to other structures in the trench could not be established.

In general trench C did not yield a high number of finds and the finds were rather fragmented and worn and made up of a rather mixed assemblage and did not present the same homogeneity within the material as seen in trench B. The ceramic picture from the trench thus matches the more complex situation presented through the complex phases of use within the trench. We were, however, able to make a join between the ev. 1 and 52 situated within the cistern (cat. no. 38 of the late Ayyubid- early Mamluk period), which underlines that this is an ancient fill, perhaps dating to the late Ayyubid- early Mamluk period and containing older material.

The most important objects for the dating of the stratigraphy in trench C are a 7th or early 8th century AD coin and a contemporary cooking pot (cat. no. 100) which are the terminus ante quem for the earliest structures in trench C. The latest objects in the fill of the cistern stem from the Ayyubid-Mamluk period (cat. no. 36, 38 – 44, 131 – 134).

23. Magness 1993, form 4 and 5, pp. 255-259.

Ware Groups

Fine Wares

In general the red slipped wares of Roman and Late Roman date were quite worn and covered in lime crust; this goes especially for the specimens from trench B. This stands in contrast to the plain wares of trench B pointing to the conclusion that the fine wares were re-deposited in the trench, as mentioned above. Within the material we were able to discern a single piece of Hellenistic Black Glazed pottery (cat. no. 1) stemming from a mixed evidence in trench C, which also contained other wares including HMGPW of the Ayyubid/Mamluk period. The Roman red slipped wares from the three trenches count Eastern Sigillata A (ESA) (cat. no. 2), African Red Slip (ARS) (cat. nos. 3-4), Late Roman C/Phocean Red Slip (LRC) (cat. nos. 5-6), Cypriot Red Slip (CRS)/Late Roman D (LRD) (cat. no. 7)²⁴ and presumably local red slipped wares (cat. nos. 8-10).

The majority of the Jarash Bowls was found in trench B. A few sherds were also located in trench C but none were found in trench A. The quality of the ware differs in the degree to which the clay was settled, the hardness of the firing and the quality of the decoration. Most examples have painted decoration but a specimen from trench C has stamped decoration (cat. no. 28).

The HMGPW of the Ayyubid-Mamluk periods was primarily found in trench C. In this trench a few Islamic glazed ware pieces were also found (cat. no. 35). Trench A did not present any diagnostic Mamluk sherds and the amount was sparse in trench B, but present, as mentioned above.

Jarash Bowls

The main typological study of the Jarash Bowls remains Watson's 1989 study in which among other details two fabric types are described – a finer and slightly coarser version of the same ware.²⁵ According to Uscatescu²⁶ three different ware groups were found within the Macellum assemblage of Jarash Bowls: α, β and γ. The Jarash Bowls seem to begin in the Byzantine period and continue into the early Umayyad period. The Jarash Bowls of the 2012 campaign in the Northwest quarter primarily derived from trench B. A few specimens stem from trench C. Most of the bowls from the Northwest quarter 2012 have painted decoration with the figures outlined in red and filled-in with white.

The degree of detail varies just as the quality of the designs does. A few stamped pieces were also encountered. The ware is characterised by a finely levigated clay – occasionally rather fine with small lime inclusions which at times have “erupted” on the surface of the bowl creating small perforations of the thin slip (which can be observed on the interior surface) or smoothed surface. At times the settling of the clay makes the fabric flaky. The bowls are all wheel thrown and have been hard fired occasionally with a sandwich core. The colours of the decoration vary slightly in hues. On the Munsell charts the reddish paint in use for the outlines vary between 10R 3/3 (dusky red) and 2.5YR 4/3-4/4 (reddish brown) while the fill-in colour often is thin which makes the colour of the clay corrupt the white – ranging between 2.5YR 8/1 (white) 8/2 (pinkish white), 5YR 8/3 (pink) and 7.5YR 8/2 (pinkish white). The colour of the clay core is mostly found between 2.5YR 6/6 – 6/8 and 5/8 (light red and red). Darker decorative bands may occur along with darker fired clay 5Y 5/1 (grey) and on occasion the exterior of the bowls are mottled by the firing process. The ware found during the 2012 campaign finds comparable in Watson Ware L and Uscatescu's α.²⁷

Handmade Geometric Painted Ware (HMGPW)

The HMGPW pottery is a hard-medium fired coarse ware of a rather sandy clay with many lime inclusions and tiny pebbles as well as quartz and red-brown inclusions. The paint is thick, matt and rather flaking.²⁸ The vessels are decorated with geometric patterns in black/grey and reddish or yellowish. The shapes encountered are larger bowls and jugs. The open shapes are decorated both on the inside and the outside. The production period of this type of pottery went through the Ayyubid and Mamluk periods termed Middle Islamic II by Walker. A distinction of a chronological sequence within these periods is still debated.²⁹

Plain Household and Storage Wares

During the 2012 campaign we operated with several plain ware fabrics. However, the material was heavily dominated by the reduced Grey ware and the oxidated Reddish wares. The form repertoire used for these wares vary but both wares were used for the bag shaped amphorae with horizontal ribs covering the body.

24. The term Late Roman D seem more appropriate and should replace the term CRS after a production site was found in Sounter Turkey in the Gebiz region (Jackson *et al.* 2012).

25. Watson 1989: 226-27.

26. Uscatescu 1996: 46.

27. Watson 1989: 242; Uscatescu 1996: 46.

28. Cf. Johns 1998, 66 for the introduction of the terminology.

29. Walker 2012: 546.

Grey Ware

The Grey ware found during the 2012 campaign is hard fired with the use of reduction firing. The ware is fired crisp and breaks in clean flakes. In general it is well-settled with occasional larger air pockets in the thick-walled basins and the levigation is medium to fine with few visible inclusions. On the surface of the pots medium sized lime particles may occur. The colour of the clay varies from dark to light grey (GLEY1 4/N - GLEY1 6/N). The vessels produced are primarily handmade conical basins with flat bases attached wheel-made folded over rims (cat. nos. 103-108) and wheel-thrown amphorae with characteristic horizontal ridges (cat. nos. 127-129). Pithoi and tiles are also fired grey in the same manner (cat. nos. 120, 136-137) as well as lamps (cat. nos. 50-51) and appliqués (cat. no. 142). The ware and the firing method were in general not used for the smaller vessels. The Grey ware corresponds to Watson Ware D, Uscatescu ζ and η, Clark *et al.* Ware A and refuse from the reduction kiln in the North Theatre.³⁰

Reddish/Red Brown Ware

This group of pottery has for the time being not been sub-grouped but counts a large variety of shapes and hues. The inclusions in the clay of this ware are identical to the Grey ware, the only difference being that it was fired red, has many white lime grits and is most often covered by a reddish wash. Occasionally the core or surface of the ware is fired dark. The shapes made of this ware were many and include: Cooking pots, casseroles, plates, cups, stemmed goblets, jugs, jars, and larger ridged amphorae of a similar type as seen in the Grey ware. The ware was in use for a long period and over time became more light red and often covered in a whitish wash or self-slip as described by Homes-Frederic and Franken.³¹ In the Islamic period this ware was furthermore occasionally painted with white or yellowish-white paint (cf. cat. nos. 86 and 92). The ware corresponds to Watson's Ware A, and C, Uscatescu's type δ, Clark *et al.* Ware C and material from the oxidation firing kiln in the North Theatre.³² During the coming campaigns a further refinement of the Reddish/Red Brown ware typology will be undertaken.

Other Waretypes

The two general waretypes, the Grey ware and the Reddish/Red Brown ware, described above were predominant in the material stem-

ming from all three trenches. However, other ware types were also represented such as the yellowish sandy and soft fabric primarily used for amphorae. Further investigations will show if more of the wares found in the Northwest quarter may relate directly to Watson's typology of wares of the 5th to 8th centuries AD and Uscatescu's typology³³ or whether the Northwest quarter produces a different set of data.

Other Finds

A few smaller terracotta shaves have been catalogued one of which is a small mould made head of Roman 2nd century AD date (cat. no. 139). Apart from the ceramic material from the campaign a Neolithic chipped stone tool (cat. no. 157) was found in a secondary deposit within trench B. The tool is by far the oldest object retrieved during the 2012 campaign. It seems to have been re-deposited through filling of this area. A few bone objects, spindle whorls, metal objects and few very fragmented glass fragments of primarily Byzantine date as well as an almost intact Byzantine glass bottle (cat. no. 144) were also found. Furthermore, larger architectural spolia such as the large architectural monumental element reused in the oil press in trench B were found (cf. the field report in this ADAJ volume). Most of the other architectural elements were found dumped in the fill of trench C.

In addition 64 coins were unearthed and will, as mentioned above, be dealt with in the 2013 report.

Conclusion

The three trenches (A-C) of the 2012 campaign and the assemblages found within them attest to a beginning of the settlement in these areas in the Roman period at the earliest. They also emphasise the flourishing local pottery production of household wares from the Byzantine and Umayyad periods. This gives an overall impression of a very homogenous assemblage evident in the dump of trench B. In trench A the finds of the upper evidences were heavily disturbed but the material from the ancient periods date to the late Roman – early Byzantine period. Trench C revealed among other contexts a late dump within the cistern which possibly dates to the Ayyubid-Mamluk period. In general the material gives the impression that there may be a gap in material evidence in the area between the Umayyad and Ayyubid-Mamluk periods.

30. Watson 1992: 237; Uscatescu 1996: 46; Clark *et al.* 1986: 249-250; Schaefer 1986: 425-429.

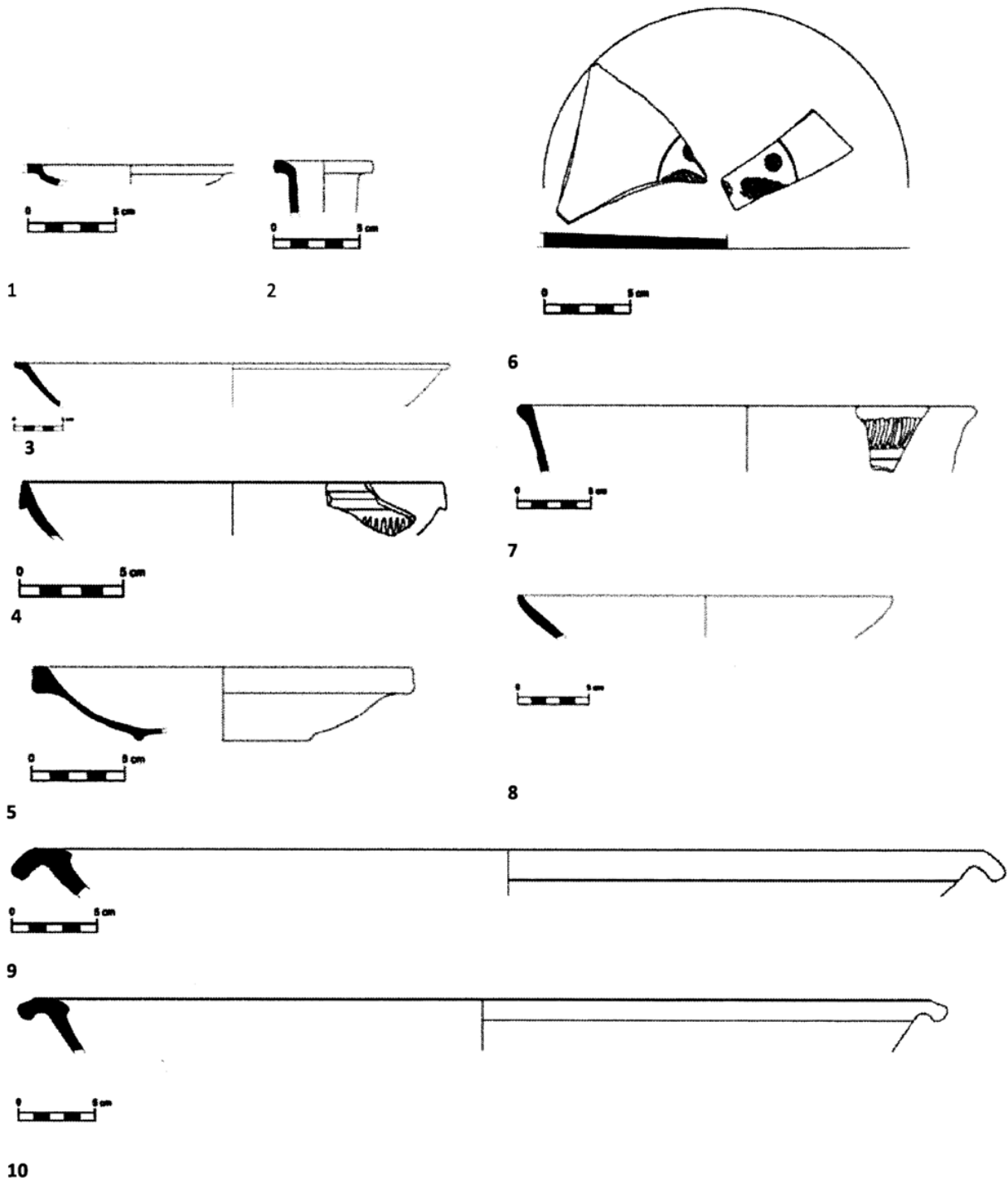
31. Homes-Frederic and Franken 1986.

32. Watson 1992: 235-237 (and shapes from Ware B);

Uscatescu 1996: 46; Clark *et al.* 1986: 251; Schaefer 1986: 429-435.

33. Watson 1992; Uscatescu 1996: 46.

Fine Wares



Catalogue

The drawings of the catalogued objects were produced by architect Jens Christian Pinborg, archaeology students Dorothea Csitneki, Signe Krag and Signe Bruun Kristensen. They were prepared for publication by Signe Bruun Kristensen.

Arrangement of catalogue:

Inventory number

Title

Figure/Illustration

Measurements (in cm)

Munsell (when not described in the described ware groups)

Description (incl. material)

References

Date

Catalogue abbreviations:

ext: exterior

H: Height

int: interior

L: Length

T: Thickness

W: Width

All measurements are given in cm.

Catalogue Authors:

AHS – Annette Højten Sørensen

AR – Anne Riedel

DC – Dorothea Csitneki

DMH – Ditte Maria Damgaard Hiort

EG – Eicke Granser

SBK – Signe Bürsen Koch

SBr – Signe Bruun Kristensen

SKr – Signe Krag

Catalogue

Danish-German Jarash Northwest Quarter Project 2012

Fine Wares

Hellenistic Black Glaze (DMH; AHS)

1.

J12-Cc-42-20

Body, fragmented.

Fig. 1.

Munsell: core: 7.5YR 6/4; int.: GLEY 1 2.5/N; ext.: GLEY 1 2.5/N; slip: GLEY 1 2.5/N.

Diam.: (int.) 10; H.: 1.2; L.: 2.8; T.: 0.2.

Small, shallow bowl or fish plate; finely levigated; flat outwards curving rim; slipped throughout.

References: Crowfoot (1957), fig. 54 no. 11.

Late Hellenistic (2nd - 1st century BC).

Eastern Sigillata A (DMH)

2.

J12-Ab-1-124

Rim, fragmented.

Fig. 2.

Munsell: core: 5YR 6/6; int.: 5YR 6/6; ext.: 5YR 6/6; slip: 10R 4/8.

Diam. (rim): 5.5; H.: 2.95; L.: 3.7; T. (rim): 0.65; T. (body): 0.41.

Closed shape (jug) with outward curving rim; finely levigated; sporadic/few small lime inclusions; slipped throughout.

References: Slane 1997, pl. 25, TA Type 36 no. FW 291; Uscatescu (1996a), fig. 37.3.

Early Roman (1st century BC - 1st century AD).

African Red Slip (DMH; AHS)

3.

J12-B-2-358

Rim, fragmented.

Fig. 3.

Munsell: slip: 10R 5/8.

Diam. (rim): 44; H.: 4.2; L.: 7.7; T. (rim): 0.5; T. (body): 0.5.

Dish/bowl; Medium/finely levigated, lime inclusions on the int. surface; flat outwards curving rim; thick reddish slip throughout. Similar to Hayes form 32, however diam. larger.

References: Hayes (1972), Form 32; Gunneweg *et al.* 1983, Fig. 19, no. Jers 83.

Roman (1st half of 3rd century AD).

4.

J12-Cdb-35-10

Rim, fragmented.

Fig. 4.

Munsell: core: 10R 6/6; int.: 10R 6/6; ext.: 10R 6/6; Slip: 10R 6/6.

Diam.: 24; H.: 2.3; L.: 4.6; T. (rim): 0.6; T. (body): 0.3.

Bowl; finely levigated with some lime inclusions; slipped throughout;

References: Hayes (1972), Form 84.

Early Byzantine (AD 440-500).

Late Roman C/Phocaeen Red Slip (DMH; DC; AHS)

5.

J12-B-2-359 + Bc-33-15-20 (non-joining sherd B-2-360).

Rim and base, fragmented.

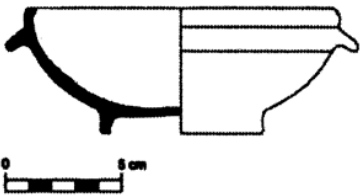
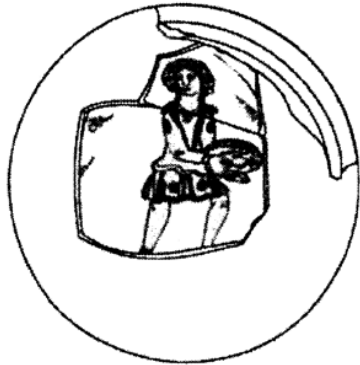
Fig. 5.

Munsell: core: 7.5YR 8/6; int. surface: 10R 5/6; ext.: 10R 5/6; Slip: 10R 5/8.

Diam. (rim): 20; H.: 3.9; T. (body): 0.2; T. (body): 0.1.

Bowl; finely levigated w. few larger lime inclusion on the exterior of rim; slipped throughout.

References: Hayes (1972), Form 3G; Hayes (1996), fig.



11a



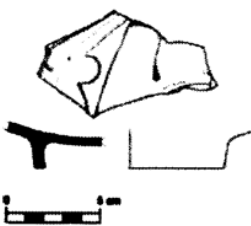
12



13



14



15



11b



16



17

92, no. 3; Vaag (1999), pl. 11, fig. 6; pl. 12, fig. 2; pl. 13, fig. 1.

Byzantine (5th - 6th century AD).

6.

J12-Cd-37-6-7

Body, fragmented, two fragments not joining.

Fig. 6.

Diam: 21.2; L.: 7.7; T.: max: 0.8, min: 0.5.

Munsell: core: 5YR 7/6, Slip: int.: 5YR 7/6, ext.: 2.5YR 6/6.

Large plate; hard-fired and finely levigated. Stamped decoration: leaves and circles at the centre.

References: Hayes (1972), LRC Form 2, Type B.

Early Byzantine (AD 425-450).

Cypriot Red Slip/Late Roman D (DMH)

7.

J12-Cd-37-9

Rim, fragmented.

Fig. 7.

Munsell: core: 2.5YR 5/8; Slip: int.: 2.5Y 6/6; ext.: 2.5YR 6/6.

Diam.: 30; H.: 4.4; L.: 5.1; T. (rim): 1; T. (body): 0.5.

Larger open shape (bowl); slightly outwards curving, flat rim; slipped throughout; fine-medium levigated with frequent small lime inclusions.

References: Sodini and Villeneuve (1992), fig. 10, no. 5.

Byzantine (5th - 7th century AD).

Other red slipped fine wares (DMDH; AHS)

8.

J12-Ae-19-18

Rim, fragmented.

Fig. 8.

Munsell: core: 10R 6/8; ext.: 10R 6/8; Slip: int.: 10R 6/8.

Diam. (rim): 26; H.: 2.9; L.: 6.8; T. (rim): 0.4; T. (body): 0.6.

Open shape, bowl or dish; finely levigated with small lime inclusions.

References: Hayes (1972), ARS form 50 type B or crude version of type A.

Roman - early Byzantine (c. AD 230-400).

9.

J12-C-1-57

Rim, fragmented.

Fig. 9.

Munsell: core: 2.5YR 7/6; ext.: 2.5YR 7/6; Slip: int.: 2.5YR 5/8.

Diam.: 60; H.: 3.3; L.: 10.5; T. (rim): 0.6.

Large open shape, bowl with rounded outwards curving rim; rather finely levigated with some lime and quartz inclusions, furthermore red, brown and black inclusions; slipped int. and on rim.

References: Hayes (1972), ARS Form 93 type A.

Byzantine (5th - 7th century AD).

10.

J12-Cc-40-4

Rim, fragmented.

Fig. 10.

Munsell: core (double): 2.5YR 7/1 and 2.5YR 6/8; int.: 10R 5/8; ext.: 2.5YR 6/8; Slip: 10R 5/8.

Diam.: 55; H.: 2.65; L.: 11.7; T. (rim): 1.15; T. (body): 0.75.

Large open shape, bowl; finely levigated with frequent small lime inclusions, visible through the slip; partly rounded outwards curving rim; slipped on the int. and rim.

References: Hayes (1972), ARS Form 93 type A.

Byzantine (5th - 7th century AD).

Jarash Bowls (DC; AHS)

Painted decoration

Rims

11.

J12-Bc-42-16+17 and Ba-46-12 (+ non joining fragment J12-Bc-42-15)

Rim and ring base, fragmented.

Fig. 11a-b.

Diam. (rim): 12.6, (base): 6; H: 1.6; L: 7.4; T. wall: 0.1.

Deco: Standing male figure holding a stemmed plate.

Stylized floral pattern surrounds the personage.

References: Profile rim: Watson (1989), fig. 2a, Form 20a;

deco.: Uscatescu (1995), p. 399, pl. 17, no. 25.

Last 3rd of 6th – early 7th century AD.

12.

J12-Bd-69-2 and Bd-70-3

Rim and ring base, fragmented.

Fig. 12.

Diam.: 26; H.: 3.4; L.: 8.1; T.: 0.3; W. (rim): 0.9.

Deco.: Dark concentric bands; figure at centre. (Deco. not shown on drawing).

References: Rim shape: Watson (1989), p. 225, fig. 1, type 7f; base shape: Uscatescu (1996), p. 335, fig. 65 no. 302.

6th - 7th century AD.

13.

J12-Bb-60-2

Rim, fragmented.

Fig. 13.

Diam.: 32; H.: 3.2; L.: 13.1; T.: 0.3; W. (rim): 1.

Deco: Floral elements, stylized grapes or leaves. (Deco. not shown on drawing).

References: Rim shape: Watson (1989), p. 225 fig. 1, form 7c; deco: Watson (1989), type Va,b; Uscatescu (1996), p.

297, fig. 27, no. 28g.

6th - 7th century AD.

14.

J12-Bb-61-1

Rim, fragmented.

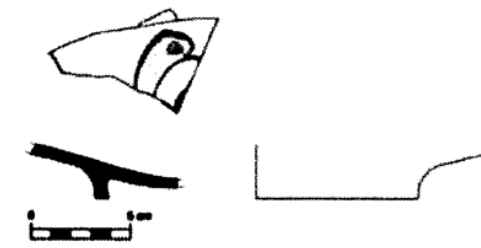
Fig. 14.

Diam.: 30; H.: 3; L.: 8.6; T.: 0.3; W. (rim): 2.4.

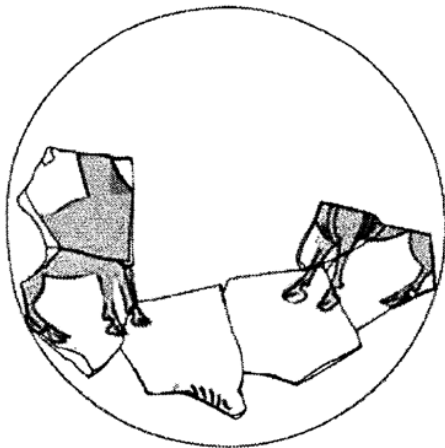
Deco.: Few traces, indiscernible motif. (Deco not shown on drawing).

References: Watson (1989), p. 225, fig. 1, between type 12c and e.

6th - 7th century AD.



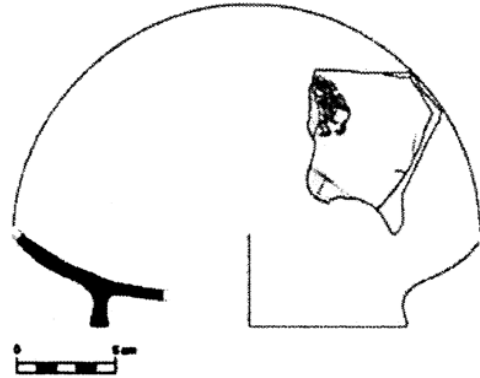
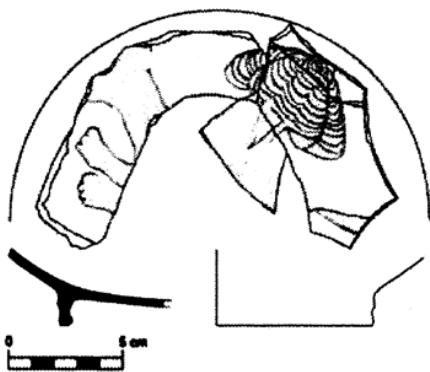
18



19



20



21



22



23



24



25



26



27

2

Ring bases

15.

J12-B-2-1262

Ring base, fragmented.

Fig. 15.

Diam.: 10; H.: 2; L.: 9.4; T.: 0.3.

Deco.: Part of an animal and trefoil leaf (?).

References: Base shape: Watson (1989), p. 251, fig. 14, no. 4; Uscatescu (1996), p. 332, fig. 62 no. 263.

7th century AD.

16.

J12-B-10-18+23+25-27

Ring base, fragmented.

Fig.: 16.

Diam.: 15; H.: 2.7; L.: 5.3; T.: 0.4.

Deco: Rooster. Behind the legs of the rooster a small tree-branch is visible.

References: Deco.: Watson (1989), p. 247, fig. 11, no. 3 and 5; Uscatescu (1995), p. 397, pl. 15, no.10.

6th - 7th century AD.

17.

J12-B-10-28

Ring base, fragmented.

Fig. 17.

Diam.: 14; H.: 1.9; L.: 12.3; T.: 0.2.

Deco.: Body and legs of a feline.

Base ring broken off.

References: Deco: Watson (1989), type IXa, p. 248, fig. 12, no. 4; Uscatescu (1995), p. 398, pl. 16, no. 16; Kehrborg (2009), p. 501, pl. 6, no. JH632.

6th - 7th century AD.

18.

J12-Bc-30-12

Ring base, fragmented.

Fig. 18.

Diam.: 16; H: 2.7; L: 8.6; T. (base): 0.6; T. (body): 0.5.

Deco.: head of a bird (ostrich).

References: Base: Uscatescu (1996), p. 319, fig. 49 no. 164, p. 325, fig. 55 no. 203; deco: Watson (1989), p. 247, fig. 11, no. 1 and 2; Uscatescu (1995), p. 398, pl. 16, no. 13 and 14; Uscatescu (1996a), fig. 27, no. 29g.

6th - 7th century AD.

19.

J12-Ba-52-1-2 and B-2-122, 1195-1196 and Bac-54-32

Ring base, fragmented.

Fig. 19.

Diam.: 20; H.: 1.9; L.: 10.2; T.: 0.4.

Deco.: Two hoofed animals (perhaps goats or camels) are facing each other, their heads are missing. Below the animals a fragmented grape or leaf is visible.

Base ring broken off.

References: Deco: Watson (1989), p. 248, fig. 12, no. 10 and 11; Uscatescu (1995), p. 398, pl. 16, no.19.

6th - 7th century AD.

20.

J12-Ba-55-1 and Ba-50-13+21-24

Ring base, fragmented.

Fig. 20.

Diam.: 13.65; H.: 3.34.

Deco: Two paws of a feline and a stylized tree.

References: Base: Uscatescu (1996), p. 327, fig. 57 no. 222; deco: Watson (1989), p. 248, fig. 12 no. 4, feline: Type IXa and tree: p. 251 fig. 14, no. 2 (Trees are not part of Watsons typology).

6th - 7th century AD.

21.

J12-Bd-69-3

Ring base, fragmented.

Fig. 21.

Diam. (base): 14; H.: 3.9; L.: 8.7; T.: 0.4.

Deco: Parts of human head with curly hair.

References: Deco.: Watson (1989), p. 246, fig. 10, no. 10; Kehrborg (2009), p. 501, pl. 6, no. JH635.

6th - 7th century AD.

Body

22.

J12-B-2-503

Body, fragmented.

Fig. 22.

L.: 11.6; H.: 4.7; T.: 0.6.

Deco.: Leaf or wing.

References: Uscatescu (1995), p. 401, pl. 19, no. 42.

1st third of 6th century AD.

23.

J12-Bc-27-79

Body, fragmented.

Fig. 23.

L.: 7.6; T.: 0.6; W.: 0.8.

Deco: Two fish.

References: Watson (1989), p. 248, fig. 12, no. 1, type VIII; Uscatescu (1995), p. 398, pl. 16, no. 21.

6th - 7th century AD.

24.

J12-Bc-27-128-130

Body, fragmented.

Fig. 24.

H.: 3.5; L.: 11.4; T.: 0.2.

Deco.: Watson (1989): 'Laden basket'.

References: Watson (1989), p. 243, fig. 8, no. 1 and 2, type IV; Uscatescu (1996), p. 197, fig. 27 no. 25a; Uscatescu (1995), p. 397, pl. 15, no. 8.

6th - 7th century AD.

25.

J12-Ba-56-2 and Ba-52-3

Body, fragmented.

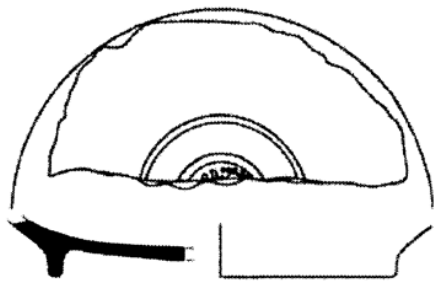
Fig. 25.

H.: 4; L.: 6.8; T.: 0.3.

Deco.: The top of a stylized tree.

References: Deco: Watson (1989), p. 251, fig.14, no. 2.

6th - 7th century AD.



28



29



30



31



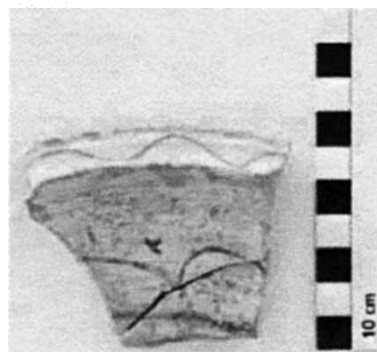
32



33



34a



34b

26.

J12-Bd-59-10

Body, fragmented.

Fig. 26.

H.: 4.2; L.: 7.2; T.: 0.1.

Deco: A foot probably wearing a sandal.

5th – 7th century AD.

27.

Bd-70-4

Body, fragmented.

Fig. 27.

H.: 6; L.: 8.9; T.: 0.4.

Deco: Trefoil with stem.

5th – 7th century AD.

Stamped decoration

28.

J12-C-2-6

Ring base, fragmented.

Fig. 28.

Diam.: 14; H.: 2.3; L.: 15.5; T.: 0.5.

Dark red slip.

Deco: Four incised concentric circles at the centre, stamped floral decoration.

References: Base shape: Uscatescu (1996), fig. 63 no. 279; deco: Uscatescu (1996), fig. 59 nos. 242-243.

7th century AD.

Undecorated

29.

J12-Bc-25-13

Rim, fragmented.

Fig. 29.

Diam.: 35; H.: 1.9; L.: 4.5; T. (body): 0.45; T. (rim): 0.8.

References: Watson (1989), p. 225, fig. 1, Type 3c.

6th – 7th century AD.

30.

J12-Bc-25-15

Rim, fragmented.

Fig. 30.

Diam.: 32; H.: 2.5; L.: 5.3; T.: 0.4; W. (rim): 0.7.

References: Watson (1989), p. 225, fig. 1, Type 7f; Uscatescu (1996), fig. 48 no. 160.

6th – 7th century AD.

31.

J12-Bc-27/28-4

Rim, fragmented.

Fig. 31.

Diam.: 28; H.: 2.9; L.: 9.6; T.: 0.3; W. (rim): 1.

References: Watson (1989), p. 225, fig. 1, no. 1b.

6th – 7th century AD.

32.

J12-Bc-43-9+10

Rim, fragmented.

Fig. 32.

Diam.: 20; H.: 2.8; L.: 8.5; T.: 0.2; W. (rim): 1.5.

Slipped int. and ext.

References: Watson (1989), p. 225, fig. 1, type 7e; Uscatescu (1996), p. 283, fig. 13 no. 10A.

6th – 7th century AD.

33.

J12-Bd-58-1

Rim and ring base, fragmented.

Fig. 33.

Diam.: 24; H.: 6.3; L.: 10; T.: 0.3; W. (rim): 1.

References: Rim shape: Watson (1989), p. 225, fig. 1, type 7e.

6th – 7th century AD.

White Painted (DMH)

34.

J12-Bd-51-6-7

Rim, fragmented.

Fig. 34a-b.

Munsell: core: 5Y 5/1; int.: 2.5Y 8/2; ext.: 2.5YR 6/6; deco.: 2.5YR 4/3; 2.5Y 2.5/1.

Diam.: 20; H.: 4.9; L.: 7.4; T. (rim): 1.7; T. (body): 0.5.

Bowl with outwards curving rim; rather finely levigated with some lime inclusions; deco.: int. and on rim: Thick white painted background. Wavy lines and small stars or flowers; ext. six deep diagonal grooves. (Deco. not shown on drawing).

References: Uscatescu (1996), fig. 32 upper right corner; Watson (1992), p. 241; fig. 11 no. 89, Walmsley *et al.* (2008), p. 130 fig. 24, no. 10; p. 131.

Byzantine (6th century AD).

Islamic Glazed ware (SBK)

35.

J12-C-1-100

Rim, fragmented.

Fig. 35a-b.

Munsell: core: 10R 5/8; wash ext.: 2.5YR 4/6.

Diam.: 30; H.: 1.7.

Open shape, bowl or plate (?). Yellow and brown glaze. (Deco. not shown on drawing).

References: Avissar and Stern (2005), I.1.6.4.

Late Ayyubid – Early Mamluk (12th– 13th century AD).

Handmade Geometric Painted Ware (HMGPW) (SBK; SB; AHS)

36.

J12-Cd-30-30

Rim and handle, fragmented.

Fig. 36.

Munsell: Not available.

Diam. rim: 26; H.: 6.25; L.: 7.3; T.: rim: 1.3; body: 1.

Bowl with broad strap handle and flattened rim. Hard fired, medium levigated with a few lime inclusions; deco.: int.: 5 reddish horizontal lines; on rim: 5 diagonal lines, ext.: Horizontal band under rim. Sloping lines at body and handle.

References: Shape: Franken and Kalsbeek (1975), p. 201, fig. 74 no. 23.

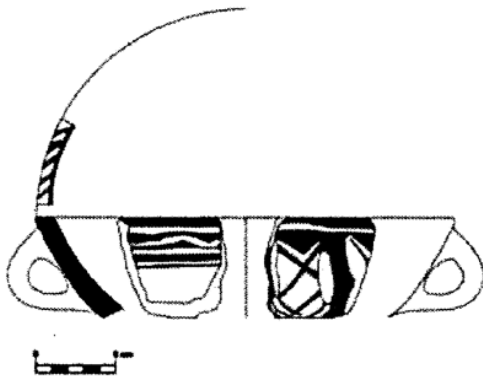
Not datable.



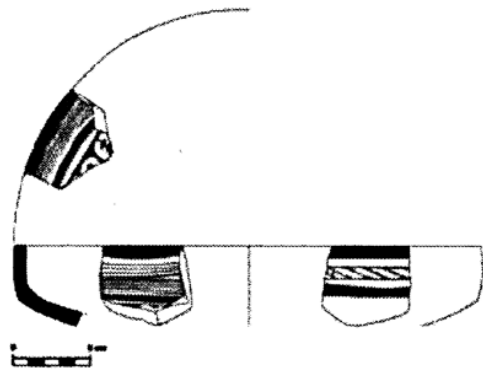
35a



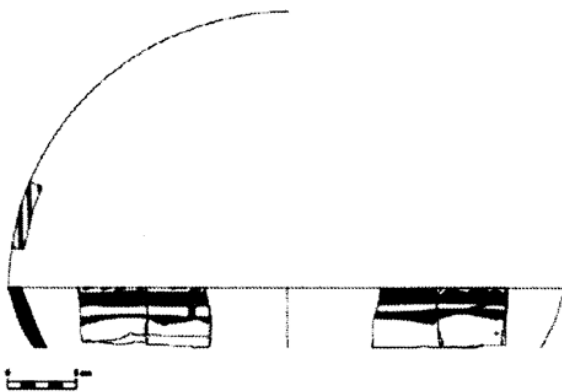
35b



36



37



38



39



40

37.

J12-B-4-5

Rim, fragmented.

Fig. 37.

Munsell: Not available.

Diam.: 30; H.: 5.2.

Bowl, with vertical sides and flattened rim.

Deco: White slip with brown horizontal lines on both int. and ext. Diagonal lines connect two horizontal lines on ext. and circular decoration replaces lines on the interior approaching the center of the bowl.

References: Shape: Walmsley (1997-98), fig. 9 no. 5; Avissar and Stern (2005), II.1.4.2 (fig. 9); Deco.: Walmsley (1997-98); fig. 9 no. 5.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

38.

J12-Cbd-1-155+Cb-52-7

Rim, fragmented.

Fig. 38.

Munsell: Not available.

Diam.: 40; H.: 4.3.

Large bowl with flattened rim; few lime and stone inclusions; deco.: Broad dark reddish lines on both ext. and int. and geometric patterns. Lines on top of rim.

References: Walmsley (1997-98), fig. 9 no. 6; Avissar and Stern (2005), II.1.4.1, fig. 2.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

39.

J12-Cc-42-25

Rim.

Fig. 39.

Munsell: Not available.

Diam.: 12; H.: 3.5.

Jug or small bowl(?). Deco: Broad band of dark paint on and around lip. Additional four narrower bands ext. Covered in lime both ext. and int.

References: Avissar and Stern (2005), II.4.4.1, fig. 4.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

40.

J12-Cd-42-14-15

Two joining pieces of rim, fragmented.

Fig. 40.

Diam.: 40; H.: 7.1.

Munsell: core: 10YR 7/4; int.: 10YR 7/4; ext.: 2.5 YR 7/6; paint: 2.5YR 3/2.

Open shape, bowl (?), with flattened rim; Lime and black inclusions; deco: broad dark line around rim. Ext.: dark triangles “hanging” from rim. Int.: horizontal lines and opposed dark triangles.

References: Walmsley (1997-98), fig. 9 no. 5.

Late Ayyubid – Mamluk (Late 12th - 14th century AD)

41.

J12-C-1-12

Handle, fragmented.

Fig. 41.

Munsell: Not available.

H.: 4.1; L.: 7.1.

Larger shape (orientation unknown); deco: Red paint on ext. surface, with two unpainted lines as decoration on handle with red dots within the lines.

References: Avissar and Stern (2005); II.4.4.1, fig. 2.4.5, II.4.4.2.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

42.

J12-C-1-114

Body, fragmented.

Fig. 42.

Munsell: core: 10YR 8/3, int.: 5YR 6/8, ext.: 10YR 8/3; deco.: 5YR 3/4.

H.: 5.8; L.: 5.9.

Unknown larger shape. Deco: ext. geometric pattern with wavy lines and simple volutes in between.

References: Deco: Avissar and Stern (2005), II.4.4.1, fig. 2.4.5; Sauer and Herr (2012) fig. 4.19.8

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

43.

J12-Cb-35-23

Handle, fragmented.

Fig. 43.

Munsell: Not available.

H.: 8.8; L.: 6.3.

Jug(?); deco: Geometric patterns in red and red brown. Diamond shapes on handle and net pattern on ext. body.

References: Shape: Arnon (2008), p. 366, type 572b, pl. XLI.2; Avissar and Stern (2005), II.4.4.1 (fig. 2.5), deco.: Avissar and Stern (2005), II.4.4.1, fig. 2.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

44.

J12-Cb-52-6+11-12

Base, fragmented.

Fig. 44.

Munsell: int.: 10YR 8/4; ext.: 5YR 7/4.

Diam.: 18; H.: 5.1.

Handmade, hollowed disc base from jug or bowl (?). Deco: One broad dark line situated on the narrowest part of the base just above the rim.

References: Shape: Avissar and Stern (2005), no. II.1.4.1 (fig. 3); II.4.4.1 (fig. 2); Walmsley (1997-98); fig 10 no. 3.

Late Ayyubid – Mamluk (Late 12th - 14th century AD).

Lamps (SKr)

45.

J12-C-1-102

Rim and handle, fragmented.

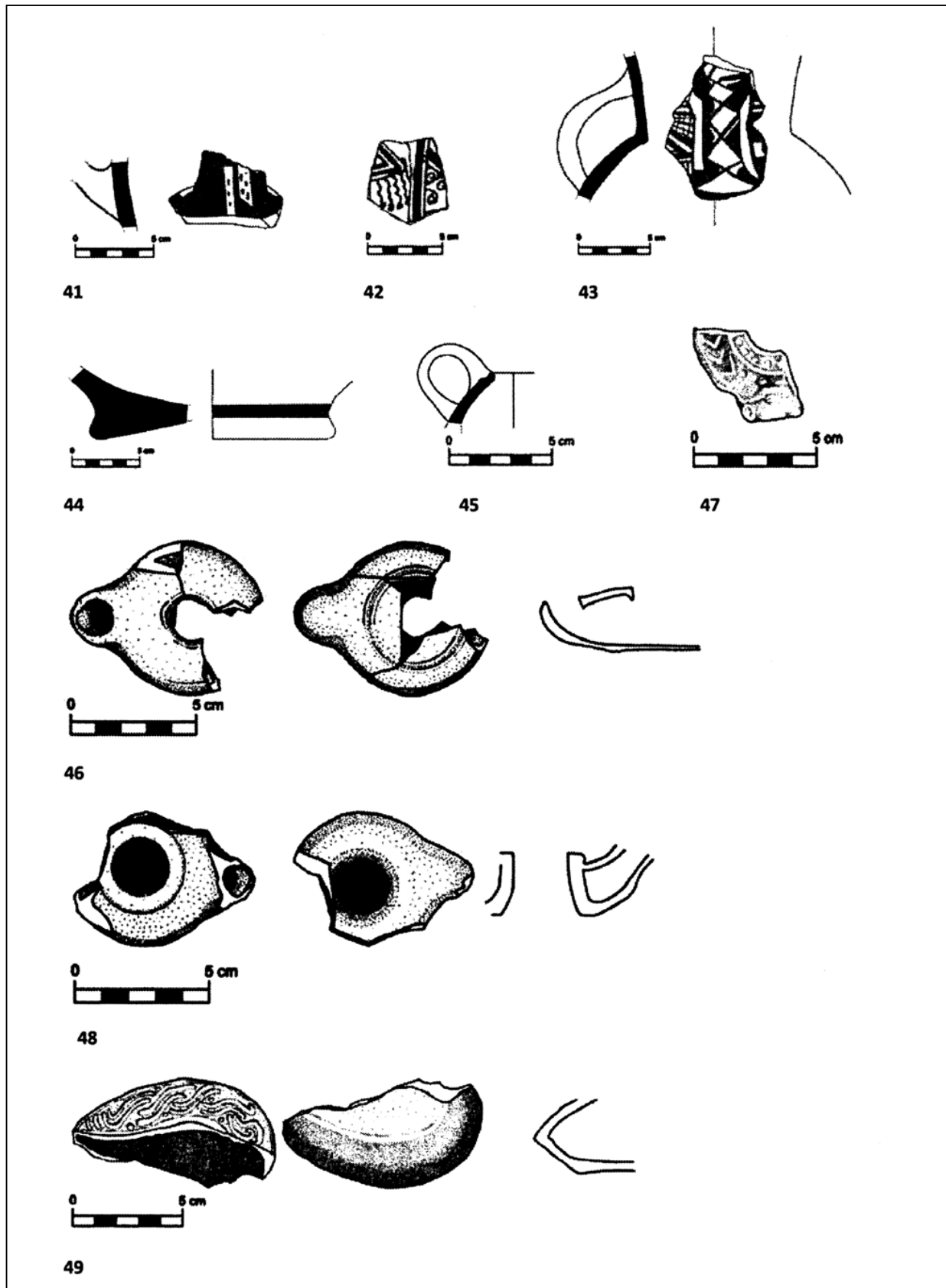
Fig. 45.

Diam. (rim): 2; H.: 2.7; L.: 2.8; T.: 0.4.

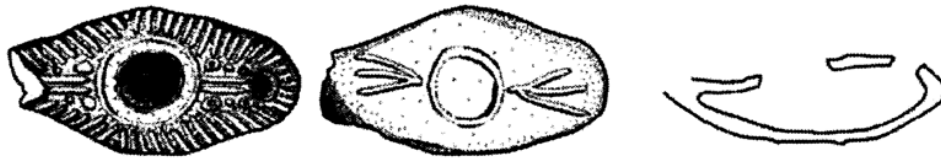
Munsell: Not available.

Possibly a lamp; wheel made; two horizontal carinated lines around the rim; one vertical carinated line on the handle.

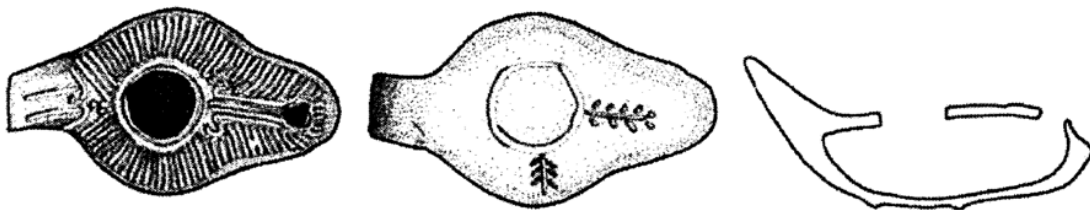
Not datable



46.
J12-Af-6-47-50
Rim, spout and base, fragmented.
Fig. 46.
H.: 2.5; L.: 7.6; T.: 0.1.
Munsell: Core: 7.5YR 6/6; int.: 5YR 7/4; ext.: 5YR 6/6; slip 2.5YR 4/4.
Moulded lamp with round body; low double ring-stand; some lime and stone inclusions; traces of red slip on the upper external surface.
References: Hadad (1997), no. 14.
Late Roman - Early Byzantine (mid-4th century AD).
47.
J12-C-2-2
Rim, handle and body.
Fig. 47.
H.: 1.8; L.: 3.9; T.: 0.6.
Munsell: Not available.
Moulded ellipse-shaped lamp; Some air pockets; deco.: Upper surface, ridges in the shape of circles, dots and pointed lines.
References: Gerber (2012), fig. 3.97.28; McNicoll *et al.* (1982), pl. 137, no. 1-5.
Late Roman - Byzantine (4th to 6th century AD).
48.
J12-Cb-53-1
Rim, base and spout, fragmented.
Fig. 48.
Diam. (rim): 3.8; H.: 2.6; L.: 6.65; T.: 0.7.
Munsell: core: 10YR 6/3; int.: 2.5YR 5/6; ext.: 2.5YR 5/6.
Moulded lamp; offset rim; Hole through the middle of the body.
References: Meriç (2002), L 1.
Probably a Late Roman or Byzantine imitation of a Late Hellenistic lamp-shape.
49.
J12-Bc-27-16
Base, fragmented.
Fig. 49.
H.: 3.7; L.: 8.8; T.: 0.5.
Munsell: core: 5YR 7/6; int.: 5YR 7/6; ext.: 5YR 7/6.
Moulded lamp with oval body; traces of use both int. and ext.; deco.: Upper ext. surface, ridges in the shape of wavy lines and dots, ridge around missing filling-hole.
References: McNicoll *et al.* (1982), pl. 140, 10; Scholl (1986), group I.
Late Byzantine (end of the 6th century AD - 1st half of the 7th century AD).
50.
J12-Bc-33-5
Almost intact.
Fig. 50.
Diam. (rim): 1.6; H.: 2.1; L.: 7.4; T.: 1.5.
Munsell: core: GLEY 1 6/10Y; int.: GLEY 1 6/10Y; ext.: GLEY 1 6/10Y.
Moulded Jarash lamp; ellipse-shaped body; deco.: Upper ext. surface, ridges in the shape of oblique and straight lines, circles and dots.
References: Scholl (1986), group II.
Late Byzantine - Umayyad (end of the 6th century AD - end of the 7th century AD).
51.
J12-Bc-42-79
Intact.
Fig. 51.
Diam. (rim): 1.9; H.: 1.7; L.: 5.2; T. (rim): 0.5.
Munsell: core: 7.5YR 6/1; int.: 7.5YR 7/4; ext.: 7.5YR 6/3.
Moulded ellipse-shaped Jarash lamp with a low ring-stand and two branches with leaves at base; traces of fire around the wick-hole; deco.: Upper ext. surface, ridges in the shape of oblique lines, straight lines, dots and curving lines.
References: Scholl (1986), group II.
Late Byzantine - Umayyad (end of the 6th - 7th century AD).
52.
J12-Bc-33-9
Rim and nozzle, fragmented.
Fig. 52.
Diam. (rim): H.: 4.4; L.: 10.6; T.: 0.4 (rim).
Munsell: core: 7.5YR 6/1; int.: 7.5YR 7/4; ext.: 7.5YR 6/3.
Moulded Jarash lamp with traces of fire around the wick-hole; deco.: Upper ext. surface, ridges in the shape of oblique lines, dots, half-circles and curving lines.
References: Scholl (1986), a combination of group II and III.
Late Byzantine - Umayyad (end 6th century - mid 8th century AD).
53.
J12-Bc-33-4
Almost intact.
Fig. 53.
Diam. (rim): 2; H.: 5.1; L.: 8.5; T.: 0.2.
Munsell: core: 5YR 5/1; int.: 5YR 1/6; ext.: 5YR 1/6.
Moulded Jarash lamp with ellipse-shaped body and zoomorphic handle; traces of fire around the wick-hole; deco.: Upper ext. surface, ridges in the shape of oblique, straight and curving lines, circles, dots.
References: Scholl (1986), group III; Kehrberg (1989), no. 26; Hadad (1997), no. 38-39; Da Costa (2001), fig. 4, no. 2.
Late Byzantine - Umayyad (1st half of the 7th - mid 8th century AD).
54.
J12-B-2-1029
Handle, fragmented.
Fig. 54.
H.: 4.1; L.: 2.1; T.: 1.7.
Munsell: Not available.
Hand moulded zoomorphic handle; oblique whiskers



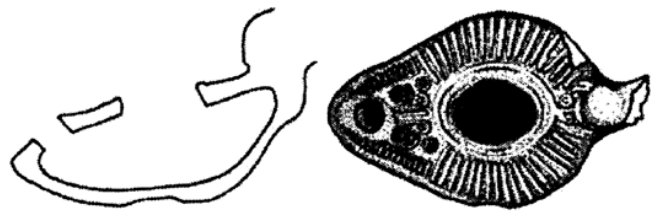
50



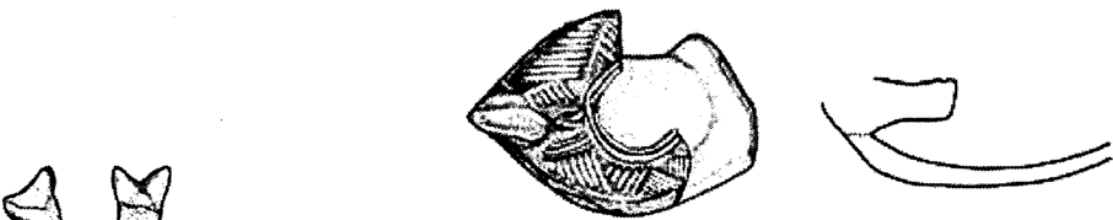
51



52



53



54



55

have been incised in the front of the head of the animal.

References: Scholl (1986), group III.

Late Byzantine - Umayyad (1st half 7th - mid 8th century AD).

55.

J12-B-14-7+9

Rim, base and handle, fragmented.

Fig. 55.

H.: 3.6; L.: 7.4; T.: 0.2.

Munsell: Not available.

Moulded ellipse-shaped lamp; deco.: Upper ext. surface, many ridges in the shape of oblique lines facing different directions.

References: Scholl (1986), subgroup IV.

Umayyad (2nd half of the 7th century AD).

Incense burner lid (SKr; AHS)

56.

J12-Ae-19-31 and J12-Af-19-1-12

Rim, fragmented.

Fig. 56a-b.

Diam. (rim): 12; H.: 9.7; T.: 0.3-0.5.

Munsell: core: 5YR 4/1; int.: 2.5YR 5/6; ext.: 2.5YR 6/4. Wheel made lid/top with long neck and cut-off triangular pointed ends; some lime inclusions and eruptions; deco: Triangular cut pattern and holes pierced through the body and neck; neck is smoothed with a horizontal carinated line separating it from the body; horizontal carinated line at centre of body.

References: Bonifay (2004), fig. 168, p. 301 (2.3.9) (7th century AD); Saller (1957), pl. 124.5; Pinard (1952); inv. no. 74.105, Museum of Art and Archaeology, University of Missouri.

Late Roman - Early Byzantine.

Cover/lid or base-less lantern (SKr)

57.

J12-Bc-42-18-22 and J12-Bcd-35-4

Rim, fragmented.

Fig. 57.

Diam.: 14; H.: 6.6; L.: 11; T.: 0.1.

Munsell: core: 7.5YR 7/4; int.: 7.5YR 7/6; ext.: 7.5YR 7/6.

Shoulder bends inwards; medium-sized holes have been pierced in the body from the outside and in; small, sporadic lime inclusions and eruptions.

References: Welles (1968), fig. 8, no. 193; Meriç (2002), K 781.

Byzantine - Umayyad (5th - 7th century AD).

Lanterns (SKr; SBr)

58.

J12-B-14-53

Handle, fragmented.

Fig. 58.

Diam. (rim): 4; H.: 5.2; L.: 4.1; T.: 0.4.

Munsell: core: 5YR 5/1; int.: 5YR 1/6; ext.: 5YR 1/6.

Handle is a round clear cut circle of clay; small, sporadic lime inclusions.

References: Gawlikowski and Musa (1986), fig. 7, no. 8; Uscatescu (1996), fig. 31.

Byzantine - Umayyad (5th - 7th century AD).

59.

J12-B-14-52

Neck, fragmented.

Fig. 59.

Diam.: 10; H.: 5.7 L.: 5.4 T.: 0.45

Munsell: Not available.

Deco.: Ext. surface, three horizontal carinated lines.

References: Gawlikowski and Musa (1986), fig. 7, no. 8; Uscatescu (1996), fig. 77, no. 437.

Byzantine - Umayyad (5th - 7th century AD).

60.

J12-Bc-42-55

Rim and base, fragmented.

Fig. 60.

Diam.: 12; H.: 1.2; T.: 0.2.

Munsell: core: 5YR 5/8; int.: 5YR 6/6; ext.: 10YR 5/1.

Flat base with lower part of knife-cut opening; mottled surface.

References: Welles (1968), fig. 8, no. 196; Gawlikowski (1986), p. 131; Gawlikowski and Musa (1986), fig. 7, no. 8; Uscatescu (1996), fig. 31.

Byzantine - Umayyad (5th - 7th century AD).

61.

J12-Bd-28-34

Body, fragmented.

Fig. 61.

Diam. (holes): 1.1; H.: 9.4; L.: 12.1; T.: 0.6.

Munsell: core: 2.5YR 6/8; int.: 2.5YR 6/8; ext.: 2.5YR 6/4.

Shoulder bends inwards; wheel marks on the internal surface create a shallow, horizontally ribbed surface; three large holes have been cut in the body from the outside and in.

References: Piazza (1983), no. 46; Welles (1968), fig. 8, no. 193; Uscatescu (1996), fig. 102, no. 701-703.

Byzantine - Umayyad (5th - 7th century AD).

62.

J12-B-8-10

Rim and shoulder, fragmented.

Fig. 62.

H.: 4; L.: 6.3; T.: 0.4.

Munsell: Not available.

Shoulder bends strongly inwards; small part of a knife-cut hole preserved, possibly the hole for the lamp; deco.: On the shoulder is an incised animal, probably a wolf; many lime eruptions.

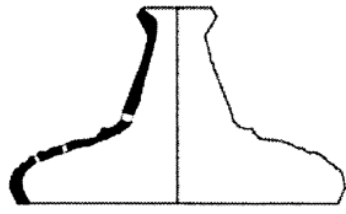
References: Uscatescu (1996), fig. 31; fig. 77, no. 436 (Also with decoration but not animal).

Byzantine (late 6th century AD).

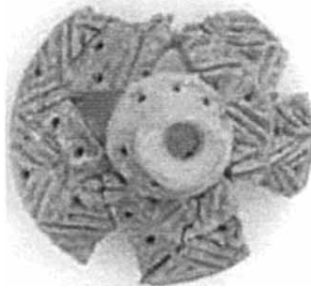
63.

J12-B-2-639+643

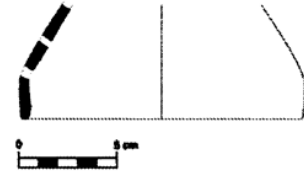
Rim and shoulder, fragmented.



56a



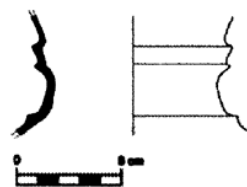
56b



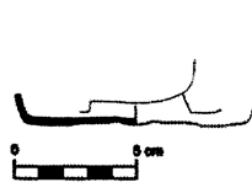
57



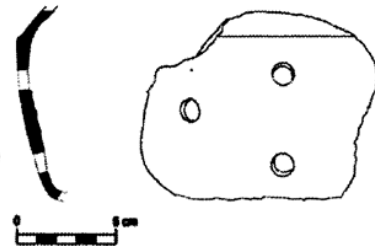
58



59



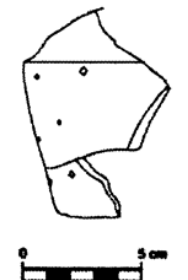
60



61



62

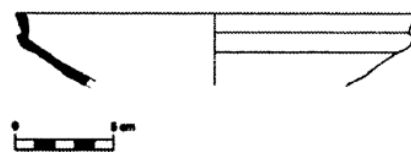


63

Table Wares



64



65



66



67

Fig. 63.

Diam. (max): 14; H.: 8.8; L.: 9.1; T.: 0.1.

Munsell: Not available.

Shoulder bends strongly inwards, part of the knife-cut opening; Square holes pierced from the ext.; hard fired, wheel made, medium levigation. A few lime inclusions and lime eruptions at exterior.

References: Gawlikowski (1986), p. 131.

Not datable.

Table wares

Plates

Reddish/Red Brown ware (AR)

64.

J12-B-2-1235 and J12-Bc-42-82

Rim, fragmented.

Fig. 64.

Diam.: 26; H.: 4.8; T.: 0.2.

Deep plate or shallow bowl with flattened lip and ledge below rim.

References: Brizzi et al. (2010), p. 363, fig. 11 (6th century AD); Uscatescu (1996), p. 337, fig. 67, no. 314 (group XI) (Late Byzantine).

Late Byzantine.

65.

J12-B-8-7

Rim, fragmented.

Fig. 65.

Diam.: 20; H.: 3.6; L.: 12.8; T. body: 0.4; T. rim: 0.5.

Deep plate or shallow bowl with flattened lip and ledge below rim.

References: Gerber (2012), p. 469, fig. 3.91:1.

Late Byzantine.

66.

J12-Bac-54-37

Base, fragmented.

Fig. 66.

Diam. (base): 14; H.: 2.7; L.: 7; T.: 0.4.

Flat base; deco.: one painted white circlet int.

References: Uscatescu (1996), p. 337, fig. 67,314 (group XI).

Late Byzantine.

67.

J12-Bab-55-12

Base, fragmented.

Fig. 67.

Diam. (base): 10; H.: 1.4; L.: 7.3; T.: 0.3.

Flat base; deco.: four painted white circlets int.

References: Uscatescu (1996), p. 337, fig. 67,312 (group XI, shape).

Late Byzantine.

Goblet

68.

J12-B-2-1233+1259

Rim and stem, fragmented.

Fig. 68.

Diam. (rim): 9, (base): 3.3; H.: 8.3; W.: 6; T. (body): 0.1; T. (rim): 0.4.

Low pedestal; bell-shaped body; flaring and slightly rounded rim; deco.: painted with white lines: ext.: 4 lines, int.: 6 lines; painted lines continue on the ext. of the base, drips of paint on int.

Not datable.

Cup

69.

J12-B-2-479 and J12-B-2-483

Body, fragmented.

Fig. 69.

Diam. (max.): 7; H.: 4.7; T. (body): 0.4.

Steep sides, curving towards base; deco. ext.: Impressed crescent-like pattern vertically overlapping each other, arranged in 2 parallel registers; deco. int.: white paint in wavy horizontal and vertical lines and drips. (Deco. not shown on drawing).

References: (Deco.) Seeden (1988), p. 407, fig. 76.

Umayyad.

Bowls

70.

J12-Bd-31-10

Rim, fragmented.

Fig. 70.

Diam. (rim): 10; H.: 5; L.: 6.1; T. (body): 0.1; T. (rim): 0.2.

Slightly rounded lip.

References: (shape) Zayadine (1977-1978), p. 49, fig. 18.254.

Byzantine.

71.

J12-Bac-54-1+3+5

Rim, fragmented.

Fig. 71.

Diam. (rim): 14.9; H.: 2.4; L.: 14.9; T. (body): 0.2, (rim): 2.

Ledge on the int. possibly for a lid.

References: Uscatescu (1996), p. 344, fig. 74.393 (group XVI, casserole).

Late Byzantine.

72.

J12-Bc-27-115

Base, fragmented.

Fig. 72.

Diam. (base): 5.8; H.: 3.3; T.: 0.3.

Ring base; body moderately elevating; deco: on interior lower ends of at least 4 vertically painted white curving lines.

Not datable.

Flask

73.

J12-Ac-1-119-121

Base, intact.

Fig. 73.

Diam. (base): 3; H.: 13.4; L.: 5.7; T.: 0.1.



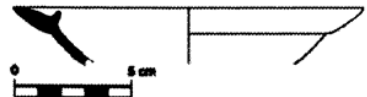
68



69



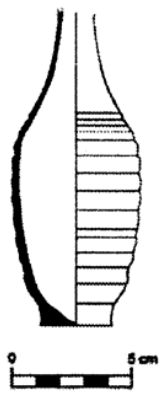
70



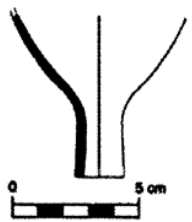
71



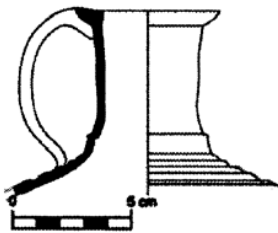
72



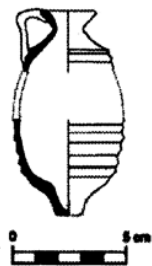
73



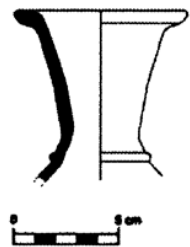
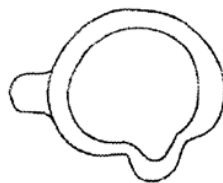
74



75



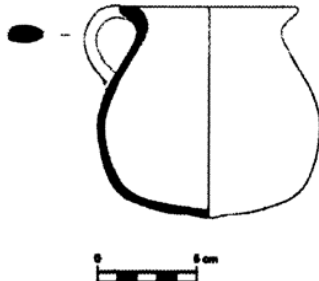
76



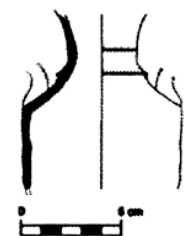
77



78



79



80

Pear-shaped flask with flat stand and lower part of neck preserved; ribbed on ext.

References: Uscatescu (1996), p. 348, fig. 78,451.

Late Byzantine.

Funnel

74.

J12-Bc-27-25

Rim, fragmented.

Fig. 74.

Diam. (rim): 1.8; H.: 6.4; L.: 6.3; T. (body): 0.2, (rim): 0.2.

Wide body narrowing towards neck; neck ending in square flattened rim.

Not datable.

Jugs (SBr)

75.

J12-Bc-42-47

Rim, fragmented.

Fig. 75.

Diam.: 6; H.: 8.1, L.: 9.6; T. (rim): 0.7, body: 0.1.

Munsell: core: 2.5YR 6/6; int.: 2.5YR 6/6; ext.: 5YR 7/4.

Globular body, flaring neck, outwards folded and flattened rim, ridge at collar; ribbed ext. and int.; rather finely levigated and hard fired.

Not datable.

76.

J12-Bc-42-5-6

Plain ware rim and base, almost intact.

Fig. 76.

Rim: H.: 2.7, L.: 3.6, Base: H.: 4.5; L.: 4.0 T. (min): 0.03, (max): 0.08.

Munsell: Core: Gley 1 4/4; int.: 2.5YR 6/4; ext.: 2.5YR 6/4.

Miniature jug, tubular ribbed body, flaring neck, outward folded rim, handle folded over rim, cylindrical base; Hard fired, finely levigated with few lime inclusions.

References: Weiss (2002) fig. 4 no. 12; Williams (1989) fig. 53 no. 531, 538; Thomsen (1986) fig. 34, nr i, j; Villeneuve (1993), boîte 7a, no. 79.

Byzantine (5th - 6th century AD).

Reddish/Red Brown ware

77.

J12-C-1-101

Rim, fragmented.

Fig. 77.

Diam.: 8; H.: 7.95; L.: 5; T. (rim): 0.6, (body): 0.5.

Narrow neck with high projecting collar, sloping shoulder, two carinated ridges at shoulder.

References: Watson (1992), fig. 3, no. 24

Byzantine – Umayyad (6th – 7th century AD).

78.

J12-Ae-19-19

Rim, fragmented.

Fig. 78.

Diam. (max): 3.5; H.: 5.4; L.: 4.8; T.: rim: 0.9, body: 0.2.

Trefoil carinated rim; cylindrical shaped body. Ridge at shoulder. Mottled ext.

Roman - Byzantine.

79.

J12-Abe-22-15-24

Rim, base and handle, almost intact.

Fig. 79.

Diam.: 9, (max): 11.7; H.: 10.8; T. (rim): 0.5, (body): 0.4.

Trefoil, globular jug with rounded base; one carinated handle at side; small globular jug; Mottled ext.

Roman - Byzantine.

80.

J12-B-2-285

Body, fragmented.

Fig. 80.

Diam. max: 8; H.: 7.95, L.: 7.5; T.: (neck): 0.3, (body): 0.4.

Conical body shape, slopes into a narrow jet flaring neck, ridge at collar, two handle attachments at shoulder; deco: two yellowish lines circulating neck and shoulder, wash on body and neck.

References: Gerber (2012), p. 353, fig. 3.50.11

Early Byzantine.

81.

J12-Bc-27-112, 118 and J12-Bd-31-1

Rim, fragmented.

Fig. 81.

Diam.: 6.5; H.: 6.4; T. (rim): 1.

Conical body, narrowing from shoulder to collar, flaring neck and flattened rim, carinated handle; deco: two whitish vertical lines on neck and lines on handle and lip.

References: Uscatescu (1996), fig. 18, Group XXVIII no. 3A, fig. 79 no. 469.

Late Byzantine.

82.

J12-B-2-734

Rim, fragmented.

Fig. 82.

H.: 5.1, L.: 7; T.: rim: 0.7, body: 0.3.

Double collar. Carinated handle. Cylindrical narrow neck, ridge circulating neck to which handle is attached.

References: Cornell (1997), pl. 10 no. PW60, PW61; pl. 74, no. PW59.

Not datable.

83.

J12-Bc-42-23

Rim, fragmented.

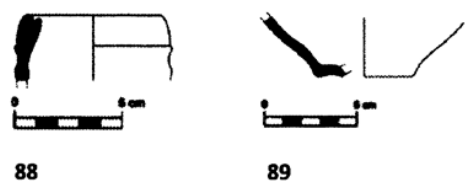
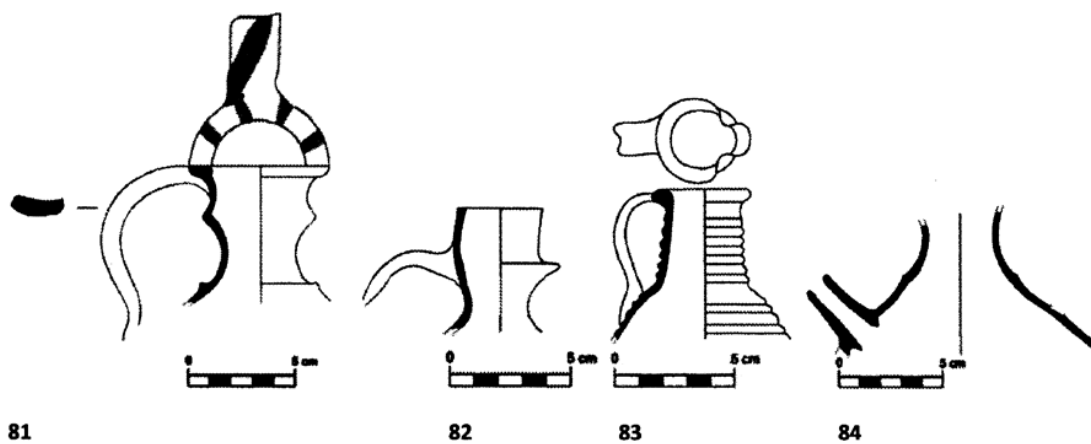
Fig. 83.

Diam.: 3.8; H.: 9.6, L.: 8.3; T.: (body): 0.4, (rim): 0.3.

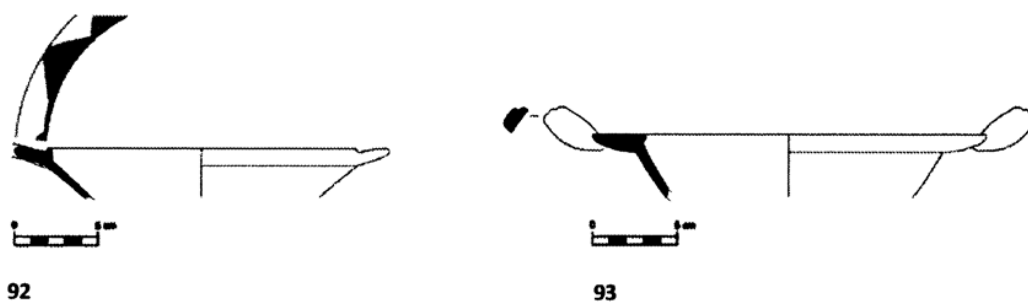
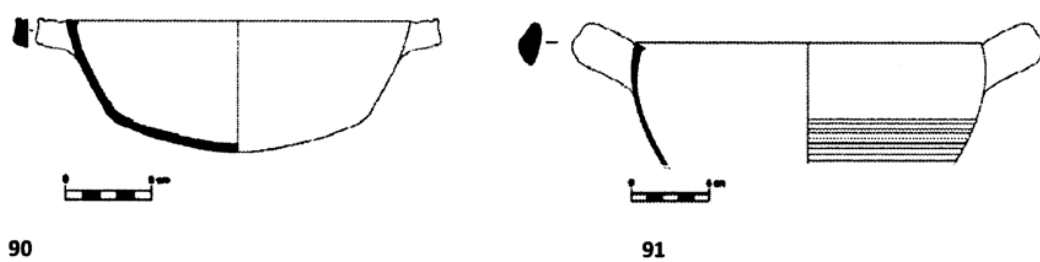
Ovoid/globular body, narrow neck, out folded rim, ribbed neck and body, trefoil rim, carinated handle set at rim.

References: Uscatescu (1996), fig. 19, group XXIX, no. 5, fig. 80 no. 483.

Late Byzantine.



Cooking Vessels



84.

J12-Bc-42-70, 71

Spout, fragmented.

Fig. 84.

Diam. (shoulder): 5.4; H.: 6.8; L.: 12.1; T.: 0.2.

Spouted jug, globular body, slightly flaring neck, short tubular spout, ribbed body.

References: Braemer (1989), fig. 11, no. 52; Uscatescu (1996), fig. 18 group XXVIII, fig. 79, no. 471, fig. 80, no. 474 (Late Byzantine); Hayes (1972).

Late Byzantine.

Closed jars (SBr)

85.

J12-Bc-27-66

Rim, fragmented.

Fig. 85.

Diam.: 8; H.: 2.3; L.: 13.9; T.: 0.1.

Munsell: core: 7.5YR 4/1 and 5YR 6/4; int.: 5YR 6/4; ext.: 7.5YR 4/1.

Globular body, short straight neck, carinated handles attached at rim, folded over handles, few lime inclusions.

Not datable.

86.

J12-Bc-27-29

Rim, fragmented.

Fig. 86.

Diam.: 10; H.: 3.9; L.: 9.6; T. (rim): 0.7, (neck): 0.4.

Munsell: core: 2YR 5/8; int.: 2.5YR 5/8; ext.: 2.5YR 5/8; deco.: 10YR 8/3.

Concave neck, flaring rim; hard fired; medium to fine levigated with lime inclusions; Deco.: ext.: broad diagonal lines on neck, vertical lines on lip; Int.: Vertical lines.

References: Deco.: Schaefer (1986), fig. 11; Shape: Uscatescu (1996), fig. 20, group XXXIV 1B, p. 352, fig. 82 nos. 494-497.

Late Byzantine – Umayyad (6th - 7th century AD).

87.

J12-Ac-19-20

Rim, fragmented.

Fig. 87.

Diam.: 11; H.: 3.7; L.: 9; T. (rim): 1, (neck): 0.5.

Munsell: core: 7.5YR 5/1; int.: 10R 6/6; ext.: 10R 6/4.

Inwards flaring rim, flattened lip, convex ridge at shoulder. Hard fired, medium to coarse levigated with fairly big lime inclusions int. and ext. Lime eruptions ext.

Not datable.

88.

J12-Ba-53-15

Rim, fragmented.

Fig. 88.

Diam.: 6; T.: rim: 1; body: 0.5.

Munsell: core: 10R 4/6; int. and ext.: 10R 4/4.

Small jar or jug. Dense dark red-brown clay, hard fired with dark inclusions, like no. 89 below. Might belong to 89. Thick overfolded and grooved rim.

References: Gerber (2012), fig. 3.30.1 (Late Roman III-

IV, AD 235-324).

Late Roman (3rd-4th century AD).

89.

J12-Ba-52-11

Base, fragmented.

Fig. 89.

Diam.: 5; T.: 0.4.

Munsell: core: 10R 5/6; int. and ext.: 10R 4/4.

Small jar or jug. Dense dark red-brown clay, hard fired with dark inclusions, like no. 88 above. Might belong to 88.

Cooking vessels

Casseroles (AR; SBr)

Reddish/Red Brown ware

90.

J12-Abe-22-9-14

Rim, base and handle, fragmented.

Fig. 90.

Diam. (rim): 19.75; H.: 7.5; L. (body): 0.4, (base): 0.5; T. (rim): 0.6.

Base rounded with convex centre; one horizontal handle preserved, attached almost at rim; knife-cut rim and traces of fire ext. and int.

References: Najjar (1989), p. 315, fig. 6.20; McNicoll *et al.* (1992), pl. 98 no. 9; Uscatescu (1996), fig. 73 no. 387 (Late Byzantine).

Roman - Byzantine.

91.

J12-Bc-42-80

Rim, fragmented.

Fig. 91.

Diam. (rim): 22; H.: 7.7; L.: 14.4; T. (body): 0.2, (rim): 0.9.

Steep body with horizontal handle attached almost at rim; eight shallow grooves beneath handle; knife-cut rim.

References: Gerber (2012), p. 437, fig. 3.80.3; Uscatescu (1996), p. 343, fig. 73, no. 381, group XVI, casserole.

Late Byzantine.

92.

Rim, fragmented.

J12-Bac-54-38

Fig. 92.

Diam. (rim): 22; H.: 2.9; L.: 8.2; T. (body): 0.3.

Rim wide and prominent with int. ledge possibly for a lid; deco.: painted white triangles on ext. of rim.

References: Uscatescu (1996), p. 344, fig. 74 no. 393, group XVI, casserole (Late Byzantine); Watson (1992), fig. 4.34 (7th century AD).

Late Byzantine.

93.

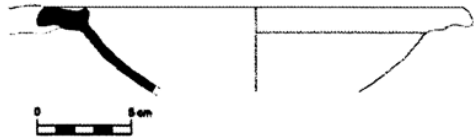
J12-Bc-27-7

Rim and handle, fragmented.

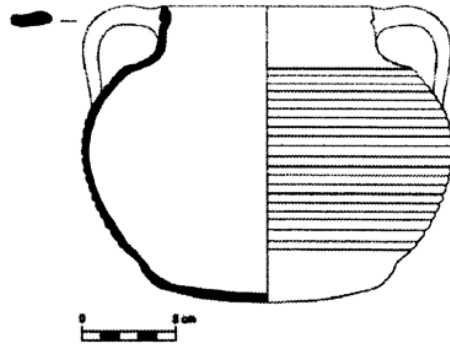
Fig. 93.

Diam.: 23; H.: 5.3; L.: 20.5; T.: 0.5.

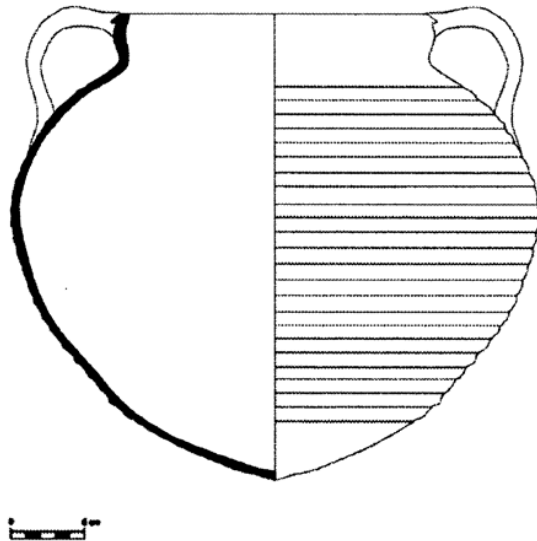
Conical shape, double folded handle, horizontal and up-



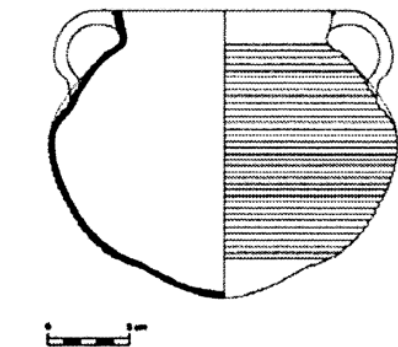
94



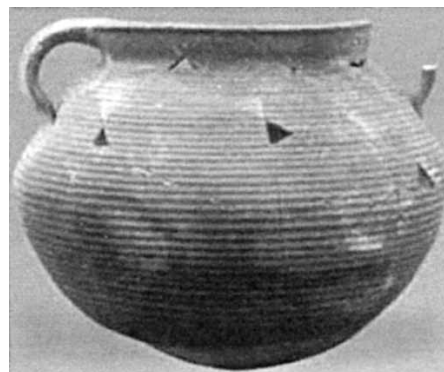
95



96



97a



97b

wards curving – above the flat everted rim; Traces of use over open fire both int. and ext.

References: Uscatescu (1996), fig. 74 group XVI, no. 393, fig. 17, group XVII no. 3B.

Byzantine (5th - 6th century AD).

94.

J12-Bc-42-59

Rim with handle attachment, fragmented.

Fig. 94.

Diam.: 22; H.: 4.4; L.: 7.9; T. (rim): 2.3, (body): 0.3.

Outwards folded rim; Conical shape; Handle attachment indicates a narrow and elongated shape; Traces of use over open fire both int. and ext.

References: Uscatescu (1996), fig. 17 group XVII, no. 3A, 3D, fig. 17, group XVII no. 7; Meriç (2002), pl. 69 no. 788.

Byzantine (5th - 6th century AD).

Cooking pots (SBr)

Reddish/Red Brown ware

95.

J12-Ca-32-23-36

Rim, body and base, almost intact.

Fig. 95.

Diam.: 11; H.: 15.35; L.: 18.3; T. (rim): 0.5, (body): 0.2, (handle): 0.8.

Munsell: core: 5YR 5/1 and 2.5YR 5/9; int.: 2.5YR 5/6; ext.: 5YR 4/2

Globular body with flattened base, outwards bevelled rim, narrow neck; slight ledge at shoulder, thinly potted; ribbed body, the horizontal lines circling the body ends 2 cm above the base. Traces of use over open fire ext. at base.

References: Kenkel (2012), Tafel 24, KT12; Gerber (2012), fig. 3.47.6-7; Sodini and Villeneuve (1992), fig. 6, nr. 12; Rasson and Seigne (1989), fig. 10 no. 1, 2, 3, 4, 5; Uscatescu (1996), fig. 84 group XXXIV, no. 520, fig. 20 Group XXXIV 6D, fig. 83 no. 510.

Roman - Byzantine .

96.

J12-Af-14-1x, J12-Af-13-3, and J12-Af- 6-25-45 (joins with Af-14-1x at 42 and 45)

Rim, body and base, almost intact.

Fig. 96.

Diam. (max.): 22; H.: 9.3; L.: 14; T. (min.): 0.1, (max.): 0.2.

Munsell: core: 7.5YR 5/2 and 2.5YR 6/8; int.: 7.5YR 6/3; ext.: 2.5YR 5/8 and 7.5YR 4/1

Globular pot with conical base, outwards folded rim; thinly potted, ribbed body, the ribs stops 2 cm above base-line.

References: Kenkel (2012), Tafel 24, KT12; Gerber (2012), fig. 3.47.6-7; Uscatescu (1996), group XXXIV 6D, fig. 83 no. 510; Pierobon (1986), p. 190 fig. 10.6;; Rasson and Seigne (1989), fig. 10 no. 1, 2, 3, 4, 5.

Roman - Byzantine.

97.

J12-Ab-17-1

Rim, body and base, almost intact.

Fig. 97a-b.

Diam. rim: 13.5; diam. max: 21.2; H.: 17.6; T.: min: 0.05, max: 0.2.

Munsell: core: 2.5 YR 4/2; int.: 2.5 YR 5/2; ext.: rim and body: 2.5 YR 5/2, base: 2.5 YR 4/2.

Globular pot with rounded base, outwards folded rim, carinated handles, thinly potted, ribbed body, the ribs stops 3.5 cm above base-line; Traces of use over open fire ext. at base. Part of a tile found in close proximity to the pot, maybe used as lid.

References: Kenkel (2012), Tafel 24, KT12; Gerber (2012), fig. 3.47.6-7; Uscatescu (1996), group XXXIV 6D, fig. 83 no. 510; Sodini and Villeneuve (1992), fig. 6, no. 10;; Rasson and Seigne (1989), fig. 10 no. 1, 2, 3, 4, 5. Roman - Byzantine.

98.

J12-Af-18-4

Rim, body and base, almost intact.

Fig. 98a-b.

Diam. (rim): 12; diam. (max): 19.5; H.: 18.2; T.: (rim): 0.5, (body): 0.15.

Munsell: core: 2.5 YR 6/8 and 4/1; int.: 2.5 YR 6/8; ext.: rim: 2.5 YR 5/8, body: 2.5 YR 4/3, base: 2.5 YR 3/1.

Globular shape, rounded base, outwards folded rim, short neck, carinated handles, thinly potted, ribbed body, the ribs stops 3.5 cm above base-line. Part of a tile (no. 135) found on top of the pot and used as lid; Traces of use over open fire ext. at base.

References: Kenkel (2012), Tafel 24, KT12; Gerber (2012), fig. 3.47.6-7; Uscatescu (1996), fig. 83 no. 510; Sodini and Villeneuve, fig. 6, no. 12; Rasson and Seigne (1989), fig. 10 no. 1, 2, 3, 4, 5.

Roman - Byzantine.

99.

J12-Bcd-34-7-25

Rim, almost intact.

Fig. 99.

Diam. (rim): 10.5, (max): 20.8; H.: 12.4; T. (rim): 0.4, (body): 0.1. Munsell: core: 5YR 7/6; int.: 5YR 7/6; ext.: 10YR 4/1.

Globular shape, rounded base, outwards folded rim, short neck, carinated handles, thinly potted, ribbed body, the ribs stops 3.5 cm above base-line. Traces of use over open fire ext. at base.

References: Sodini and Villeneuve (1992), fig. 6, no. 11; Uscatescu (1996), fig. 84 group XXXIV, no. 517.

Late Byzantine (?).

100.

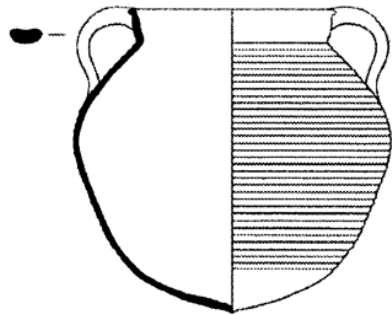
J12-Cc-45-1-12

Base, fragmented.

Fig. 100.

L.: 14.01; H.: 12.1; T.: 0.2.

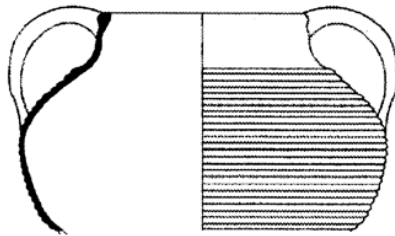
Munsell: core: 2.5YR 6/6, int.: 2.5YR 6/6, ext.: 2.5YR 5/3



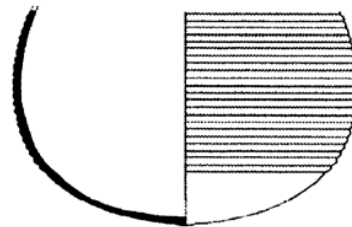
98a



98b

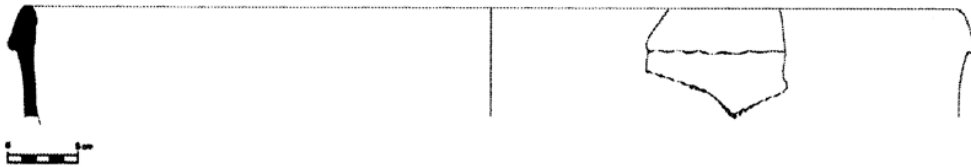


99

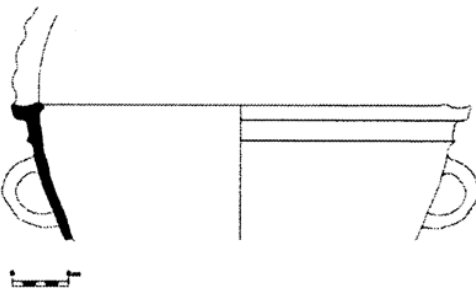


100

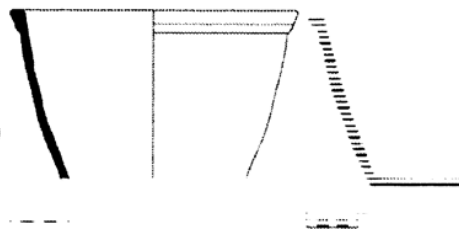
Storage Vessels



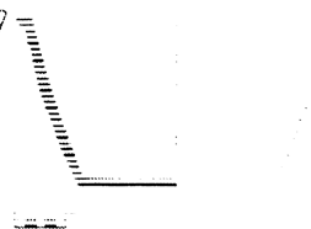
101



102



103



104

Globular with a rounded base, thinly potted, ribbed body; traces of use over open fire ext. at base.

References: Sodini and Villeneuve (1992), fig. 6, no. 12; Rasson and Seigne (1989), fig. 10 no. 1, 2, 3, 4, 5.

Late Byzantine (?).

Storage vessels

Handmade Basins (EG; AHS; SBr)

101.

J12-B-2-490

Rim, fragmented.

Fig. 101.

Diam. (rim): 69; H.: 7.6; L.: 9.5; W. (rim): 1.4; T.: 0.5.

Folded over and pinched rim, straight sides; hard fired with some lime and stone inclusions; covered in lime crust throughout.

References: Uscatescu (1996), p. 292, fig. 22, group XXXVI.

Not datable.

102.

J12-Bc-27-49

Rim and handle, fragmented.

Fig. 102.

Diam. (rim): 40; H.: 11.6; L.: 13.6; W. (rim): 2.3; T.: 0.5.

Munsell: ext.: 7.5YR 6/3.

Pinched 'pie crust' pattern on rim, vertically set handle, hard fired; medium levigated with some lime inclusions.

References: Uscatescu (1996), p. 357, fig. 87 no. 555.

Late Byzantine.

Grey ware

103.

J12-B-2-977

Rim, fragmented.

Fig. 103.

Diam. rim: 24; H.: 13.9; L.: 9.6; W. (rim): 1.2; T. (body): 0.7.

Flat over fold rim; bell-shaped body.

References: Uscatescu (1996), fig. 22, Group XXXVI.

Late Byzantine – Umayyad (6th – 7th century AD).

104.

J12-Bc-42-30-35

Rim and base, fragmented.

Fig. 104.

Diam. (rim): 48, (base): 19; H.: 16.3; W. (rim): 1.5; W. (body): 0.6.

Flat over fold rim; flat base and conical sides.

References: Uscatescu (1996), fig. 22, Group XXXVI.

Late Byzantine – Umayyad (6th – 7th century AD).

105.

J12-Bc-42-36-44

Rim, base and handle, fragmented.

Fig. 105.

Diam. (rim): 40; H.: 23.4; W. (body): 0.5; T. (rim): 1.8.

Flat but flaring over folded rim; flat base and conical sides; vertically set strap handles.

References: Uscatescu (1996), p. 292, fig. 22 no. 7, p. 357, fig. 87 no. 555.

Late Byzantine (6th century AD).

106.

J12-Bc-27-140

Rim, fragmented.

Fig. 106.

Diam.: 44; H.: 7.5; L.: 12.6; T. (rim): 3.4, (neck): 1.2.

Inwards flaring neck, with a broad flattened rim; deco.: combed wavy lines on both body and rim. Deco. on body is not shown on drawing.

References: Uscatescu (1996), p. 361, fig. 91 no. 586; Schaefer (1986), p. 428, fig. 9, Group B no. 10.

Late Byzantine – Umayyad (6th – 7th century AD).

107.

J12-Ca-32-8

Rim, fragmented.

Fig. 107.

Diam. (rim): 33; H.: 6.2; L.: 16.2; W.: 1.5 (rim); T.: 0.5.

Flat over folded rim, body curves inwards at lower part.

References: Schaefer (1986), fig. 9, group B no. 7; Zayadine (1977-78), p. 54, fig. 26, 507.

Late Byzantine – Umayyad (6th – 7th century AD).

108.

J12-Cd-37-11

Rim with handle attachment, fragmented.

Fig. 108.

Diam. rim: 60; H.: 10; L.: 9.9; W. (body): 0.9; T. (rim): 1.8.

Rim over folded; deco: 'pie-crust' pattern.

References: Uscatescu (1996), p. 369, fig. 99, no. 670.

Late Byzantine – Umayyad (6th – 7th century AD).

Wheelmade Basin/Crater (EG; SBr; AHS)

109.

J12-Bc-42-84+74+75

Rim, fragmented.

Fig. 109.

Diam. (rim): 40; H.: 19.5; W.: 0.5.

Munsell: core: 2.5YR 5/8; int.: 2.5YR 4/1.

Hard fired; medium levigated; deco: Two white painted horizontal lines on body.

References: Uscatescu (1996), p. 340, fig. 70 no. 359.

Late Byzantine (6th century AD).

110.

J12-Cc-40-2

Rim, fragmented.

Fig. 110.

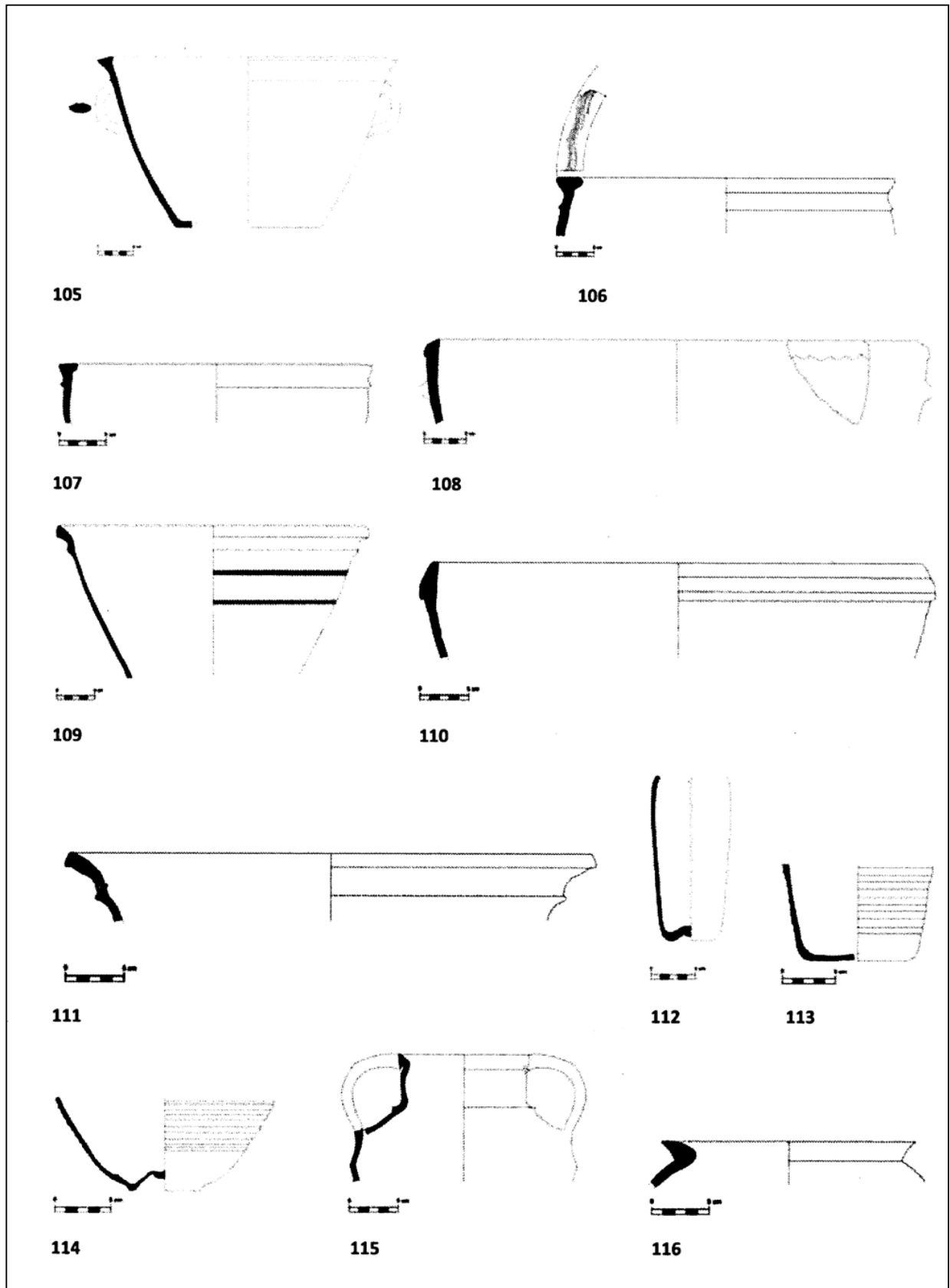
H.: 9.8; L.: 10.1; T.: (body) 0.6, (rim) 0.7.

Munsell: core: 7.5YR 7/4; int.: 5YR 7/6; ext.: 5YR 4/3.

Over folded rim; hard fired; medium levigated.

References: Uscatescu (1996), p. 295 fig. 25, group XLII, 1.

Not datable.



Grey ware

111.

J12-Bd-47-3

Rim, fragmented.

Fig. 111.

Diam.: 44; H.: 5.5; L.: 11.9; T. (neck): 0.5.

Flaring convex neck and body. Flat rim, flaring heavily. Convex line on shoulder. Metal (lead) repair just above shoulder ridge.

References: Uscatescu (1996), p. 340, fig. 70 no. 358.

Late Byzantine (6th century AD).

Bottles/smaller jars (SBr)

112.

J12-Bb-62-13-35

Base, intact.

Fig. 112.

Diam. (base): 6.3; Diam. (max): 8.7; H.: 18.

Munsell: core: 2.5YR 6/8; int.: 2.5YR 6/8; ext.: 10R 6/4;

Whitish self slip ext.

Cylindrical body with concave base, the body curves inwards at neck. Hard fired, medium levigated with a few lime inclusions.

References: Uscatescu (1996), fig. 78 group XXIV, no. 457.

Late Byzantine – Umayyad.

113.

J12-Bc-27-54-57

Base, fragmented.

Fig. 113.

Diam. (base): 10; H.: 9; L.: 27; T.: 0.5.

Munsell: core: 10R 5/6; slip int.: 10R 5/1, ext.: 10R 5/1.

Conical body with flat, slightly concave base, ribbed body, rather thin walled; medium/coarse levigated.

Not datable.

114.

J12-Bc-42-99

Base, fragmented.

Fig. 114.

Diam.: 5.4; H.: 8.2; L.: 14.9; T.: 0.1.

Munsell: core: 2.5YR 7/8; int.: 2.5YR 7/8; ext.: 7.5YR 6/6.

Ribbed, globular body, base ring; hard fired; rather finely levigated with stone inclusions, and air pockets.

References: Kenkel (2012), Taf. 36 Kru 70.

Not datable.

Grey ware (EG)

115.

J12-Bc-33-11+24+25 and Bc-42-87

Rim and handle.

Fig. 115.

Diam. (rim): 13; H.: 12.8; L.: 9.1; W.: 1.1; T.: 0.1.

Biansulate jar with angular shoulder and out-turned rim.

Not datable.

Pithoi (EG; AHS)

Handmade

116.

J12-B-2-921

Rim, fragmented.

Fig. 116.

Diam. (rim): 22; H.: 3.6; L.: 15.1; W.: 2.1 (rim); T.: 0.8.

Munsell: core: 2.5YR 5/1; int.: 2.5YR 5/1; ext.: 2.5YR 5/1.

Hard fired; medium levigated with a few stone and some lime inclusions.

References: Uscatescu (1996), p. 367, fig. 97 no. 647.

Byzantine.

117.

J12-C-20-13

Rim, fragmented.

Fig. 117.

Diam. (rim): 20; H.: 3.9; L.: 14.2; W.: 2.9.

Munsell: Not available

Flaring rim; hard fired; medium levigated with some lime, stone and quartz inclusions.

References: Uscatescu (1996), p. 367, fig. 97 no. 649.

Late Byzantine (6th century AD).

118.

J12-Ae-21-4-7

Base, fragmented. Most probably belong to the same pithos as no. 119.

Fig. 118.

Diam. (base): 5.8; H.: 7.6; L.: 30.6; W.: 2.1; T.: 0.95.

Munsell: core: 2.5YR 5/6+2.5YR 5/1; int. and ext.: 2.5YR 5/6.

Rounded base; hard fired; coarse levigation with small to medium sized lime inclusions.

References: Uscatescu (1996), fig. 98 no. 657.

Not datable.

119.

J12-Abe-21-1-3

Handle, fragmented. Most probably belong to the same pithos as no. 118.

Fig. 119.

H.: 25.6; L.: 33.8; T.: 0.7.

Munsell: core: 7.5YR 5/2; int.: 2.5YR 6/6; ext.: 7.5 YR 6/3.

Vertically set handle; hard fired, medium levigated with air pockets, lime and stone.

Not datable.

Grey Ware

120.

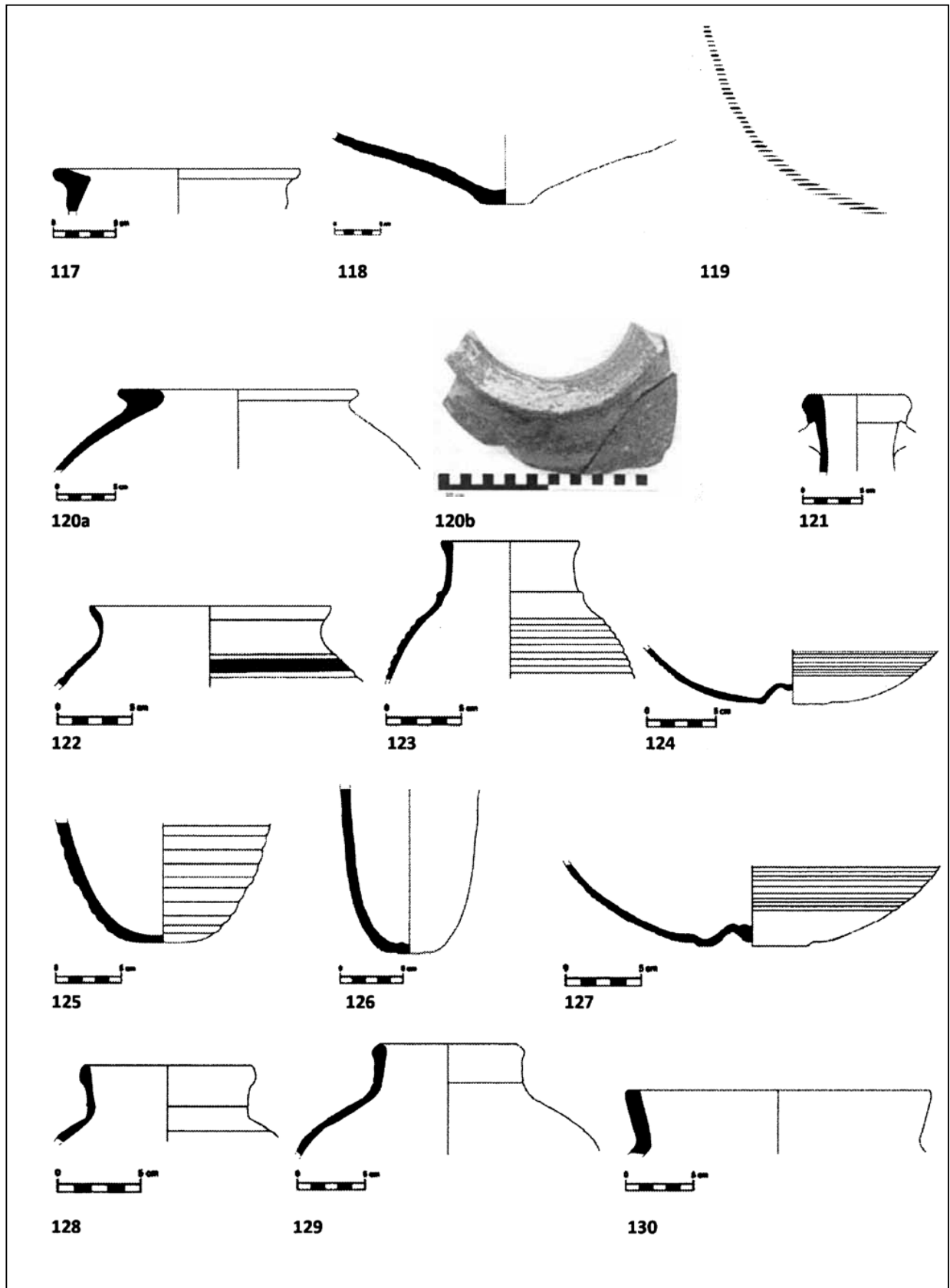
J12-Bc-42-3+4

Rim, fragmented.

Fig. 120a-b.

Diam. (rim): 20; H.: 6.7; L.: 20.5; W. (rim): 3.5; T. (body): 0.7.

Flat, flaring rim; deco: Combed wavy and horizontal pat-



terns on shoulder (Deco. not shown on drawing).
Not datable.

Amphorae (EG; AHS)

121.

J12-C-1-130

Rim and handle, fragmented.

Fig. 121.

Diam.: 8; H.: 6.4; L.: 6; T. (body): 0.7, (rim): 1.3.

Munsell: Not available.

Narrow over folded rim, hard fired, with sloppy finish; medium levigated.

References: Reynolds (2005), p. 594, pl. 7 fig. 47.

Roman.

122.

J12-Bc-27-64

Rim, fragmented.

Fig. 122.

H.: 6.4; L.: 7.8; T.: 0.1; Diam. (rim): 16.

Munsell: int. 2.5YR 6/6; ext.: 2.5YR 6/6; Deco.: 5YR 8/4.

Hard fired; rather finely levigated with a few lime inclusions and some lime eruptions on the ext.; deco: white horizontal line of paint on shoulder.

Not datable.

123.

J12-Bac-54-31

Rim, fragmented.

Fig. 123.

Diam (rim): 9; H.: 9; L.: 8.3.

Munsell: core: 10YR 7/2; int.: 10YR 6/2; ext.: 7/3.

Slightly flaring rim; hard fired; medium levigated.

References: Uscatescu (1996), fig. 93 nos. 603-604.

Late Byzantine (6th century AD).

124.

J12-Bc-42-100

Base, intact.

Fig. 124.

Diam. (base): 5; H.: 3.9; L.: 19.9; T.: 0.1.

Munsell: core: 5YR 6/6; int.: 7.5YR 7/4; ext.: 5YR 6/6.

Bag shaped amphora with upturned base; hard fired; rather finely levigated with some stone and lime inclusions, some lime eruptions ext.

References: Uscatescu (1996), fig. 93 no. 600, 604; fig. 94 no. 618.

Late Byzantine (6th century AD).

125.

J12-Bc-42-65

Base, fragmented.

Fig. 125.

H.: 8.8; T.: 0.7.

Munsell: core: 5YR 7/6; int.: 10YR 8/4; ext.: 10YR 2/4.

Straight rim; hard fired; rather coarse levigated; ripped ext.

References: Kenkel (2012), Taf. 40 Am 21.1b.

Byzantine – Umayyad (5th - 7th century AD).

126.

J12-Bc-42-90+91

Base, intact.

Fig. 126.

Diam. (base): 1.4; H.: 13; L.: 9.1; T.: 0.5.

Munsell: core: 2.5Y 8/4; int.: 2.5Y 8/4; ext.: 2.5Y 8/4.

Cylindrical shape; hard fired; rather coarse levigated with a few stone inclusions.

Not datable.

Grey ware

127.

J12-Bd-28-36-38

Base, fragmented.

Fig. 127.

Diam. (base): 7; H.: 5.3; L.: 20.1; T.: (body): 0.4.

Bag shaped amphora with upturned base.

References: Uscatescu (1996), fig. 93 no. 600, 604; fig. 94 no. 618; Houston Smith (1973), pl. 31; fig. 105.

Late Byzantine – Umayyad (6th - 7th century AD).

128.

J12-Bc-33-12-14

Rim, fragmented.

Fig. 128.

Diam. (rim): 10; H.: 4.5; T. (rim): 0.8; (body): 0.1.

Slightly flaring rim.

References: Houston Smith (1973); pl. 31; fig. 284, 495.

Late Byzantine – Umayyad (7th century AD).

129.

J12-Bc-42-26

Rim, fragmented.

Fig. 129.

Diam. (rim): 10; H.: 8.1; L.: 13.9; T.: 0.2.

Bag shaped, ribbed ext.

References: Reynolds (2005), p. 606, Pl. 19 fig. 145 and 147.

Not datable.

Unpainted handmade coarse ware (SBK)

130.

J12-B-4-4

Rim, fragmented.

Fig. 130.

Diam.: 22; H.: 4.5.

Out-turned rim from closed shape, jug/jar (?); some quartz and secondary firing on ext.; deco: Dark brown wash on both ext. and int. (darker on interior).

References: Shape: Avissar and Stern (2005) II.4.4.1, fig. 8.

Late 12th - 14th century AD.

131.

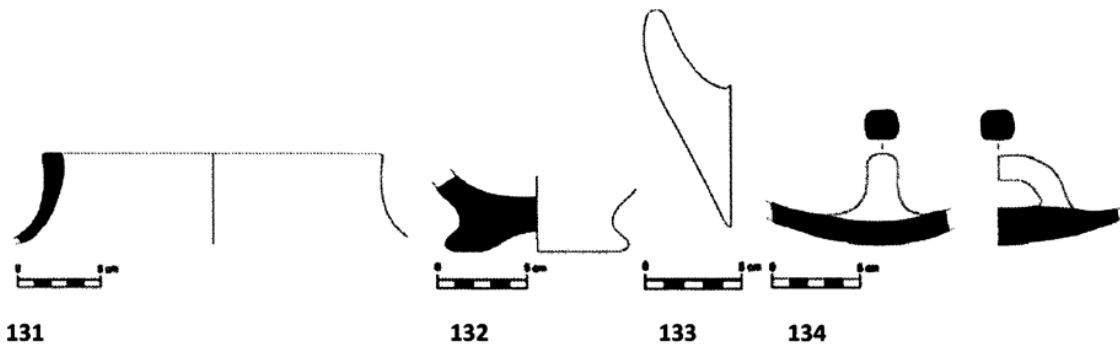
J12-Cd-42-30

Rim, fragmented.

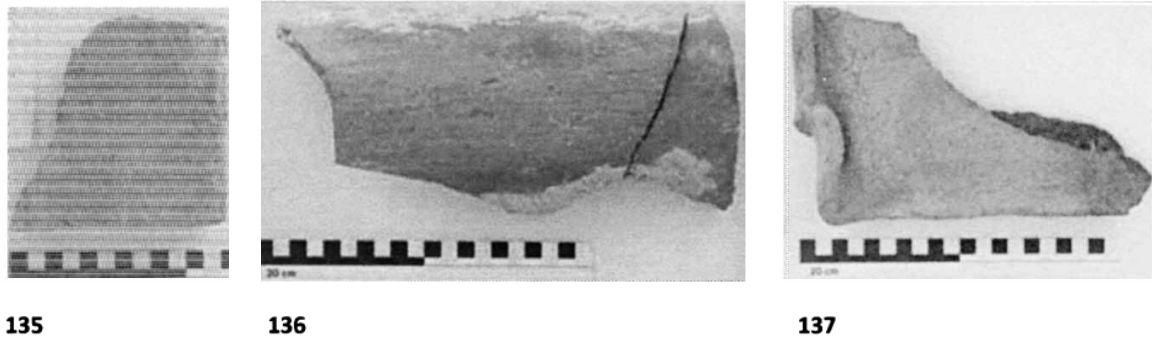
Fig. 131.

Diam.: 20; H.: 5.4.

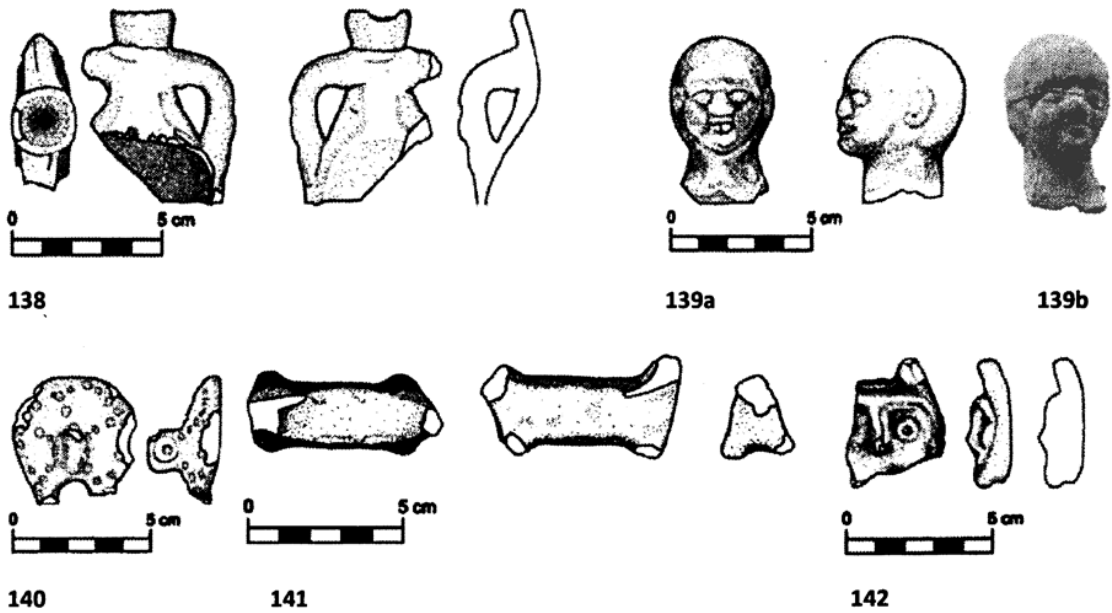
Flattened rim from closed shape, jug/jar (?). Traces of peeled decoration on ext. (Might have been painted). Sec-



Tiles



Miscellanea



ondary firing on exterior.

References: Avissar and Stern (2005); II.4.4.1, fig. 8.
Late 12th - 14th century AD.

132.

J12-C-2-9

Base, fragmented.

Fig. 132.

Diam.: 19; H.: 4.2.

Hollowed disc base from jug or bowl (?); some large lime eruptions; smoothed int.

References: Avissar and Stern (2005), no. II.1.4.1, fig. 3; II.4.2.1, fig. 5.

Late 12th - 14th century AD.

133.

J12-Cd-42-6-8

Handle, fragmented.

Fig. 133.

H.: 10.6; L.: 9.3.

Pierced ear-shaped handle. Vertically attached; some black and lime inclusions.

References: Walker (2012), p. 563, fig. 4.18.3; Walmsley (1997-98), p. 140 no. 8, Avissar and Stern (2005), II.2.2.2.
13th - 14th century AD.

134.

J12-Cd-42-31

Handle and body, fragmented.

Fig. 134.

H: 10; L: 6.4.

Flattened, angled handle attached to the concave side of a lid; convex side is smoothed; secondary firing on handle.

References: Handle shape: Walmsley (1997-98), fig. 9 no. 2.

Late 12th - 14th century AD.

Tile (EG; AHS)

135.

J12-Af-18-3

Rim (placed on top of the cooking pot no. 98), fragmented.

Fig. 135.

H.: 11.5; L.: 12.5; W.: 2.8.

Square floor tile or suspensurium; Coarse, hard fired, with many air-pockets.

Not datable.

136.

J12-Bc-42-28+29

Rim, fragmented.

Fig. 136.

H.: 4.6; L.: 25.5; T.: 0.8.

Imbrex, partly moulded with cut-off rim, grey ware; hard fired, coarse levigated with air-pockets, few lime and stone inclusions, some lime crust.

Not datable.

137.

J12-Cd-1-161

Rim, fragmented.

Fig. 137.

H.: 3.3; L.: 21; T.: 2.

Tegula, hand made with partly over-folded rim, grey ware; hard fired, coarse levigation with air-pockets, a few lime and stone inclusions, arge lime eruptions at int. surface.

Not datable.

Miscellanea

Pilgrim flask (DC)

138.

J12-Bac-54-27

Rim and handle, fragmented.

Fig. 138.

Diam. (rim): 2; H.: 6.3; L.: 5.02; T. (rim): 0.3, T. (handle): 0.9; T. (body): 0.4.

Munsell: core: 10YR 7/3; int.: 10YR 7/3; ext: 10YR 7/3.

Moulded, worn, hard-fired and rather finleylevigated. Some lime inclusions, and covering lime crust; deco.: traces pattern on belly.

References: Hammond (1977-1978), p. 232, pl. XLVI, no.1.

Byzantine.

Terracotta (SBK)

139.

J12-Aa-4-1x

Human head, fragmented.

Fig. 139a-b.

H.: 5.9; W.: 3.8.

Munsell: Not available.

Mold made, hollow. Broken off at the neck. No rendering of hair on clay, but traces of lines of red, especially behind the ears, probably rendered hair.

References: Illife (1944), no. 33 and 41.

Roman (2nd century AD).

140.

J12-Bc-42-76

Animal figurine, almost intact.

Fig. 140.

Diam.: 1.2; H.: 4.2.

Munsell: int: 2.5Y 5/1; 7.5YR 7/3

Hand made, rounded figurine/lid (?), with two protruding 'arms' (fragmented) and a hollowing in between. Knob on top, with plastic circular decoration (eyes?); deco: 28 holes cover the top part.

References: Eyes: Fehérvári (1998), no. 87.

Not datable.

141.

J12-0-1

Animal figurine, fragmented.

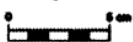
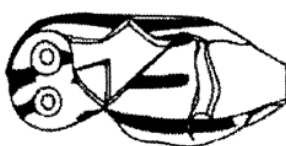
Fig. 141.

H.: 3.35; L.: 6.4.

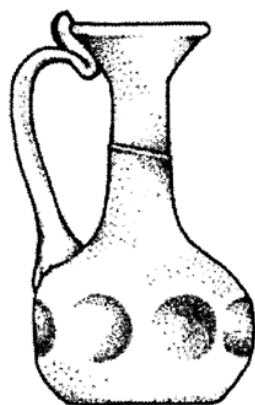
Reddish brown clay with black, quartz and lime inclusions; hand made, four legged animal figurine. Body has a slight square shape. All legs and the head and tail(?) are broken off.

References: Type: Holland (2006), fig. 222 no. 1-3; Ball et

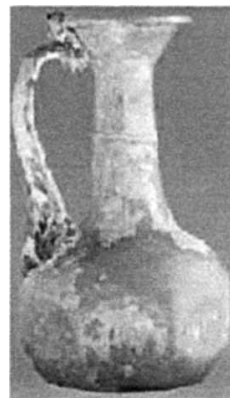
Miscellanea



143



144a



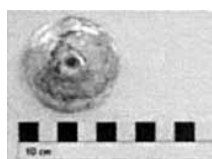
144b



145



146



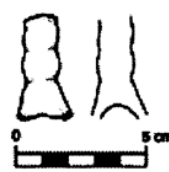
147



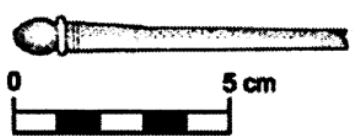
148



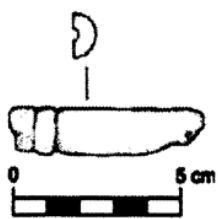
149



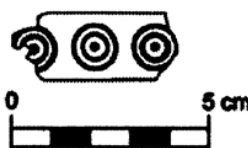
150



151



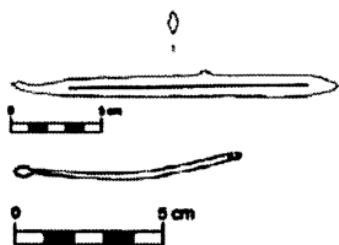
152



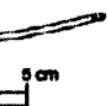
153



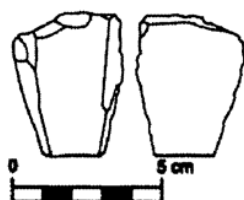
154



155 (upper)



156 (below)



157



158



159

al. (1986), fig. 6 no. 8.
Not datable.

Appliqué

Grey ware

142.

J12-Bac-54-30

Human head, fragmented.

Fig. 142.

H. 4.5; L. 3.5.

Hand made, eyes and nostrils incised, eyebrow and nose molded. Frame-like structure continues above right side of head. Applied to vessel.

References: Uscatescu (1996), nos. 12 and 13.

Roman (1st - 2nd century AD).

Zoomorphic vessel (SBr; AHS)

143.

J12-12-Bc-27-17-24

Body, almost intact.

Fig. 143.

Diam. (base) (min.): 2.3, (max.): 2.5; H.: 13.4; L.: 6.5; T.: (min): 0.3, (max): 1.0.

Munsell: core: 2.5YR 5/6; int.: 5YR 5/2; ext.: 2.5YR 5/6. Cylindrical with curving end and pointed, flat 'nose'; traces from spout or handle attachments on upper part of vessel, hard fired, heavy reddish/orange clay; wheel made; Deco.: White horizontal lines on body, ends 4cm from 'nose'.

References: Uscatescu (1996), fig. 114, no. 837.

Late Byzantine – Umayyad (Deco.), (6th - 7th century AD).

Glass (AR)

144.

J12-Ca-27-1x

Jug, almost intact.

Fig. 144a-b.

Diam. (body max.): 6, (rim): 3.8, (base): 3.8; H.: 10.4.

Flat base, globular body; long neck, tapering to the rim; bell-shaped mouth; attached coil handle at shoulder, folded at the rim; Light yellow green translucent; deco.: 7 indents on body, horizontal thread on neck.

References: Dussart (1998), p. 178, pl. 60.9, group BXIV. 221; Saldern (1975), p. 111, no. 132; Stern (2001), p. 287, no. 151.

Byzantine (5th – 6th century AD).

145.

J12-B-11-7

Rim and neck, fragmented.

Fig. 145.

Diam. (max): 3; H.: 2.5, T.: 3.1.

Flask; spiral trail winding around entire fragment. Light yellowish green, translucent.

References: Israeli (2003), p. 173, no. 191; Meyer (1989), p. 240, fig. 1; Stern (2001), p. 302, no. 165.

Byzantine or early Islamic; 6th century AD (Israeli); Late Byzantine–Post-Umayyad (Meyer); 6th - 7th century AD (Stern).

146.

J12-Ca-32-12

Rim and neck, fragmented.

Fig. 146.

H.: 3.8; Diam. (rim): 2.8.

Bottle with slightly widening neck towards rim; no prominent rim, smoothed on top; Light green, transparent.

Mid/Late Roman (mid 3rd – 4th century AD).

147.

J12-B-12-1

Base, intact.

Fig. 147.

H.: 3.2; T.: 1; Diam. (max.): 4.9.

Stemmed goblet with hollow stem and folded base ring; Light yellow green translucent, pontil mark visible.

References: Baur (1938), p. 527, pl. 21; Çakmakçı (2009), p. 62, tab. 3 (A – Goblets produced with hollow stem, Type A1c); Dussart (1998), p. 267, pl. 27.43; Meyer (1989), p. 240, fig. 1; Stern (2001), p. 310, no. 173.

Byzantine; 4th - 5th century AD (Baur); end of 6th century AD (Dussart); Late Byzantine–Post-Umayyad (Meyer); 6th - 7th century AD (Stern).

148.

J12-Bc-27-34

Base, fragmented.

Fig. 148.

H.: 4.1; L.: 4.4; T.: 0.35.

Base of double kohl tube; Light green, translucent, pontil mark visible.

References: Dussard (1998), p. 297, pl. 57.24 (BXIII. 2211); Fansa and Bollmann (2008), p. 160, nos. 72, 73; Israeli (2003), p. 231, no. 291; Stern (2001) p. 316, no. 178; Late Roman/Byzantine; 4th - 6th century AD (Fansa and Bollmann); 6th - 7th century AD (Stern); 4th - 6th century AD (Israeli).

149.

J12-B-14-45

Stem, fragmented.

Fig. 149.

H.: 4; T.: 0.3; Diam. (max.): 2.2; (min.): 1.

Polycandelon lamp; olive-green, translucent, pontil mark visible.

References: Dussart (1998), p. 256, pl. 16.1.3 (BVI. 211); Dussart *et al.* (2004), p. 74, fig. 4.5; Keller (2010), p. 187, fig. 2.1; Meyer (1938), p. 240, fig. 1.

Byzantine; 5th - 6th century AD (Keller); Byzantine–Umayyad (Dussart *et al.*); Early Byzantine–Post-Umayyad (Meyer).

150.

J12-C-1-135

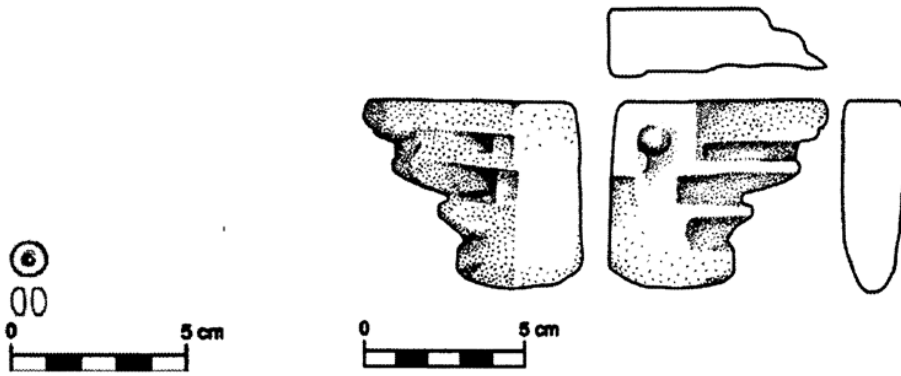
Stem, fragmented.

Fig. 150.

Diam. (max): 2.1, (stem): 1.2; H.: 4.

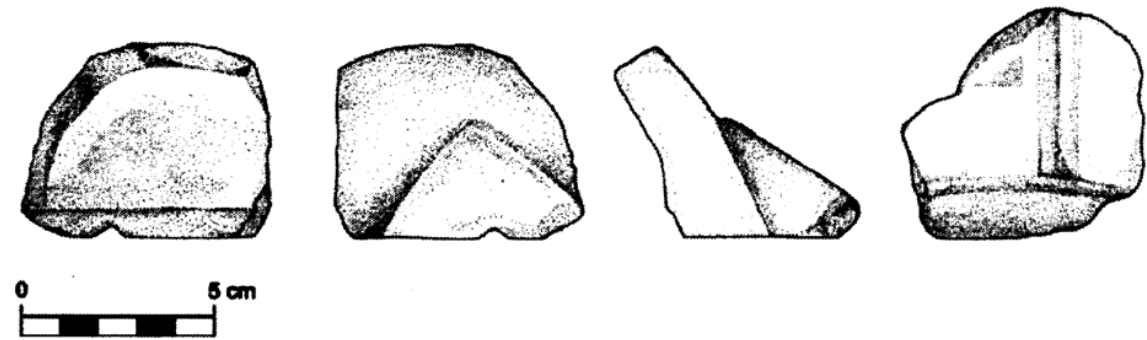
Knobbed stem of lamp or goblet with three or more knobs. Light bluish green, translucent.

References: Baur (1938), p. 519, pl. CXLI a, fig. 17 (368);

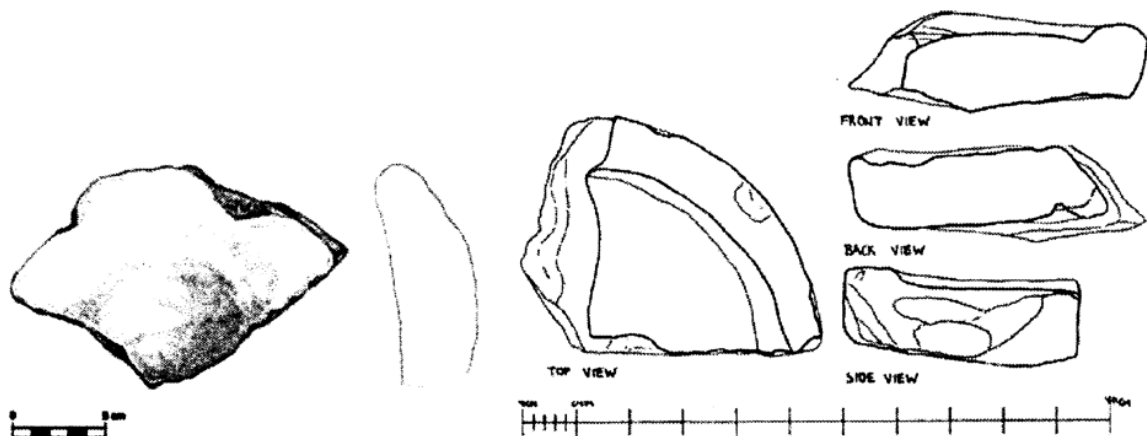


160

161



162



163

164

Dussart (1998), p. 88, pl. 16.14, 16.17; Hadad (1998), p. 75, Type 2, fig. 2.14; Meyer (1989), p. 240, fig. 1. Umayyad/Abbasid 8th – 9th century AD; 5th –6th century AD (Baur); 4th –7th century AD (Dussart); Byzantine (Hadad); Late Byzantine/Umayyad (6th - 7th century AD) (Meyer).

Bone utilities (SKr)

151.

J12-Ba-2-1298

Worked bone pen, almost intact.

Fig. 151.

Diam.: 0.4-0.8; H.: 7.6.

The pen has been smoothed and rounded; deco: Head has been carved round, under this are three incised, horizontal lines; a small superficial hole is on the top of the head. The one end has been broken off; possibly a kohl pen.

References: McNicoll *et al.* (1982), pl. 134, 18-19; Clark *et al.* (1986), pl. XXVI, no. 1.

Late Roman - Byzantine (4th - 5th century AD).

152.

J12-B-23-2

Worked bone cylinder, fragmented.

Fig. 152.

Diam.: 1.45; H.: 5.75.

Smoothed and rounded; deco: Two horizontal, deep grooves carved around the bone; one end is broken off; possibly a kohl container.

References: Findlater *et al.* (1998), fig. 7 and 9.

Late Roman - Byzantine (4th - 6th century AD).

153.

J12-Bc-27-41

Bone inlay, fragmented.

Fig. 153.

H.: 1.65; L.: 4.1; T.: 0.15.

A rectangular bone inlay with incised concentric circles; three of these are preserved and consists of three circles each.

References: McNicoll *et al.* (1982), pl. 111, 31.

Not datable.

Metal (DC)

154.

J12-B-8-22

Belt-buckle (?).

Fig. 154.

L.: 2.5; H.: 1.5; T.: 0.4.

Iron (Fe), rectangular.

Not datable.

155.

J12-B-14-28

Spear-head.

Fig. 155.

L.: 15; T. (max): 1; (min.): 0.4.

Iron (Fe); Spear-head with mid rib and broken off hilt.

Not datable.

156.

J12-Ca-20-1x

Make-up pen.

Fig. 156.

L.: 8.8; T. (body): 0.2; T. (head): 0.3.

Bronze. Rounded head and two horizontal grooves at the lower part.

Not datable.

Chipped stone tool (EG)

157.

J12-B-1-11

Flint tool, fragmented.

Fig. 157.

H : 4.7; L.: 3.6; T.: 0.8.

Stone has been worked/smoothed by use of wood or bronze; compressing and chipped, beige-pink/reddish flint.

References: Kerestes (1977-78), pl. LXXV.1; 3rd row, 3rd left.

Neolithic.

Spindle whorls (SBr)

158.

J12-Ab-1-83

Fig. 158.

Diam.: 2.5; H.: 0.95.

Steatite, bluish grey, cone shaped and pierced at centre.

References: McNicoll (1982), pl. 132, no. 7; McNicoll (1992), pl. 95, no. i; Riis (1990), fig. 97, no. 754.

Not datable.

159.

J12-Bc-27-95

Fig. 159.

Diam.: 2.5, (hole): 0.35; H.: 0.9.

Munsell: GLEY 2 2.5/5PB Bluish black.

Steatite, cone shaped and pierced at centre. Deco.: Two incised circles, circulating hole.

References: McNicoll (1982), pl. 132, no. 7; McNicoll (1992), pl. 95, no. i; Riis (1990), fig. 97, no. 754.

Not datable.

Bead (SBr)

160.

J12-Bd-72-1

Bead, intact (worn).

Fig. 160.

Diam. (max): 1.4; H.: 1.1.

Carnelian, Reddish brown; flattened; drilled hole at centre; worn on one surface.

Not datable.

Metal Mould (SBr)

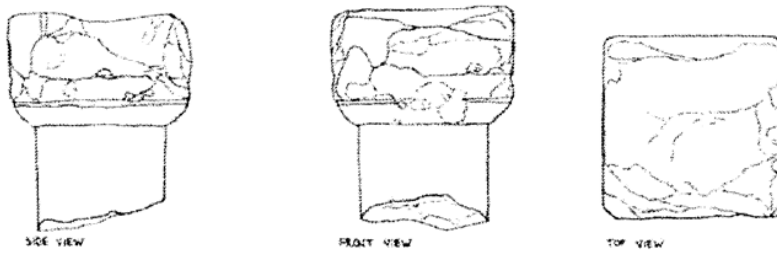
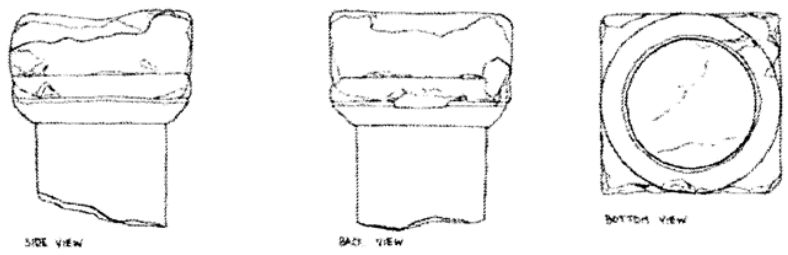
161.

J12-B-2-1227

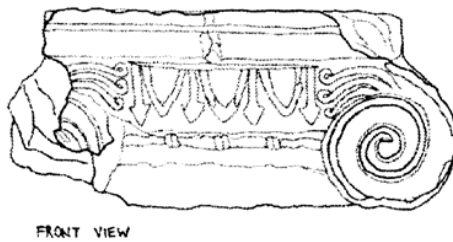
Mould, fragmented.

Fig. 161.

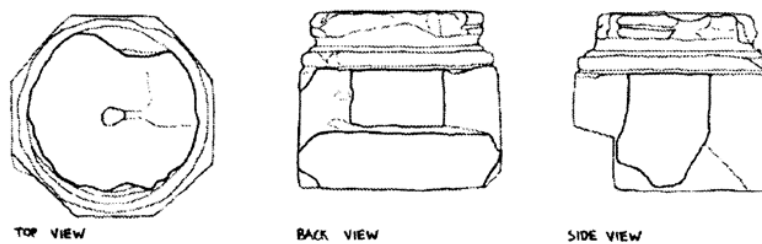
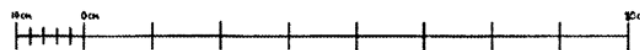
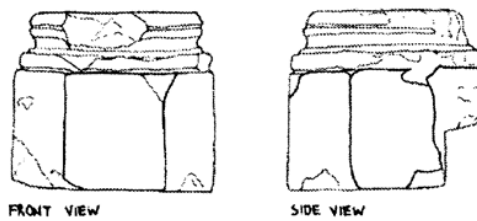
H.: 5.9; L.: 6.7; T.: 2.



165



166



167

Pale greyish lime stone with one circular and three oblong depressions; traces of lead in the circular depression (Testing method: Plumbtest paper from WVR (chemical company)).
Not datable.

Stone vessels (SKr)

162.

J12-Bd-70-1

Marble spout, fragmented.

Fig. 162.

H.: 5.1; L.: 6.5; T.: 6.

Larger vessel which might have had several spouts; possibly a mortarium; the colour of the marble is whitish.

References: Crawford (1990), fig. 180.

Byzantine.

163.

J12-C-1-43

Basalt bowl, fragmented.

Fig. 163.

H.: 4.8; L.: 17.6; T.: 3.3.

The stone has been worked and roughly smoothed with upwards curving sides; possibly a mortarium; the stone is black/grey.

References: Clark *et al.* (1986), fig. 24.

Not datable.

164.

J12-Cc-50-3

Limestone bowl.

Fig. 164.

H.: 6.9; L.: 23; T.: 7.

The stone has been worked and smoothened with upwards curving sides and a central depression; it was possible used as a basin; the limestone is whitish/buff.

References: Clark *et al.* (1986), fig. 24.

Not datable.

Miniature Horned Altar (DMH)

165.

J12-Ae-19-1x

Miniature horned altar, fragmented.

Fig. 165.

H.: 10.15; L.: 8.4; W.: 4.1; D.: 6.

Munsell: 10YR 8/4.

Small miniature altar; limestone; weathered; round pillar with a moulded convex top; the base is missing; the uppermost part has four horns and probably an incense burner bowl, however, both horns and bowl are hard to discern due to the weathering.

References: Yale University Art Gallery, eCatalogue, no. 1931.414; Galling (1925), 65-67, Taf. 13.

Hellenistic/Roman.

Architectural elements (DMH)

Ionic Capital

166.

J11-D02 and J12-C-1-D02B

Ionic capital.

Fig. 166.

Diam.: 63; H.: 38; W.: 80.

Ionic Capital; light-brown limestone; weathered; worked on all sides; local type.

References: Kraeling (1938), pl. XLVI.b; Zayadine (1986), pl. XII.

4th century AD (?)

Base

167.

J12-Cb-35-32

Attic, fragmented.

Fig. 167.

H: 26; L: 29.6; W: 29.2.

Attic base on an octagonal pedestal; light-brown limestone; rather well preserved, with some weathering; chisel marks are visible on the lower part and a little plaster on the top; The back part has been worked to fit into a stepped structure.

Not datable.

Addendum

During the 2011 survey campaign (see the publications in *ADAJ* 2012) which included a survey of the city wall in the Northwest quarter a large fragment of a deep sculptural relief was found in the debris of the city wall. As this was not included in the 2012 publications, it is included here, as it is a significant find.

Fragment of relief with human figure and animal found in the debris of the city wall during the 2011 campaign (**Fig. 1a, 1b**)

Inventory number: B01

Found in the collapse of the city wall in sector B in 2011, Material: white/yellowish limestone

Measures:

Width: 51 cm

Max. relief depth: 42 cm

Height: 30 cm

Date: Roman

State of preservation: Heavily damaged on all four sides. Only parts of the torso of a human figure and fragments of an animal are visible. The surface is mostly in a good condition, but larger parts of the right side are missing.

Description:

The object is a fragment of a larger relief. The relief is of considerable depth and measures 27 cm in the deepest preserved place. The depth of the relief gives the effect of sculpture in the round. Due to the fragility of the limestone protruding body parts were only partly undercut and major parts were left connected to the stone thus creating several layers of straight backgrounds.

Depicted is the middle part of a draped human figure. To its right the torso of an animal is situated. Behind the left leg and left part of the body of the figure drapery is visible.

The frontal human figure is standing upright. It is stepping forward with the right leg. The figure is wearing an under-knee tunic/chiton. Three clear cut folds fall from the right side downwards to the left side, while the hem is falling slightly in the opposite direction. The drapery in the background belongs to a long himation which the figure is wearing. Set apart from the himation three vertical rows of drill holes were left.

On the surface of the naked body parts and the dress of the figure there are visible fine tooth chisel marks.

On the right side of the human figure there is a strongly fragmented animal. The left front leg is placed in front of the right leg. Between the legs a row of drill holes is left. The right leg is straight. The identification of the species of the animal is not possible due to the state of preservation. From the positioning in the relief one may assume that we are dealing with either a quadruped or an eagle.

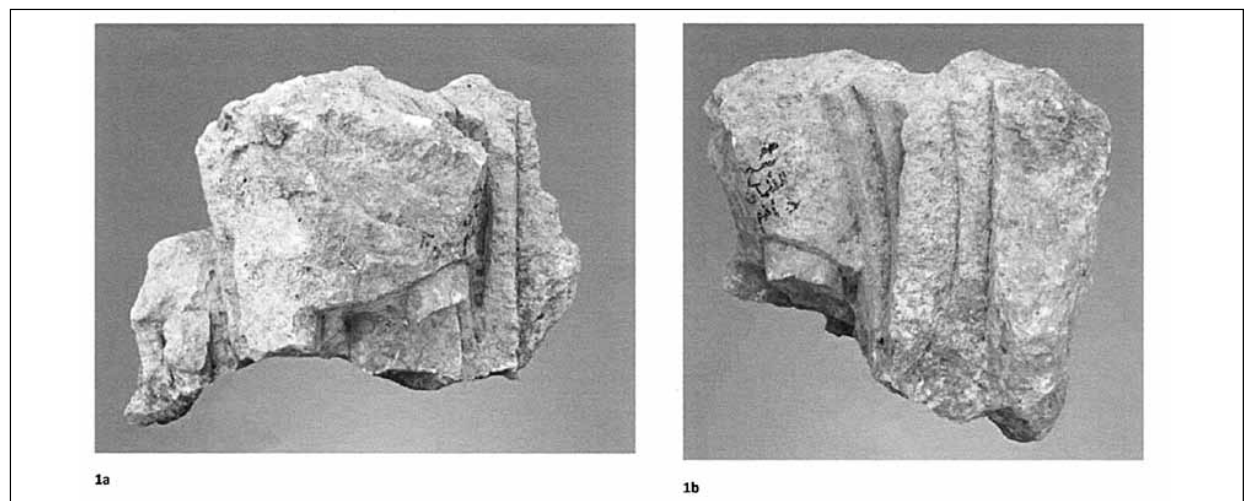
The backside of the relief is roughly worked but straight.

Interpretation

The poor state of preservation makes any interpretation speculative. It is impossible to determine whether the figures formed part of either a two figure relief or a larger relief involving more figures.

However, the motive – the animal positioned as an attribute to the human figure – may indicate that we are dealing with a male or female divine figure.

The find spot of the object may indicate that it has been used as a spolia in the city wall or have come from the necropolis to the west of the city.



1. Fragment of relief with human figure and animal.

Bibliography

- Archaeological Center, Tel Aviv, Auction 38
<http://www.archaeological-center.com/en/auctions/38> (accessed 06.04.2013)
- Arnon, Y. D.
 2008 *Caesarea Maritima, the Late Periods (700-1291 AD)*: BAR-IS 1771, Oxford.
- Ball, W., Bowsher, J., Kehrberg, I., Walmsley, A. and Watson, P.
 1986 The North Decumanus and North Tetrapylon at Jarash: An Archaeological and Architectural Report. Pp. 351-393 in F. Zayadine (ed.), *Jarash Archaeological Project*, Vol. I.
- Avisar, M and Stern, E.
 2005 *Pottery of the Crusader, Ayyubid, and Mamluk Periods in Israel*, Jerusalem.
- Baur, P. V. C.
 1938 Glassware: Pp. 505-546 in C. H. Kraeling (ed.), *Gerasa. City of the Decapolis*, New Haven.
- Berlin, A. and Slane, K.W.
 1997 *Tel Anafa II, i. The Hellenistic and Roman Pottery*. Ann Arbor.
- Bessard, F.
 2009 Umayyad Urban Economy in Jarash. *Munjazat*: 58-59.
- Bonifay, M.
 2004 *Etudes sur la céramique romaine tardive d'Afrique*. BAR-IS 1301, Oxford.
- Braemer, F.
 1989 Une fabrique (Locale?) de céramique fine á Jarash au tournant de l'ère. *Syria* 66: 153-167.
- Brizzi, M., Sepio, D. and Baldoni, D.
 2010 Italian Excavation at Jarash 2002-2009: The Area of the East Propylaeum of the Sanctuary of Artemis and the 'Propylaea Church' Complex, *ADAJ* 54: 345-369.
- Çakmakçı, Z.
 2009 A Typological Approach to Glass Goblet Production from Late Antiquity to the Middle Ages in the Light of Recent Finds. Pp. 49-60 in E. Laflı (ed.), *Late Antiquity/Early Byzantine Glass in the Eastern Mediterranean. Colloquia Anatolica et Aegaea. Acta Congressus Internationalis Smyrnensis* 2. 25-28 October 2009, Izmir.
- Canivet, P. and J.-P. Rey-Coquais (eds.)
 1992 *La Syrie de Byzance à l'Islam, VIIe-VIIIesiècles*. Damascus.
- Christensen, A. P. and Friis Johansen, C.
 1986 *Les poteries hellénistiques et les terressigillées-orientales, Hama. Fouilles et Recherches de la Fondation Carlsberg. 1931-1938 III,2*. København.
- Clark, V. A., Bowsher, J. M. C., Stewart, J. D., Meyer, C. M. and Falkner, B. K.
 1986 The Jarash North Theatre: Architecture and Archaeology 1982-1983, Pp. 205-302 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman.
- Crawford, J. S.
 1990 *The Byzantine Shops at Sardis*. Cambridge, Massachusetts and London.
- Crowfoot, J. W., Crowfoot G. M., and Kenyon, K. M.
 1957 *The Objects from Samaria*, London.
- Da Costa, K.
 2001 Byzantine and Early Islamic Lamps: Typology and Distribution. Pp. 241-258 in E. Villeneuve and P. M. Watson (eds.), *La Céramique Byzantine et Proto-Islamique en Syrie-Jordanie (IVe-VIIIe Siècles Apr. J.-C.)*. Actes du colloque tenu à Amman les 3, 4 et 5 décembre 1994, Beyrouth.
- Degeest, R.
 2000 *The Common Wares of Sagalassos*. Studies in Eastern Mediterranean Archaeology. Turnhout.
- Dussart, O.
 1998 *Le Verre en Jordanie et en Syrie du Sud*. BAH 152, Beirut.
- Dussart, O., Velde, B., Blanc, P.-M. and Sodini, J.-P.
 2004 Glass from Qal'at Sem'an (Northern Syria): The Reworking of Glass during the Transition from Roman to Islamic Compositions. *Journal of Glass Studies* 46: 67-83
- Fansa, M. and Bollmann, B. (eds.)
 2008 *Die Kunst der frühen Christen in Syrien. Zeichen, Bilder und Symbole vom 4. bis zum 7. Jahrhundert*. Oldenburg.
- Fehérvári, G.
 1998 *Pottery of the Islamic World in the Tareq Rajab Museum*. Kuwait.
- Findlater, G., El-Najjar, M., Al-Shiyab, A.-H., O'Hea, M. and Easthaugh, E.
 1998 The Wadi Faynan Project: the South Cemetery Excavation, Jordan 1996: a Preliminary Report. *Levant* 30: 69-83.
- Franken, H. J. and Kalsbeek J.
 1975 *Potters of a Medieval Village in the Jordan Valley*, Amsterdam, Oxford, New York.
- Galling, K.
 1925 *Der Altar in den Kulturen des alten Orients*, Berlin.
- Gawlikowski, M., and Musa, A.
 1983 The Church of Bishop Marianos, Pp. 137-162 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman.
- Gawlikowski, M.
 1986 A Residential Area by the South Decumanus, Pp. 107-136 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman.
- Gerber, Y.
 2005 Late Roman Coarse Ware from Petra, Jordan: Changes in typology and chemical composition,

- Pp. 725-736 in J. M. GurtEaparraguera, J. BuxedaGarrigós and M. A. Cau Ontiveros (eds.), *LCRW I: Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean*, BAR-IS 1340, Oxford.
- 2012 Classical Period Pottery, in *Ceramic Finds, Typological and Technological Studies of the Pottery Remains from Tell Hesban and Vicinity. Hesban 11*: 175–506
- Gunneweg, J., Perlman, I. and Yellin, J.
1983 *The Provenance, Typology and Chronology of Eastern Sigillata*, Jerusalem.
- Hadad, S.
1997 Oil Lamps from the Third to the Eighth Century C. E. at Scythopolis-Bet Shean, *Dumbarton Oaks Papers* 51: 147-188
1998 Glass Lamps from the Byzantine through Mamluk Periods at Bet Shean, Israel. *Journal of Glass Studies* 40: 63–76.
- Hammond, P. C.
1977-1978 Excavations at Petra 1975-1977. *ADAJ* 22: 81-101.
- Hayes, J.W.
1972 *Late Roman Pottery. A Catalogue of Roman Fine Wares*, London.
- Holland, T.
2006 *Excavations at Tell Es-Sweyhat, Syria*, Volume 2, Part 2: *Figurines and Plates – Archaeology of the Bronze Age, Hellenistic, and Roman Remains at an Ancient Town on the Euphrates River*, Chicago.
- Homés-Federicq, D. (ed.)
1980 *Inoubliable Petra, Le royaume nabateen aux confins du desert*, Bruxelles.
- Homés-Federicq, D. and Franken, H. J.
1986 *Pottery and Potters: Past and Present, 7000 years of Ceramic Art in Jordan*, Tübingen.
- Houston Smith, R.
1973 *Pella of the Decapolis, The 1967 Season of the College of Wooster Expedition to Pella*, Wooster.
- Israeli, Y. (ed.)
2003 *Ancient Glass in the Israel Museum. The Eliahu-Dobkin Collection and Other Gifts*, Jerusalem.
- Jackson, M., M. Zelle, L. Vandeput, and V. Köse
2012 Primary evidence for Late Roman D Ware production in southern Asia Minor: a challenge to “Cypriot Red Ware”, *AnatSt*, 62, 89-114.
- Johns, J.
1998 The Rise of Middle Islamic Hand-Made Geometrically Painted Ware in Bilād al-Shām (11th-13th Centuries A.D.), Pp. 65-93 in R.-P. Gayraud (ed.), *Colloque international d'archéologieislamique*, Cairo.
- Kehrberg, I.
1989 Selected lamps and pottery from the Hippodrome at Jarash. *Syria* 66: 85-97.
- 2009 Byzantine Ceramic Production and organisational aspects of sixth century AD pottery workshops at the hippodrome of Jarash. *SHAJ*, 493-512.
- Keller, D.
2010 Abbots' Orders, Pilgrims' Donations, Glass Collection. The Supply of Glass Lamps for a Monastic/Pilgrimage Church in Southern Jordan, Pp. 183-198 in J. Drauschke and D. Keller (eds.), *Glass in Byzantium. Production, Usage, Analyses. International Workshop organized by the Byzantine Archaeology Mainz. 17th–18th of January 2008*, Römisch-Germanisches Zentralmuseum Regensburg.
- Kenkel, F.
2012 *Untersuchungen zur hellenistischen, römischen und byzantinischen Keramik des Tell Zirā'aimWādī al-'Arab (Nordjordanien) – Handelsobjekte und Alltagsgegenstände einer ländlichen Siedlung im Einflussgebiet der Dekapolisstädte*. Doctoraldissertation, Universität zu Köln.
- Kerestes, T. M., Lundquist, J. M., Wood, B. M. and Yassine, K.
1977-78 An Archaeological Survey of Three Reservoir Areas in Northern Jordan. *ADAJ* 22: 108-136.
- Kraeling, C. H.
1938 *Gerasa. City of the Decapolis*. New Haven, CT.
Lichtenberger, A. and Raja R.
in press Intentional Cooking Pot Deposits in Late Roman Jarash (Northwest Quarter). *Syria* (in press).
- McNicoll, A., Smith, R. H., and Hennessey, B.
1982 *Pella in Jordan 1: an interim report on the joint University of Sydney and The College of Wooster Excavations at Pella 1979-1981*. Canberra.
- McNicoll, A., Edwards, P. C. and Hanbury-Tenison, J. W.
1992 *Pella in Jordan 2: the second interim report of the joint University of Sydney and the College of Wooster excavations at Pella, 1982-1985*. Sydney.
- Meriç, R.
2002 *Späthellenistisch-römische Keramik und Kleinfunde aus einem Schachtbrunnen am Staatsmarkt in Ephesos*. Wien.
- Meyer, C.
1998 Byzantine and Umayyad Glass from Jarash: Battleship Curves. *ADAJ* 33: 235–244.
- Najjar, M.
1989 Abbasid Pottery from El-Muwaqqar. *ADAJ* 33: 305–322.
- Piazza, M. G.
1983 Soundings in the intermediate terrace of the sanctuary of Artemis at Gerasa, 1979-1981. *Mesopotamia*: 113-134.

- Pierobon, R.
1986 The area of the Kilns, Pp. 184-187 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman.
- Pinard, M.
1951 Poteries et fragments chrétiens a décor incisé provenant de Carthage. *Cahiers de Byrsa* 2: 121-150.
- Rasson, A. M. and Seigne J.
1989 Une citerne Byzantino-omeyyade sur le sanctuaire de Zeus. *Syria* 66: 117-151.
- Reynolds, P.
2005 Levantine Amphorae from Cilicia to Gaza: a typology and analysis of regional production trends from the 1st to 7th centuries, Pp. 563-611 in J. M. GurtEaparraguera, J. BuxedaGarrigós and M. A. Cau Ontiveros (eds.), *LCRW I: Late Roman Coarse Wares, Cooking Wares and Amphorae in the Mediterranean*. BAR-IS 1340, Oxford.
- Riis, P. J. and Buhl, M. L.
1990 *Les objets de la periode dite Syro-Hittite. Hama, fouilles et recherché de la foundation Carlsberg - 1931-1938* II. 2, København.
- Saldern, A. (ed.)
1974 *Kunstmuseum Düsseldorf. Glassammlung Hentrich - Antike und Islam*, Düsseldorf.
- Saller, F. S.
1957 *Excavations at Bethany (1949-1953)*, Jerusalem.
- Sauer, J. A. and L. G. Herr (eds.)
2012 *Hesban II: Ceramic Finds: Typological and Technological Studies of the Pottery Remains from Tell Hesban and Vicinity*, Berrien Springs, MI.
- Schaefer, J.
1986 An Umayyad Potters' complex in the North Theatre, Jarash, Pp. 411-459 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*. Amman.
- Scholl, T.
1986 The Chronology of Jarash Lamps, in *Jarash Archaeological Project 1981-1983*, F. Zayadine (ed.), Amman: 163-166. Seeden, H.
- 1988 Busra 1983-84: Second Archaeological Report. *Damaszener Mitteilungen* 3: 387-412.
- Slane, K. W.
1997 The Fine Wares, in *Tel Anafa II, i. The Hellenistic and Roman Pottery*. A. Berlin and K. W. Slane, Ann Arbor.
- Sodini, J.-P. and Villeneuve, E.
1992 Le Passage de la Céramique Byzantine a la Céramique Omeyyade en Syrie du Nord, en Palestine et en Transjordanie. Pp. 195-218 in P. Canivet and J.-P. Rey-Coquais (eds.), *La Syrie de Byzance à l'Islam. VIIe-VIIIe Siècles. Actes du Colloque international 11-15 Septembre 1990*. Damascus.
- Stern, E. M.
2001 *Römisches, byzantinisches und frühmittelalterliches Glas 10 v. Chr.-700 n. Chr., Sammlung Ernesto Wolf*. Ostfildern-Ruit.
- Thomsen, R., Christensen A. P. and Ploug, G.
1986 The Graeco-Roman Objects of Clay, the Coins and Necropolis. in *Hama. Fouilles et recherche de la foundation Carlsberg- 1931-1938* III.3, København.
- Uscatescu, A.
1995 Jarash Bowls and other related local wares from the Spanish excavations at the Macellum of Gerasa (Jarash). *ADAJ* 39: 365-408.
- 1996 *La Cerámica del Macellum de Gerasa (Yaraš, Jordania)*. Madrid.
- 2001 Mid Fourth-Fifth Centuries AD stamped pottery from the hippodrome in Jarash. *SHAJ*, Amman.
- Vaag, L. E.
1999 *En undersøgelse af den Senantikke keramikgruppe: Phocaeen Red Slip Ware. Typologi, datering og distribution*. Appendix, Bind 2. PhD. Dissertation, Aarhus University.
- Villeneuve, E. and Watson, P. M. (eds.)
2001 *La Céramique Byzantine et Proto-Islamique en Syrie-Jordaine (IV – VIII Siècles Apr. J.C.)*. Beirut.
- Villeneuve, F., Humbert, J. and Chambon, A.
1993 *Khirbet edh-Dharih*. Tessonier.
- Walker, B.
2012 The Islamic Period. Pp. 507-597 in J. A. Sauer and L. G. Herr (eds.), *Hesban II: Ceramic Finds: Typological and Technological Studies of the Pottery Remains from Tell Hesban and Vicinity*. Berrien Springs, MI.
- Walker, B. J. and LaBianca, Ø. S.
2003 The Islamic Qaşūr of Tall Hisbān: Preliminary Report on the 1998 and 2001 Season. *ADAJ* 47: 443-471.
- Walmsley, A.
1997-98 Settled Life in Mamluk Jordan - Views of the Jordan Valley from Fahl (Pella). *ARAM* 9-10: 129-143.
- Walmsley, A., Blanke, L., Damgaard, K., Mellah, A., McPhillips, S., Roenje, L., Simpson, I., and Bessard, F.
2008 A Mosque, Shops and Bath in Central Jarash: The 2007 Season of the Islamic Jarash Project. *ADAJ* 52: 109-137.
- Watson, P.
1989 Jarash Bowls: Study of a provincial group of byzantine decorated fine ware. *Syria*: 223-261.
- 1992 Change in Foreign and Regional Economic Links with Pella in the Seventh Century AD: The Ceramic Evidence, Pp. 233-247 in P. Canivet and J.-P. Rey-Coquais (eds.), *La Syrie de Byzance à l'Islam. VIIe-VIIIe Siècles. Actes*

- du Colloque international 11.-15. Septembre 1990. Damascus.
- Weiss, Z. and Talgam, R.
2002 The Nile festival, building and mosaics: mythological representations in early Byzantine sephoris. in *The Roman and Byzantine Near East* 3, J. H. Humphrey (ed.), Portsmouth, RI.
- Welles, B. C. (ed.)
1968 *The Excavations at Dura Europos*. New Haven.
- Wilkinson, C. K.
1973 *Nishapur: Pottery of the Early Islamic period*. New York.
- Williams, C.
1989 *Anemurium. The Roman and Early Byzantine Pottery*. Wetteren.
- Yale University Art Gallery
[http://ecatalogue.art.yale.edu/detail. htm? obje tId=4993](http://ecatalogue.art.yale.edu/detail.htm?obje tId=4993)
(accessed 03.04.2013)
- Zayadine, F.
1978 Excavations on the Upper Citadel of Amman Area A (1975 and 1977). *ADAJ* 22: 20–56.
1983 F. Zayadine (ed.), Amman, 7-28.
1986 The Jearsh Project for Excavation and Restoration, in *Jarash Archaeological Project*
1986 *Jarash Archaeological Project 1981-1983*. Amman.
- Zeitler , J. P.
1990 *The Near East in antiquity, Houses, Sherds and Bones; Aspects of Daily Life in Petra*. Amman.
-

PRELIMINARY REPORT OF THE SECOND SEASON OF THE DANISH-GERMAN JARASH NORTHWEST QUARTER PROJECT 2012

Georg Kalaitzoglou, Achim Lichtenberger, Rubina Raja

Introduction

Between the 1st August and 11th September 2012 the Danish-German team from the University of Aarhus, Denmark and Ruhr-Universität Bochum, Germany conducted its second campaign in the Northwest quarter of the ancient city of Jarash. On the basis of the results of the 2011 campaign, which consisted of architectural, geodetic and geophysical surveys (see Lichtenberger and Raja 2012 and Kalaitzoglou *et al.* 2012 for the 2011 campaign); it was decided to lay out three trenches. These were chosen to gain further insight into the settlement history of the Northwest quarter of the city, which is the highest point within the ancient city walls and which until now has not been investigated in detail. The project, which is directed by Achim Lichtenberger and Rubina Raja, is funded by the Deutsche Forschungsgemeinschaft (DFG) and the H.P. Hjerl Hansen Mindefondet for Dansk Palæstinaforskning.¹

We would like to thank the acting director general of the Department of Antiquities, Fares al-Hmoud, for the permission for the 2012 campaign and the director of the Department of Antiquities in Jarash Dr. Rafe Harahsheh for his and his staff's support during our campaign. Furthermore, thanks go to our representative Dr. Mohamed Abu Abileh, who was an invaluable help during our campaign.

The main aim of the campaign was to begin to clarify the settlement history of the hill.² Fur-

thermore aims were to complete the topographic map begun in 2011 and to map the Northern part of the city wall within the investigation area in detail. Three trenches A-C (**Fig. 1**) were laid out on top of the hill. These were chosen on the basis of the results of the 2011 campaign. Trench A, which was located on the highest point of the hill, was laid out to clarify an L-shaped geomagnetic anomaly detected in 2011.³ Trenches B and C were located in areas where undocumented activity had already taken place. Trench B was chosen because strong walls and a monumental architectural element were already visible on the surface. Trench C was laid out in order to investigate the most prominent visible building structure on top of the hill, the so-called 'Ionic building'.⁴

In total approx. 95 m² were excavated until bedrock or the oldest structures was reached. It was an objective to reach bedrock or virgin soil without disturbing any relevant ancient structures. All trenches were backfilled. The relative chronology of the trenches was reconstructed, but in most cases an absolute dating of the various features will be subject to further ceramic and find studies. The major part of the finds point to a Roman, Byzantine and later date, whereas a smaller amount of finds can be related to earlier periods. A representative part of the finds from the 2012 campaign is published in this volume of *ADAJ* as well (see Lichtenberger, Raja and Sørensen).

1. The team consisted of the two directors Achim Lichtenberger and Rubina Raja, head of the field team Georg Kalaitzoglou, head of the registration team Annette Højen Sørensen, architect Jens Christian Pinborg, conservator Helle Strehle, photographer Michael Bencke and the field and registration team: Dorothea Csitneki, Eicke Granser, Christoffer Pelle Hagelquist, Ditte Maria Damsgaard Hiort, Signe Børsen Koch,

Signe Krag, Signe Bruun Kristensen, Cathrin Pogoda, Anne Riedel and Stefan Riedel.

2. For preliminary reports on the field works in 2011 see Lichtenberger and Raja, 2012.

3. Kalaitzoglou *et al.* 2012.

4. The name derives from spoils of Ionic capitals implemented into this building.



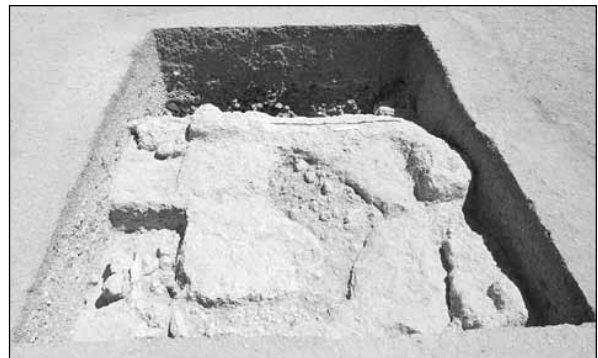
1. Detail of the Northwest quarter with Trenches A–C, 2012.

Trench A (in collaboration with Christoffer Pelle Hagelquist)

General Outline and Structures

One objective of the 2012 campaign was to clarify an L-shaped anomaly on the highest place in the Northwest quarter near the ancient city wall, which the geomagnetic prospection of the 2011 campaign had revealed. Therefore, trench A, measuring 5 x 5 meters and later extended by 1 meter towards the East, was opened above the anomaly. Today the area is used as a football pitch (**Fig.2**).

The geomagnetic anomaly turned out to reflect soil that was lying up against curving bedrock in the eastern-most part of the trench. The most important feature in trench A is the discovery of a rectangular room about 1.5 m under the surface which was cut c. 2.5 m deep into the bedrock. A niche (ev. 12)⁵ was uncovered in the top southeast corner of the room. Furthermore an installation on the floor consisting of two limestone blocks (ev. 24) was unearthed. Apart from these structures no other features were recorded in relation to the plastered bedrock (ev. 9) or floor (ev. 23). The inner face of the room shows one phase of plaster revetment



2. Trench A, overview from west with ancient under the modern fill.

only, which indicates that at least the room's architectural design is of a single phase. For some reason the room was filled up with various deposition layers which contained some intentionally deposited finds. The surface of the bedrock (ev. 2, ev. 5) that nearly covers the whole area of trench A has chisel marks in several places indicating that this area was used as a quarry before building activities started.

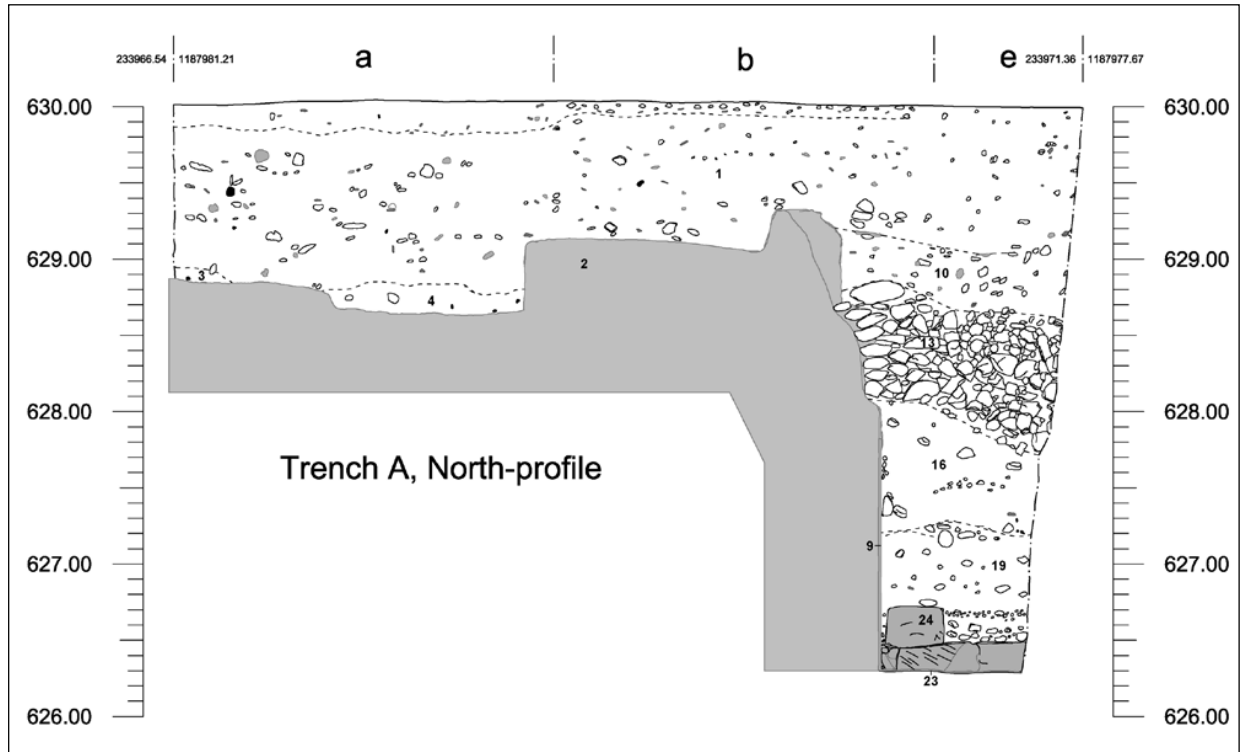
The soil stratigraphy is comprised of two main soil stratigraphic units; modern backfill layers (ev. 1, ev. 3, ev. 4 and parts of ev. 6) and ancient intentional fill layers (parts of ev. 6, ev. 7, ev. 8, ev. 10, ev. 13, ev. 16, ev. 19, ev. 22 and

5. Instead of "locus" or "unit" we use the term "evidence" to label archaeological complexes, assemblages

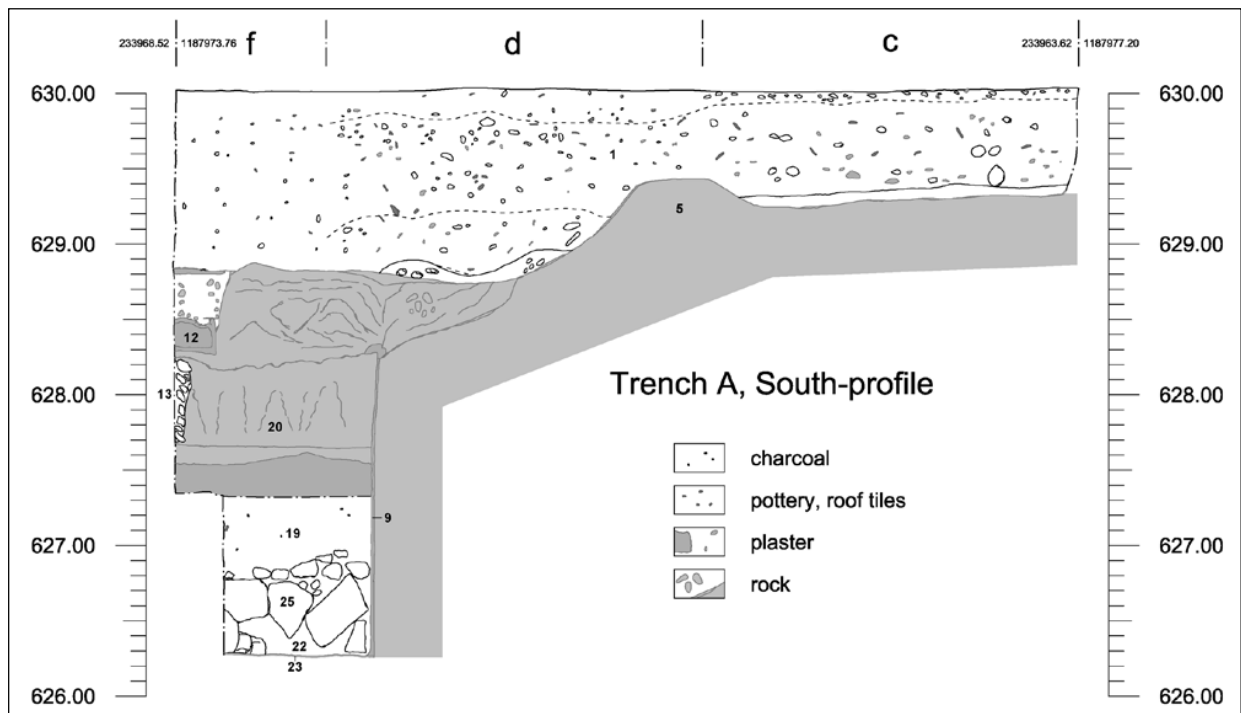
and also finds in situ.

ev. 25). The uppermost part of the ancient fill (ev. 6, ev. 7 and ev. 8) was already disturbed when the modern fill was deposited. The en-

tire trench has been covered by the modern fill about 0.20 m to 1.70 m thick (**Figs.3 and 4**). The modern backfill relating to a leveling of the



3. Trench A, North profile.



4. Trench A, South-profile.

area mostly consisted of a clayish soil which held material spanning from the Neolithic period to the early Islamic period. The material of the modern backfill does not necessarily come from the hill top or the vicinity and thus gives no reliable indications for the ancient settlement history in this particular spot.

The ancient stratified fill layers hold material, which provide information about the last phase of the structure. Although some dense stone clusters were encountered, the ancient fill layers

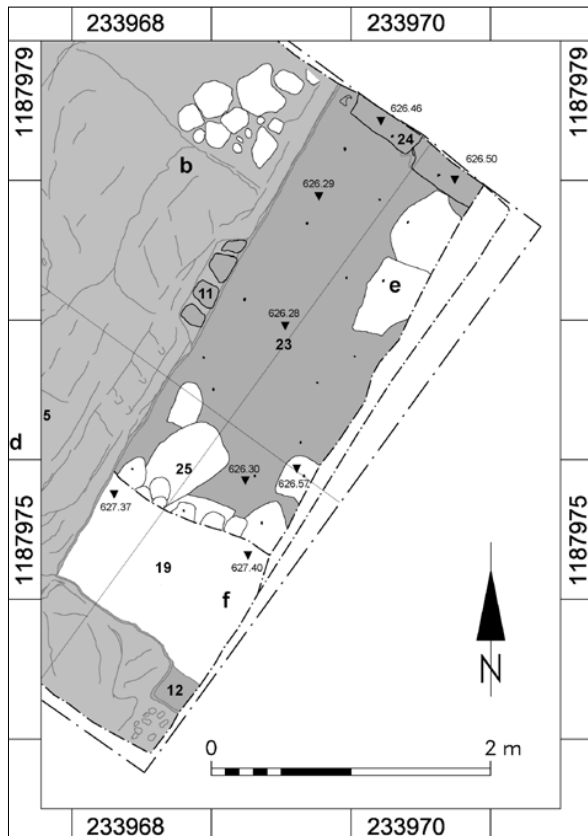
show little internal stratification suggesting a rapid infilling.

The Rock-cut Room Phase

The excavated parts of the plastered room measured approx. 4.5 m north-south, 1 m east-west by 2.5 m in height (Figs. 6, 7). The disturbance made from the modern backfill makes it difficult to establish an accurate height of the room, but traces of beddings for beams were located near the top of the curving bedrock. The



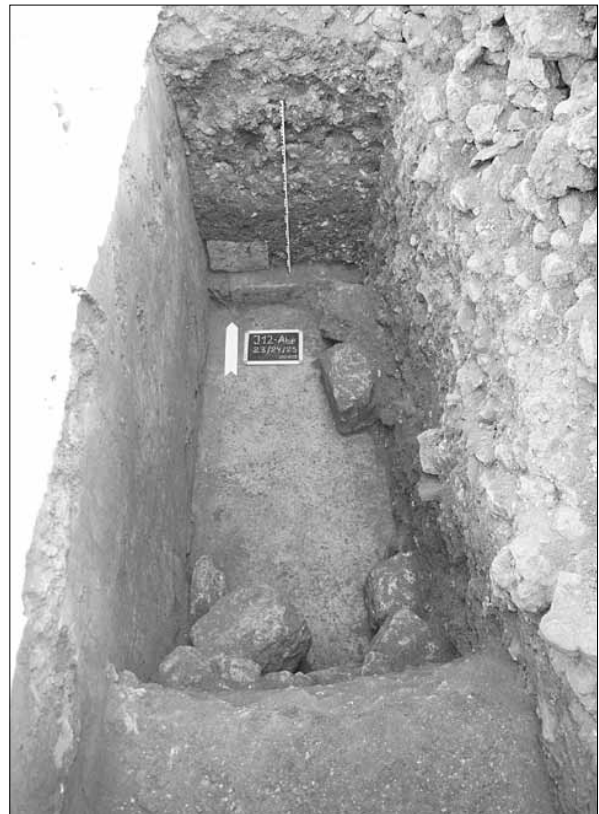
5. Trench A, level of the cooking pot deposits (ev. 14, 17, 18).



6. Trench A, eastern part, floor level of the rock-cut room.

south-eastern extent of the room is not clear, as this area was excavated for only 1 m in eastern direction. As the floor (ev. 23) and plastered bedrock (ev. 9) together continue beyond the north-eastern limit of the trench, it was not possible to determine the exact dimensions of the room. The plastering in general was well preserved with a few minor cracks in the floor plastering; however, the plastered bedrock had suffered some damage. The plaster is of a white-greyish colour and approx. 1-2 cm thick. It cannot be classified as hydraulic plaster, because it is too porous and contains too much charcoal.

To achieve a flat surface, which the curving bedrock did not provide, some worked stones were placed to fill the gaps and plastered (ev. 11). A niche (ev. 12) located on top of the plastered bedrock in the southeast part of the trench was cut into residual clay. In the niche and in the fill in front of it fragments of a cooking-pot were found. The eastern extension of the niche remains unknown as it extends outside of trench



7. Trench A, plastered room under ancient fill, from south.

A. The installation of the two limestone blocks (ev. 24) connected to the plastered bedrock and floor in the northeast corner indicates further built structures but their use is impossible to determine as the stone setting extends outside trench A (**Fig.7**).

The Archaeological Materials inside the Rock-cut Room

C₁₄ datings of the fill of the room suggest a date of the filling in the second half of the 3rd century AD.⁶ Lying near the installation of the two worked stones on the floor sherds from one large pithos (cat. no. 118-119) and fragments of other vessels including two good preserved specimens (cat. no. 79, cat. no. 90) were found indicating the latest phase of use of the room. All the pots were found in close proximity to each other and were covered by the ancient backfill. The diagnostic pieces of ceramic indicate a *terminus post quem* for the latest phase of use of the room in the Roman period. On the

6. Cf. Lichtenberger and Raja (in press).

floor no other traces of a collapse than the pottery were found which leads to the conclusion that the room was not destroyed or abandoned for a longer time before it was completely filled up to its former roof level with soil and debris.

The lower fill ev. 19 contained fragments of an incense burner lid (cat. no. 56) which also dates most probably to the Roman period. In the same part of the fill a Nabatean coin (Aretas IV), a fragment of a miniature altar (cat. no. 165), and an Eastern Sigillata A fragment (Af-19-16, not catalogued) were found. The existence of older finds in the fill shows that these early artifacts were present at the place where the material for backfill was taken.

In the fill layer ev. 16, above layer ev. 19, two almost complete cooking pots, placed upright, were found (**Fig. 5, 8**). They were deposited intentionally when the room had already fallen out of use and nearly completely filled. A reddish/red brown ware wheel made globular bi-ansulate cooking pot (cat. no. 98, ev. 18) was surrounded by stones and closed by a piece of tile (cat. no. 135). Inside this pot was a bottom layer of grey powdery ash with charcoal (cf. registration report in this ADAJ volume). Fragments of pottery and burned glass were located on top of the ash and the cooking pot had traces of fire on the outside. The other reddish/red brown ware wheel made bi-ansulate globular cooking pot (cat. no. 97, ev. 17) was situated up against the plastered bedrock beside a large stone with a piece of tile beside it. The cooking pot showed traces of fire on the outside. Inside was a bottom layer of grey powdery ash with charcoal (cf. registration report in this volume). In the fill around the cooking pots no traces of open fire or herds were found.

Above the deposition of the two complete

cooking pots fragments of other reddish/red brown cooking pots of the same type were found in the fill layer ev.13 (**Fig.5**). In it the bottom of a cooking pot (cat. no. 96) containing a similar grey powdery ash with charcoal was located (cf. registration report in this ADAJ volume). The pot sherds found in the niche (ev. 12) also stem from the same type of cooking pot. It is obvious that the cooking pots in ev. 13 and 16 were deposited intentionally.

A fine typology of local cooking pots in Jerash has not yet been established but a good starting is provided by Uscatescu.⁷ The general bi-ansulate ripped and rounded cooking pot is found from the late Hellenistic and Roman periods until the 9th century AD. So far the closest comparanda for the pots in trench A stem from the Late Roman/early Byzantine period.

At first sight the situation of the intentionally deposited cooking pots may give the impression of being cremations. Generally cremation was no longer common practice in this region from the Roman imperial period onward⁸. Only some examples from the 3rd century AD are known.⁹ However, since the ash inside the pots does not contain any traces of human bones an interpretation of the pots with ash as cremations is not possible.

Although the pots were used and partly darkened by fire, no concentrations of charcoal from hearths or open fireplaces were associated with the cooking pots in the different evidences (**Fig. 8**). In ev. 18 the ash was covered by two large glass sherds. There was no floor in direct association with these evidences as they were placed directly in a fill layer. Cooking therefore seems improbable and for now we have to be content with stating that we deal with intentional 7th century AD deposits whose intentions however remain unknown for now.¹⁰

7. Uscatescu, 1996.

8. Abu-Shmeis and Nabulsi, 2009, pp.513-525 table 1 is a list of 35 graves dating from the Late Hellenistic to the Late Byzantine/Early Umayyad times. These are unpublished or only noticed in preliminary reports. It remains unclear if the given historical periods date the graves or the incinerations.

9. An observation of two Roman cooking-pots used for cremation burials have been located at the Roman aqueduct near Megiddo, Palestine. The two cooking-pots contained burnt human bones that probably are related to Roman soldiers from 1st-2nd centuries AD (Hershkovitz, 1988-89; Tsuk, 1988). Bearing in mind that our cooking-pots had no evidence of burnt bones and were located in a Late Byzantine backfill demon-

strate a negative comparing between the two cases. – Other possible comparative cases could be assigned to two Roman cave tombs, located at the site of Umm as-Summaq al-Janubi and Hijra (Abu Shmais, et. al., 2009; Timm, Abu-Shmeis and Nabulsi, 2011). Both tombs involve Roman cremation burials with lead urns containing burnt human bones dating to the 2nd century AD. However, when considered in conjunction the lead urns from the two sites, and our cooking-pots, it is very clear that our cooking-pots are not associated with the same ritualization or content as the lead urns at Umm as-Summaq al-Janubi and Hijra.

10. See the discussion in Lichtenberger and Raja (in press).



8. Trench A, cooking pots (ev. 17, 18) in the ancient fill from east.

Concluding comments about the rock-cut room and the deployment phases within the excavated area

A relative chronology of the earliest phases of activity in trench A can be reconstructed as follows: The earliest activities seem to be related to quarrying and the younger rock-cut room (ev. 9, ev. 12, ev. 24) is the oldest evidence of building activity in the excavated area.

The construction date and function of the rock-cut room is unknown and the filling of the room seems to have taken place in the Roman period, in the second half of the 3rd century A.D. as indicated by the C₁₄ dates and the pottery typology. The pot sherds from the floor level indicate that the latest use of the rock-cut room took place in Roman times, too. The dating of the find material recovered from the different portions of the ancient fill (partly ev. 6, ev. 13, ev. 16, ev. 19, ev. 22, ev. 25) in the rock-cut room suggests that these archaeological materials had been deposited within a short period. The archaeological material in the bottom layer dates probably to the same periods as the ancient uppermost layer, possibly the Roman period. The cooking pots were deposited complete and more or less full of ashes; the reason for the deposition remains unknown until further analysis of their contents has taken place. It appears that the rock-cut room fell out of use and was subsequently filled in Roman times by soil containing earlier material.

Trench B (in collaboration with Cathrin Pogoda)

The trench was excavated at the eastern slope of the hill, east of a probably Mamluk house

(see Fig. 1). This house consists of two rooms and was erected on an older terrace. Former undocumented excavation activities left a semi-circular pit in front of this retaining wall which partly rests on bedrock. The excavated earth of the undocumented activities shows, that the whole area east in front of the terrace was filled with ancient debris. It contains a large amount of pottery, ashy soil and large stones. Due to modern finds it is possible to reconstruct at least two undocumented excavations: the first one in the year 1983, based on a juice carton with this expiry date and the second one during the years of 1994 till 1996, due to the expiry dates of two crisps bags. As a result of these undocumented activities ev. 2, 7, 12, 22, 25 and 28 were contaminated with Mamluk material. Already in 2011 a huge architectural block was seen partly uncovered at the surface (J12-Bcd-19). On two sides it showed an altar-relief. A second block (J12-Bd-2-1x) was found in addition to the architectural stone inside the excavated earth of the undocumented excavations. This block fitted on top of the large block. Together with the retaining wall the discovery of the two architectural pieces was the decisive reason to dispose the trench at this spot (for the architectural element see below).

The First Building Phase: The Retaining Wall and the Pilaster

The northern part of the western retaining wall (ev. 5a) and a pilaster (ev. 45) which was built of relatively large stones belong to the first building phase because both structures were erected on solid bedrock and the pilaster lies in line with the south-eastern corner of the northern retaining wall (Fig. 9). The gap between pilaster and wall might have been covered with an arch, as the most upper block in the wall bents slightly to the east. The terrace extends to the north outside the baulk and composes a corner westbound. The front of the retaining wall is not particularly accurate dressed as the gaps between the limestones were filled with smaller stones (Fig.10). Either further pilasters followed from the corner of the wall via the pilaster to the east, or the masoned pilaster was generating the corner of a hall which was extending to the north. The last conjecture is most likely, because depos-

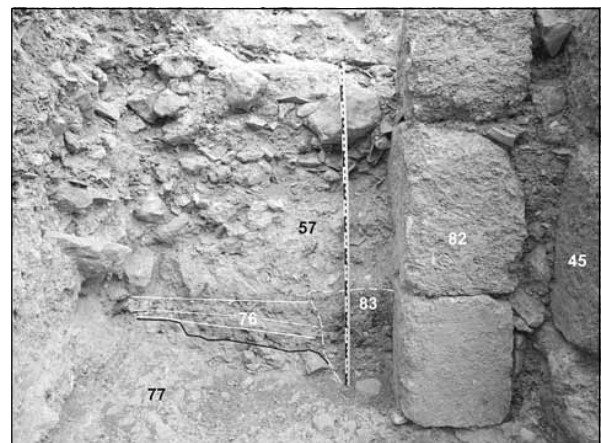


9. Trench B, excavated structures.



10. Trench B, overview from east.

its of a simple mortar-floor (ev. 76) above the bedrock (**Fig. 11**), extending to the north, were preserved between the pilaster (ev. 45) and the retaining wall (ev. 5a). To receive a date for these earliest structures the solid bedrock



11. Trench B, fundement ditch of the tower-like structure ev. 82 cutting the plastered floor (ev. 76), detail from west.

was exposed from the disturbed center of the trench till the northern baulk (**Fig. 13**). Neither the area around the floor plaster (ev. 76) nor beneath it yielded finds which are datable with acceptable accuracy.



12. Trench B, South-profile from north.

The Second Building Phase: The Oil Press Installation

The oil press installation was erected in the course of the second building phase (**Fig. 9**). For this purpose a room was created in front of the older terrace. Therefore the surface of the bedrock was leveled with a fill and a flat fundamen-
tation created. The northern part of the east wall (ev. 9) also stands on this fundamen-
tation. Further walls were erected to create at least two rooms or chambers in front of the retaining wall (ev. 5a). A younger retaining wall (ev. 5b) was arranged next to the south-east corner of the older retaining wall (ev. 5a). This younger wall must have taken the place of an older boundary of the terrace (wall or stairs). The core of the younger wall (ev. 26b) differs from the core of the older wall (ev. 26a) in fabric and content (**Fig. 9**). The younger retaining wall proceeds the older terrace in southern direction and extends into the baulk. Against this terrace-string a wall was built in the south (ev. 16, later superimposed by another wall ev. 3) which comprises the younger retaining wall (ev. 5b) in some extent. The south wall is bounded in the east by a wall (ev. 9) which runs parallel to the retaining wall, proceeding further in southern direction and extending to the pilaster (ev. 45) in northern direction. The east wall has a 1.46 m wide doorway in its northern part. To support the pilaster from its northern side the older plastered floors were driven through to create a pit for erecting a small stone pilaster (ev. 82, see **Fig. 11**). This supporting pilaster and the pilaster ev. 45 are not standing attached to each other but separated by a gap filled with soil and smaller stones. Additionally



13. Trench B, North-profile from south.

the pilaster ev. 45 was supported in its fundamen-
tation by a large block in the east. Because both the retaining wall (ev. 5b) and the east wall (ev. 9) extend beyond the baulks it is assumed that there is another room behind the south wall (ev. 16).

The south wall (ev. 16) has a door-like opening (ev. 39) whose jambs were built of two large rectangular blocks, but with 1.10 m in width and only 0.84 m in height this opening is obviously too low to be a door (**Fig. 12**). The sill was constructed by two smaller rectangular stones while a massive block serves as a lintel. This opening was obviously accomplished to attach the press-beam of the oil press.

In order to erect the oil press installation the room inside the walls (ev. 5a, 5b, 9, and 16) was further filled to create an adequate deep fundamen-
tation for the anchorage of the press-piers (ev. 20 and the removed architectural block ev. 19, **Fig. 22**) and the weight-stones (ev. 13 and 78) as well as to delve the vat-shaped oil reservoir into the floor. Furthermore it was necessary to constitute a flat surface for the press-bed.

In the northern part of the trench (sector a) the floor consisted of a hard yellowish clay (**Fig. 13**) whereas in the southern part (sector c) it was made up of a package including smaller stones and plastered at the surface with simple mortar (ev. 36). Larger stones compose the surface of the raised floor. Large stone slabs, whose surfaces were elaborated to a rectangular embed-
ment, compose the mouth of the oil reservoir (ev. 37), which is encased and sealed with a coarsely granular layer of mortar. The approx. quadrilateral immersion around the opening sug-

gests that the oil reservoir could be closed with a covering plate (stone or wood). The vat-shaped oil reservoir possesses yet another oval-shaped immersion probably to collect suspended particles. In northern direction, close to the reservoir, an oval-shaped press-bed (ev. 79) made up of lime stone is arranged. Into its edges parts of a channel were included whereas the remainder parts consist of mortar. The channel surrounds the press-bed and flows into a round opening beneath the stone slabs where the oil ran into the reservoir.

The firm press-block stands on a thin fill of stones and soil above the solid bedrock. It seems that the press-stone was reused because a rounded immersion with a lateral outflow at its southern surface was filled with mortar. The press-bed was obviously in use for a long time as it has deep furrows at the southern and northern edges, which had to be refilled partially with mortar to provide adequate press results¹¹.

A large block (ev. 20) is arranged between the press-bed (ev. 79) and the younger retaining wall (ev. 5b) to assure the guidance of the press-mattings with the olives. Its counterpart was a large reused block (ev. 19) on the opposite side. It shows an altar-relief on two sides (see below). This block was not recovered *in situ* but found lying on top of the east wall (ev. 9) and probably had been moved during the undocumented excavation. Some plastic bags which were found under the huge block are an indication of this conjecture. Both piers of the oil press, standing vis-à-vis composed the guidance respectively

the sidewise restriction for the piles with press-mattings under the press-beam which was positioned in the low opening (ev. 39) of the south wall (ev. 16). The inner lateral surface of the stones was rendered concave.

In the immediate vicinity of the press-bed (ev. 79) in northern direction a construction (ev. 81) is attached, which served for the anchorage of the two weight-stones (ev. 13 and 78). Those three elements rest on a thin clayish layer above bedrock. The two weight-stones are almost cubic and drilled T-shaped. The whole construction – especially the two heavy weights – was displaced out of its original position immediately in front of the older retaining wall (ev. 5a), possibly due to an earthquake.

This very well preserved oil press is of lever-and-weight type. The general type, classified by Rafael Frankel as type 4.2¹², is a slightly developed version of the simple lever press of the Iron Age¹³ (his type 4) in this region and is known from Hellenistic¹⁴/Early Roman to Early Islamic times. This subtype of oil press is well known in Jordan as well and some years ago T. Waliszewski published some examples.¹⁵ Up to 2012 only two examples were known from Jarash, one excavated in the late 1920th near St. Theodore and the second some decades ago at the South-gate.¹⁶ Of the eight variants known of this subtype our olive oil press according to its technical features (a beam anchored in a wall niche, a press bed flanked by two plain piers and a lateral collecting vat) belongs to the so called Gerzim press type¹⁷. The advantage of the vertical stone

11. Similar marks are known from press-beds in Gerasa (west of St. Theodore, Fisher, 1930, p.9 with fig.6) and the Athenian Agora (Frantz, 1988, p.121, pl.76a) but also in Madaura in Algeria (Brun, 2004, p.11, fig. down right). Although chemical analysis of this special phenomenon has to our knowledge not been undertaken for press-beds, it is likely that these traces of wear result from mechanical erosion by the fluids and the dissolving power esterified oleic acid has on weak varieties of lime stone.

12. Frankel, 2009. According to the classification of Jean-Pierre Brun, which is limited to the mechanical features, it would be lever press type A3 (Brun, 2004, fig. on p.14).

13. cf. the example in Hazor from 8th c. B.C.

14. Although such an early date is not impossible for this type of oil press, it is questionable for the so called Alone Abba press which in some features (e.g. the form and T-shaped drilling of the stone weights) is very close to our oil press. See Porat, Frankel and Getzov,

2011, pp.51-81. 84*-86*. In the light of the finds made in Alone Abba, which date from Hellenistic to Middle Roman times, it seems improbable that all belong to the phase of the oil press installation. The earlier finds seem to be too precious and luxurious for a simple oil press and could belong to a grave/tomb that was perhaps located in the former cave. The cave was then re-used for an oil press after its ceiling had collapsed.

15. Waliszewski, 2009. For the distribution of this type see the map on fig.8. Similar are the weights and pillars at Byzantine Jil'ad (Waliszewski, 2009, p.713 fig.6-7). Very similar weights were also found in a Byzantine oil press installation at 'Ammān Citadel (Waliszewski, 2009, pp.713-716 fig.9-14).

16. St. Theodore: Fisher 1930, p.9 with fig.6; South-gate: Seigne 1986, p.47 fig.6, pl. VI 1-2, pl. VII. It was built between and partly under the fundament walls of the southern chamber of the so called Roman 'souk'.

17. Porat, Frankel and Getzov, 2011, pp.84*-86*, esp. p.85 with fig.17:4.

pillars is that the baskets filled with olives were limited from both sides and therefore the pressure is given a more vertical direction centered on the press bed. As a result of the up and down moving of the pressed baskets the pillars are hollowed at their inner sides. It can be expected that in the area behind the north-baulk not only the northern wall of the press-room but most probably also a trapetum (crusher) were situated.

The End of the Utilization of the Oil Press and the Filling of the Room

The entire oil press-chamber and also the eastern adjacent area were found completely filled (Figs.12–14). Due to the fact that also the opening (ev. 39) inside the south wall (ev. 16) of the room was filled and that it exhibits an identical arrangement in layers compared to the interior room (ev. 27–29, 32–33) it is assumed that also the adjacent not excavated room to the south of the trench is completely filled with the same debris. The backfill of the pressroom happened at once and obviously in a short time. The pressroom was in good order and also empty before it was filled with debris, because no abandonment fill was found inside. The pottery from the debris was lying on top of the floor in sectors c and d and in the oil reservoir as well. Therefore the backfill happened immediately after the oil press and the room had been abandoned. Considering the different filling-layers inside the room, its boundaries, the pottery in between the backfill and the position of the larger stones it becomes apparent that the debris was filled continuous but quick. It is visible quite clearly in the profiles of the trench. Grey ashy layers were found as well in the southern part (ev. 27) and in the northern part (ev. 46) in almost the same



14. Trench B, East-profile from west.

height with the same concentration of pottery. Large stones which belong also to the backfill are arranged concentrated in the northern part of the trench (Fig. 13). Dense concentrations of pottery appear consistently lying in a horizontal position on a layer of debris. This indeed allows concluding in which order the different layers of debris were filled in. Due to the fact that the unusual high amount of pottery sherds looks quite homogenous and could be dated therefore to the same period, the intervals between the separate fillings could not be very long.

Finally it is necessary to clarify from where the debris was deposited. The enormous amount of similar pottery gives the impression of a potters' dump. But the absence of waste as well as the broad spectrum of vessel-types and a surprisingly high amount of debris such as stones, tesserae and pieces of mortar is in turn indication against this interpretation.

The oil press might have been filled in the course of an earthquake but several earthquakes are attested in the first Millennium AD for Jarash. In the course of cleanup efforts dumping places were needed for the debris. Apparently the oil press was no longer in use at this time so the room might have been used as dumping place.

No sufficient dating can be given because of the lack of finds from the first building phase. For this reason it is not possible to date the initial phase of the oil press. Through this missing link the inception of the second building phase is not precisely datable as well. A Late Roman rim of a jar or jug from ev. 53 (cat. no. 88) demonstrates that the northern clay floor could not be older than it and a rim of Late Byzantine to Early Umayyad date in ev. 62 (cat. no. 112) shows that the last renovation of the northern clay floor took place in this period. The pottery from the fill of same or similar type which could be dated into Byzantine to Early Islamic times indicates that the end of the oil press took place in Early Islamic times. One of the best datable finds so far is a lamp of the 2nd half of the 7th century AD (cat. no. 55) found in ev. 12. But this evidence was partly disturbed by illicit diggings.

The Third Building Phase: A New South Wall and a Stone Structure in the West

For the time after the filling of the oil press room a third building phase is attested. Another

wall (ev. 3), consisting of large lime stones, was built above the south wall (ev. 16) after placing a filling of soil and pottery (ev. 17) between the older and the younger south wall. The younger south wall (ev. 3) runs against the younger retaining wall (ev. 5b) which was still visible in this time. Above the core of the younger retaining wall (ev. 26b) at the western baulk of the trench a wall section was uncovered that belongs to a structure partly covered by the Mamluk house in the west (**Fig. 9**). Due to the absence of significant finds it is not possible to date the third building phase more accurately than between Early Islamic time (filling of the oil press) and the Ayyubid-Mamluk periods (use of the house on the terrace).

Concluding Remarks

The older western retaining wall (ev. 5a) and the pilaster (ev. 45) are the oldest traces of building activities in the excavated area. There are no finds that permit the dating of the first building phase. The oil press was built in the second phase; just for this reason the east (ev. 9), south (ev. 16) and the younger western retaining wall (ev. 5b) were erected. Together with these walls the older western retaining wall (ev. 5a) composed the room within which the oil press was situated. Trench B gives strong evidence that this part of the Northwest quarter passed through considerable architectural and perhaps functional alterations at some point in its history. That the foundation of an olive oil press with such structural expenses was possible can be explained for the present in more than one way. This part of the settlement was either abandoned and deserted or rural products like olive oil were needed to such an extent that the investment and encroachment on the architectural layout were accepted. When exactly this happened is not clear yet. After the oil press was no longer in use, the room and its surrounding area were used as a dump and filled with debris. All finds were in good conditions and their dates span from Byzantine to Early Is-

lamic times, which gives a date for the destruction in Early Islamic times¹⁸ and also a probable date for the end of the utilization phase of the oil press. This should be not much earlier, perhaps in the Late Byzantine to Early Islamic period. The oil press must have been erected some time before that because the worn press bed seems to have been used for some time. After the back-fill a last building phase can be reconstructed consisting of the younger south wall (ev. 3) and another wall built above the core of the younger retaining wall (ev. 26b). Due to the lack of significant finds this third and last building phase is not precisely datable but must be connected to the buildings on the western terrace and the youngest finds which consist of a few Ayyubid to Mamluk sherds in the ev. 2, 4, 12, 22, 25 and 28.¹⁹

Trench C (in collaboration with Stefan Riedel) *General Outline and Structures*

The most prominent building on top of the hill of the Northwest quarter is the so called 'Ionic building'. It is a large courtyard house integrated in the local terrace system and showing signs of a series of repairs and alterations, which took place in the Early Islamic to Mamluk periods (**Fig. 1**). The trench was laid out in the south-western corner of this building. The rectangular outline of the excavated area measures approx. 6.50 x 6.50 m each side. To the north the level raises *ca.* 1.00 m towards the inner parts of the building and to the south it slopes, creating an altitude difference within this area of 1.15 m from north to south before the beginning of the excavation. The area was disturbed in recent times, since to the south of the trench many stones of various sizes were found and the east-west-orientated southern wall of the large building could not be traced in the trench where it was supposed to have been situated. The fill in most parts of the trench consisted of stones of different sizes, some of them dressed as blocks. On top of this fill, almost in the middle of the

18. The walls and some other structures especially the west walls (ev. 5a, b) and the press weights (ev. 13, 78) seem to be affected and moved by an earthquake and also the press piers were found fallen down, but it is not yet possible to link these facts to a specific earthquake that causes destructions in Gerasa especially the disastrous of AD 749. The collapse of the

piers could be caused by the ancient filling and we are sure that they were moved during the undocumented activities.

19. While ev. 4 belongs to the collapse debris of the younger (Mamluk?) house on the terrace the other evidences were partly contaminated during the undocumented activities.

trench, an Ionic capital of limestone was already recorded in the 2011 campaign (cat. no. 166). On closer examination, the capital revealed to have been exposed to fire.

Excavation in this area disclosed various structures which shed light on the history of the uppermost part of the walled city of Jarash at least from Byzantine/Early Islamic times to the Mamluk period. Especially in the northern and western sections of the trench several built structures which overlay each other were discovered (Fig. 15). However, the oldest traces in the area are chisel-marks and -channels on top of the bedrock in the south-western (ev. 44) and north-eastern (ev. 7) part of the excavated area,

proving that the spot was used as quarry before building activities started. The remaining traces indicate that almost square blocks of approx. 0.50 to 0.60 m were broken down in this spot. Bedrock was discovered in the southern (ev. 44), western (ev. 22), and northern (ev. 7) part of the trench. It was found to be part of a more than semi-circular natural structure which forms a karst-cave to the north of which the eastern ceiling partly collapsed in later times. Especially in its southern and south-western parts the bedrock was worked off and roughly dressed in order to function as a cistern, which was revealed in the centre of the area. Most of the unearthed structures are related to this cistern and therefore



15. Trench C, excavated structures.

their description and interpretation must emanate from the cistern itself. Beside the quarry, only the southern structures in the trench are older than the initial construction of the cistern.

The First Building Phase: the Southern Structures

In the south-west of the trench the remains of a room were discovered. It once extended eastwards over the later cistern (**Figs.15, 16**). Since no traces of entablature or the like were observed which might have carried the eastern part of the room, it must be assumed that the cistern did not yet exist in the time of the house which the room was part of. That the room must be older than the cistern is attested by channels related to the mentioned quarrying activity which were partly cut off when the bedrock (ev. 44) was cut in order to serve as wall for the cistern. Furthermore, residual-clay (ev. 49) was discovered just east of the bedrock (ev. 44) and in the eastern

part of the trench (**Fig. 16**). This residual-clay was partly cut into in order to serve as foundation of the eastern wall of the south-west room (ev. 43). Within the eastern residual-clay large rocks with weathered surface were unearthed which show that this area was exposed to environmental conditions and therefore the southern part of the cave was never covered by a natural ceiling. Thus, the southern part of the cave at the time of the erection of the south-west room must have been filled by residual-clay which was strong enough to sustain the room's walls and a cave could only have existed in the northern part. This observation proves that the cistern was constructed after the room was already out of use.

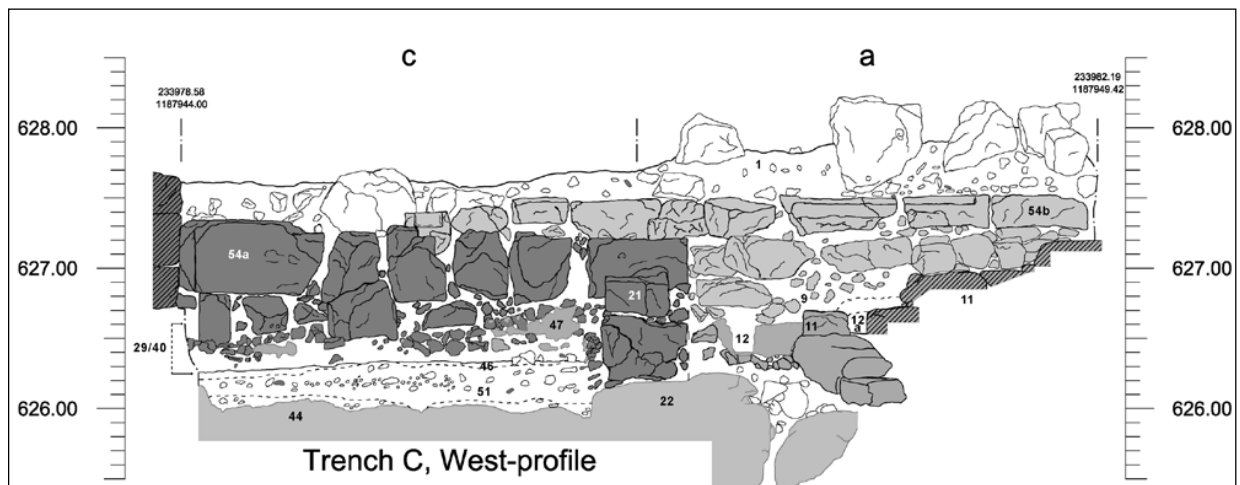
The western wall of the south-west room is constituted by two walls: an older wall (ev. 54a) which is partly overbuilt by a younger one (ev. 54b) coming in from the north (**Figs.17, 18**). Both lie in line with the west wall of the



16. Trench C, cistern wall and older structures in the eastern part, from west.



17. Trench C, overview from east.



18. Trench C, West-profile.

large building in the north ('Ionic building') and might have been used as its foundation in this spot. The older west wall stretches further south to an unknown extension where it seems to function as the foundation of the retaining wall of a small terrace situated west and south-west of the trench. To the north the older west wall forms the north-western corner of the room with the west-east-orientated wall (ev. 21). This wall is placed on bedrock (ev. 22) and was torn down most probably during the initial construction of the cistern, just like another wall in the very south-eastern corner of the trench (ev. 43) which shows similar traces of being torn down in this context. Furthermore, the latter is based on bedrock (ev. 44), too, and runs parallel to the older west wall (ev. 54a) at a distance of about 5.00 m. Thus, it is reasonable that this wall is the eastern wall of the discovered room. All three walls (ev. 54a, ev. 21, ev. 43) are composed of limestone blocks of which some are well dressed.

The lower parts of the older west wall and the wall (ev. 21) were covered by undecorated wall-plaster which was superimposed on an underlay of small irregular stones (ev. 47). The underlay and attached plaster were several centimetres pushed apart from the walls by an earthquake, an intentional breakdown or similar influence. Underlay and wall-plaster also covered a single block just in front of the older West-wall which might have served as pillar or support of a beam as part of the roof structure. A beaten earth floor (ev. 46) above a fundament of soil (ev. 51) runs against the wall-plaster (ev. 47). The northern and eastern parts of this floor were either removed during the cistern's construction or broke apart before. The south-eastern part most probably was destroyed due to the mentioned modern disturbances of the spot. The whole assemblage of these evidences (ev. 54a, ev. 21, ev. 43, ev. 47, ev. 46, ev. 51) will in the following be called the south-west room.

The end of the utilisation of the south-west

room is witnessed by the collapse of the roof and parts of the underlay with attached wall-plaster (ev. 29, ev. 40) which was found *in situ* upon the preserved floor (ev. 46) in front of the west-wall (ev. 54a). Below the northern part of the collapse (ev. 29) the fragmented bottom of a cooking vessel (ev. 45, cat. no. 100) was discovered, pressed into the beaten earth floor and slightly overlapped by the detached wall-plaster. Below roof-tiles within the southern part of the collapse (ev. 40) a bronze coin was found. Especially the latter evidence provides a hint for the dating of the collapse of the room and therefore the end of the first traceable building activity in this spot. Since only the base of the cooking vessel (cat. no. 100) was preserved, it cannot be dated precisely. The coin on the other hand provides a more sophisticated date. It is only 1.1 cm in diameter and worn. Only one side shows traces of a depiction, potentially Arabic letters. Of much more interest are the coin's clipped edges which left an irregular contour with seven angles. The edges must have been cut off to gain additional material for other purposes. Therefore it seems reasonable that the edges of the coin were clipped after the coinage reform of the Umayyad caliph Abd al-Malik in the late 7th or very early 8th century AD. This reform reduced the circulating coins' weights to make them fit the domestic standards the Islamic caliphs were familiar with.²⁰ Therefore, cutting off pieces from older, overweight coins was a suitable means to reduce it to the new standard and gain additional material. Due to the worn preservation of the coin and especially its edges it seems to be likely that the coin ended up in the collapse in about the middle of the 8th century AD.²¹

The Second and Third Building Phases: the Cistern and Related Channels

After the south-west room collapsed, the cistern was constructed. This might have been

20. The metrological basis and the reduction of the weights is exposed and discussed by Grierson, 1960. Although he is almost exclusively concerned with gold and silver, the reform must consequently also have influenced the copper coinage, which he only very briefly touches upon (Grierson, 1960, pp.246-247).

21. The collapse of this room might be the result of the well attested earthquake in AD 749 which caused severe destructions in many cities of the Jordan-valley

since no other earthquake has been reported in those times or within this geographic region, neither from literary sources (cf. Guidoboni, Comastri and Traina, 1994) nor from archaeological investigations (cf. Marco et. al. 2003). For the dating and the various references in literary sources see Tsafirir and Foerster, 1992. The range of destruction in various sites is collected by Marco, et al., 2003, table 2.

due to a partially collapse of the natural cave which became visible and was therefore used as a large part of the reservoir.²² The cistern was of a roughly circular shape and measured around 4.00 m in diameter. To the south, west and north-west it was cut into the genuine rock, which also forms an outcrop that covers about a third of the cistern in the north. This outcrop (ev. 7) is worked in most parts of its southern edge, most probably as bedding for a lost wall whose eastern end might be marked by square, roughly pecked traces of a stand, measuring approx. 0.15 m each side (**Fig.19**). A complete excavation of the cistern was impossible due to the instability of the rock in the western and north-western part. It was carried out to a depth of approx. 3.00 m from the ceiling of the rock's outcrop but it continues at least for another 0.50 m. At its east and north side a continuous wall constitutes the limit of the cistern (ev. 38). This wall runs against the genuine rock in the south-east and probably also in the north-west (**Fig.15**, dotted lines). It consists of two faces of irregular stones with a maximum size of 0.35 to 0.20 m and a *ca.* 1 cm thick layer of mortar in between these two faces. The inner face of this wall shows two different phases of plaster-revetment which had been broken apart in the upper parts (**Fig.16**). The plaster of the older revetment is directly attached to the inner face of the wall. It contains tiny red and green inclusions and is well smoothened. Its reddish colour indicates



19. Trench C, build structures of the cistern phases in the northern part, from south.

that it might be some kind of hydraulic mortar which especially makes sense in the case of a cistern's revetment. At an undetermined later date a second layer of mortar was superimposed upon the first revetment, probably due to necessary repairs. The greyish mortar of this second revetment seems to be of inferior quality compared to the first one, containing small pebbles and charcoal-inclusions. The construction of the cistern cannot be dated precisely but at least to the time after the collapse of the southern building.

In total, four channels have been unveiled which are related to the cistern and three of them undoubtedly served to carry water from the higher located northern and western parts of the hill into the reservoir (**Figs.19-20**). The oldest channel, approaching the cistern from the north-west, is of rectangular shape and approx. 0.14 m wide and belongs to the first utilization phase of the cistern. Its visible northern part (ev. 34a) was cut from the rock in its western part and plastered to the east and at the bottom. The southern part (ev. 34b) which formed the ending of the channel from where the water fell into the cistern was completely cut from the bedrock. This part broke away at an undetermined date after the cistern was already backfilled since it lay on top of the younger fill (ev. 35). The alluvial deposits (ev. 36) in the northern, *in situ* part (ev. 34a) furthermore prove that the channel was already out of use before this backfill and even



20. Trench C, evidences in the northern part and cistern fill, from south.

22. The tempting interpretation that the collapse of the South-west room and the assumed collapse which unveiled the cave coincide cannot be testified. But it

seems reasonable that both might have happened due to the devastating earthquake of AD 749.

before the structures to the north and northwest of the cistern were built because they are partly built over the channel (**Fig. 20**). These structures altogether belong to the second utilization- and building phase related to the cistern since they are based on a common foundation layer which covers the older channel (ev. 34b) and the bed-rock (ev. 7). They include a stair-like structure in the northwest (ev. 11) with two related channels (ev. 12, 12a), a structure of two large, well-dressed blocks east of it (ev. 3) and a plastered area (ev. 8) with a triangular plastered channel (ev. 16) which runs against the two blocks (ev. 3) and extends north- and eastwards.

The structure (ev. 11) is part of stairs elevating towards the north, which also comprise steps on top of (ev. 12 and ev. 12a). This stair structure is set against the older torn down wall (ev. 21). The lowest of these stairs is composed of mortar in its western part. This part serves as the northern wall of the second channel which, in its preserved course, was completely plastered and likewise 0.14 m wide. The third channel was observed just north of the lowest stair disappearing under the younger west-wall (ev. 54b) and merging with the second channel just before the water ran into the cistern. The exact situation of the water conduction is disguised through a collapse of the karst-cave in this part which included parts of the bedrock in the west (ev. 22), the rock-cut part of the first channel (ev. 34b), and even parts of the cave's ceiling in the north-western part of the cave (ev. 55, **Fig. 20**).

The surface of the two well-dressed blocks (ev. 3) lies on the same level as the third step of the stair-like structure (ev. 11). The rectangular space between these two structures measures approx. 0.20 m and was filled with irregular stones and soil in later times. Whether this was another channel coming from the north is reasonable to assume but cannot be ascertained. This part could not be excavated due to the instability of the cave in this spot. North of the two blocks at least one more rectangular slab was discovered, running against the north-eastern corner of it and disappearing in the trench's north-baulk. Since no construction fill of this phase or the like was found north of (ev. 3) it might have been part of

a basin or a similar structure.

From the east a plastered area (ev. 8) runs against the two blocks and the slab. It is horizontally straightened in the northern part but towards the south the plaster also covers an irregular and rough conglomeration of small and medium sized stones which stretches westwards in front of the southern block of (ev. 3). It is based on the same foundation layer (ev. 17) as the structures to its west (ev. 3, ev. 11). Almost in the middle of the plastered area a plastered triangular channel (ev. 16) runs in north-western direction in a slight curve. After approx. 0.30 m its northern part is covered by a small, slab-like stone and disappears below a plastered area (ev. 8). To the east the plastered area is covered by a collapse (ev. 13, ev. 18) upon which a north-south-orientated wall (ev. 15) of the large building was erected in later times. Beneath the eastern part of this collapse (ev. 13) traces of a small band of yellowish clay (ev. 24) and a 0.05 m to 0.10 m thick layer containing a large amount of pottery (ev. 14) were revealed. These are based on a foundation layer (ev. 25) which levels the uneven surface of the bedrock below (ev. 7) and raises the walked-on level to about the same height as the plastered area (ev. 8). Due to this observation and the circumstance that the collapse (ev. 13, ev. 18) covers the plastered area (ev. 8) and the walked-on level further east (ev. 24, ev. 14), the latter must belong to the same building phase as the described structures to its west.

A cistern, similar to the one in trench C was found on the slopes south of the South decumanus.²³ Such a cumulation of cisterns in the hilly terrain west of the river valley makes it probable that on the hill no common water-supply system did exist in Early Islamic times and water was collected by open channels for the households.

The Backfill of the Cistern and Final Building Phases of the Area

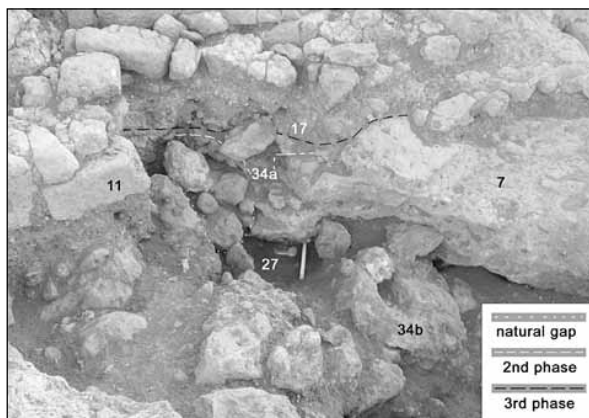
The backfill of the cistern happened in at least two steps. The older fill (ev. 42, ev. 50, ev. 52, ev. 53) mainly consisted of large blocks with hollow spaces in between and a limestone column drum (**Figs.15, 20**). The youngest piece of

23. Surveyed 2011 by the Danish-Jordanian Islamic Jarash project. For a brief summary see Keller, Porter

and Tuttle, 2012, fig.23 (area A) and fig.24.

pottery found in this mixed backfill (cat. no. 133) dates to the Mamluk period and indicate a 13th to 14th century AD date. Before a second, mixed fill (ev. 35, ev. 37) was filled in, parts of the cave's ceiling collapsed (ev. 55). The rock-cut part of the oldest channel (ev. 34b) also broke in this context. It formed the eastern part of a cavity under which an almost completely preserved glass-bottle (cat. no. 144) was found (**Fig. 21**). This bottle was found lying in smooth soil (ev. 27) which is part of a natural fill intruding into this part of the cave through small crevices before they were sealed for the first building phase of the cistern (channel ev. 34a). Nevertheless, it is astonishing that the bottle, which dates to the Byzantine period, remained untouched and in place during the utilization phases of the cistern until this part of the cave finally collapsed (channel ev. 34b) and fell on the older fill (ev. 42, ev. 50, ev. 52, ev. 53). Consequently, the north-western part of the bedrock bordering the cistern was not part of the reservoir itself but sealed in order to carry water directly into the cistern.

The final building phases of the excavated area are related to the erection of the large building. A preliminary step must have been the construction of the younger west wall (ev. 54b). This wall overlies the western part of the stair-like structure (ev. 11) with its channels (ev. 12, 12a) and parts of the older west wall (ev. 54a), a fact indicating that the cistern probably was already out of use. This wall is based on a foundation layer of soil and stones, included



21. Trench C, stratigraphical position of the glass bottle (cat. no. 144), from south.

several spolia and seems to have served as the fundament of the large building's west wall. Later the level of the northern part was raised in order to create the floor level of the large building. This fill (ev. 5) covered the older structures including the plastered area (ev. 8) and the two well-dressed blocks (ev. 3). The infilling goes together with the erection of the large building's interior westwall (ev. 15). North of the two well-dressed blocks (ev. 3) the Middle Islamic fill (ev. 32) included the dump of cow's bones and fragmented cooking vessels (cat. no. 95, 107). The latter are of a common type, and date to the Late Byzantine/Umayyad period.

Concluding Remarks about the Sequence of Building Activities and the Utilisation Phases within the Excavated Area

Beside the non-absolute dateable activities related to the area's use as quarry, the south-west room (ev. 21, ev. 54a, ev. 46, ev. 47, ev. 43) is the oldest witness of building activity in the excavated area. Despite the fact that the date of its erection is unknown, the destruction of the room can roughly be pinpointed to the middle of the 8th century AD and might be connected to the earthquake of AD 749.²⁴ The subsequent building activities seem to have succeeded each other in a comparatively short time interval. After the initial construction of the cistern with the older channel (ev. 34a) the stair-like structure (ev. 11) with its related channels (ev. 12, 12a) and the structures to the north above the cistern (ev. 3, 8, 14, 16, 17, 23, 24, 25) were erected. Since the channels (ev. 12, ev. 12a, ev. 16) belong to this phase, the cistern must still have been in use, and it is tempting to assign the second layer of plaster of the cistern's wall (ev. 38) to these activities as well. After the construction of the younger west wall (ev. 54b) the level at least of the northern part was raised in order to construct the large building. Judging from the pottery found within the fill (ev. 32, cat. no. 95, 107) this graduation also took place after Early Islamic times. The cistern must have been out of use at this time although its final backfill cannot be dated earlier than the Mamluk period because cat. no. 133 was found in the older fill (ev. 42, 50, 52, 53). To obtain a closer dating and idea

24. For the earthquake of AD 749 see above n. 19.

about the large building's purpose and possible previous buildings further excavation and analysis needs to be undertaken.

An Altar-like Architectural Element from Trench B

(inv. no. J12-Bcd-19 + J12-Bd-2-1x)

A large architectural element, broken in two parts was found re-used in the oil press discovered in trench B.

(1) Monumental rectangular worked limestone block (J12-Bcd-19, **Fig.22**)

Material:

Soft whitish limestone

Measures:

Height: 1.95 m

Width: lower part: 0.89 m, upper part: 0.90 m

Depth: 0.55 m

State of Preservation:

The block is damaged in several places and the top part is broken off. The front top left and right corners are damaged as well as the front bottom left and right corners. The right most

part of the back side is damaged as well. On the front below the pilaster columns there is a deep square hole (secondarily made) and a depression runs horizontally from the hole to the left side of the block. This reworking probably stems from secondary use in the oil-press. The broad front side up until the pilasters is curving concavely also due to the secondary use of the block as a pier in an oil press. On the back side approx. one-third below the top there is a horizontal running furrow approx. 4-5 cm broad and 3 cm deep, which runs across the entire block. The right short side is damaged on both upper corners and the corner horns are partly broken away. The lower corners are also damaged. The left short side is damaged on all corners as well.

Description:

The block is worked on all sides.

Front Side:

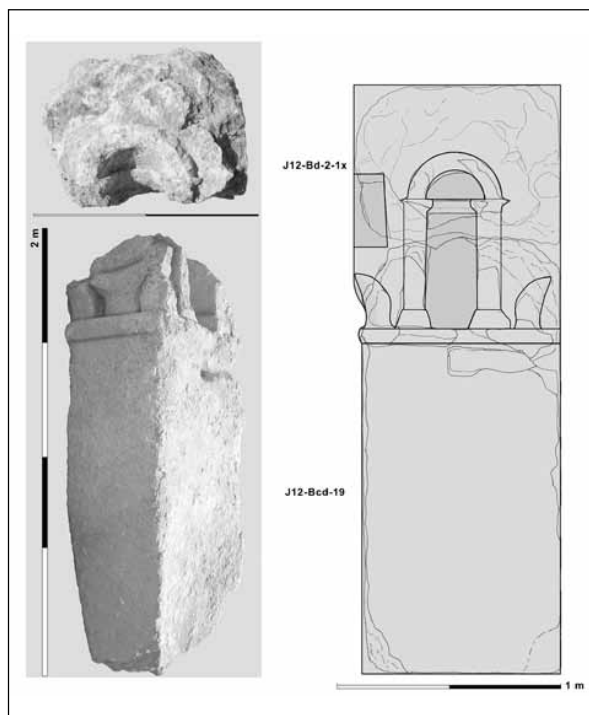
On the upper front side of the block the lower part of two slightly off-axis pilaster columns are visible. These are standing on a carved protruding basis, which runs horizontally across the front of the entire block and continues on the right short side of the block. Between the pilaster columns there is a deep narrow niche (23 cm wide, 41 cm high, 18 cm deep). Directly under the protruding basis a centrally placed square deep post-hole is visible. The stone curves slightly concavely on the approx. 2/3 under the protruding basis.

Left Short Side:

The upper corners of the left short side each has a horn-shaped element, which curves slightly outwards. Centrally a deep relief showing a stylized basin or bowl is placed. Due to the narrowness of this side the bowl is in its proportions very slender. These elements are placed on the carved protruding basis, which runs horizontally across the entire short side. Below the basis the stone is worked but without any decorative features.

Right Short Side:

The right short side is roughly smoothed along all four edges, but without any decorative features. In the central field an anathyrosis is visible. It has rectangular shape and is finely cut.



22. Photos and drawing of the altar-like architectural element from Trench B.

Back Side:

On the upper part of the back side there is a roughly worked horizontally running step on the top part of the back side. As the step does not cut and damage the horns, it remains unclear whether it relates to the original use or the secondary re-use in the oil-press. Approximately a third below the top there is a horizontal furrow, which cuts all along the back side of the monumental block. The rest of the back side is roughly worked.

Top:

The top of the block is heavily damaged.

Bottom:

The bottom of the block is partly damaged, but has been worked to a straight surface.

(2) Top part of monumental stone with niche (J12-Bd-2-1x, **Fig.22**)

Material:

Soft whitish limestone

Measures:

Height: 0.71 m

Width: 0.89 m

Depth: 0.69 m

State of Preservation:

The block is heavily damaged on all sides, the surface is badly weathered.

Front Side:

The upper part of the front side is damaged. Centrally in the lower part the curved part of a rounded niche is visible. The capitals of columns flanking the niche on each side are also visible. Inside the niche a protruding cornice is running.

Left Side:

The left side is also damaged and worn; a rectangular niche is worked in.

Right Side:

The right side, which is curving, is damaged and worn.

The Back Side:

The back side, which is curving, is damaged and worn.

The Top:

The top of the block is curving towards the back side, but is also damaged and worn.

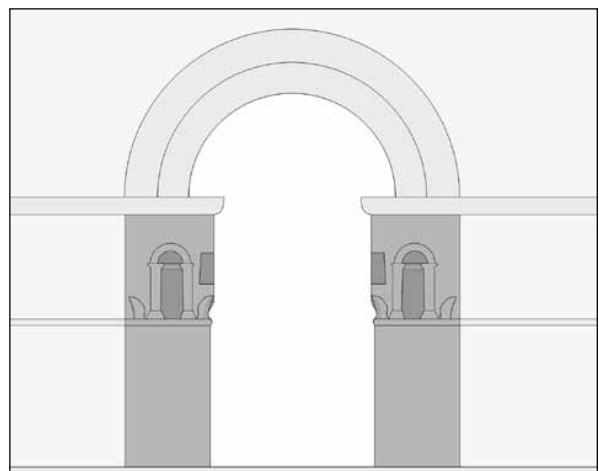
The Bottom:

The bottom of the block shows heavy signs of having been broken off.

Interpretation:

The parts belong together and the total height of the monument must have been approx. 2.70 m. An accurate dating of the block is not possible. It can be assumed that it stems from the Hellenistic to Roman period. Judging from the material (whitish soft limestone) one might suggest that the element did not belong to one of the post-Hadrianic monumental buildings within the city center, for which the harder reddish limestone was preferred.

The visual vocabulary of the block – the horns and basin on the right side and the horns and the niche on the front – implies altar iconography. However, the shape of the block indicates that it was not an altar but was used as part of an architectural framework, probably as flanking a doorway or gate (**Fig.23**). One might expect that it had a counter piece. In its original state the long-side with the niche was the front-view and the left side with the stylized basin/bowl and a rectangular niche on top was aligned with the passageway. The right side with the anathyrosis was probably connected with a wall. There is some possibility that the entrance was covered by an arch or a lintel, but this remains a hypothetical reconstruction.



23. Hypothetical reconstruction in an architectural position flanking a doorway.

Niches at the front of an architecturally framed entrance or passage are well attested in the architecture of the southern Levant such as in a monumental form at the Artemision in Jerash or in the Syrian sanctuary of Hösn Soleiman; especially entrances to sanctuaries were often framed by such features.²⁵ The altar elements (horns and basin) are common on Roman altars in Jerash, but they seem to be restricted to altars²⁶, other architectural elements did not take over such altar motifs. This makes the monument exceptional in its eclecticism. The only remote comparanda for altar-iconography reduced to an architectural décor element or motif can be found in local sanctuaries of Lebanon and Syria. Two examples are found at Burj Baqirah and at close-by Khirbet el-Hatib in the Limestone massif.²⁷ Here altar reliefs frame the lintels of the entrances to the sanctuaries. This comparison, however, has to be put into perspective, since at Burj Baqirah a Zeus Bomos (Zeus Altar) was venerated and thus it seems self-evident to have depicted altars on the lintels. Another example of altar depictions framing a doorway is found at Sfire in Northern Lebanon.²⁸ There, two altars on either side of the front wall frame the entrance to the sanctuary court. Within the court of the sanctuary, no temple stood, but the main focus of the cult was a large altar. Again, as probably in the Limestone massif, we have a correlation between the depiction of an altar at the front and the nature of the cult.

From the comparanda one might suggest that the large block discovered in trench B was part of a monumental framing (perhaps entrance?) of a sanctuary.²⁹ Because of its eclectic composition and the material one might consider that it belonged to a pre-Hadrianic sacred building, but this must remain a hypothesis. The location of its primary use also remains obscure. One might consider that such a large block was not brought from far away to be re-used in an oil press and

that it thus came from somewhere close-by; but this also remains speculative.

Conclusion

The three trenches excavated during the 2012 campaign yielded little evidence for occupation prior to the Roman/Byzantine period. Most until now documented building activity took place between the Roman and early Islamic periods with some reoccupations in the middle Islamic period.

The earliest traces of human activities are the quarries in trenches A and C. They predate the later building activities and might be an indication of a sparsely settled area during the Roman period. However, the hill might have been occupied also in Roman and earlier periods as attested by sparse finds of pottery dating to the Hellenistic and Roman periods. This is also suggested by the backfill of the rock cut room in trench A which took place in the second half of the 3rd century CE, indicating that there was some occupation during the Roman period. Furthermore the monumental altar-shaped architectural element, which was reused in an oil press, probably relates to an earlier period. However, it remains unsure whether this block had its original place of origin in the vicinity. At some point in the settlement history of the Northwest quarter a system of terraces was laid out in order to accommodate dense habitation, which covers the entire hill slopes. Even the oldest structures in the terraced area excavated so far follow the alignment of this system. As is evident by the overall mapping in general and in trenches B and C in particular some alterations of the inner arrangement took place over time.

The most prominent feature excavated in the 2012 campaign was a well preserved oil press in trench B. At least in some parts of the Northwest quarter, such as around trench B, the extensive fill with destruction debris in Late Byzantine or

25. Jerash Artemision: Parapetti, 2002, pp.27-28. Hösn Soleiman: Krencker and Zschietzschmann, 1938, pp.44-46. pl.33-34. In general for the motif cf. Freyberger, 1999, pp.133-134; Kader, 1996, pp.161-162 fig.77 and Freyberger, 2004, p.19 n.17. fig.2.

26. cf. e.g. Kraeling, ed. 1938, pl.98. 112. 115. 120; Browning, 1982, p.158 fig.91; Borkowski, 1989, p.80, pl.1 no.4. The motif stands already in a Late Bronze Age/Iron Age tradition in Palestine: cf. Zwickel, 1990, pp.116-128, fig.133-135; Hitchcock, 2002 with

references.

27. Burj Baqirah: Steinsapir, 2005, pp.50-51. 126. Khirbet el-Hatib: Kreuz, 1999, pp.24-25. pl.43-44. cf. also possibly an altar on the portal at Harab Sams: Tate, 1992, p.119, fig.173.

28. Steinsapir, 2005, p.70. pp.134-135.

29. However it also cannot be ruled out that the block stemmed from a funerary monument, although up to now no comparanda for such an architectural composition are known.

as in Trench C in Early Islamic times put an end to the settlement history.

Until the Middle Islamic period the excavated areas seem to have been more or less abandoned. From this period building activity begun again and the large courtyard house over the cistern in trench C was constructed. Smaller and simple houses were also erected. Repairs and modifications of the buildings prove that the occupants, who had Mamluk style pottery, lived in this area at least over a period of some generations.

Bibliography

Abu-Shmeis, A. and Nabulsi, A.

- 2009 Cremation Burials in Amman, Jordan. *SHAJ* 10: 513-525.

Ayalon, E., Frankel, R. and Kloner, A.

- 1972 *Oil and Wine Presses in Israel from Hellenistic, Roman and Byzantine Periods*. BAR International Series, Oxford, Archaeopress.

Borkowski, Z.

- 1989 Inscriptions on Altars from the Hippodrome of Gerasa. *Syria* 66: 79-83.

Browning, I.

- 1982 *Jerash and the Decapolis*. London, Chatto and Windus.

Brun, J. P.

- 2004 *Archéologie du Vin et de l'Huile de la Préhistoire à l'Époque Hellénistique*. Paris, Errance.

Déonna, W.

- 1934 Mobilier Délien. *BCH* 58: 381-447.

Frankel, R.

- 1998 *Wine and Oil Production in Antiquity in Israel and Other Mediterranean Countries*. Sheffield, Continuum.

Freyberger, K. S.

- 1999 Das kaiserzeitliche Damaskus: Schauplatz lokaler Tradition und auswärtiger Einflüsse. *DaM* 11: 123-138.

- 2004 Das Heiligtum in Hössn Soleiman (Baitokaike): Religion und Handel im syrischen Küstengebiet in hellenistischer und römischer Zeit. *DaM* 14: 13-40.

Grierson, P.

- 1960 The Monetary Reforms of 'Abd al-Malik, *Journal of Economic and Social History of the Orient* 3,3: 241-264.

Guidoboni, E., Comastri, A. and Traina, G.

- 1994 *Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th century*. Rome, Istituto Nazionale di Geofisica.

Hitchcock, L. A.

- 2002 Levantine horned altars: an Aegean perspective on the transformation of socio-religious repro-

duction. Pp. 233-249 in D.M. Gunn and P.M. McNutt (eds.), *'Imagining' Biblical Worlds. Studies in Spatial, Social and Historical Constructs in Honor of James W. Flanagan*. Sheffield, Sheffield Academic Press.

Fisher, C. S.

- 1930 Yale University – Jerusalem School Expedition at Jerash. First Campaign. *BASOR*, 40: 2-11.

Frantz, A.

- 1988 *The Athenian Agora 24. Late Antiquity: A.D. 267-700*. Princeton and New Jersey, American School of Classical Studies at Athens.

Herskovitz, I.

- 1988-89 Cremation, its Practice and Identification: A Case Study from Roman Period. *TelAvivJA* 15/16: 98-100.

Kader, J.

- 1996 *Propylon und Bogentor*. Damaszener Forschungen 7. Mainz, Philipp von Zabern.

Kalaitzoglou, G. et al.

- 2012 Report on the Geophysical Prospection of the Northwest Quarter of Gerasa/Jarash 2011. *ADAJ* 56: 79-90.

Kehrberg, I.

- 2009 Byzantine Ceramic Production and Organizational Aspects of Sixth Century AD Pottery Workshops at the Hippodrome of Jarash. *SHAJ* 10: 493-512.

Keller, D. R., Porter, B. A. and Tuttle, C. A.

- 2012 Archaeology in Jordan, 2010 and 2011 Seasons. *AJA* 116: 693-750.

Kenkel, F.

- 2012 *Untersuchungen zur hellenistischen, römischen und byzantinischen Keramik des Tall Zirā'a im Wādī al-'Arab (Nordjordanien)-Handelsobjekte und Alltagsgegenstände einer ländlichen Siedlung im Einflussgebiet der Dekapolisstädte*. Doctorate Thesis University of Cologne 2012, Cologne.

Kraeling, C. H.

- 1938 *Gerasa. City of the Decapolis*. New Haven, American School of Oriental Research.

Krencker, D. and Zschietzschmann, W.

- 1938 *Römische Tempel in Syrien*. Denkmäler antiker Architektur. Berlin and Leipzig, de Gruyter.

Kreuz, P.-A.

- 1999 *Kaiserzeitliche Heiligtümer im nordsyrischen Kalksteinmassiv*. Unpubl. MA Thesis, University of Cologne.

Lapp, P. W.

- 1961 *Palestinian Ceramic Chronology 200 BC-AD 70*. New Haven, ASOR.

Lichtenberger, A. and Raja, R.

- 2012 Preliminary Report of the First Season of the Danish-German Jerash Northwest Quarter Proj-

- ect 2011. *ADAJ* 56: 231-239.
- in press Intentional Cooking Pot Deposits in Late Roman Jerash (Northwest Quarter), Syria.
- Magness, J.
1993 *Jerusalem Ceramic Chronology circa 200–800 AD*. Sheffield, Continuum.
- Marco, S. et al.
2003 Archaeology, History, and Geology of the AD 749 Earthquake, Dead Sea Transform. *Geology* 31(8): 665-668.
- Parapetti, R.
2002 Gerasa und das Artemis-Heiligtum. Pp.23-35 in A. Hoffmann and S. Kerner (eds.), *Gadara-Gerasa und die Dekapolis*. Bildbände zur Archäologie. Mainz, Philipp von Zabern.
- Porat, L., Frankel, R. and Getzov, N.
2012 The Lever Presses of Eretz Israel in the Light of the Alone Abba Oil Press, *Atiqot* 70: 84*-86*.
- Seigne, J.
1986 Recherches sur le Sanctuaire de Zeus a Jérash (Octobre 1982-Décembre 1983), Rapport Préliminaire. Pp.29-59 in F. Zayadine (ed.), *Jerash Archaeological Project 1981-1983*, I. Amman, The Department of Antiquities of Jordan.
- Steinsapir, A. I.
2005 *Rural Sanctuaries in Roman Syria: The Creation of a Sacred Landscape*. BAR International Series 1431. Oxford: Archaeopress.
- Tate, G.
1992 *Les Campagnes de la Syrie du Nord du II^e au VII^e Siècle*. Paris, P. Geuthner.
- Timm, S., Abu-Shmeis, A. and Nabulsi, A.
2011 Zwei griechische Inschriften einer Bleiurne mit Leichenbrand aus Hirbet Hiğra in ‘Ammān, Jordanien. *ZDPV* 127,2: 175-184.
- Tsafrir, Y. and Foerster, G.
1992 The Dating of the ‘Earthquake of the Sabbatical Year’ of 749 C.E. in Palestine. *BSOAS* 55,2: 231-235.
- Tsuk, T.
1988/89 The Aqueduct to Legio and the Location of the Camp of the VIth Roman Legion. *TelAvivJA* 15/16: 92-97.
- Waliszewski, T.
2009 Technological Similarities Across the Jordan Valley. *SHAJ* 10: 709-721.
- Zwickel, W.
1990 *Räuerkult und Räuergeräte. Exegetische und archäologische Studien zum Räueropfer im Alten Testament*. Freiburg, Vandenhoeck and Ruprecht.

A PRELIMINARY REPORT OF THE TULUL ADH-DHAHAB (WADI AZ-ZARQA) SURVEY AND EXCAVATION SEASONS 2005 - 2011

*Thomas Pola, Hannelore Kröger, Bernd Rasink, Jochen Reinhard,
Mohammad al-Balawnah and Mohammad Abu Abila*

The Tulul adh-Dhahab project¹ started in 2005 as an interdisciplinary project entitled 'Tulul adh-Dhahab: A Fortified Central Location of the Iron Age and Hellenistic Period in Lower Wadi az-Zarqa (Jordan)'. It is a joint project of the Faculty of Human Sciences and Theology at Dortmund University (TU), involving Prof. Dr Thomas Pola and his team of archaeologists, and the Department of Antiquities of Jordan, supported by Bale University archaeologists. There were six seasons (2005 - 2009 and 2011).

1. The site

a. Tulul adh-Dhahab

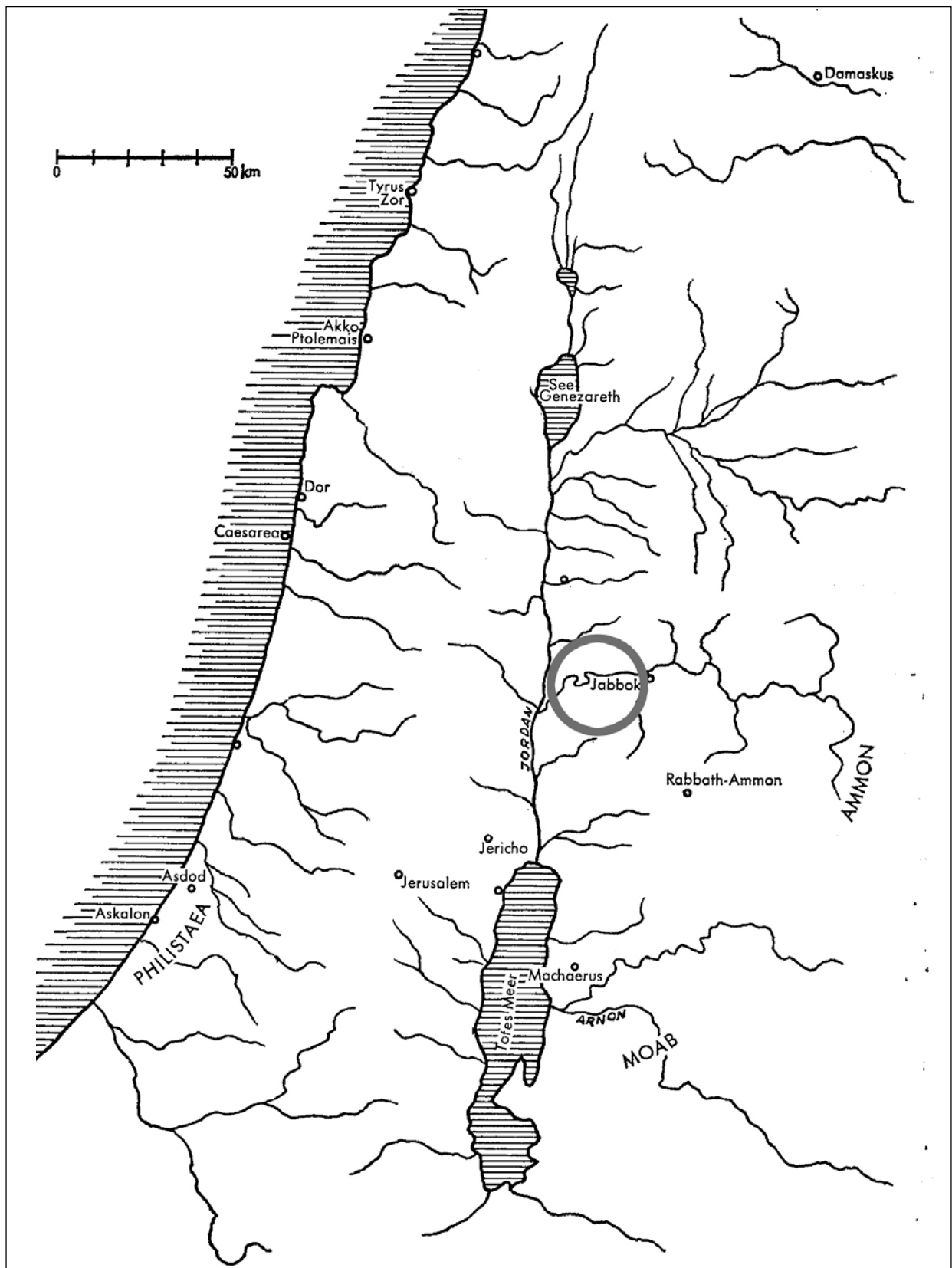
The hills of Tulul adh-Dhahab are located in the bottom of lower Wadi az-Zarqa, about 8 km east of the modern village of Dayr Alla in the Jordan valley (**Fig. 1**). The western hill (Tall adh-Dhahab al-Gharbya; PG 2149.1771) is shaped like a trapezium (**Fig. 2**) and measures 220 by 170 m (Zwickel 1990: 249), with a height of about 90 m (from -100 m to -10 m bsl). Its four terraces are best seen from the south (in contrast to Gordon's [1983] counting of the terraces, our project counts Terrace II separately; thus Gordon's Terrace II combines our Terraces II and III, while Gordon's Terrace III is our IV.). The top terrace (I) covers more than 100 by 60 m. At the top of the south slope, facing south, is the small Terrace II. The large Terrace III faces westward (150 by 75 m). Terrace IV is small in comparison. Access to Ter-

rases I - III was (and is) only possible via the west slope because of the almost vertical angle of the bedrock on the east and south slopes.

The eastern hill (Tall adh-Dhahab al-Sharqiya; PG 2149.1772) is longish. It is slightly smaller than the western hill (130 by 50 m; Zwickel 1990: 250), with a height of about 83 m (from -100 to -17 m bsl). Only its comparatively small top (60 by 30 m) would have been suitable for permanent settlement. The twin hills are separated by a ravine, at the bottom of which the Zarqa river snakes its way. However, the *tulul* are not '*talls*' in the traditional sense, i.e. consisting of accumulated layers of occupation (such as Tall Dayr Alla in the Jordan valley). Geologically they consist of shell limestone and yellowish - brown sandstone. The main difference between this sandstone and that of Petra is the thick iron oxide layers of the former. As the sandstone layers of the *tulul* and adjacent slopes of the Zarqa valley are almost horizontal, it is sometimes difficult to distinguish between geological formations and artefacts associated with the ancient city walls. There is no modern settlement on the *tulul*. Unfortunately, a direct route to the top of the western hill was bulldozed in about 1995, right across the ancient ruins. This operation also levelled two terraces near the bottom of the hill for agricultural purpose. In the meantime the site was acquired by the Department of Antiquities of Jordan, which prevented further destruction by bulldozers.

1. The authors express their cordial thanks to the Department of Antiquities (DoA) of Jordan, especially its late Director General HE Dr Fawwaz al-Khraishah and its Director Generals HE Dr Ziad al-Saad and HE Feris Hmoud, for having given us the opportunity to carry out archaeological work in Jordan over many years. We were most kindly supported by Firyal Mohammad

Issa Bani Issa, Ibrahim Zubi, Khalil Hamdan, Mohammad al-Balawnah and Dr Mohammad Abu Abila as DoA representatives or co-directors, and by Hussein al-Jarrah (former local DoA inspector). Our friendship aims to preserve the cultural heritage of Jordan as relevant for all mankind.



1. The Tulul adh-Dhahab in the lower Wadi az-Zarqa.



2. View of the Western hill of the Tulul adh-Dhahab. (E. Rehfeld)

However, destructive looting (the site is unfortunately known as ‘The Hills of Gold’ in Arabic) is still a big problem at the site.

b. The site in relation to ancient routes and roads

In pre-Roman antiquity the twin hills blocked the Zarqa valley. The az-Zarqa river may have been much deeper before the King Talal dam was completed in 1977 east of the site, especially in antiquity as the climate may have been different. Clearly the two hills and Zarqa river would have prevented any person coming from the Jordan valley from ascending the *wadi*. Anybody coming from the west would have had no access to the Zarqa valley east of the *tulul*. Consequently, they must have had great strategic importance in antiquity. This can also be concluded from the location of Wadi Ḥajjaj, which ascends *ca* 800 m vertical height over 4 km from south of the western hill up to Tall Ḥajjaj (PG 2154.1732; it belongs to the modern village Subeihi). In antiquity, anybody who passed Tall Ḥajjaj in a southeasterly direction would have arrived at the plain of Ard el-Arde, which was situated west of the former Ammonite territory. This would explain why the western hill might have been a late Ammonite fortress in Seleucid times. Moreover, in pre-Roman time the strategic importance of the site was also linked to the fact that the Jordan valley road was only *ca* 8 km away. The presence of a ford across the Jordan river near Tall ad-Damiya (PG 2018.1679), where the Zarqa river joins the Jordan river, leads one to the conclusion that there was an ancient east - west route which met the Jordan valley road. Consequently, the easiest route from Ammonite territory to modern Palestine would have involved

descending Wadi Ḥajjaj to Tulul adh-Dhahab, following the aZarqa river (in so doing crossing the Jordan valley road) and crossing the Jordan river at Tall ad-Damiya. This was also the easiest means of turning north or south along the Jordan valley road.

Tulul adh-Dhahab lost their strategic importance when the Romans constructed a road starting at the Jordan valley road, passing by Tall Abu Zighan (PG 2108.1773) and then ascending the west slope of Jebel Mesara to the plain of Ard el-Arde (Mittmann 1963). The reducing quantity of Roman and Byzantine pottery on the western hill of Tulul adh-Dhahab (see below) mirrors the decline in the strategic importance of the *tulul* after the construction of the Roman road starting at Tall Abu Zighan.

2. History of Research and Possible Identification with Ancient Place Names

The history of research is dominated by the twin facts that the site has not been surveyed (or excavated), with the exception of R. L. Gordon's survey in 1980 - 82 (Gordon 1983, 1984) and that there have been no new arguments in the scholarly literature for many decades regarding the identification of the site with place names mentioned in ancient sources.

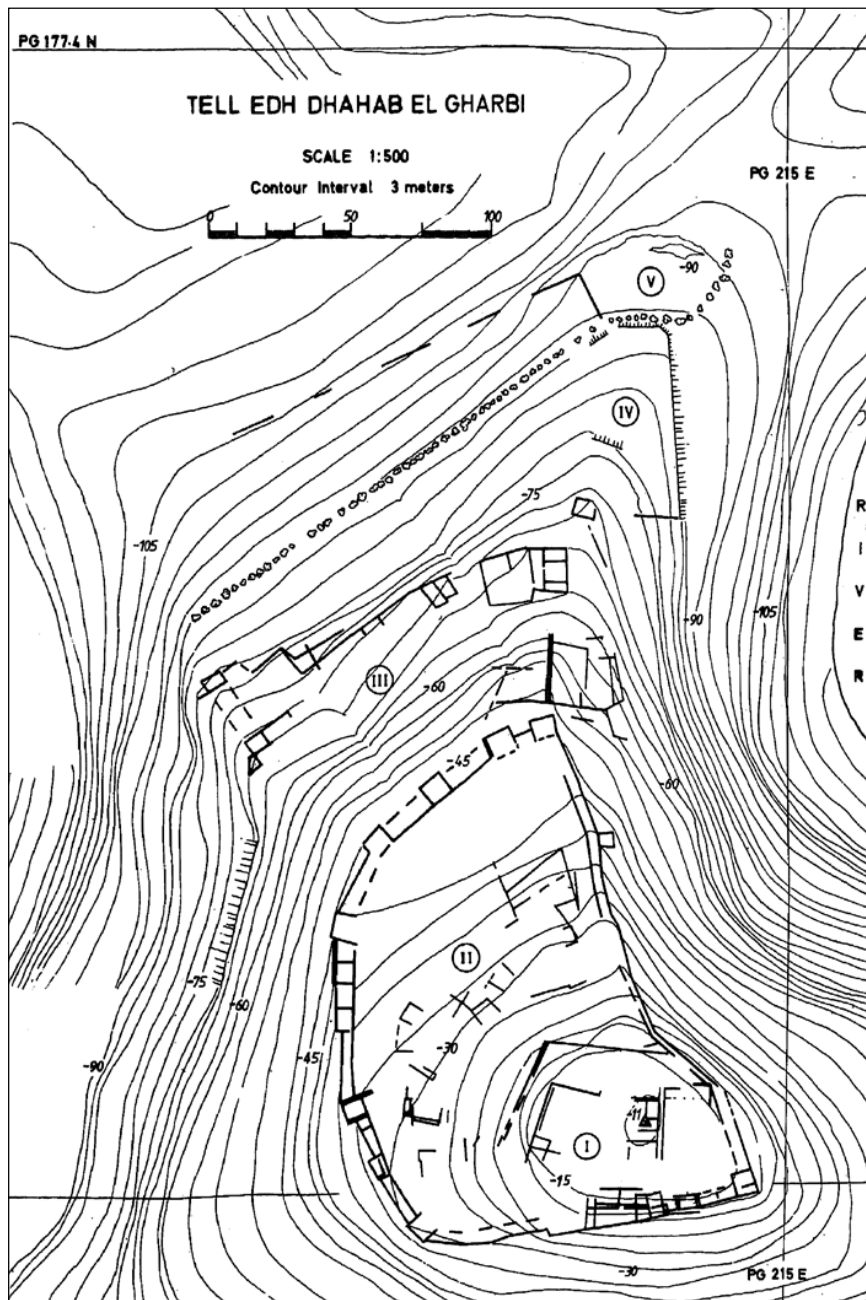
a. The Survey of Robert L. Gordon (1980 - 82)

Although Gordon's survey also included the environs of the site for about 5 km to the west and south, his interest was focused on the *tulul* as “the largest historic site in the survey area” (Gordon 1983: 275). His report is very valuable because it describes the state of the western hill before the above-mentioned bulldozing and 25 years of natural erosion. On the one hand, some of the ruins (especially sections of wall) described by Gordon are not visible any more, while on the other ruins visible today are missing from Gordon's description (especially the defensive construction between Terraces III and IV, the top of which was truncated by the bulldozing). Gordon also published valuable archaeological maps of lower Wadi az-Zarqa, the *tulul*, the western hill in more detail and of Tall al-Mughanni which is located about 3 km west of the *tulul* (PG 2120.1785; Gordon 1983: 276, 279-280, 1984: 132, 134).

According to Gordon, the main periods of set-

tlement on the *tulul* were 'presence' in the Middle Palaeolithic, 'less presence' in the Neolithic and 'presence and occupation' in the Early Bronze Age, with the 'main period of occupation' overall being the Iron Age and also (as the main period on the western hill) the Hellenistic period. There was also 'occupation' on the *tulul* in Roman times and 'presence' (on the western hill) in the Byzantine era. Gaps in settlement appear to exist in the Early Palaeolithic, Late Bronze Age and Persian periods. There is no evidence at all for any

Islamic presence (Gordon 1983: 287). Gordon believed that the casemate wall fragments and building ruins visible above the ground surface were constructed in the Hellenistic and Roman periods. According to Gordon, the Hellenistic city was situated on Terrace III (Fig. 3). Unfortunately, he did not manage to locate the ancient cemetery. A map of Hellenistic and Roman place names (and Roman roads) in lower Wadi az-Zarqa and the surrounding area has been published by Siegfried Mittmann (1987: 64).



3. Top map of the western hill of the Tulul adh-Dhahab. (Gordon 1983, 280).

b. Possible identification with place names mentioned in ancient sources

Scholars agree with the identification of the Biblical River Jabbok as the Zarqa river. Unfortunately, there is no agreement regarding the location of the cities of Pnuël and Maḥanaim, mentioned in the Old Testament and in a late 10th century BC inscription of Pharaoh Shishak from Karnak (Moers 2005; Weippert 2010). Until around 1970 Biblical scholars identified Pnuël with Tulul adh-Dhahab (or with one or other of the twin peaks) and presumed that there must have been a sanctuary from Iron Age I or earlier. After 1970 the majority took the dual form of the ancient Semitic name 'Maḥanaim' literally and associated this dual with the twin peaks. Moreover, these scholars no longer believed in the existence of an Iron Age I temple. This compelled these scholars to look for another location for Pnuël. According to Genesis 32, a ford across the lower River Jabbok was located close to Pnuël. Consequently, the site had to be located next to *the Zarqa river* and was therefore identified as Tall al-Hamma East (PG 2112.1778; Zwickel 1996). It should be added that, according to the Deuteronomistic History, Pnuël was fortified (or built) by Jeroboam I and became the temporary capital of the northern kingdom (perhaps owing to Shishak's military activities in the west). However, the interpretation of 'Maḥanaim' as a quantitative dual form is not compelling (Knauf 1995).

A second topographic problem concerns the location of Seleucid-era places mentioned in the works of Flavius Josephus, i.e. Am(m)athous (a late Ammonite fortress) and Essa. According to Josephus, Amathous was the biggest fortress east of Jordan (Jos. Ant. 13, 356). Siegfried Mittmann identified Essa with Tulul adh-Dhahab and Amathous with Tall al-Mughanni (as the Semitic *hmm* ["to be hot"] in 'Ammathous' could refer to the hot spring visible from the top of this *tall* [Mittmann 1987]). This was rejected by Wolfgang Thiel, who argued that Amathous was located at Tulul adh-Dhahab (Thiel 2005: 203-206), and also by Detlev Dormeyer (forthcoming). According to Dormeyer, 'Essa' is simply a mistake in the Greek text: it never existed.

3. Aims of the Tulul adh-Dhahab Project

Although the project is an interdisciplinary

one, its archaeological component is generally separated from the component relating to interpretation of the ancient sources. Consequently, the aim of the project is to shed light on the history of settlement on Tulul adh-Dhahab. For greater clarity, the history of settlement needs to be investigated separately for each of the twin hills (although they clearly need to be related to each other) and for each terrace of the western hill. Moreover, the area surrounding the *tulul* needs to be surveyed in the search for the ancient cemetery (or cemeteries) and an ancient settlement at the base of the western peak.

4. Methodology

Owing to a restricted financial budget for the project, the archaeological work focused on the western hill, *viz.* Terraces I and II, and also on the defensive construction between Terraces III and IV. The methodology was based on survey and soundings undertaken in short seasons of two to four weeks.

Geomagnetic survey was carried out with a 2 nT Fluxgate gradiometer FM256 (Geoscan Research UK) in 10 x 10 m squares, with points at 0.5 m intervals north - south and 0.25 m intervals east - west, in a north - south direction on Terraces I and II (Terrace III had been destroyed and there was no sign of the defensive construction).

With the aid of a Leica TCRA 1103 tacheometer, all artefacts visible on the ground surface were surveyed in order to produce a map of the western hill. To support photographic documentation and surveying, low altitude aerial photographs were taken using a kite and compact digital camera (see Reinhard 2012). The resulting imagery was used to create 3D photogrammetric models of the excavated areas. These models were merged with the survey data to produce more detailed excavation plans, which will be published separately. Using the same approach, a digital surface model (DSM) of Tulul adh-Dhahab area was created from images derived from the 1953 Hunting aerial survey, which showed the site and its setting in an unbulldozed state.

a. Terrace I

A grid was established (see below). As tumbled pillars with heart-shaped columns were visible on the surface in the south-east corner of

Terrace I, two peristyle courts could be identified. Excavation therefore focused on this area in order to reconstruct the architecture and recover information relating to the history of settlement.

b. Terrace II

A large robber trench excavated in a tower-like construction inside the city wall was cleared and documented.

c. Defensive construction between Terraces III and IV

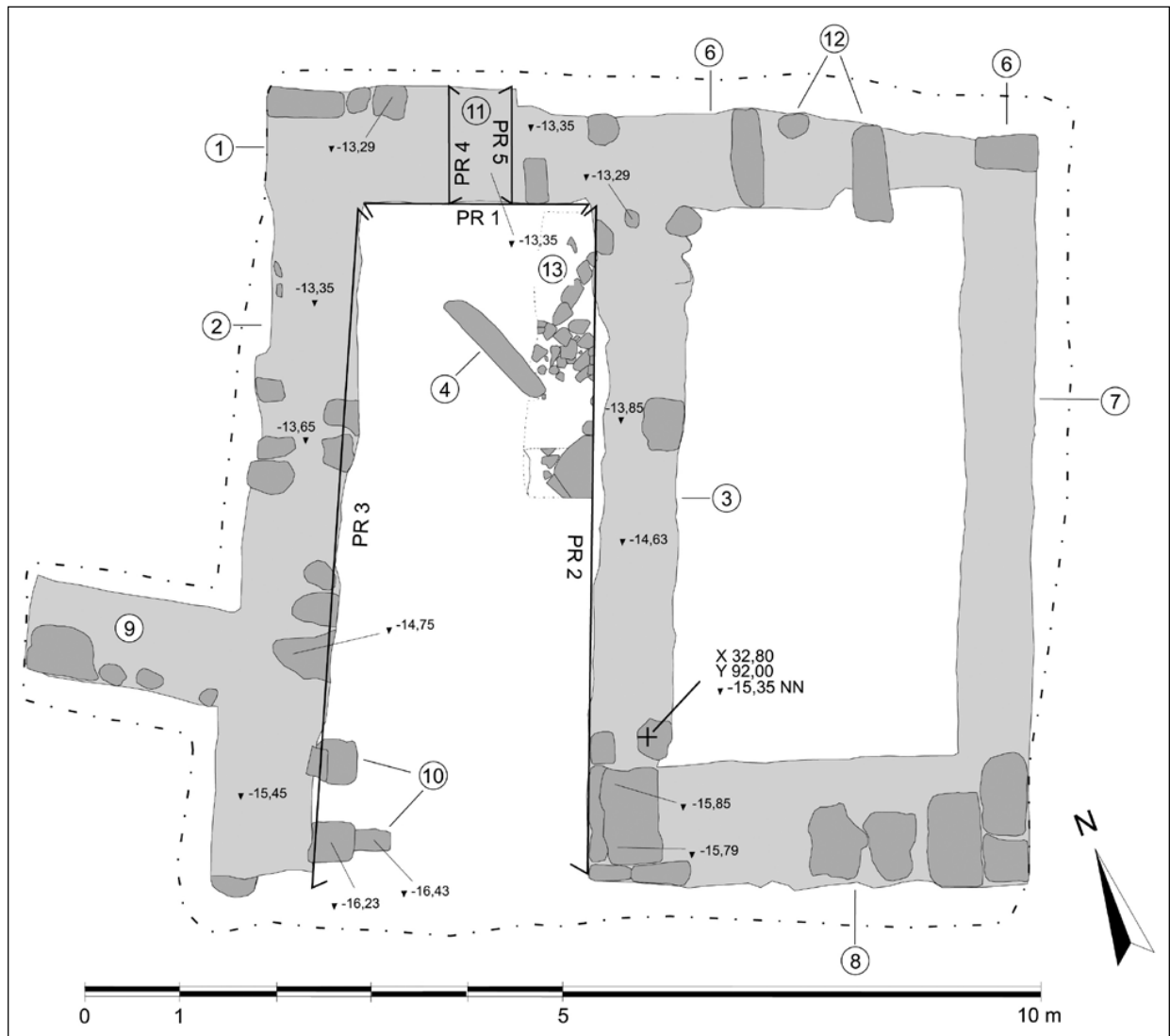
Several soundings were excavated in order to gather information about the purpose and dimensions of the architecture

5. Preliminary Results

a. A city wall tower at the southern edge of Terrace II

When we started the 2006 season, we found a large robber trench at the southern edge of Terrace II and two-metre high walls forming part of a tower within the city wall. Its purpose was to defend the buildings on Terrace II.

The four-sided tower measured 8 m east - west, parallel with the edge of the terrace, by 8 m north-west - south-east (**Fig. 4**). The west wall was not exactly perpendicular to the back wall; the width of these two walls was about 1 m. The two walls forming the eastern end of the construction were about 80 cm wide. The wid-



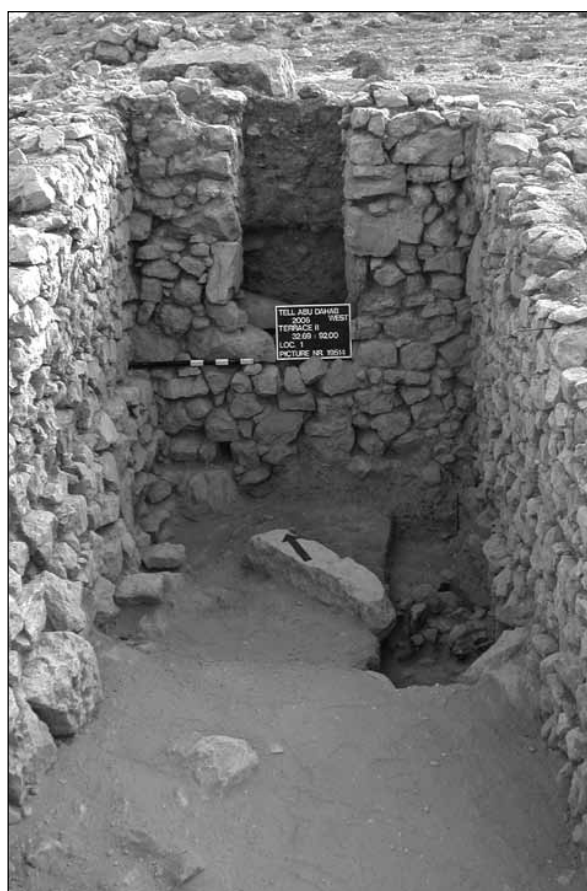
4. Map of the tower: 1-3, 6-8, 10 main walls; 4 lintel; 9 defending wall of terrace II, 11-12 entrances; 13 grounding stones of the older wall. (Drawing B. Rasink/J. Reitsema).

est wall was to the south, on the edge of the terrace facing the slope, but it was badly eroded. The tower is connected to the city wall in order to protect the edge of Terrace II (9); a wall (3) across the centre divides it into two areas, each with its own entrance (11; 12). In the western area the walls were recorded. It was easy to identify the entrance level from the three high walls, each of which displayed had a projection at the same level which might have been for a wooden floor (**Fig. 5**). The entrance was constructed of larger stones than the other walls. All walls were carefully built using the same technique, with no mortar. Some remnants of plaster suggest that upper parts of the walls may have been rendered.

A rectangular stone (1.5 x 0.4 x 0.6 m) was found in the western part of the tower (4). It might once have been the lintel from the entrance (11). It had no inscription and no engraving.

Four layers were identified in the entrance. Immediately over the bedrock, there was a layer of fine soil (1) that might date back to the use of the structure. Above this was a layer of coarser soil, 70 cm thick, which contained a few small stones. The layer above this was coarser still and contained larger stones; it was up to 80 cm thick. Finally, there was a layer of topsoil derived from modern erosion processes. There were no finds in any of the layers and as a result they cannot be dated.

In a small sounding by the eastern wall, another layer was visible (**Fig. 6**). Under the level reached by the robbers in the base of the tower,



5. View into the Western part of the tower.

we identified a different deposit containing a large quantity of charcoal (3/; 5). A lot of the charcoal was found above the foundation stones of a small wall running north-east - south-west (13). This wall is definitely older than the city wall tower. Its position at the edge of the slope



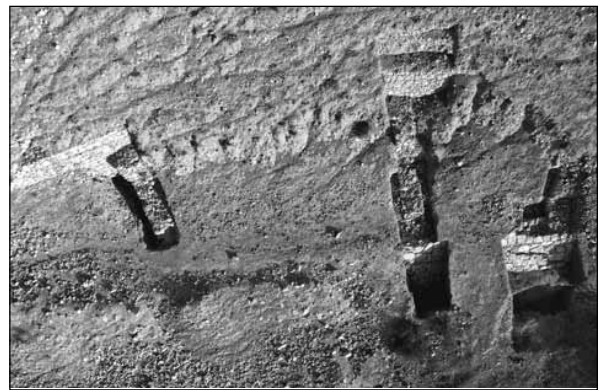
6. The Eastern wall of the Western part of the tower. 1/3 soil containing a lot of charcoal; 2 possible walking level, 13 older wall. (Drawing B. Rasink/J. Reitsema).

indicates that this wall belonged to a fortification that protected an earlier phase of the settlement. It had been dismantled down to its foundations. The large quantity of charcoal indicates that it may have been destroyed by fire². Greyish soil north of this wall (2/6) might represent a surface associated with its construction (13).

The excavation of the city wall tower demonstrates the importance of the western hill of Tulul adh-Dhahab. The stratigraphy in the entrance suggests that there could be *ca* 1.5 m depth of undisturbed occupation deposits on this part of Terrace II. Earlier architectural remains that predate the tower should be explored in future.

b. Defensive construction between Terraces III and IV

There was no mention of this construction below Terrace III in R. L. Gordon's report because at that time it was completely covered by erosion soil. When a route was bulldozed from the bottom of the hill to Terrace III (in 1995 or thereabouts), it truncated the tops of the walls associated with relating this construction. Soundings excavated between 2005 and 2009 demonstrate that glacis walls (at an angle of exactly 45°) and casemate walls extend along the west slope (**Fig. 7**) for a distance of *ca* 60 m and are founded on bedrock. The middle part is supported by four walls, with a width of *ca* 1.5 m, which run perpendicular to the slope *ca* 8 m from each other. The trenches showed that these belong to a massive casemate-like construction associated with the city wall, but which is not linked to the wall on the slope. Presumably, the purpose of this construction was to prevent the wall on the slope from collapsing on to the connecting walls as a result of attack or earthquake. Their height above bedrock is *ca* 8 m. The foundations of one of these walls were exposed in a sounding. Although pottery sherds from the foundation level (with the exception of one Attic sherd) belong to Iron Age II, we do not believe that this defensive system was constructed in the Iron Age, because it is much more likely



7. Sondage trench, showing details of the massive defense structure at the northwestern hill slope. The trench of 1 to 1.5 m exposes the wall base with its corresponding glacis. (Kite Aerial Photograph taken in 2011 by Jochen Reinhard. Note the 1 m scale between the glacis and a caper bush).

to have been constructed during the Hellenistic period. In order to reinforce this Hellenistic construction, the spaces between the supporting walls are likely to have been filled with soil taken from elsewhere which contained Iron Age sherds. The 2009 season demonstrated that there was a second construction phase. The top of the wall on the slope was destroyed in antiquity for an architectural purpose that remains unclear. This more recent architecture was clearly associated with a tower-like construction below the excavation area that is still visible above the ground surface. Excavation of the walls associated with this phase should also shed light on the question of where the ancient route to Terrace III was located. Clearly, the bulldozer is unlikely to have followed the ancient route in its entirety. Another task is to elaborate how the defensive construction was linked to the Terrace III city wall (there must have been some kind of staircase between the city wall and casemates). The lower part of this construction also needs to be identified towards the bottom of the hill, and its likely height and extent assessed. Assuming that Amathous was in fact located on the western hill, was the fact that the defensive construction covered almost the entire western slope the reason why Josephus called Amathous “the biggest fortress east of Jordan” (Jos. Ant. 13, 356)?

2. Additional comment by Thomas Pola: According to a radiometric date from the abovementioned charcoal, it dates to between 1,305 and 978 BC (Erl-11091). Consequently, it cannot be ruled out that the stones under

the walls of the abovementioned tower date to the Late Bronze Age or Iron Age I. Unfortunately it will be difficult to confirm this by excavation in the centre of Terrace II owing to severe security problems.

c. Archaeological features on Terrace I

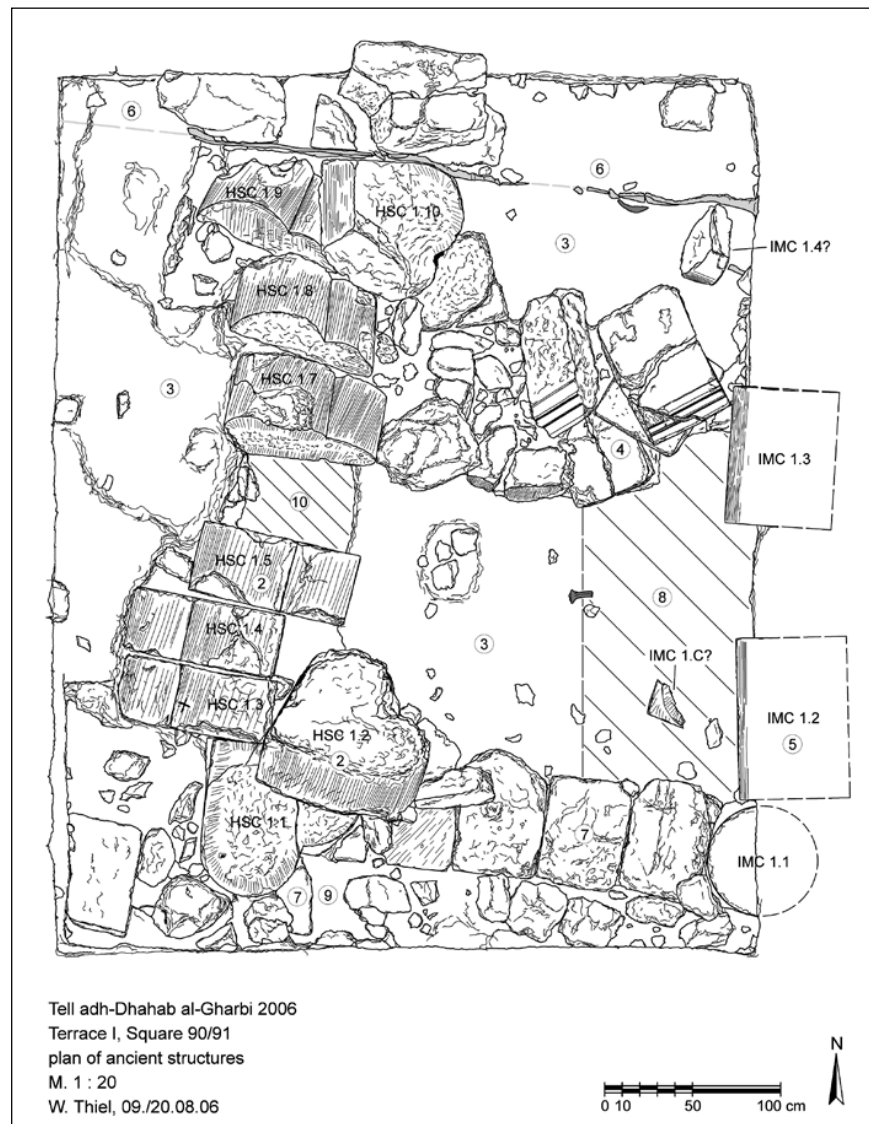
One of the investigation's foci was the hilltop, a plateau of 7,500 m² designated Terrace I. In 2006, the plateau was gridded out with squares measuring 4 x 4 m, separated by 1 m-wide baulks. A total of 12 squares have been fully or partially excavated so far, which corresponds to 4% of the possible 300 squares on Terrace I.

The first test excavations undertaken in 2006 uncovered the north-western corner of a colonnade of a peristyle court in the Doric order in Square 90/91 (Fig. 8). The distinctive heart-shaped corner columns are marked on the plan (Fig. 9). The dating of this feature to the Hellenistic period was confirmed by ceramic finds; only a small quantity of Iron Age pottery was recovered.

Chronological periods identified on Terrace I

Based on the results of the 2011 season, the architectural remains were divided into an earlier and a later phase, which were separated by a burnt layer. This burnt layer was found in all squares and was particularly pronounced in Squares 77 West and 109.

Square 77 contained a wall which ran north - south into Square 93. The wall bore clear traces of fire (Fig. 10) and the burnt layer extended right up to it, demonstrating that the wall was actually affected by the conflagration. Another wall, this time running east - west, was discovered below the burnt layer and displayed no traces of fire. It was clearly covered over when the north - south wall was built and therefore



8. Terrace I, Square 90/91. Map of ancient structures, peristyle court I. (Drawing Wolfgang Thiel).



9. Terrace I, General map of the excavation areas. A, B columns of peristyle court I; C the S-E column of peristyle court II; D Hellenistic house structure; E, F Iron Age house structures. (M. Thede, C. Hildebrand).



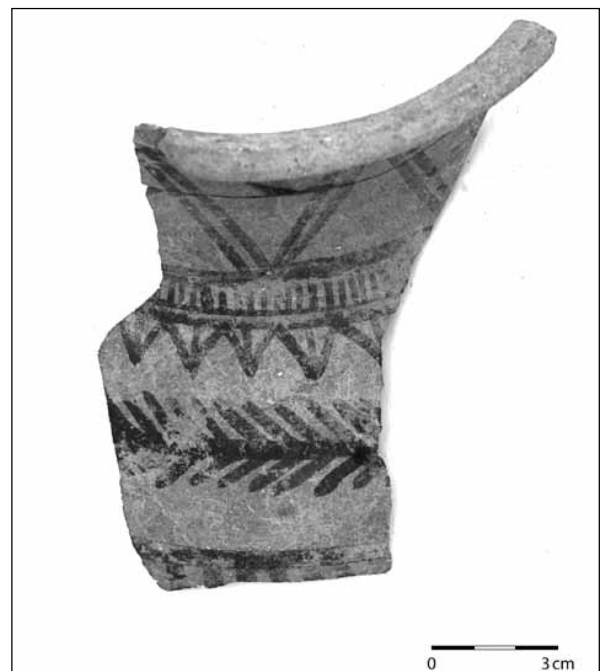
10. Terrace I, Square 77. From N-S the wall of the Hellenistic period with scorch marks and the charcoal layer (Fig. 9 D). From E - W the wall of an Iron Age house structure -

dates to an earlier period.

In Square 109, the burnt layer abutted the stylobate of the corner column of a second peristyle court further to the north. An east - west wall displaying no traces of burning ran beneath it.

Earlier phase

The dating of the earlier phase was based on an analysis of pottery recovered from Squares 90/91, 93, 108 and 109 (Fig. 11). It was found on a rammed-earth surface, approximately 1.2 m beneath the burnt layer. These finds attest



11. Terrace I, Square 108. Colored sherd, Iron Age. (A. Post).

to the use of the site during the Iron Age. This date was confirmed by a radiocarbon date from Square 93, which covered the range 1,212 - 988 BC (Erl-14616).

The discovery of carved stones and blocks of stone with engraved scenes and geometric pat-

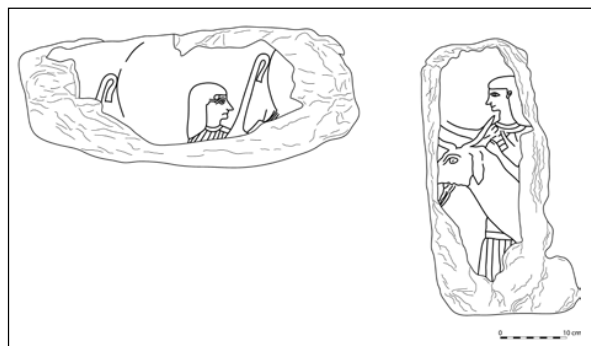
terns, which were reused in later constructions (Pola 2010), are of particular importance as evidence for the Iron Age use of the site.

Two fragments of the same stone, showing a lion's head facing left, were found on the western edge of the plateau. Another fragment bore the profile of a left-facing beardless figure (perhaps a woman or a child) behind a domestic animal with horns (perhaps a goat) which also faced left. Comparing the size of the animal with that of the human figure suggests that the drawing depicts a child. For the purpose of this report, this fragment will be described the 'cultic scene' (Fig. 12).

Various engraved stone fragments were recovered from Terrace I. Some bore geometric patterns that could not be interpreted more precisely. One fragment depicted a lion's mane and yet another depicted the profile of a beardless figure (head and torso) holding up a curved object (perhaps a harp) which extended above the figure's head. Parts of the same object also appear to the left of the figure. This fragment will henceforth be termed the 'orchestra scene'.

Pola suggests that the engraved stones, some of which weigh up to 200 kg, were quarried from the bedrock of the plateau and were primarily used on-site. In dating the stones, Pola refers to Othmar Keel, who has (pers. comm. 16th May 2007) suggested a probable 9th or 8th century BC date.

Petra Watermann (pers. comm. 4th November 2006) asserts that the 'cultic scene' contains only clues to its date for now, based on its depiction of the face and clothing. According to her, the depiction of an eye on the figure's temple is characteristic of Egyptian art, but also occurred in Assyria. She cites parallels in the depiction of non-Assyrians from Bit Adini (Wäfler 1975,



12. Carved Stones from Iron Age. (C. Hildebrand).

206 (text) and plan 3 (plates) [Nimrud, Central Palace, Room F]). Based on the clothing in the 'cultic scene', which has sewn-on inverted pleats, Watermann proposes the ancient Syrian region in terms of geography and the 9th or 8th centuries BC in terms of chronology (based on Reimpell 1921, 28, 64, 66, and 67; Watson 1987, 41). Thus, the engravings constitute iconographic evidence pointing to Iron Age II.

In terms of interpreting the engravings, the depiction of the lion is believed to have been an apotropaic symbol. With regard to the 'cultic scene', it should be noted that during Iron Age II children were only depicted accompanied by their extended families, if at all. Therefore, the piece only contains a fragment of a scene, which most likely originally depicted an entire family. The person shown is accompanying a domestic animal to a public sacrifice at a sanctuary. The stone fragments and their depictions thus suggest that Terrace I was the site of an Iron Age II sanctuary. This theory is supported by the interpretation of the 'orchestra scene'. In terms of style and execution, the depiction of the orchestra is similar to that of the 'religious scene', so we may assume that it was all part of the same composition.

The 'religious scene' faces left, while the orchestra faces right. Provided that both scenes belong to the same composition, they would be moving towards a centre as yet unknown to us. We may undoubtedly interpret the stones as fragments of religious imagery from a temple or some other official building. A parallel case appears to have existed in the sacred architecture of pre-Babylonian Palestine, as recorded in 6th century BC written sources (Pola 2010). According to these records, the engravings would have been on orthostats which would have formed the facing of the building. Owing to the limited size of the exploratory trenches, it has not yet been possible to find the actual building or temple.

We may conclude that a settlement perhaps existed on Tall adh-Dhahab West at the time of the city of Pnuël, mentioned in the Shishak inscription from Karnak of the late 10th century BC (Weippert 2010).. During the 9th or 8th centuries BC the settlement probably had a special palace with a sacred building, which gave the site an air of heightened importance. The

archaeological and scientific results from the test excavations demand further investigation aimed at studying the site more closely, with a view discovering evidence that would confirm or deny the identification of the site as the Biblical and historical city of Pnuël.

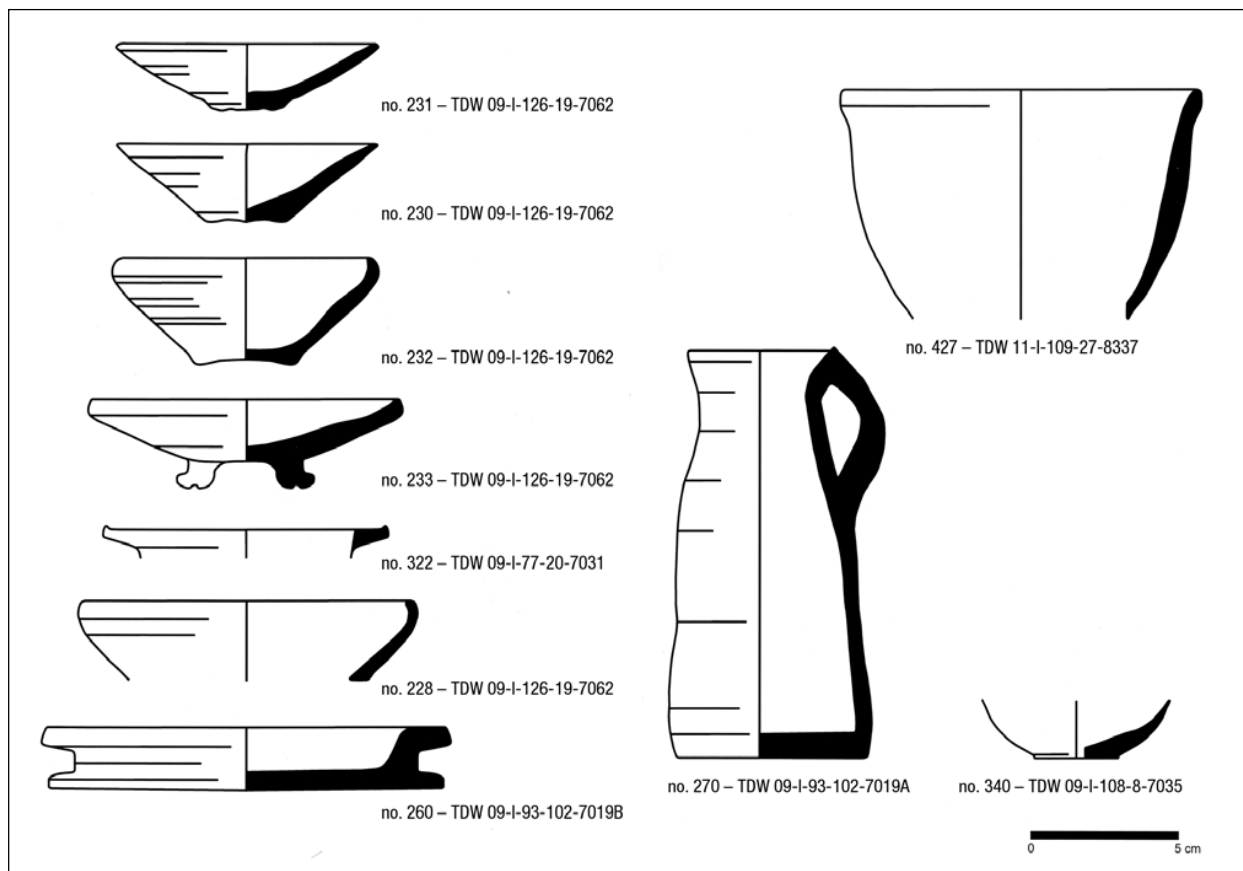
Later phase

Based on the aforementioned historical sources, Amathous was an important fortified centre in Late Hellenistic and Early Roman times.

Thanks to an abundance of ceramic finds (**Fig. 13**) and architectural features in Square 90/91, the occupation of Terrace I on the western hill of Tulul adh-Dhahab during the Hellenistic period had already been demonstrated by the 2006 season. However, it was not until the discovery of the previously unknown heart-shaped column in Square 92 in 2011 that it became possible to ascertain the location and orientation of the southern peristyle court more precisely (Fig. 9 A and B). Two heart-shaped column drums, 40 and 46 cm in height, were

found in their original position on top of a 33 cm-high stylobate. The entire feature was confirmed as being *in situ*. The column rests on a masonry foundation whose depth has not yet been determined. The orientation of the column with the tip of the heart-shape pointing north-east suggests that this was the north-eastern corner of the colonnade. This new corner column accords with the feature discovered in Square 90/91 in 2006. It has the same characteristics, being a fragment of heart-shaped column 43 cm high standing on top of a 21 cm-high stylobate; it also rested on a masonry foundation. The right-angled tip of the heart-shape pointed north-west. These two features combine to form the northern row of columns of a south-facing peristyle court with a width of 9.7 m.

To the north of this peristyle, the colonnade of another - most likely contemporary - peristyle was found in Square 109. However, it will require the discovery of additional *in situ* columns to ascertain the exact location and dimensions of this building.



13. Terrace I, Hellenistic Fine Ware pottery, plates, small bowls, cups, small jug. (A. Post).

The burnt layer

The small-scale investigations in the areas of the columns not only helped to determine the orientation of the peristyles, but also provided important evidence concerning the large-scale conflagration that occurred on Terrace I, evidence of which had already been discovered in the 2009 season in Square 77 West. Arrowheads found in the burnt layer suggested that some kind of battle had taken place.

During the excavations in the areas of the two corner columns in Squares 90/91 and 92, high concentrations of charcoal were found, starting at the top of the stylobate and continuing downwards into the ground. These concentrations were situated at the same height as the burnt layer in Squares 77 and 108. An inspection of all sections showed that the burnt layer was present at the same height over the entire area excavated so far. Charcoal samples were taken for radiometric dating from the burnt layer around the corner column in Square 92 (**Figs. 14 and 15**) and from the same layer in Squares 108 and 109. The dates that came back from the AMS laboratory in Erlangen (Erl-17117 - 17121 and Erl-17124) all covered an near-identical

range, from the late 3rd to the middle of the 1st centuries BC.

The laboratory in Erlangen initially viewed the six dates as independent of each other and calibrated them individually. Because the samples were closely associated, both archaeologically and stratigraphically, and because they were derived from a single event, joint calibration seemed justified (software = CalPal; curve = InCat04). This secures the date still further, giving a range of between 210 and 70 BC (68% probability).

Based on the assumption that the dated samples had been taken from the burnt remains of construction timbers, this date relates to the construction of the buildings and not their destruction. Provided that this elaborate building did not incorporate reused timbers, we may assume that the southern peristyle court was erected sometime between the 2nd and the early 1st centuries BC.

Lead sling bullets adorned with symbols and Greek inscriptions, a small repository of which was found in the burnt layer on the stylobate of the corner column in Square 92, warrant particular attention. Analyses of the lead (see Dreyer, this volume) provided more information on the



14, 15. Terrace I, Square 92. Left: Dr. Mohammad Abu Abilah, DOA, taking a sample of charcoal for radiocarbon dating (H. Kröger); Right: Heart shaped column of the N-E corner of peristyle court I. (M. Ximénez-Carillo).

conflagration - which probably occurred during a battle - and the historical context of the event (Fig. 16).

Other important clues relating to the period of use of the areas excavated on Terrace I came from coins, twelve of which were recovered. The earliest coin dates from 169 / 168 BC (issuing authority unknown), while the most recent coins were minted by the Hasmonean ruler Alexander Yannaeus in 77 / 78 and 80 / 76 BC respectively. No later coins were found. Given the current state of research, this means that the destruction of the building by fire occurred before the middle of the 1st century BC.

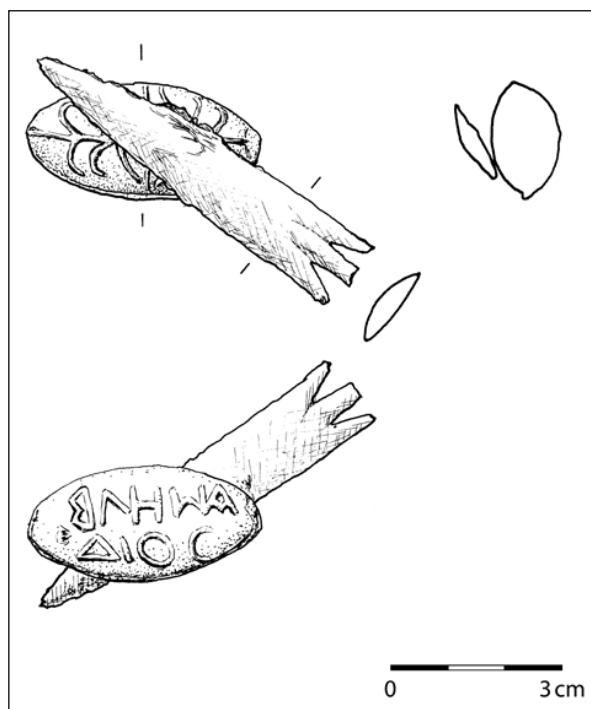
No evidence has been uncovered in the squares excavated to date that would point to the rebuilding of the structures or a continued use of the site after the conflagration, and no distinct finds from the later period of the Roman conquest were unearthed. Moreover, the archaeological features clearly show that the ruins were no longer used.

An example from Square 109 serves to illustrate this (Fig. 17). The burnt layer was clearly visible at the foot of the corner column of the northern peristyle building. The overlying deposit was approximately 0.8 m thick and contained almost no finds, except deposits of organ-

ic fragments. This layer consisted of ‘dissolved’ clay tiles which had been used in the upstanding masonry of the building. The clay tiles naturally ‘dissolved’ over time and enveloped the lower portions of the columns. An earthquake, which probably occurred in 365 AD (Kallner-Amiran 1950), caused the remains of the freestanding column to collapse into and onto the ‘dissolved’ building materials.

6. Conclusions

Returning to the question of identifying the location of Amathous, we can make the following comments. According to the archaeological results so far, the hypothesis that Roman Amathous was located on the western hill is not very likely owing to chronological discrepancies. As the archaeological features show, there was no phase of reconstruction after the conflagration occurred. This is despite the fact that the location of Terrace I would have been ideal for the construction of an official Roman building. Moreover, there is a lack of significant Roman finds which would allow us to identify the hill as the location of a provincial capital. At this stage of research, it seems unlikely that the western hill will be associated with the Roman district capi-



16. Terrace I, Square 92, sling bullet I. (C. Hildebrand).



17. Terrace I, Square 109. The S-E column of peristyle court II, the charcoal layer and the Iron Age wall E-W (Fig. 9 F). (Photo: M. Ximénez-Carillo).

tal referred to by Flavius Josephus as Amathous.

According to our current state of knowledge, the Hellenistic site on the western hill of Tulul adh-Dhahab was constructed sometime between the 2nd and early 1st centuries BC, and was destroyed in battle before the mid-1st century BC. It is therefore possible that the site was the Seleucid - Hasmonean Amathous mentioned by Josephus. The Hellenistic inhabitants clearly reused remaining Iron Age walls for the foundations of their building..

Acknowledgements

Between 2005 and 2011, the project was kindly supported by numerous privates individuals, amongst them many medical doctors, and the following institutions and companies: Dortmund University (TU), Gesellschaft der Freunde der Technischen Universität Dortmund, Weckbacher GmbH (Dortmund), Evangelische Kirche von Westfalen, KONE GmbH (Hannover), Schneider + Ehret (Lünen). Since January 2012, the project has been kindly supported by "Verein zur Förderung der Archäologie im unteren Jabboktal / Jordanien e.V." (<http://www.tulul-adh-dhahab-verein.de>).

The project was supported in its scholarly and scientific aspects by Prof. D. Frank Siegmund (Düsseldorf University), D. Sandra Viehmeier (Bale University), Prof. D. Manfred Bayer Faculty of Physics, (Dortmund University), Prof. D. D. h.c. mult. Othmar Keel (Fribourg University), Prof. D. D. D. h.c. Dieter Vieweger (German Protestant Institute for Archaeology, Amman), Prof. D. Gerrit van der Kooij (Leiden University), Prof. D. Detlev Dormeyer (Dortmund University), D. Wolfgang Thiel (Munich), D. Andreas Post (Münster), Petra Watermann (Dortmund University) and other scholars.

Prof. D. Thomas Pola
Dortmund University (TU) North Campus
Faculty of Human Sciences and Theology (14)
Emil-Figge- Strasse 50
D-44227 Dortmund Germany
thomas.pola@tu-dortmund.de

Bibliography

Bender, F.

- 1969 Beiträge zur Geologie Jordaniens, Geologisches Jahrbuch, *Beihefte* 81, Berlin.

Gordon, R.L., Villiers, Linda, E.

- 1983 Telul adh Dhahab and Its Environs Surveys of 1980 and 1982. A Preliminary Report. *ADAJ* 27: 275-289.

Gordon, R.L.

- 1984 Telul adh Dhahab Survey (Jordan) 1980 and 1982: *Mitteilungen der Deutschen Orient-Gesellschaft* 116: 131-137.

Kallner-Amiran, D.H.

- 1951 A Revised Earthquake-Catalogue of Palestine. *Israel Exploration Journal* 1: 223-246.

Knauf, E.A.

- 1995 Art. Mahanajim. *Neues Bibel-Lexikon II*: 687.

Mittmann, S., Amathous, Essa, Ragaba.

- 1987 Drei hellenistische Festungen im östlichen Randbereich des mittleren Jordangraben. *Zeitschrift des Deutschen Palästina-Vereins* 103: 49-66.

Mittmann, S.

- 1963 Die römische Straße in der nordwestlichen Belka. *Zeitschrift des Deutschen Palästina-Vereins* 79: 152-163.

Moers, G.

- 2005 Der Palästinafeldzug Scheschonqs I., Texte aus der Umwelt des Alten Testaments NF 2. Staatsverträge, Herrscherinschriften und andere Dokumente zur politischen Geschichte, ed. B. Janowski u. G. Wilhelm, *Gütersloh*: 246-271.

Pola, Th., al-Balawnah M., Rehfeld, E., Krause, T.

- 2011 Fragments of Carved Stones from Tulul adh-Dhahab in the Lower Wadi az-Zarqā. *Journal of Epigraphy and Rock Drawings* 3 (2009): 17-24.

Pola, Th.

- 2012 Art. Pnuël/Pniël. *WiBiLex*, August 2012 (<http://www.bibelwissenschaft.de/nc/wibilex/das-bibellexikon>).

- 2010 Ritzzeichnungen. Werfen archäologische Funde aus dem Ostjordanland Licht auf Ez 8, 10 und 1 Kön 6, 29-36?, *Theologische Beiträge* 41: 97-113.

- 2006 Tulul Abu ad-Dahab (formerly Tulul adh-Dhahab) in the lower Wadi az-Zarqa: *Munjazat* 7: 44.

- 2005 Tulul Abu adh-Dhahab West: *Munjazat* 6: 16.

- 2007 Tulul adh-Dhahab (West): *Munjazat* 8: 45.

Reimpell, W.

- 1921 *Geschichte der babylonischen und assyrischen Kleidung*, ed. E. Meyer, Berlin.

Reinhard, J.

- 2012 Things on strings and complex computer algorithms. Kite Aerial Photography and Structure from Motion Photogrammetry at the Tulul adh-Dhahab, Jordan: *AARGnews* 45: 37-41.

Thiel, Wolfgang M.

- 2005 Vom Ornament zum Medium. Die kanonischen griechischen Bauordnungen und ihr Beitrag zur Hellenisierung Palästinas im 2. und 1. Jh.

- v. Chr., Pp. 189-235 in Chr. Frevel (ed.), Medien im antiken Palästina. *Materielle Kommunikation und Medialität als Thema der Palästinaarchäologie*, Forschungen zum Alten Testament II/10, Tübingen.
 - van der Steen, E.J.
 - 2004 Tribes and Territories in Transition. Central East Jordan Valley in the Late Bronze Age and Early Iron Ages. a Study of Sources, *Orientalia Lovanensia analecta* 130, Leuven et al.
 - Wäfler, M.
 - 1975 Nicht-Assyrer neuassyrischer Darstellungen, *Alter Orient und Altes Testament* 26, Kevelaer and Neukirchen.
 - Watson, Ph.J.
 - 1987 *Costume of Old Testament Peoples*, New York et al.
 - Weippert, M.
 - 2010 Der Palästina-Feldzug des Pharao Šošēnq I. (um 925). Die Palästinaliste Šošēnqs I. (um 925). Pp. 228-238 in M. Weippert (ed.), Historisches Textbuch zum Alten Testament, *Grundrisse zum Alten Testament* 10, Göttingen:
 - Zwickel, W.
 - 1990 Eisenzeitliche Ortslagen im Ostjordanland, *Tübinger Atlas des Vorderen Orients* 81. Wiesbaden.
 - 1996 Pnuel. *Biblische Notizen* 85: 38-43.
-

TULUL ADH-DHAHAB (WADI AZ-ZARQA) LEAD SLING BULLETS FROM TERRACE I

*Boris Dreyer*¹

During excavations on the western hill ('Terrace I') of Tulul adh-Dhahab, four lead sling bullets - displaying some fragmentation or deformation² - were discovered close together in a burned layer, in a context suggestive of storage (see below). The sling bullets can assist with establishing the historical context of the excavation site and the conflict that took place there.

Bullet no. 1

The first sling bullet (8304: **Fig. 1a - b**) was found sintered together with an arrowhead. In this case, if there was any impact damage, which would have demonstrated its use, it must have been very slight.

The bullet weighs 59.54g (actually the combined weight of bullet and arrowhead). It is 41 mm long, 20 mm wide (frontal perspective), and approximately 13 mm thick (an exact measurement is impossible because of the arrowhead).

Obverse

The letters are about 5 - 8 mm high and the script runs from left to right; the letters are not dotted. The text reads: Βλήμα Διός = "The missile of Zeus". blh`ma is well documented (Euripides, Supp. 330; Dion. Hal. 10,16; in the specialist literature: Philon 2,431; Max. Tyr.



1a. Tulul adh-Dhahab, terrace I. Lead sling bullet 1 obverse



1b. Tulul adh-Dhahab, terrace I. Lead sling bullet 1 reverse

1. I am grateful to my colleagues Prof. Dr Thomas Pola (Dortmund) and Mrs Hannelore Kröger MA (Spence), who direct the excavations, for the confidence they have placed in me and for putting drawings and digital photographs at my disposal. I am also indebted to my Erlangen colleague, Prof. Dr Matthäus, to Dr Gian Franco Chiai (Berlin), to Dr Wolfgang Thiel (Munich) and to the members of my graduate seminar in Erlangen (especially Mr Aike van Douwe and Mr Boris Mijat) for their speed of assistance in view of the short period of time available to complete the task. Mrs Kröger generously provided me with a great deal of information about the excavations.

2. Basic information with further references: Peter Weiß and Niels Draskowski, Neue griechische Schleudern. Thissaphernes und weitere Kommandeure, *Chiron* 40, 2010, pp. 123-153. Also important: John Ma, Autour des balles de fronde «camiréennes», *Chiron* 40, 2010, pp. 155-173; Alain Bresson, Rhodes during the siege of 305-304 BC: population, territory and strategy of defence, in: N. Faucherre and Isabelle Pimouguet-Pédarros, *Les sièges de Rhodes de l'Antiquité à la période moderne*. Centre de Recherche en Histoire Internationale et Atlantique, Presses Universitaires de Rennes no. 40, 2010, pp. 103-133.

9,8), usually in the plural.

One can almost hear the soldiers' battle-cry. It is something that often occurs³ and in this case the battle-cry accords well with the emblem: a thunderbolt. Zeus, the thrower of thunderbolts, was the perfect patron deity for this probable specialist military unit and also provides a clue as to the origin of the troops (see below).

The *alpha* and the *sigma* differ in style from that on bullet no. 3, and the *eta* from that on bullet no. 4. Different individuals were therefore presumably responsible for the inscriptions on the bullets. The *mu* is rotated by 180 degrees, which is unusual but not unknown (retrograde script, on the other hand, is common and occurs on bullet no. 3). It is also curious that the formation of the *beta* appears to imply retrograde script. Our reading is supported by analysis of the emblem on the reverse.

Reverse

The unit that made and used this bullet was Greek or Macedonian; the emblem on the reverse is further evidence of this. Although obscured by the arrowhead, it is clearly a thun-

derbolt. These occur frequently on sling-shot bullets⁴, especially those discovered in Jordanian excavations, at Ptolemais (Akko)⁵ and, especially, at Dor⁶.

On the Tulul adh-Dahab bullets, the thunderbolt is even better preserved on bullets nos 3 and 4, where the little wings which are often shown on either side can be easily made out. On bullet no. 3, however, and possibly also on bullet no. 4, they do not conform to the usual symmetrical arrangement. Like the letters on the respective obverses, the thunderbolts themselves vary in their execution. Presumably the different individuals who were responsible for the inscriptions also depicted the thunderbolts. Sling shot was simply manufactured on the spot as needed, with no great effort. This is why up-to-the-minute slogans for an ongoing battle are often found in the inscriptions. Nevertheless, the variations between the thunderbolts in the way the lightning flashes are depicted always occur within a certain spectrum. The flashes always emanate from the central flash-like branches, sometimes springing from a single point in the centre, sometimes from points distributed along

3. See examples, e.g. in Ma (see note 2), pp. 167-170.

4. E.g. Weiß and Dabrowski (see note 2), no. 20.

5. Described (without any contextual information) at: http://www.google.de/imgres?q=ancient+lead+slingshot&start=112&hl=de&biw=1600&bih=670&tbn=isch&tbnid=vP66oYkAXW7TMM:&imgrefurl=http://www.bible-history.com/past/images/&docid=0UjKTDB216X91M&imgurl=http://www.bible-history.com/past/images/lead_slingshot_acco.jpg&w=275&h=490&ei=DVhGUYXbFsbCtQbP84DwCA&zoom=1&sa=X&ved=0CEkQrQMwFzhk&iact=hc&vpx=294&vpy=256&dur=2014&hovh=300&hovw=168&tx=114&ty=156&page=4&tbnh=138&tbnw=84&ndsp=44. More lead sling bullets, in this case with a scorpion emblem, originate from a Hellenistic concentration (not destroyed by fire), also containing arrowheads, next to the defensive wall, E. Stern *et al.* (eds), *New Encyclopedia of Archaeological Excavations of the Holy Land*, Washington DC, Vol. 1, 1993, Acco (see below) pp. 16-31, esp. p. 24 inc. Fig.

6. E. Stern, *Dor. Ruler of the Seas*, Jerusalem 1994, pp. 211-213 with a discussion of lead sling bullet finds from the area, including Akko-Ptolemais, Tel Tanninim and Jerusalem. Cf. D. Gera, Tryphon and the Lead Projectile from Dor, *Qadmoniot* 18, 1985, pp. 54-55 [Hebrew]; D. Gera, Tryphon's Sling Bullet from Dor, *Israel Exploration Journal* 35, 1985, pp. 153-163. See also E. Stern, J. Berg, A. Gilboa, B. Guz-Zilberstein, A. Raban, R. Rosenthal-Heginbottom and I. Sharon, *Excavations at Dor, Final Report, Volume I A, Areas A and C: Introduction and Stratigraphy*. Institute of Archaeology of the Hebrew University, Qedem Reports 1,

Jerusalem 1995; E. Stern, J. Berg, A. Gilboa, B. Guz-Zilberstein, A. Raban, R. Rosenthal-Heginbottom and I. Sharon, *Excavations at Dor, Final Report, Volume I B, Areas A and C: The Finds*. Institute of Archaeology of the Hebrew University, Qedem Reports 1, Jerusalem 1995; cf. in general terms the Tel Dor bibliography: <http://dor.huji.ac.il/bibliography.html>.

On the historical context of the finds, see W. Thiel, *Studien zum hellenistischen Siedlungswesen in Palästina und Transjordanien. Historische und archäologische Untersuchungen zur städtebaulichen Entwicklung ausgewählter Siedlungen unter den Ptolemäern und Seleukiden*, Munich 2007, pp. 37-46 and 63-125. Most authorities believe that the lead sling-shot from Dor is firmly dated evidence of the unsuccessful and subsequently lifted siege of Dor by Antiochus VII Sidetes in 139/138 BC. In 133/132 BC Antiochus had also besieged Jerusalem under John Hyrcanus and Simeon, the brother of and successor to Jonathan the Maccabean (see above for lead sling-shot from Jerusalem). However, this leaves open the question of whether all the lead sling-shot found at Dor should be linked to the activities of the Seleucid usurper Diodotus Tryphon (whose name appears on one of the bullets [see above]) or whether they are of a later date. The fact that some bullets from Dor resemble those from Tulul adh-Dahab in terms of weight, emblem and inscription, and that - according to Flavius Josephus - Dor was also besieged by order of Alexander Jannaeus at the beginning of his reign (probably around 103 - 101/100 BC), makes it tempting to hypothesise that the same unit was involved.

its length. They shoot away from the middle, bending outwards somewhat, and are slightly reinforced at their tips. Clearly, the men who produced the images had a shared conception of what a thunderbolt should look like.

Figurative representations of thunderbolts (on coins or reliefs) fall either into the staff- / lance-like category or the more distinctive fan-shaped category. The latter includes Greek types, where the lightning flashes usually fan out at the tips. In all of them the design is symmetrical. A frond-like design is typically eastern⁷ and the images on our bullets clearly all belong to this type. Although the names vary, the script is not uniform and the thunderbolts are not even identical, the provenance of all four bullets and thus of the unit which fired them is the same.

The bullets from Dor also have thunderbolts. They have mostly been associated with military engagements in the 130s, but it is also possible that they were used at a later date. The same is true for a thunderbolt from Akko. From the illustrations that are available for Dor and Akko, all are of the type popular in the eastern Mediterranean region (**Fig. 2**).

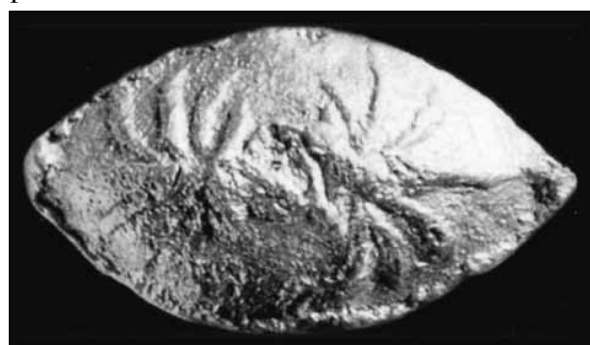
On closer inspection, however, the thunderbolts from Akko (in which the lightning flashes form a rosette springing from a single source) and Dor (where the rays are bent back like spiders' legs) differ quite considerably from each other. They also have little in common with the four examples under discussion here, even in view of the facts that the Tulul adh-Dhahab thunderbolts vary slightly amongst themselves, and that one is not even symmetrical. Moreover, the Greek letters on the Tryphon bullet from Dor⁸, when compared to those on our bullets, are written differently (e.g. on bullet no 4, the *iota* - though admittedly relatively insignificant - is different, as are the *kappa*, *eta* and *nu*).

Bullet no. 2

The second bullet (8320; **Figs. 3a - b**), which is 37 mm long, 20 mm wide, 11 mm thick and which weighs 39.97 g, is deformed at the front, either by impact or heat. Whatever the cause, it has not affected the weight, at least in comparison to the other bullets. The deformation

has also caused a hollow in the middle (approximately 3 mm in diameter and 1.5 mm deep). The overall damage, however, appears slight - too slight for the bullet to have been exposed to the prolonged influence of heat from a fire in the defenders' ammunition store, which is suggested by the burned layer of the find context (Hannelore Kröger [site director] pers. comm.). The bullets are therefore more likely to have been ammunition used by the attackers.

At any rate, damage is evident, whether caused by use or by deformation, and is most pronounced in the case of bullet no. 2. Presum-



2. Lead sling bullet from Akko (see note 5)



3a. Tulul adh-Dhahab, terrace I. Lead sling bullet 2 obverse



3b. Tulul adh-Dhahab, terrace I. Lead sling bullet 2 reverse

7. S. LIMC VIII 2 pl. 251, 173; 255, 222; 256, 230.

8. E. Stern 1994 (see note 6), p. 211 and Gera 1985 (see

note 6), pp. 153-163, esp. plate 19.

ably its inscription was lost when the damage was sustained, since every other lead sling bullet has an inscription. The emblem, though less well-preserved, is the same as that on bullets nos 1, 3 and 4. If bullet no. 2 was fired by the same unit as the others, but the damage suffered by the other bullets is - as described - less, an interesting secondary hypothesis would be that the bullets came into contact with heat at different stages of the siege. If the bullets came from the attackers, then bullet no. 2 may have been fired earlier and was therefore exposed to the heat for longer than the others.

Bullet no. 3

The third bullet (8321; **Figs. 4a - b**) has barely discernable impact damage, apart from the fact

that the beginning of the (retrograde) inscription on the obverse is probably missing.

It weighs 52.81 g, is 37 mm long, 19 mm wide and 16 mm thick. The height of the letters is roughly 5 - 8 mm (as on bullet no. 1). The letters are not dotted. The direction of the script is retrograde. Although the letters are of the same size as those on bullet no. 1 and are also all on one line, the script is nevertheless markedly different (see discussion of the *alpha* and *sigma* above).

Obverse

[. .]EYΣAΙ. In view of the space available, one would have expected at least another two letters before the *epsilon*. However, nothing is visible. If no additional letters need to be taken



4a. Tulul adh-Dhahab, terrace I. Lead sling bullet 3 obverse



4b. Tulul adh-Dhahab, terrace I. Lead sling bullet 3 reverse

into account, the inscription may be a shortened version of the name Εὔσαμ<ος> or genitive Εὔσαμ<ου>. This name is known from several sources: LGPN I p. 185 (Lesbos, Mytilene: 3rd century AD) and LGPN III A, p. 176 (Acarnania, Oiniadai: 2nd century BC); cf. F. Bechtel, *Die historischen Personennamen des Griechischen bis zur Kaiserzeit*, Halle 1917 (ND Hildesheim 1964), p. 174. Unfortunately, few conclusions can be drawn from these sources about the provenance of the unit which used the bullets. In the Hellenistic period, as later in Roman times, army sling units were usually highly specialised. Certain regions concentrated on this method of combat, which required a great deal of practice: most frequently mentioned are the Aetolians, Acarnanians, Thessalonians, some of the Greek islanders (particularly the Rhodians) and later, in the Roman Imperial period, the Balearic islanders⁹. However, in the context of sling bullet finds from Kamiros on Rhodes, J. Ma and A. Bresson were able to show clearly that, despite this specialisation, these particular regions did not enjoy a monopoly¹⁰, a fact which opens up further interesting possibilities for the provenance of our sling troops.

Reverse

For the thunderbolt, see description of bullet no. 1. Close inspection shows that the design is not quite symmetrical. Compared with bullet no. 1, the individual lightning flashes on bullet no. 3 spring more from the centre.



5 a. *Tulul adh-Dhahab, terrace I. Lead sling bullet 4 obverse*



5 b. *Tulul adh-Dhahab, terrace I. Lead sling bullet 4 reverse*

Bullet no. 4

The fourth bullet (8322; **Figs. 5 a - b**) weighs 38.44 g, is 37 mm long, 19 mm wide and 12 mm thick; on the right- and left-hand sides there are signs of impact damage or deformation by fire.

Obverse

The letters are approximately 5 mm high, smaller than the lettering on bullets nos 1 and 3. This is probably because the inscription is on

9. Literature on the history of army sling units: V.A. Anochin and R. Rolle, *Griechische Schleuderbleie von den Mauern vor Olbia*. In: R. Rolle and K. Schmidt (eds.): *Archäologische Studien in Kontaktzonen der antiken Welt*, Veröffentlichung der Joachim Jungius Gesellschaft der Wissenschaften 87, Vandenhoeck & Ruprecht Göttingen 1998, pp. 837-848; M. Grünwald and A. Richter, *Zeugen Caesars schwerster Schlacht? Beschriftete andalusische Schleuderbleie aus der Zeit des Zweiten Punischen Krieges und der Kampagne von Munda*, *ZPE* 157, 2006, pp. 261-269. See also A.V.M. Hubrecht, *The use of the sling in the Balearic Islands*, *Bulletin Antieke Beschaving* 39, 1964, pp. 92-93; M. Korfmann, *Schleuder und Bogen in Südwestasien. Von den frühesten Belegen bis zum Beginn der historischen Stadtstaaten*, *Antiquita Series 3: Abhandlungen zur Vor- und Frühgeschichte, zur klassischen und provinzialrömischen Archäologie und zur Geschichte des Altertums* 13, Habelt Bonn 1972; W.B. Griffith, *The sling and its place in the Roman Imperial Army*. Proceedings of the Fifth Roman Military Equipment Conference. In: C. van Driel-Murray (ed.): *Roman*

Military Equipment. The sources of evidence, British Archaeological Reports International Series 476, Oxford 1989, pp. 255-279; D. Baatz, *Schleudergeschosse aus Blei. Eine waffentechnische Untersuchung*, *Saaleburch Jahrbuch* 45, 1990, pp. 59-67; Th. Völling, *Funditores im römischen Heer*, *Saaleburch Jahrbuch* 45, 1990, pp. 24-58; M. Feugère, *Les Armes des Romains*, *Collection des Hesperides*, Errance Paris 1993; M. Feugère, *L'équipement militaire d'époque républicaine en Gaule*, *Journal of Roman Military Equipment Studies* 5, 1994, pp. 3-23; H.P. Isler, *Glandes. Schleudergeschosse aus den Grabungen auf dem Monte Iato*, *Archäologischer Anzeiger* 1994, pp. 239-254; A. V. A. J. Bosman, *Pouring lead in the pouring rain. Making slingshot under battle conditions*, *Journal of Roman Military Equipment Studies* 6, 1995, pp. 99-103; G.D. Stiebel, *"...You were the word of war." A sling shot testimony from Israel*, *Journal of Roman Military Equipment Studies* 8, 1997, pp. 301-307.

10. Ma (see note 2), pp. 155-173, esp. 164-65, and Bresson (see note 2), pp. 113-117.

two lines. The style of script is different from that of bullet no. 1, as shown by the *eta*, if correctly deciphered. From left to right, the script reads: ΜΑΧΙΟ[Y] || ΝΙΚΗ.

Fire damage makes the reading of the first line open to doubt; the second line is not in doubt and is also well-documented. According to Peter Weiß and Niels Draskowski (*Chiron* 40, 2010, p. 151, Fig. 101; Schleuderblei, *DNP* 11, 2001, p. 185) it was used to ‘summon victory’.

Some of the bullets from Dor also summoned victory in a similar way, for example: ΤΡΥΦΩΝΟΣ ΝΙΚΗ¹¹. So, provided the name has been read correctly, the writer wished to say: “For victory by (or ‘over’) Machios”. In the first case, the person named would be an officer with whom the unit identified; in the second, it would be a prominent individual in the ranks of the defenders.

The name Machios is rare (it must be quoted here in a shortened form or else have been deformed, since the *upsilon* is no longer visible¹²), but is documented in Thessaly in the second half of the 3rd century BC (LGPN III B p. 271 [Pharsalos], IG IX 2, 234) and also at Hellenistic Pergamon (Perg. Forsch. 11, II 565; cf. Bechtel, p. 298).

Reverse

With slight variations, the reverse has a similar emblem to those of bullets nos 1, 2 and 3, although it is not as well preserved (and possibly also not quite symmetrical).

Summary

The first bullet is heavier than the others because of the arrowhead, but otherwise its measurements match those of bullets nos 2 and 4, although bullet 2 has traces of battle or fire damage. Bullet no. 3 differs in weight and thickness from the others, and also from the numerous other Greek bullets from other find sites, which are typically 2.8 - 3.5 cm and 30 - 45 g (*DNP* 11, 2001, p. 184 [P. Weiß]). Our bullets nos 1, 2 and

4 weigh, at 38 - 40 g, the equivalent of 1/10 of a *mina*, making allowance for some weight loss; in other words, they were of a standard size¹³.

Conclusions

The besiegers (the condition of the bullets suggests they should be attributed to the besiegers rather than to the besieged) appear to have brought special units with them, whose members used the Greek language and identified with Zeus, the thrower of thunderbolts. Radiocarbon dating and the most recently excavated coin series (H. Kröger pers. comm.) are indicative of the period immediately after the turn of the first century BC. Whilst this could be an argument for identifying the site as the Amathus mentioned by Flavius Josephus, there are caveats. In particular, there are hardly any of the Roman finds which would identify the provincial capital which Amathus later became. However, the history related by Flavius Josephus for the preceding period makes the theory more attractive when the lead bullets are taken into account.

Alexander Jannaeus, who besieged Amathus at the beginning of the 90s BC and later destroyed it, had Greek mercenaries from Pisidia and Cilicia amongst his troops (Flav. Josephus, *Bell. Jud.* 1,4,2-3; *Arch.* 13,13,3-5; cf. G. Boettger, *Topographisch-historisches Lexicon zu den Schriften des Flavius Josephus*, Leipzig 1879, see above pp. 20-21). These Greeks, along with 1,000 cavalry troops, would certainly have been amongst the contingent of 8,000 mercenaries (*Bell. Jud.* 1,4,5) upon whom Alexander could rely. Alexander avoided Syrian mercenaries on principle because they were hated both by the Jewish population (*Bell. Jud.* 1,4,3) and by himself (*Arch.* 13,13,5). The letters on the bullets are consistent with a Late Hellenistic date.

Many Greek towns had the thunderbolt-throwing Zeus as a protective deity on their coins, sometimes personified as a thunderbolt¹⁴. The mercenaries could therefore have come from Asia Minor or from any other part

11. Gera (see note 6), pp. 153-163 and plate 19.

12. In contrast to the 4th century BC, when the *upsilon* can be left out (Weiß and Draskowski [see note 2], p. 128; A. Bresson [see note 2], p. 117).

13. Cf. S. Aybek and B. Dreyer, Eine wehrhafte Stadt in spät-hellenistisch-römischer Zeit. Die Katapult-Arsenale der Stadt Metropolis (Ionien), *IstMitt* 61, 2001, pp. 205-217.

14. From the evidence of coin designs, these included

Olympia, the kingdom of Bithynia, Seleucia in Pieria, Caelia in Apulia, Kentoripai in Sicily, Oinoanda, Termessos and Lokroi in Italy, Kaunos, Syracuse, Byzantion (here Athena carries the thunderbolt), Cyrene, Abbatis (Phrygia), Sinope, Tralleis, Cassope (Epirus), Hydissos (Caria), Myndos (Caria), Amastris and Olba. The designs are on the “Ancient Coin Research” database and can be printed for academic purposes.

of Magna Graeca. One clue may however help us further, namely the form of the thunderbolt, which (according to evidence in LIMC [see above]) is of a typically eastern style, with each tip having a frond bending away from it. This design is very close to that of the Phrygian town

of Abbaitis¹⁵ (Fig. 6). The thunderbolts from Oinoanda in Lycia¹⁶ and Termessos in Pisidia¹⁷ are also similar (Figs. 7 and 8) as are, potentially, the thunderbolt from Tralleis¹⁸ (Fig. 9) and the thunderbolts from the towns of Hydissos¹⁹ and Myndos in Caria²⁰ (Figs. 10 and 11).



6. Coin minted in Abbaitis



9. Coin minted in Tralleis



7. Coin minted in Oinoanda



10. Coin minted in Hydissos



8. Coin minted in Termessos



11. Coin minted in Myndos

15. Abbaitis (Phrygia): BMC 5 and Pl. II, 1; SNG Cop. 1. SNG Tübingen 3889 – Numismatik Lanz München, Auction 120 (10.5.2004), Lot 169, Fig. after http://www.acsearch.info/ext_image.html?id=1192.

16. Oinoanda: NC 2005, S. 65, 1 b, Ira & Larry Goldberg coins & collectibles, Auction 72 (3.2.2013), Fig. after http://www.acsearch.info/ext_image.html?id=564692. On Zeus in Oinoanda, see H. Brandt and F. Kolb, *Lycia et Pamphylia. Eine römische Provinz im Südwesten Kleinasiens*, Mainz 2005, pp. 34 and 113; also p. 112 for Lycia.

17. Termessos: SNG BN 2089; beneficiaries of Dr Busso Peus, Auction 403 (27.4.2011), Lot 732, Fig. after http://www.acsearch.info/ext_image.html?id=473232.

On Zeus in Termessos, see H. Brandt and F. Kolb, 2005, pp. 75-76 (temple of Zeus Solymos?), 117 (cf. p. 111 Selge).

18. Tralleis: SNG Kayan 1010; Auction House H. D. Rauch, Auction 88 (17.5.2011), Lot 163, Figure after <http://www.acsearch.info/record.html?id=483018>.

19. Hydissos (Karien): SNG Keckman 56; beneficiaries of Dr Busso Peus, Auction 376 (29.10.2003), Lot 434, Fig. after http://www.acsearch.info/ext_image.html?id=151746.

20. Myndos (Caria): Coin Hoards VIII, 1994, pp. 56, 481; beneficiaries of Dr Busso Peus, Auctions 407/408 (7.11.2012), Lot 637, Figure after http://www.acsearch.info/ext_image.html?id=614442.

Compared, for example, to the emblem of the Syrian town of Seleucia Pieria, the ‘branches’ of these thunderbolts are bent further outwards (except in the case of the Tralleis emblem) and the wings in the middle are more emphasised. One must, however, be careful not to discount specialist sling troops from Syria, simply on the basis of an emblem whose appearance was certainly partly determined by time constraints, individual imagination and the peculiarities of the material it was made of.

It is after all possible that the same dies were used for several towns²¹. The thunderbolt is a general symbol for Zeus, who was the patron deity of many towns in Asia Minor. The emblem occurs on many coins and also on other artefacts (see discussion above on the thunderbolt symbol on lead sling shot). But these examples show - and this is new - that there were differences between localities and periods. To account for these, there must have been differences in the minting process. For example, it is possible that a town might have ordered a coin, had a die manufactured and then, for the sake of civic identity,

had its own thunderbolt engraved on the die. To investigate this theory, however, one would have to compare all known coin reverses on which this symbol appeared, in order to reconstruct the differences between the dies²². Unfortunately it is not possible to pursue this matter further here.

It is also important to remember that there is no guarantee that the visual representation of the attributes of ‘official’ patron deities was taken as the model for the design of emblems on lead sling bullets. Nevertheless - and this we may state with certainty in this context - Zeus was amongst the most frequently represented deities in Pisidia and Cilicia²³ and the known depictions of the thunderbolt of these and neighbouring regions in southern Asia Minor are similar to those on the reverses of the lead sling bullets from Tulul adh-Dhahab.

Boris Dreyer, University of Erlangen -
Nuremberg
Department of History, Kochstr. 4,
Box 8, 91054, Erlangen,
Germany

21. K. Kraft, *Das System der kaiserzeitlichen Münzprägung in Kleinasien. Materialien und Entwürfe*, Berlin 1972; on the current state of the discussion with further ideas (concerning, amongst other things, local representations of deities) see G. F. Chiai, *Die Götter und ihr Territorium: Münzen als Quellen zur Interpretatio im kaiserzeitlichen Phrygien*, in: G. F. Chiai, Chr. Kunst and R. Häußler (eds), *Interpretatio Graeca, Romana, Indigena. Religiöse Kommunikation zwischen Globalisierung und Partikularisierung*, Osnabrück 2013, pp. 51-70.

22. I am grateful to G. F. Chiai for this idea (*per litteras*).

23. S. Pilhofer-Froehlich, *Romanisierung in Kilikien? Das Zeugnis der Inschriften*, Munich 2006, pp. 77-78, esp. p. 77: “*Der inschriftlich und numismatisch mit Abstand am häufigsten vorkommende Gott ist Zeus*” (Eng. “Zeus is the deity most frequently mentioned in inscriptions and depicted on coins”). This refers only to the mention of the name, but includes epithets. Such

epithets presuppose familiar Greek conceptions (Soter, Ktesios, Olympios, Polieus, Hypsistos) or indicate the conflation of a local deity with the most important Greek god (Pisarisseeus, Olbios, Megas Lamotes, Korykios, Megas, Megistos, Keraunios, Phanaseus, Bronton, Androkla, Aneiketos, Kosmios, Epekoos, Boreios). For southern Pisidia (Etenna), see H. Brandt and F. Kolb, 2005, p. 117; cf. 115; 111 (Selge). Regarding the most prominent deity of this region, Zeus Sabazios, see *ibid.* p. 97. See also P. Depord and E. Varinlioglu, *Les Hautes Terres de Carie*, Bordeaux 2001, pp. 77; 129-132; 140-149; 165-168; 173, 191; 216; 219; 238; cf. Chr. Marek, *Geschichte Kleinasien in der Antike*, Munich 2010², pp. 627-647, esp. 628-638. The examples there presented are, however, a warning against going too far in attempting to make exclusively local attributions, given how widely Zeus was worshipped and the variety of forms that worship took.

BROWN UNIVERSITY PETRA ARCHAEOLOGICAL PROJECT: THE 2011 AND 2012 PETRA AREA AND WĀDĪ SILAYSIL SURVEY

Alex R. Knodell and Susan E. Alcock

Introduction

The Petra Area and Wādī Silaysil Survey (PAWS) undertook its second and third seasons of fieldwork in 2011 and 2012 as a major component of the Brown University Petra Archaeological Project (BUPAP)¹. The PAWS research area is located to the north of the Petra city center, between the modern village communities of Umm Şayhūn and Bayḍa, within which three zones were intensively surveyed in 2011: Areas D, E and F. Two further areas were intensively surveyed in 2012: Areas G and H (**Fig. 1**)². As noted in our 2010 report, this area is sufficiently close to Petra to have attracted the attention of previous travellers and archaeologists, going back to the 19th century (for a review, see Knodell and Alcock 2011). The PAWS survey, however, diverges from all prior work in the area owing to its systematic and intensive nature and its overtly diachronic focus, as well as its close integration with other aspects of BUPAP research. As we found in our first season (2010), this approach to the documentation of the landscape yields significant and substantial results (Alcock and Tuttle 2010, 2011, 2012; Knodell and Alcock 2011; Alcock and Knodell 2012). The following provides a brief description of our methods, then discusses the results of the 2011 and 2012 seasons.

The PAWS Survey Area and Methodology

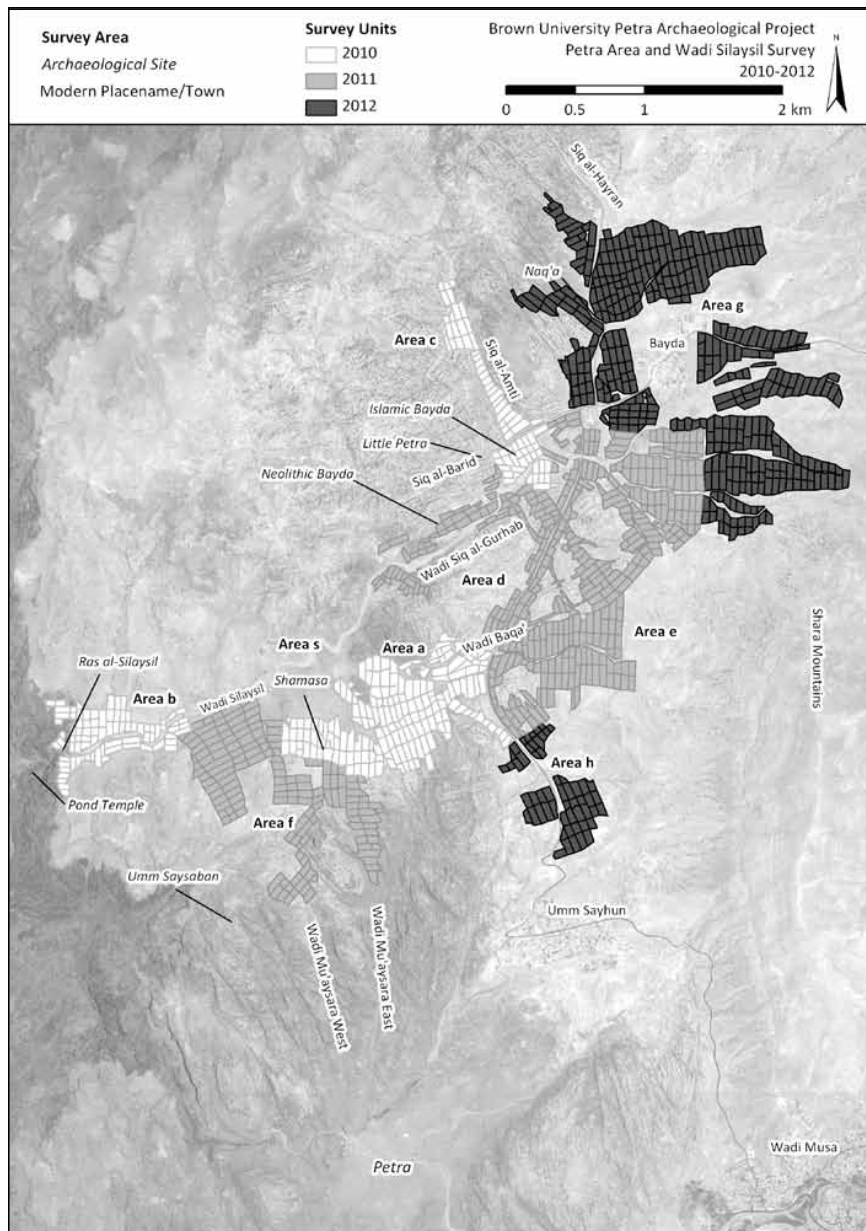
A detailed description of the PAWS methodology has been given elsewhere (Knodell and

Alcock 2011: 492-495), but will be reviewed briefly here. Our project works in the tradition of intensive, systematic and diachronic survey, as practiced in the Mediterranean basin and other parts of the world. While survey archaeology has long and successfully been conducted in Jordan (Banning 2001; MacDonald 2007), such work is not typically conducted with the degree of intensity undertaken by PAWS. In 2011 and 2012, as in 2010, our selected areas for investigation were divided into a number of survey units (or SUs), the boundaries of which were demarcated by GPS points taken at unit corners. The size and shape of survey units were defined based on team size and natural breaking points in the landscape (e.g. field boundaries or topographical features), as well as a desire to keep units small enough to maintain good spatial control of the data (usually 40 - 50 meters wide and 50 - 100 meters long). All terrain was covered as part of a survey unit unless its topographical character – such as steep slopes or bedrock outcrops – made this impossible. In most cases, however, such zones were subsequently explored by a separate team whose goal was the documentation of archaeological features within and between survey units. In each survey unit, four to six field walkers spaced 10 meters apart examined the ground surface, counted and collected all worked stone, counted all ceramics and collected diagnostic sherds, and counted and categorized all modern material within an individual

1. The Brown University Petra Archaeological Project is a multi-component research program co-directed by Susan E. Alcock and Christopher A. Tuttle; Alex R. Knodell is field director of the archaeological survey that is the subject of this article. For more information about the various aspects of BUPAP, see our project

website, which contains descriptions of all of its components and lists of publications: <http://proteus.brown.edu/bupap/Home>.

2. Unless otherwise noted, all maps by Alex R. Knodell; background image: copyright 2011 DigitalGlobe Incorporated.



1. Overall map of areas surveyed in 2010, 2011 and 2012 with place names and known archaeological sites.

walker's two-meter wide transect across the survey unit³.

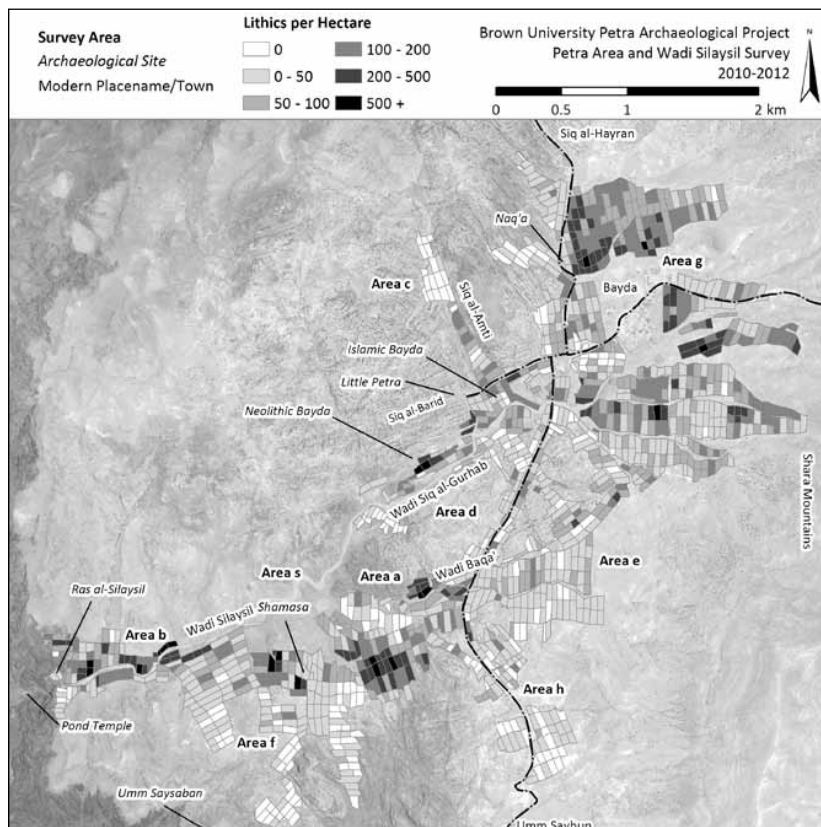
After collection, all artifacts were studied, and representative examples drawn and photographed. Such analysis allows the production of detailed distribution maps of artifacts (**Figs. 2, 3 and 4**), which were made using ESRI's ArcGIS. All artifactual, spatial and field data is managed in L-P Archaeology's ARK (Archaeological Recording Kit), an open source, standards compli-

ant, web-delivered system, which will eventually be made publicly available online.

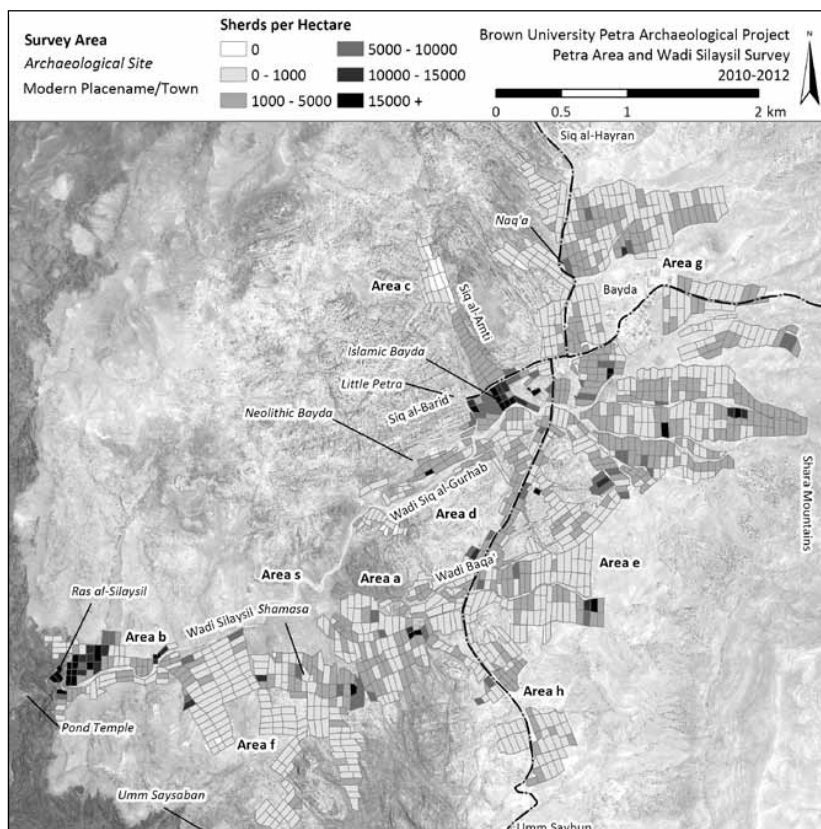
Lithic finds were studied by Gary Rollefson and Clive Vella. Ceramic analysis for the Bronze Age to Early Islamic periods was conducted by Tali Erickson-Gini; the Middle to Late Islamic pottery was studied by Micaela Sinibaldi. **Table. 1** provides a chronological chart of the periodization employed by the project; we should emphasize that we use terms such as

3. For a more detailed explanation of this process, including the nature of the paper-based and GIS documentation performed, the definition of what constituted a

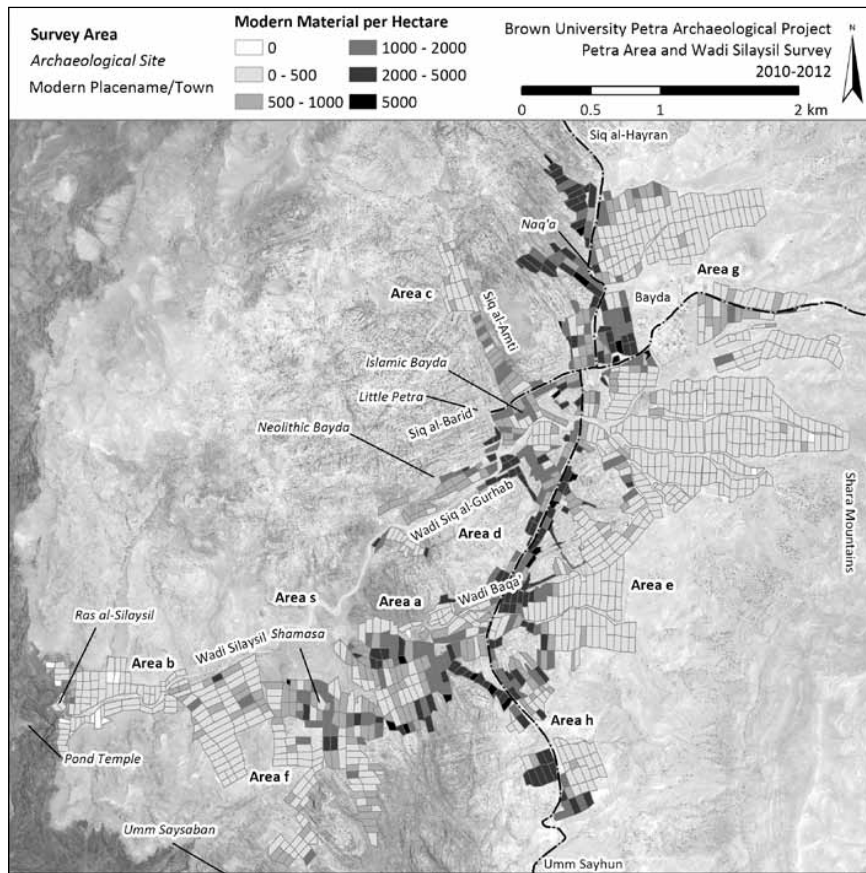
'diagnostic' artifact and the calculation of artifact densities per survey unit, see Knodell and Alcock (2011).



2. Overall lithic density.



3. Overall ceramic density.



4. Overall modern density.

Hellenistic and Roman to make chronological, rather than cultural designations.

Not all discoveries, of course, were surface artifacts. Indeed, the landscape north of Petra has been modified to an astonishing extent through rock-cut interventions in the sandstone bedrock, creating cisterns and other water capture features, agricultural installations such as presses, ritual niches and baetyls, and many other elements. Moreover, numerous constructed retaining walls, for terracing or damming, are scattered across the region. Such things were often first observed, quickly noted and mapped by the survey team, and were then revisited by a 'Features' team, led by Christian Cloke and Cecelia Feldman, which at the very least drew, measured and photographed all archaeological features and in some cases undertook detailed architectural drawing or total station survey. Significantly more features were noted in 2011 and 2012 than in 2010. Cloke and Feldman have now evolved 11 broad functional classes and a more rigorous typology (with 24 categories)

based on identifying characteristics to allow for consistent recording and greater transparency in identification and interpretation (see **Fig. 5** for a map of features found in 2010, 2011 and 2012). Dating the vast majority of these features remains a significant challenge, though associated surface assemblages provide some sense of general chronology.

It should be noted that the project continues to use the artifact or the feature as the minimal unit of analysis, and therefore continues not to define 'sites' in any strict sense. This decision is encouraged by our increasing sense that the patterned interaction of features and artifacts across the regional landscape is quite extensive and overlapping in time, making it very difficult to ascribe boundaries to sites in tight spatial terms.

Preliminary Results of the 2011 Season

Two of the areas selected for survey in 2011 (Areas D and F) were intended to link those investigated in 2010 (Areas A, B and C), while

Table 1: Chronological periodization employed by the Brown University Petra Archaeological Project.

Period	Date Ranges ⁴
Lower Paleolithic	1 m.a.-250 k.a.
Middle Paleolithic	250-50 k.a.
Upper Paleolithic	45-19 k.a.
Early/Mid Epipaleolithic	21,000-15,300 BC
Natufian	15,700-10,000 BC
PPNA	10,000-9,000 BC
PPNB	9,000-6,900 BC
PPNC	6,900-6,350 BC
Late (Ceramic) Neolithic	6,350-5,500 BC
Chalcolithic	5,500-4,300 BC
Early Bronze Age	4,300-2,500 BC
Middle Bronze Age	2500-1550 BC
Late Bronze Age	1550-1200 BC
Iron Age I	1200-1000 BC
Iron Age II	1000-500 BC
Iron Age IIa	1000-900
Iron Age IIb-c	900-586
Iron Age III	586-539
Babylonian/Persian	539-300 BC
Early Hellenistic	300-200 BC
Late Hellenistic	200-50 BC
Early Roman	50 BC-100 AD
Middle Roman	100-250 AD
Late Roman	250-450 AD
Byzantine	450-650 AD
Early Islamic	650-1000 AD
Middle Islamic	1000-1400 AD
Late Islamic	1400-1800 AD
Modern	1800-present AD

4. All dates are approximate. The chronology of many periods obviously remains to a degree in flux and not all periods listed here are present in our survey area. It is also the case that further ceramic analysis, notably in terms of fabric classifications, will modify our present reading of the material. The following offers some explanation for the periodization adopted by BUPAP. Prehistoric dates (Lower Paleolithic to Early Bronze Age) are after Levy (1995: xv-xvi) and Weninger *et al.* (2007), and adapted slightly to reflect the specific situation in southern Jordan. For Iron Age dates see Herr (1997) and Bienkowski (2001). For Hellenistic to Byzantine, see Erickson-Gini (2010) and Erickson-Gini and Israel (2013). For an alternative chronological schema

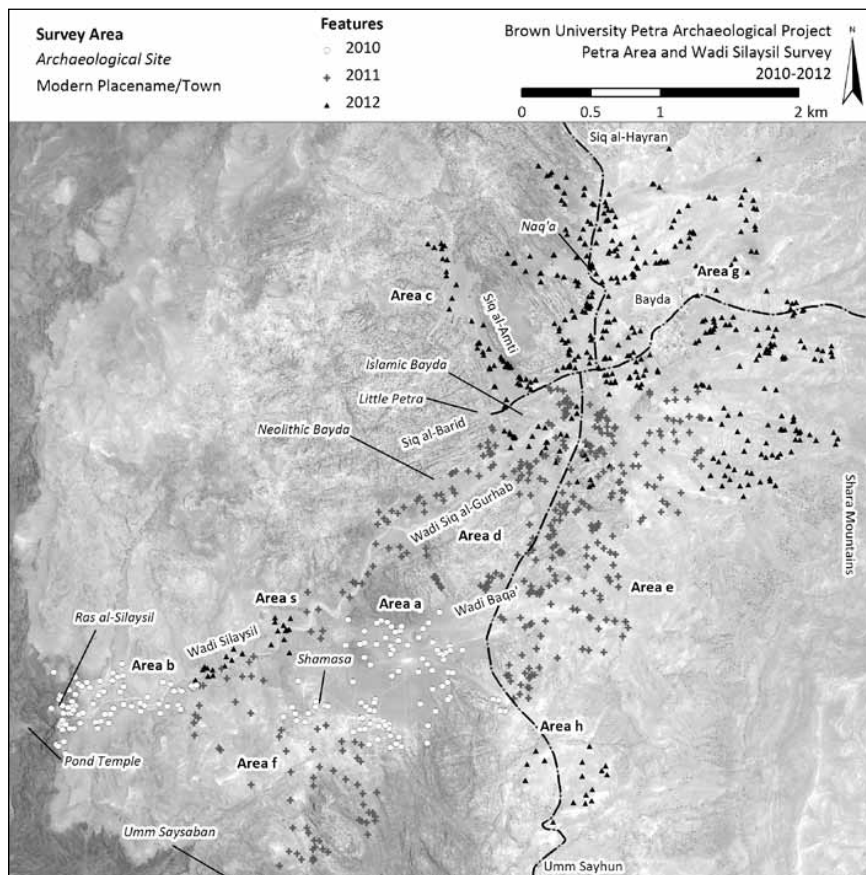
Area E expanded our coverage to the east side of the modern north - south road between Umm Sayhun and Bayda, which very roughly follows the eastern boundary of the Petra Archaeological Park (**Fig. 1**). This general area, as noted before, lies within a few kilometers of the Petra city center, embraces some of the most viable agricultural land available to the north and is transected by several potential routes in and out of the city. Sites in the region previously studied, by ourselves and others, include Shamasa (located in Area A), Rās as-Silaysil (Area B), Little Petra (Area C), Nabataean and Islamic Bayda (Areas C and D), Neolithic Bayda (Area D) and Umm Saysabān (to the south of Area F; for the locations of these places see **Fig. 1**). A summary of previous work in the BUPAP study area is given in the report of our first season (Knodell and Alcock 2011; see also, e.g., Bikai *et al.* 2007, 2008; Byrd 2005; Kirkbride 1966; Lindner and Gunsam 1995, 2002; Lindner *et al.* 2001; Sinibaldi and Tuttle 2011).

As seen in **Figs. 2 - 4**, lithic, ceramic and modern materials were found (as in 2010) throughout the areas walked in 2011. Modern densities (garbage, essentially, with metal, plastic, glass and ‘other’ recorded separately) were highest along the roads and in areas that are popular picnic and camping spots for both tourists and the local population. Distributions of modern material in the more remote Area F and the eastern parts of Area E were for the most part much lighter. Ceramic and lithic finds were almost continuously scattered across the landscape examined, with distinct periodic ‘hot spots’.

Area D

The 107 survey units of Area D connected Areas A and C from 2010, extending west from

that covers the Nabataean period – here Hellenistic to Roman, see Schmid (2000); our reasons for not using this more standard chronology will be explained in detail in forthcoming publications that deal with the ceramics in greater detail. For reasons of practicality, very broad subdivisions within the Islamic periods are indicated with the chronology proposed by Whitcomb (1992), though amended slightly with regard to the end date of the Byzantine and the start of the Early Islamic periods. We emphasize that all periodizations are intended to indicate material culture transitions in a broader historical framework, rather than cultural or religious identities (for example, Edomite, Nabataean, or Islamic).



5. Distribution of features across the survey area.

the modern road and the vicinity of Nabataean and Islamic remains at Bayḍa, through Wādī Sīq al-Gurhab and past Neolithic Bayḍa (**Fig. 1**). Amongst the lithics, Late Prehistoric (Late Neolithic, Chalcolithic and Early Bronze Age) material dominates the assemblages, but Middle Paleolithic and Epipaleolithic / Pre-Pottery Neolithic finds were also recorded.

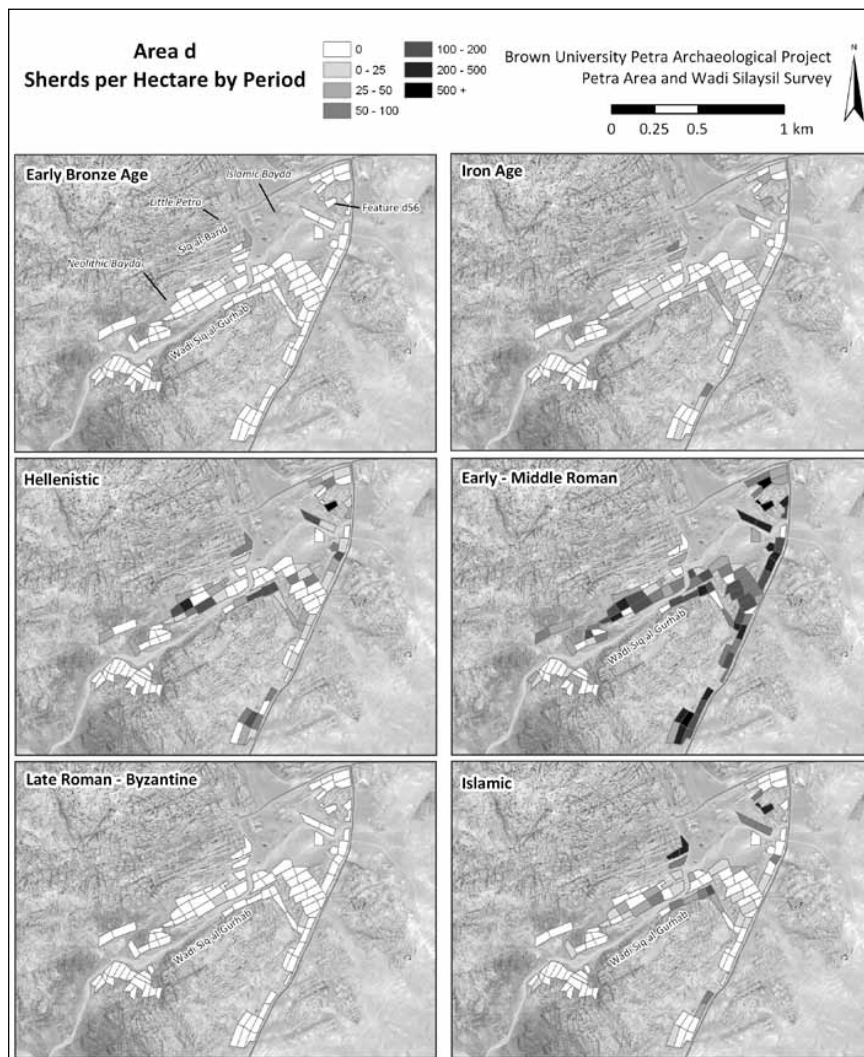
Ceramic densities were highest in the areas around Islamic Bayḍa, which also has significant remains from earlier periods, and at points in Wādī Sīq al-Gurhab. Area D, in survey units near Little Petra and Neolithic Bayḍa, yielded some of the project's first recorded Early Bronze Age pottery; Iron Age II and Hellenistic materials were observed there as well (**Fig. 6**)⁵. The vast majority of the ceramic evidence collected here, however,

as elsewhere in the survey region, is dated to the Early and Middle Roman periods. Very few imported wares were noted for this time period. The pattern of a remarkable dearth of Late Roman and Byzantine ceramics continued from our previous season, but – unsurprisingly given its proximity to Islamic Bayḍa – Area D produced a large number of handmade vessel sherds of Middle and Late Islamic date.

We recorded a wide range of features (96 in number) in Area D, including quarries, presses, cisterns and other water features, tombs and rock reliefs. Many but by no means all of these interventions are in the vicinity of early Bayḍa and the complex rock-cut landscape previously observed there (Bikai *et al.* 2007, 2008). The near ubiquity of such features across the landscape was particularly significant, indicating the

5. Figs. 6, 7, 9, 11 and 13 present ceramic densities of each survey unit by period. Toponyms and specific locations are indicated only in the upper left tile; these do not necessarily correspond to the particular period map in which they are rendered. Some collapsing of chronological categories is necessary to indicate general trends in the ceramic data. In the diachronic period density maps we use the following terms to encompass

the following more specific periods: Iron Age material is predominantly Iron IIb and c, though more nuance may yet emerge from this following further study; Hellenistic includes sherds that were designated as both Hellenistic and Hellenistic / Roman (not a large category); the majority of sherds included in the Islamic category are dated generally to the Middle to Late Islamic periods.



6. Area D, ceramics by period.

extent to which this area as a whole was modified, well beyond the previously studied locations at Little Petra, Neolithic Bayda and the Nabataean Hall immediately east of the Islamic Village. Extensive and elaborate complexes are located in the northeastern part of Area D, south and south-west of the Nabataean Hallat Bayda (Bikai *et al.* 2008), and in the vicinity of Neolithic Bayda. There was often a direct correlation between high ceramic densities and the presence of complex features.

Area E

The 285 survey units of Area E, lying on the east side of the Umm Sayhun - Bayda road, are comprised of small fields among the sandstone rock formations along the road, with many series of terraced fields further east and moving up

the slopes of the Sharāh mountains.

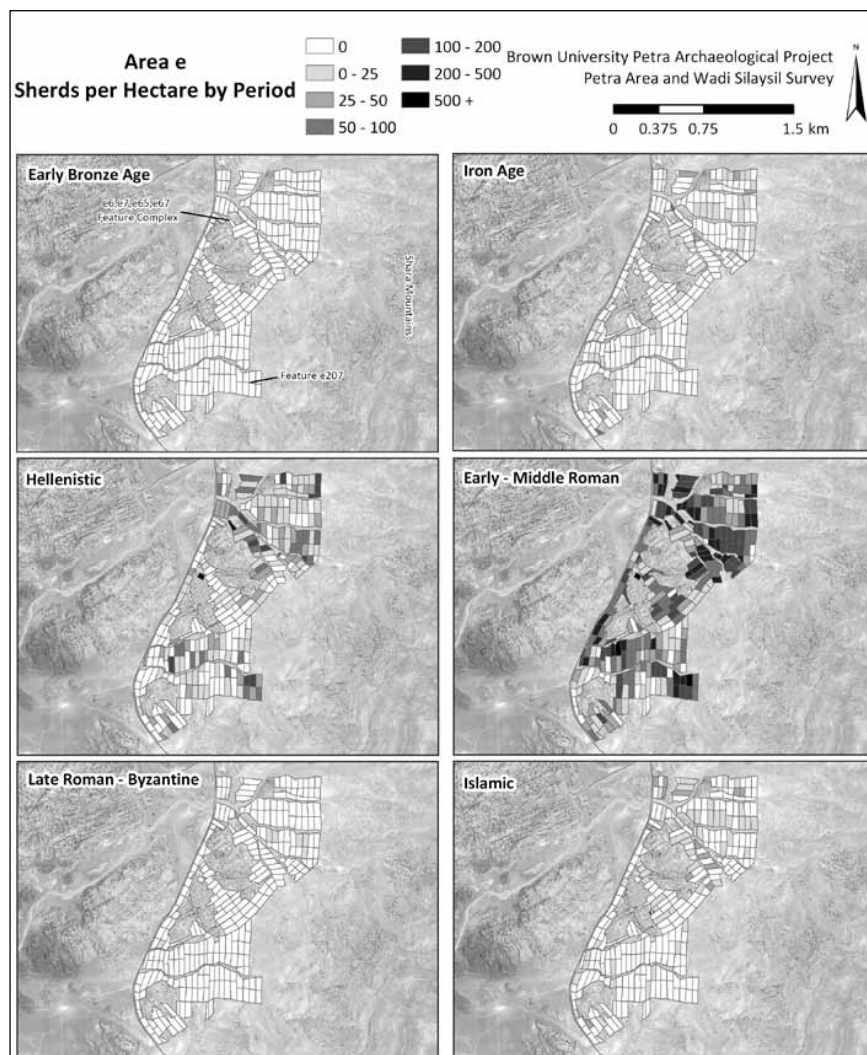
Lithic finds were particularly abundant in Area E (Fig. 2) with a higher percentage of survey units yielding such artifacts than in Areas D or F; these provided the best array of tool types for multiple periods from the Lower Paleolithic to later prehistoric times. Several Lower Paleolithic bifaces (hand axes), for example, were recovered. It can be hazarded that this territory, east of the Umm Şayhūn - Bayda road and climbing toward the Sharāh mountains, may have been more intensively exploited in deep prehistory than other areas explored in 2011; possible reasons for this should be further explored. At this point, we would connect the activities of pre-modern humans in this area with the presence of water and lithic raw material resources on the slopes of the Sharāh mountains.

The topography also provides a vantage point for observing prey animals moving through the landscape below, while still being relatively easy to access. Moreover, the Namala pass to the north-west, which leads down to the Wādī ‘Arabah, would have been an important migratory route for both humans and animals.

Ceramic densities were fairly consistent across this terrain, though with some significant concentrations, for example, in direct relation to Feature E207 at the very edge of the south-eastern extent of Area E (**Fig. 7**). No Early Bronze Age pottery was found on the east side of the road in 2011 (and it should be noted that we have found no Middle or Late Bronze Age ceramics anywhere in the study region), but Iron II finds were recorded, as were Hellenistic sherds. A concentration of the latter, together with Early

Roman material of higher quality than that of surrounding units, was discovered at Feature E207: the remains of a large structure on a high outcrop commanding an impressive view over the BUPAP survey territory and beyond. Overall in Area E, Early and Middle Roman material continues to appear in the densest concentrations, with the now familiar subsequent drop off in Late Roman and Byzantine times. Islamic period material was also found, especially in the more northerly part of the Area.

209 features were discovered in Area E, characterized by agricultural and hydraulic installations in the sandstone bedrock at its western edge and by numerous terrace walls further to the east (in some cases running over 200 meters in length). There are some highly imbricated rock-cut complexes in Area E (as indeed



7. Area E, ceramics by period.

elsewhere in the survey region), where features originally identified separately were found to work as systems of water capture and management, sometimes in tandem with agricultural installations. This high degree of connectivity must be true as well for the patterning of walls, here and elsewhere in the study region. One such complex of particular interest consists of a variety of features (E6, E7, E65, E66 and E67) found at different times throughout the season and includes the remains of a terrace system, substantial buildings, presses and an elaborate system of water channels (**Fig. 8**). Moreover, this complex is located close to several baetyls, niches and other ritual features, to which it was no doubt connected.

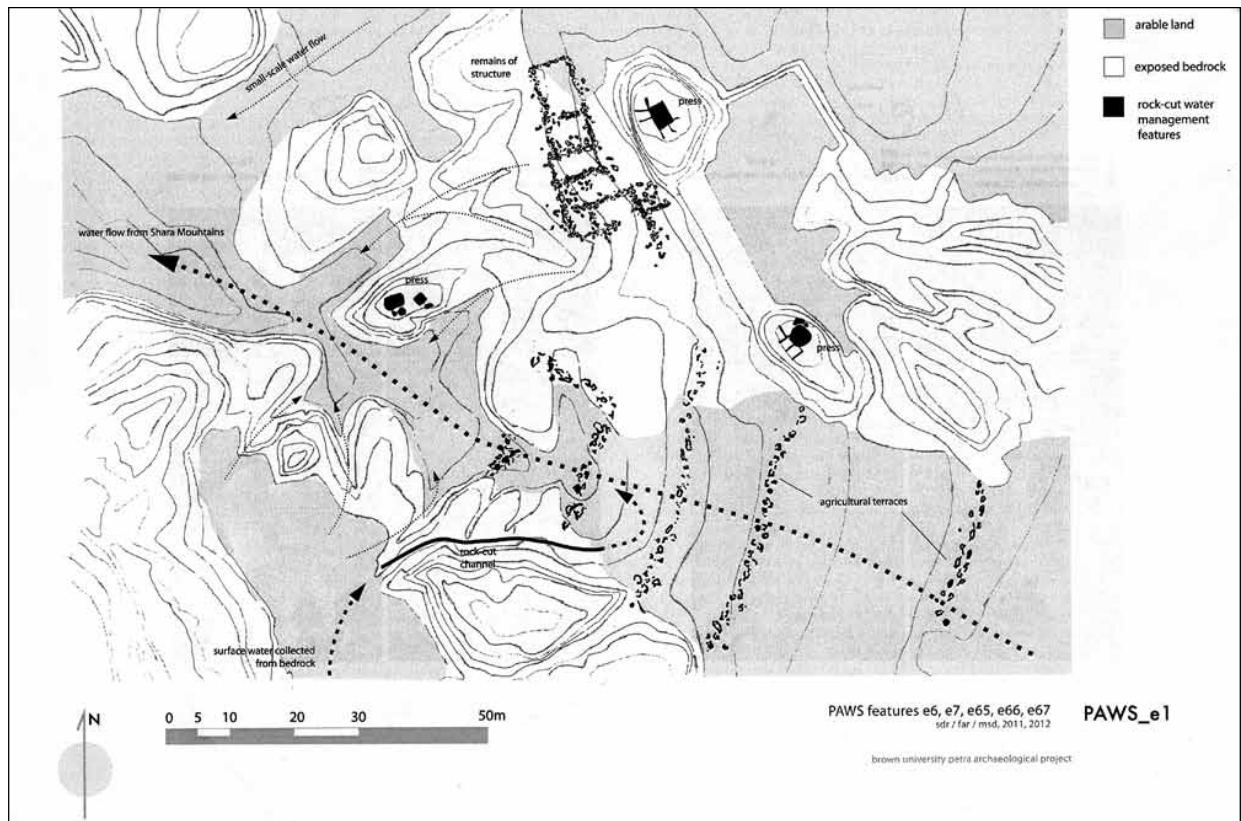
Finally, the results of the PAWS survey, especially for Area E, were shared with the UNESCO sponsored Risk Mapping Project in Petra, which concerned itself with definition of the boundary and potential buffer zone for the Petra Archaeological Park. Discussing their specific case study (the Park's eastern boundary between

Umm Şayhūn and Bayda), the report noted that while this area had been identified as highly suitable for development in the most recent Strategic Master Plan, "this appeared contrary to the richness of the archaeological remains confirmed by recent archaeological surveys," citing the work of BUPAP (Paolini *et al.* 2012: 66).

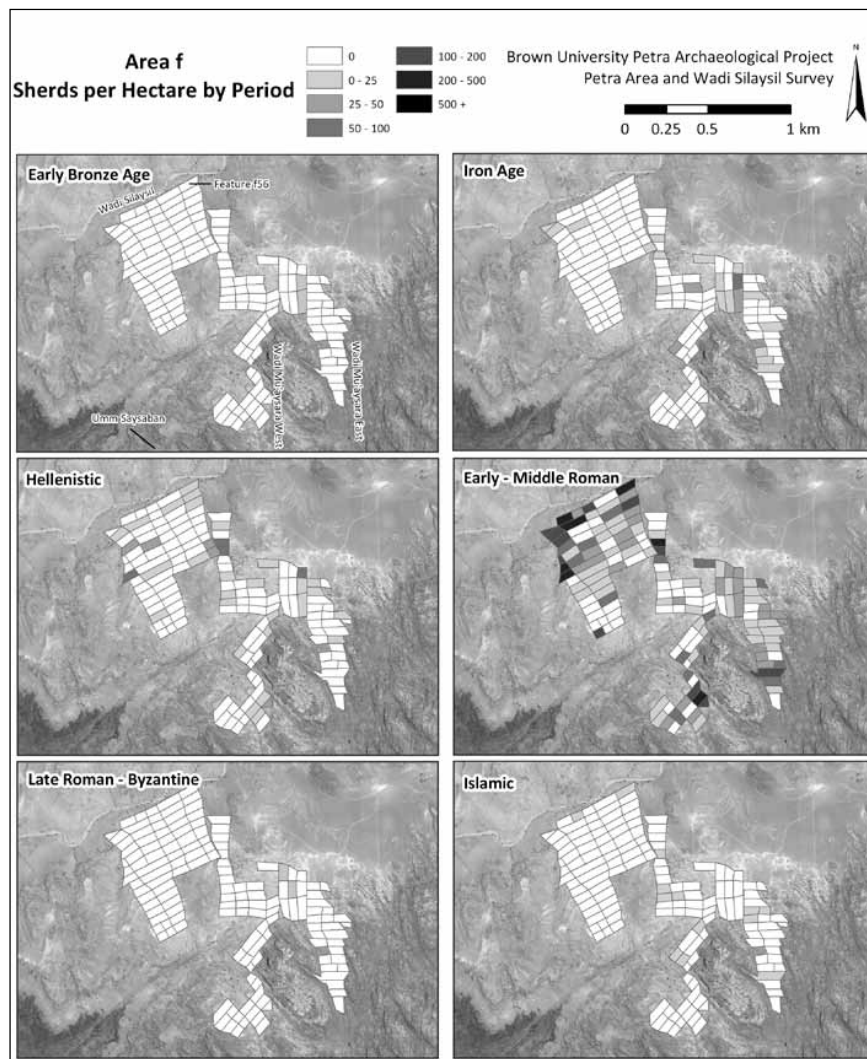
Area F

Area F, consisting of 144 survey units between Wādī Silaysil and Wadi Mu'aysara East and Wadi Mu'aysara West, joins Areas A and B (walked in 2010). As with Area D, Area F was less productive in terms of lithic material than Area E, but finds of Middle Paleolithic date were made, as well as of Epipaleolithic and Pre-Pottery Neolithic material. Area F yielded, for the first time, definite Pre-Pottery Neolithic B and Late (Pottery) Neolithic arrowheads.

Ceramic counts were comparatively low here, with only a few exceptions (**Fig. 9**). Two survey units produced Early Bronze Age material; it should be noted that the contemporary site



8. Area plan of Features E6, E7, E65, E66 and E67 (map by Sarah F. Rhoads, Felipe A. Rojas and Michal S. Dziedziniewicz).



9. Area F, ceramics by period.

of Umm Saysaban lies above and to the southwest of Area F. Later periods follow roughly the same pattern as detected elsewhere: some Iron II and Hellenistic activity, a peak in the Early and Middle Roman era, a sharp drop off in the Late Roman and Byzantine periods, and renewed traces of activity in Islamic times.

72 features were identified in Area F, chiefly associated with agricultural and hydraulic modifications of the landscape, such as terraces and dams. The most notable feature discovered was Feature F56, a hill-top construction reminiscent of Feature E207, with an admirable view in several directions. The numerous associated ceramics indicated a heavy Early to Middle Roman presence; the area around is marked by quarries, terrace walls and dams testifying to extensive landscape manipulation and water management strategies.

Extensive Survey

The methodology of intensive survey employed by BUPAP is not, of course, feasible across the entire landscape we seek to investigate. Bedrock outcrops, high massifs or very steep slopes cannot be walked in this fashion, but are equally necessary for understanding long-term human activity in and use of the region. To that end, specific zones were more extensively explored by small teams looking carefully for the presence of features. In 2011, three such zones were targeted in this fashion. One lay in Area E, in the near vicinity of the 'Seven Wonders' *bedouin* camp; another augmented our picture of activity in the vicinity of the Wadi Baqa' dams in Area A; finally, Area S was designated for features found in a zone west of Area D, along Wadi Siq al-Gurhab and Wadi

Silaysil. Thirteen features were found here, including a roughly two meter-tall carved relief (Feature S13; **Fig. 10**) emulating a tomb façade, with molded cornice and the incised outline of a door. This feature is interestingly positioned, overlooking an extensive series of dams and walls (Feature S9).

Other BUPAP Activities

The PAWS survey was only one of several activities conducted during the BUPAP 2011 season; while these are to be published in full elsewhere, they will be briefly noted here. Excavation continued at Islamic Bayḍa with three trenches under the direction of Christopher Tuttle and Micaela Sinibaldi (assisted by Katherine Harrington and Clive Vella). Work in the two trenches already opened in 2010 (see Sinibaldi and Tuttle 2011) resumed and a third trench was opened. During this season new structures with a domestic function were excavated and new observations on building techniques were made. Geophysical survey of select locations at Islamic Bayḍa was also undertaken by Thomas M. Urban. A program of laboratory analysis – including phytolith study (sampling for which was undertaken in 2011), dendrochronological analysis and radiocarbon dating – is planned for Islamic Bayḍa, which will be included in the full publication, currently in progress.



10. Feature S13, carved ‘tomb’ relief (photo by Christian F. Cloke).

The season also saw the inception of the Petra Routes Project (PRP) as a subcomponent of BUPAP. The goal of the PRP team (coordinated by Michelle Berenfeld and Felipe Rojas) is to document known route ways in and out of the Petra city center, at both a regional and a local scale. In particular, they started the meticulous recording of features (including the remains of roads) in Wadi Mu’aysara East and Wadi Mu’aysara West, which link Petra to the PAWS survey territory to the north and to settlements such as Shamasa and Ras al-Silaysil (Fig. 1; Rojas and Berenfeld 2012).

We continued a program of geophysical prospection, undertaken by Thomas M. Urban, who employed both magnetometry and ground penetrating radar (GPR) in the 2011 season. Urban’s work in the city center in the Upper Market (a continuation of BUPAP’s Petra Upper Market Archaeology [PUMA] endeavor), confirmed – through detailed gridded GPR survey – the presence of a well-defined anomaly of substantial size first observed through electromagnetic induction survey and magnetometry in 2010 (Urban *et al.* 2012). Additional geophysical testing in the Petra city center was done at the Temple of the Winged Lions, at the Turkmanniyya Tomb and at the Petra Church; preliminary results from the latter two sites were provided to both the Petra Archaeological Park and UNESCO representatives concerned with the conservation and preservation of these two major monuments. Urban also carried out geophysical profiles at the settlement of Shamasa (surveyed and documented in our 2010 season) and near Bayḍa, both in the Siq al-Amti (surveyed as part of Area C in 2010) and in a 2011 survey unit (PAWS D71) with extremely high ceramic densities lying in front of a two-storey Nabataean tomb (Feature D56).

Finally, the BUPAP project also collaborated with a team from Cornell University’s Wiener Laboratory for Aegean and Near Eastern Dendrochronology, led by Sturt Manning, who has started a program of dendrochronological sampling in southern Jordan. We would also like to thank Dr Fuad Hourani of the University of Jordan for briefly visiting the project and advising us on how to approach the geomorphological history of what is clearly a highly dynamic region.

Preliminary Results of the 2012 Season

Continuing with the methods from 2011, we conducted intensive regional survey in the area north of the Petra city center, this time in two areas: Area G extended the survey area north of previously surveyed territory, focusing on the vicinity of the modern village of Bayḍa; Area H extended the eastern part of the survey area to the south, in order to close the gap between our survey area and the village of Umm Sayhun. This represents the completion of the first phase of work by the Petra Area and Wadi Silaysil Survey, which has now covered a coherent area of *ca* 6 sq. km (or *ca* 600 ha.) in a natural valley bounded to the north by the Namala pass, in the east by the Sharāh mountains, in the south by Umm Sayhun and the mountains separating Petra and its northern hinterland, in the west by the precipitous drop to the Wadi Araba' at the end of Wadi Silaysil and in the north-west by the rugged landscape north of Wadi Silaysil and Wadi Siq al-Gurhab (Fig. 1).

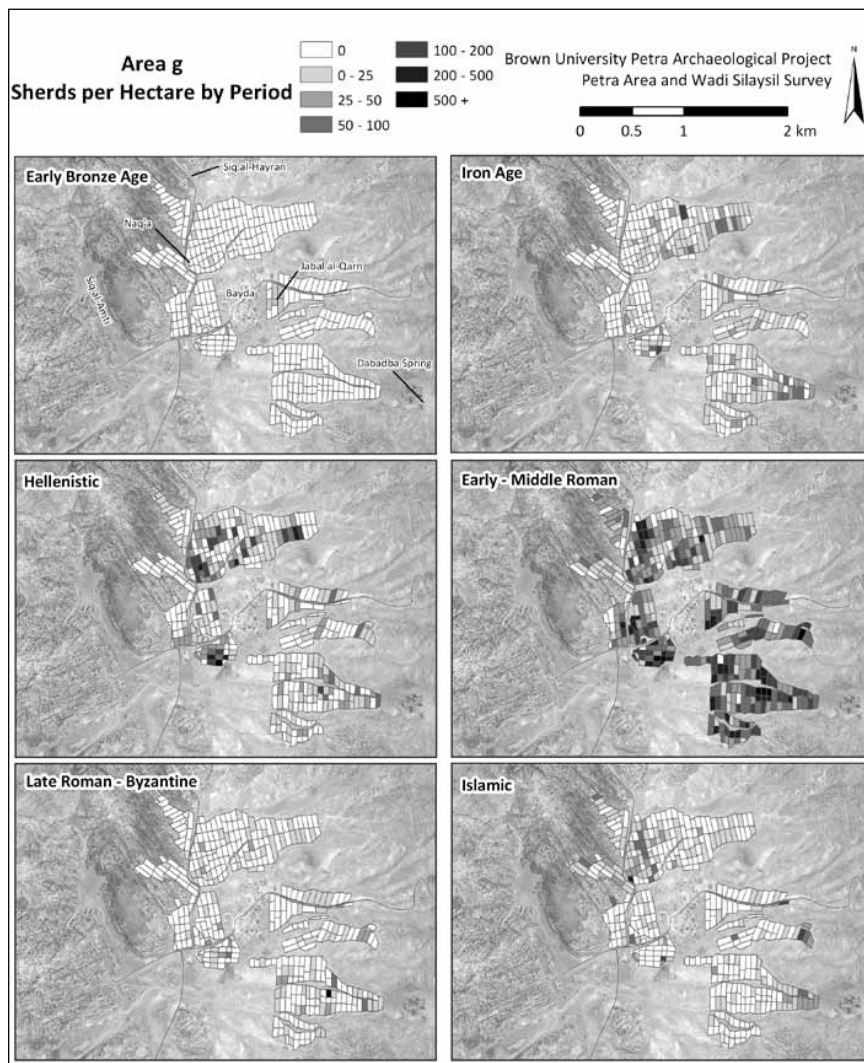
Area G

Area G, the largest yet surveyed, consists of 396 survey units surrounding the modern village of Bayḍa and abutting Area E to the south. Area G extends to the beginning of the Namala pass in the north and to a variety of steep cliffs and ridges in the west. On the east it extends up the slopes of the Sharāh mountains toward the Dabadba spring. A previously known site in this area is the Early Modern village of Naq'a.

Lithic finds in Area G were exceptionally widespread (Fig. 2). Lower and Middle Paleolithic periods were well represented, as in Area E, and some 17 hand axes were recovered, along with over 60 pieces produced using the Levallois technique. The pattern of lithic distribution differed from that recorded in other areas in that there was a distinct lack of Epipaleolithic and Pre-Pottery Neolithic material. Less than 0.5 % of the total assemblage from Area G can be dated to these periods. By far the most well represented period was the Late Prehistoric period, again broadly defined as encompassing the Late Neolithic to Early Bronze Age. The dominance of this type of material is in general accordance with the rest of the PAWS survey area (Knodell and Alcock 2011; see also descriptions of Areas D, E and F above).

Ceramics ranging in date from the Early Bronze Age to the modern period were found throughout Area G (Fig. 11). Early Bronze Age ceramics were found mainly in the vicinity of Jabal al-Qarn, an apparent Early Bronze Age settlement discovered by the PAWS survey on a hilltop immediately east of the modern village of Bayḍa. This is an exceptionally significant discovery, which was documented using a range of methods (Vella *et al.* 2012). Later remains near the site had been known to archaeologists and identified as belonging to the Nabataean / Roman periods, based the presence of pottery and some wall foundations ('Amr *et al.* 1998; 'Amr and al-Momani 2001). The presence of Early Bronze Age material, however, was not recognized until now, an identification stemming from the similarity of wall remains and pottery to those found at Umm Saysaban, the only other known Early Bronze Age site in the study area and its immediate surroundings (Lindner *et al.* 2001; Hübner 2013). The collection of some 200 Late Prehistoric lithics in the survey units covering the site (G252 - G260) was also illuminating.

Iron Age (almost entirely Iron II) ceramics were well represented in Area G, more so than study thus far suggests has been the case in Areas A - F. Densities were highest in the easternmost stretches of Area G, as one moves up the slopes of the Sharāh mountains. This pattern is not surprising, given the proximity to water sources and the increased visibility (often sought in the Iron Age) that these locations afford. Hellenistic period material in general tends to represent continued occupation in areas that were of interest during the Iron Age, with some exceptions. An example of a place that becomes prominent in Hellenistic times, without an Iron Age predecessor, is the Early Modern village of Naq'a. As seen in all other parts of the survey area, further intensification occurs in the Early - Middle Roman period, where nearly the entire landscape is populated with sherds of these periods, with varying degrees of density. Places arguably of most intense activity, represented by the highest density of material, are often those that had been occupied in previous periods, although again this is not always the case; certain locations with only limited earlier activity also experience marked growth, at least in terms of sherd



11. Area G, ceramics by period.

densities, in the Early - Middle Roman period. There is no question that this represents either a major shift in population or in land-use during these periods, which would have transformed the entire landscape. As in other parts of the survey area, there is a marked decline in Late Roman - Byzantine material. While this material is nearly absent in Areas A - F, however, it is much more widely distributed in Area G, though never (with the exception of one survey unit) in high densities. Finally, the Middle - Late Islamic period is nearly indistinguishable in its pattern from that of the Iron Age, again with areas of greatest interest on the slopes of the Sharāh Mountains. One surprise for this period, however, was the relatively small amount of material found at Naq'a.

Some 343 individual features or feature

groups were recorded in Area G (**Fig. 5**). These consisted of a variety of types, as described for the 2011 survey areas discussed above. In the parts of Area G located on the slopes of the Sharāh mountains, terrace walls were near ubiquitous, reflecting a primary concern with water and agricultural management in this area. The presence of several deep *wadis* and the well-known Dabadba spring just east of the southern extent of Area G provides a clear explanation for this patterning. Of particular interest were several fragments of water pipe found in Area G running east - west, and in Area H running north-east - south-west, toward Petra; a few traces of water pipe were also found near features in Area E. More targeted examination may allow us to trace the path of this aqueduct in greater detail, though the material distribu-

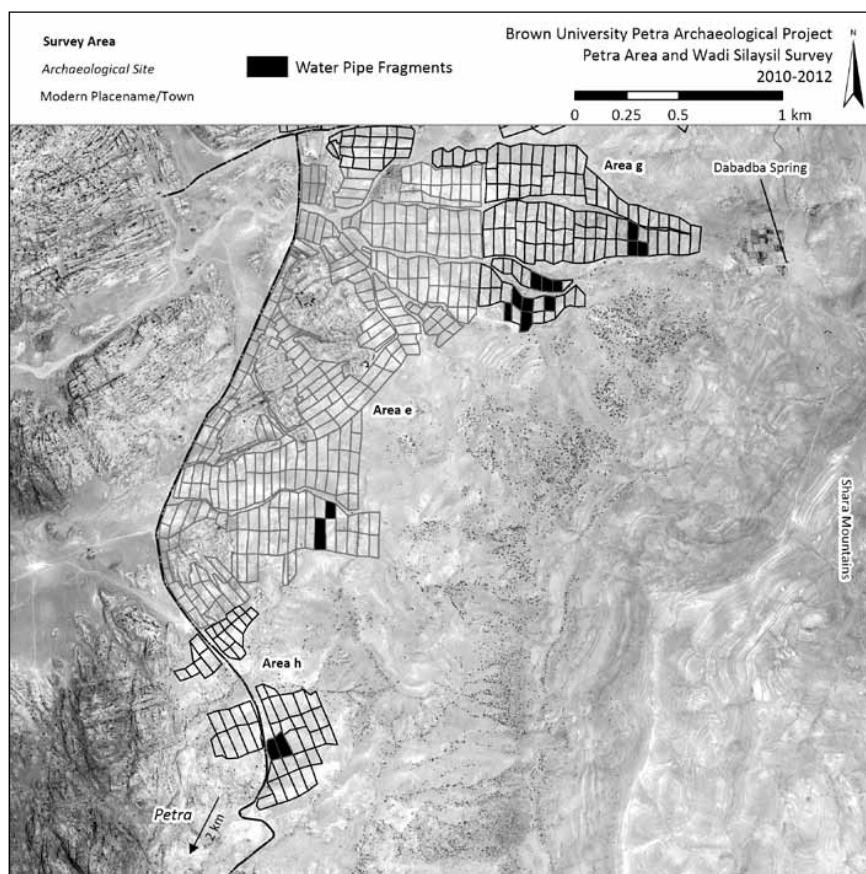
tion is already telling, with fragments in survey units spanning several hundred meters and demonstrating clear directional patterning (**Fig. 12**; 23 water pipes were collected in Area G, five in Area H).

Other aspects of the agricultural landscape include presses and cisterns. Several buildings and building complexes were also found amongst these wall systems, often at locations affording exceptional visibility over the surrounding terrain; this suggests to us that there is often a direct relationship between the such structures and field systems. The overwhelming presence of Early - Middle Roman ceramics in the area may indicate that the majority of features date to this period as well. That said, many of these features were likely used over extended periods of time, and several exhibit numerous episodes of repair, in some cases dating even to the modern period. Various inscriptions (mostly modern, though several ancient) were also recorded, as well as several examples of rock art (ancient and modern).

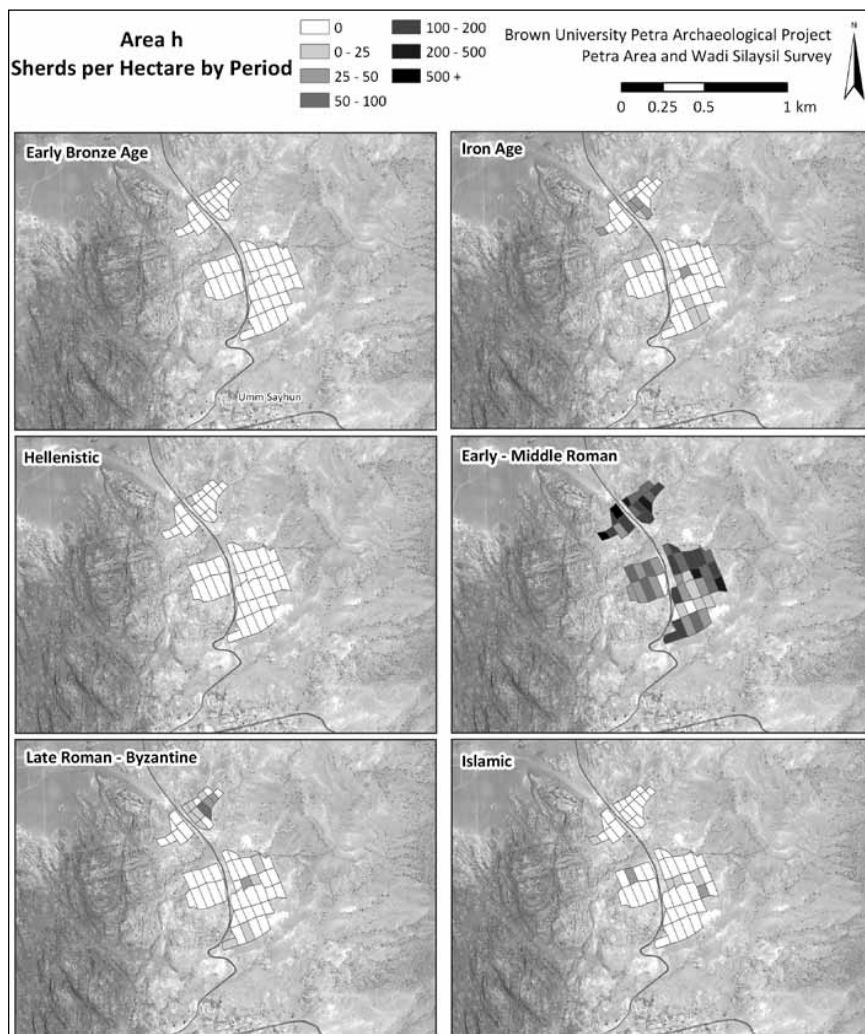
Area H

Area H consists of 56 survey units, located between the rest of the survey area and the modern village of Umm Sayhun. This area effectively closes the gap between Areas A and E, surveyed in 2010 and 2011, and the modern village, which forms the southern boundary of the eastern part of the overall study zone.

Lithic finds in Area H were in general less numerous than in the other survey areas, following the trend seen to the north of it in the southern part of Area E, with relatively low densities of finds, mainly of Late Prehistoric date (**Fig. 2**). Ceramic finds were also not particularly abundant (**Fig. 13**), with no Bronze Age material, a handful of Iron II material, no Hellenistic material and very few Late Roman - Byzantine and Middle - Late Islamic sherds. Once again, Early - Middle Roman is the best-represented period, with densities comparable to other parts of the survey areas, often concentrated around particular features, mainly structures. While area H ceramics were not as numerous as in other areas,



12. Map of aqueduct water pipe remains found in Areas G and E.



13. Area H, ceramics by period.

there were some particularly fine examples of Early Roman pottery and lamp fragments. The close proximity of Area H to the Petra city center makes the relatively low densities surprising, though this may be balanced by the apparent increase in finely made ceramics.

A total of 24 features were recorded in Area H, again somewhat surprising given its close proximity to the city center of Petra. This relatively low density may have to do with its rather rugged and abrupt topography. It is worth noting, however, that several significant features, such as cisterns, quarries and other rock cuttings are located between Area H and Petra proper, though located outside of the PAWS survey area.

Extensive Survey

In addition to the intensive pedestrian survey, which consisted of a combination of fieldwalking,

artifact collection and feature recording in Areas G and H, additional 'extensive' survey work was again undertaken in zones not suitable for side-by-side fieldwalking (see above description for the 2011 season). In 2012 we continued this type of work in Wadi Silaysil (Area S), as well as in some of the massifs in the center of the survey area, which were added to the Area D and E feature series, depending on their location (Area D west of the Umm Sayhun - Bayḍa road; Area E east of the road). Limited exploration was also undertaken farther up the slopes of the Sharāh mountains in order to better contextualize the surveyed areas below (see **Fig. 5** for the overall distribution of features throughout the survey area).

Test Squares

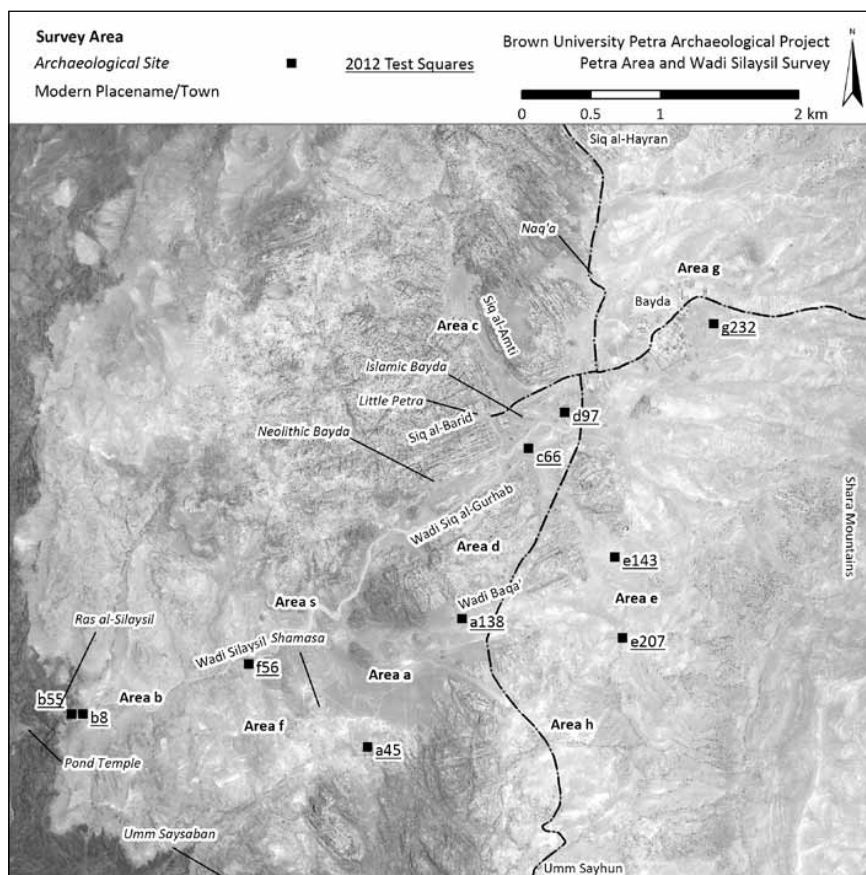
The final component of PAWS, added for the first time in 2012, was limited test excavations

at ten features found throughout the course of the survey (**Fig. 14**). This work was organized and overseen by Clive Vella and Emanuela Bocancea. The motivation behind this program of test excavations was both to verify the testimony of the surface record and to improve our understanding of ceramic chronologies. We also hoped to evaluate the ‘archaeological potential’ of these locations, in order to determine whether further excavation at these sites would substantially improve our understanding of them, both in their own right and in terms of their relationship to the wider landscape. Locations selected for test excavations included: a terrace / dam in Wadi Baqa’ (Feature A138), the so-called Dushara Shrine at Shamasa (Feature A45), structures at the village site of Ras al-Silaysil (Features B8 and B55), an ashlar-constructed limestone platform near Islamic Bayda (Feature C66), a baetyl near a two-story tomb (BD835 in Brünnow and Domaszewski [2004: 401]), also near Bayda (Feature D97), a unique round building in Area E (Feature E143), two stone-built, hilltop structures that appear to have functioned as look-out posts (Features E207

and F56), and finally the newly discovered Early Bronze Age site at Jabal al-Qarn (Feature G232). Highlights included instances of finely constructed flagstone floors and numerous ceramic finds, some of which have been taken for Optically Stimulated Luminescence (OSL) dating.

Other BUPAP Activities

A variety of related, but independent activities continued in 2012 as other components of the Brown University Petra Archaeological Project. Geophysical prospection under the direction of Thomas Urban continued in a variety of locations, including Jabal al-Qarn (Vella *et al.* 2012) and in the Wadi Baqa’ terrace / dam system (Urban *et al.* 2013) as part of a detailed study of this system undertaken by Bocancea, Tuttle, Urban and Vella. This study includes limited excavation (described above) as well as OSL dating and a study of various soil parameters through its entire extent, from the slopes of the Sharāh mountains down to the intersection of Wadi Baqa’ with Wadi Silaysil. Geophysical work was also carried on at the site of Islamic Bayda.



14. Test square locations.

The Petra Routes Project also continued its work under the direction of Michelle Berenfeld and Felipe Rojas, in collaboration with a team of architects aiming to develop innovative ways of documenting the challenging and dynamic landscapes found in Wadi Mu'aysara East and Wadi Mu'aysara West. Innovative artistic representations were produced to complement the extensive feature mapping and documentation carried out throughout these *wadis*. The Petra Routes Project team also provided invaluable assistance in producing drawings of particular features for the PAWS team (e.g. **Fig. 8**).

Conclusions

The 2010 - 2012 field seasons of the PAWS survey represent a first stage of work in the hinterland of Petra, after which the project will take a break from fieldwork for a study season and comprehensive publication of what has been accomplished up to this point. The overview of methods and results from 2010 (Knodell and Alcock 2011) and from 2011 and 2012 presented here are only brief overviews of the data produced and forthcoming interpretations. The amount and range of work undertaken will necessarily involve specialized studies on all components of the project, summarized here for the sake of our colleagues and collaborators who have an interest in BUPAP. Moreover, we plan to make all 'raw data' produced by the project available online, in an interactive format that will be of use to other scholars. The data for the study area are already extraordinarily rich and varied, from the wide temporal range of the lithic and ceramic evidence recovered, to the plethora of features observed, both built and rock-cut. The PAWS survey, together with the multiple other components of the Brown University Petra Archaeological Project, is on its way to providing an unparalleled close examination of the hinterland of Petra.

Acknowledgements

We would like to express our deep gratitude to the institutions and individuals who made this research possible, namely the Department of Antiquities of Jordan (especially Mr Fares ad-Hmoud [Acting Director General], Mr Jihad Haroun, Mr Akram Atoom and Mr Husain Askar), the Petra Archaeological Park (Dr Emad

Hijazeen, Eng. Tahani al-Salhi), Brown University and the Joukowsky Institute for Archaeology and the Ancient World, and the American Center of Oriental Research in Amman. We also would like to acknowledge and thank the Loeb Classical Library Foundation and the Curtiss T. & Mary G. Brennan Foundation for their sponsorship of these field seasons. Thanks are also due to our hosts, the Dakhillala Qublan family of Umm Sayhun and all of the residents of the Petra region. We are particularly grateful to the various participants of this project, especially BUPAP co-director, Christopher A. Tuttle. Team leaders for the 2011 and 2012 seasons for fieldwalking, feature recording and excavation teams (Emanuela Bocancea, Christian Cloke, Sarah Craft, Cecelia Feldman, Linda Gosner and Clive Vella) also deserve special mention for their efforts. Lithic analysis was conducted by Gary Rollefson and Clive Vella, ceramic analysis by Tali Erickson-Gini and Micaela Sinibaldi. Finally we are grateful to all project members who participated in the 2011 and 2012 seasons: Linah Ababneh, Filip Ani, Husain Askar, Michelle Berenfeld, Emanuela Bocancea, Christian Cloke, Nick De Pace, Colleen Donahoe, Andrew Dufton, Ameen al-Duqs, Michal Dziedziniewicz, Cecelia Feldman, Athan Geolas, Tali Erickson-Gini, Linda Gosner, Katherine Harrington, Susan Herringer, Fuad Hourani, Nancy Khalek, Sophia Laparidou, Brita Lorentzen, Sturt Manning, Kathryn McBride, Allison Mickel, Andrew Moore, Claudia Moser, Tareq Ramadan, Sarah Rhoads, Felipe Rojas, Gary Rollefson, Oscar Sanabria, Micaela Sinibaldi, Alex Smith, Julia Troche, Chris Tuttle, Tommy Urban, Clive Vella and Milena Zafirova. Thanks are also due to Chris Tuttle, Tali Erickson-Gini and Micaela Sinibaldi for providing valuable feedback on drafts of this article.

Alex R. Knodell
Getty Research Institute
1200 Getty Center Drive
Los Angeles, CA 90049-1745
United States of America
Susan E. Alcock
Joukowsky Institute for Archaeology and the Ancient World
Brown University
Box 1837/60 George Street
Providence, RI 02912, United States of America

Bibliography

- Alcock, S.E. and Knodell, A.R.
 2012 Landscapes North of Petra: The Petra Area and Wadi Silaysil Survey (Brown University Petra Archaeological Project, 2010-2011). Pp. 5-16 in L. Nehmé and L. Wadeson (eds.), *The Nabataeans in Focus: Current Archaeological Research at Petra. Papers from the Special Session of the Seminar for Arabian Studies Held on 29 July 2011*. Supplement to the Proceedings of the Seminar for Arabian Studies 42. Oxford: Archaeopress.
- Alcock, S.E. and Tuttle, C.A.
 2010 Brown University Petra Archaeological Project - 2010 Season. *Munjazat*.
 2011 Brown University Petra Archaeological Project - 2011 Season. *Munjazat*.
 2012 Brown University Petra Archaeological Project - 2012 Season. *Munjazat*.
- ‘Amr, K. and al-Momani, A.
 2001 Preliminary Report on the Archaeological Component of the Wadi Musa Water Supply and Wastewater Project (1998-2000). *ADAJ* 45: 253-285.
- ‘Amr, K., al-Momani, A., Farajat, S., and Falahat, H.
 1998 Archaeological Survey of the Wadi Musa Water Supply and Wastewater Project Area. *ADAJ* 42: 503-548.
- Banning, E.
 2001 Archaeological Survey in Jordan. Pp. 631-638 in B. MacDonald, R. Adams, and P. Bienkowski (eds.), *The Archaeology of Jordan*. Sheffield: Sheffield Academic Press.
- Bienkowski, P.
 2001 Iron Age Settlement in Edom: A Revised Framework. Pp. 257-269 in P.M.M. Daviau, J.W. Wevers, and M. Weigl (eds.), *The World of the Aramaeans II: Studies in History and Archaeology in Honour of Paul-Eugène Dion*. Journal for the Study of the Old Testament Supplement Series 325. Sheffield: Sheffield Academic Press.
- Bikai, P.M., Kanellopoulos, C. and Saunders, S.L.
 2007 Gods and Vineyards at Beidha. Pp. 369-374 in T.E. Levy, P.M.M. Daviau, R.W. Younger, and M. Shaer (eds.), *Crossing Jordan: North American Contributions to the Archaeology of Jordan*. Equinox, London.
 2008 Beidha in Jordan: A Dionysian Hall in a Nabataean Landscape. *AJA* 112(3): 465-507.
- Brünnow, R.E. and Domaszewski, A.v.
 2004 *Die Provincia Arabia: auf Grundzweier in den Jahren 1897 und 1898 unternommenen Reisen und der Berichtfrüherer Reisender beschrieben I, Die Römerstraße von Mâdebâ über Petra und Odrühbis El-‘Aḳaba, Unter Mitwirkung von Julius Euting*. Hildesheim: Georg Olms Verlag.
- Byrd, B. F.
 2005 *Early Village Life at Beidha, Jordan: Neolithic Spatial Organization and Vernacular Architecture. The Excavations of Mrs. Diana Kirkbride-Helbæk*. British Academy Monographs in Archaeology. Oxford: Published for Council for British Research in the Levant, by Oxford University Press.
- Erickson-Gini, T.
 2010 *Nabataean Settlement and Self-Organized Economy in the Central Negev. Crisis and Renewal*. BAR International Series 2054. Oxford: Archaeopress.
- Erickson-Gini, T. and Israel, Y.
 2013 Excavating the Nabataean Incense Road. *JEMAHs* 1: 24-53.
- Herr, L.G.
 1997 Archaeological Sources for the History of Palestine: The Iron Age II Period: Emerging Nations. *The Biblical Archaeologist* 60(3): 114-151; 154-183.
- Hübner, U.
 2013 Die archäologische Expedition 2011 in die Region um Petra: Ausgrabungen auf Umm Sabsabân. *Naturhistorische Gesellschaft Nürnberg Jahresmitteilungen* 2011: 157-168.
- Kirkbride, D.
 1966 Five Seasons at the Pre-Pottery Neolithic Village of Beidha in Jordan. *PEQ* 98: 8-72.
- Knodell, A.R. and Alcock, S.E.
 2011 Brown University Petra Archaeological Project: The 2010 Petra Area and Wadi Silaysil Survey, *ADAJ* 55: 489-508.
- Levy, T.E.
 1995 *Archaeology of Society in the Holy Land*. London: Leicester University Press.
- Lindner, M. and Gunsam, E.
 1995 The Unique Nabataean High Place of Ras Slay-sil Northwest of Petra and its Topographical Context. *ADAJ* 39: 267-280.
 2002 A Fortified Suburb of Ancient Petra: Shamma-sa. *ADAJ* 46: 225-242.
- Lindner, M., Hübner, U. and Genz, H.
 2001 The Early Bronze Age settlement on Umm Sabsabân north of Petra (Jordan) and its topographical context, report on the 1998/1999 survey. *ADAJ* 45, 287-310.
- MacDonald, B.
 2007 Archaeological Site Surveying in Jordan: The North American Contribution. Pp. 27-36 in T.E. Levy, P. M. Michèle Daviau, R.W. Younger, and M. Shaer (eds.), *Crossing Jordan: North American Contributions to the Archaeology of Jordan*. London: Equinox.

- Paolini, A., Vafadari, A., Cesaro, G., Santana Quintero, M., Val Balen, K. Vileikis, O., and Fakhoury, L.
 2012 *Risk Management at Heritage Sites: A Case Study of the Petra World Heritage Site*. Paris: UNESCO.
- Rojas, F.A. and Berenfeld, M.L.
 2012 Lückenschliessen: Archäologische Forschungen in Petrasnordweslichen Wadis). Pp. 48-55 in E. van der Meijden Zanoni (ed.), *Petra: Wunder in der Wüste. Auf den Spuren von J.L. Burckhardt alias Schiech Ibrahim*. Basel: Antikenmuseum Basel und Sammlung Ludwig.
- Schmid, S.
 2000 *Petra ezZantur II. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen. Teil 1: Die Feinkeramik der Nabatäer. Typologie, Chronologie und kulturhistorische Hintergründe*. Terra Archaeologica IV. Mainz: Monographien der Schweizerisch-Liechtensteinischen Stiftung für Archäologische Forschungen im Ausland.
- Sinibaldi, M. and Tuttle, C.
 2011 The Brown University Petra Archaeological Project: 2010 Excavations at Islamic Bayda. *ADAJ* 55: 431-450.
- Urban, T.M., Alcock, S.E. and Tuttle, C.A.
 2012 Virtual Discoveries at a Wonder of the World: Geophysical Investigations and Ancient Plumbing at Petra, Jordan. *Antiquity* 86(331): <http://antiquity.ac.uk/projgall/urban331/>.
- Urban, T.M., Bocancea, E., Vella, C., Herringer, S.N., Alcock, S.E. and Tuttle, C.A.
 2013 Investigating Ancient Dams in Petra with Ground-Penetrating Radar. *The Leading Edge* 32(2): 190-192.
- Vella, C., Urban, T.M., Bocancea, E., Tuttle, C.A. and Alcock, S.E.
 2012 Discovery of an Early Bronze Age settlement at Jabal al-Qarn near Petra, Jordan. *Antiquity* 86(334): <http://antiquity.ac.uk/projgall/vella334/>.
- Weninger B., Jöris, O. and Danzeglocke, U.
 2007 Cologne Radiocarbon Calibration and Paleoclimate Research Package. <http://www.CalPal-online.de>
- Whitcomb, D.
 1992 Reassessing the Archaeology of Jordan in the Abbasid Period. Pp. 385-390 in S. Tell, *Studies in the History and Archaeology of Jordan 4*. Amman: Department of Antiquities..

EAST OF JAWA: CHALCOLITHIC / EARLY BRONZE AGE SETTLEMENT ACTIVITY IN AL-ḤARRA (NORTH-EAST JORDAN)

Bernd Müller-Neuhof

with Lorraine Abu-Azizeh, Wael Abu-Azizeh and Julia Meister

Introduction

The first complex societies in south-west Asia emerged in Mesopotamia and the southern Levant in the Late Chalcolithic / Early Bronze Age (5th to early 3rd millennia BC). One of the characteristic features of these societies was their association with supra-regional, long distance communication (trade) networks.

The “Arid habitats in the 5th to early 3rd millennia BC: mobile subsistence, communication and key resource use in the northern *badia* (north-east Jordan)”¹ archaeological research project investigates the possible impact of these developments on the northern *badia*, a currently arid region in north-east Jordan, centrally located between Mesopotamia and the southern Levant (Müller-Neuhof 2012a).

Since the project started in 2010, six archaeological survey seasons have taken place in this region, focusing on different areas within the northern *badia*.

Investigations were carried out at the large flint mines and cortical tool blank production sites in the greater Wadi Ruwayshid region. These date to the Chalcolithic / Early Bronze Age (C/EBA) and are located in *al-Hamad*, the eastern limestone desert of the northern *badia*, on the western escarpment of al-Risha limestone plateau (Müller-Neuhof in press a – d; forthcoming a). Further investigations focused on evidence for C/EBA rainwater harvesting irrigation and terraced field agriculture close to Jawa (Müller-Neuhof 2012b; forthcoming b), as well as on an evaluation of the accessibility and traversability of the basalt desert of *al-Ḥarra*. A key element of this research was the identifi-

cation and documentation of C/EBA economic activities and land-use patterns in *al-Ḥarra*.

It was initially hypothesised that *al-Ḥarra* may have played a central role in local communication networks, serving as a transit region for the trade in cortical tool blanks from the Wadi Ruwayshid mines to postulated ‘consumer’ regions in the west. The region is characterised by dense surface scatters of basalt boulders. These hamper easy movement and are, at first sight, a major obstacle for communication routes crossing this region. However, there are numerous *wadis* and *qi’an* (mudpans) in *al-Ḥarra*, which facilitate access to and easy movement within the basalt desert. Two transect surveys followed these features and crossed *al-Ḥarra*, aiming for Jawa, the hypothetical (midway) destination of C/EBA trading groups.

The first transect survey crossed the basalt desert from south-east to north-west and was carried out in autumn 2010. It was almost 100 km-long and started at Qa’ Abu al-Husayn in the south-east. From this location, it followed the fissure eruption zone, characterised by a chain of long, narrow *qi’an* (such as Qa’ Bakhita, Qa’ al-Aza’im and some smaller adjacent *qi’an*) to the north-west. The route continued along Wadi Aza’im, where a *ca* 9 km-long leg was not surveyed because it was not accessible by car, although it could easily be reached on foot. The transect then passed through Wadi Ladhyim, Qa’ Tell Ladhyim and Wadi She’ib via the easily accessible basalt gravel country around Jabal al-Ashaqif before crossing the Amman - Baghdad road and Qa’ esh-Shahba. Still following the fissure eruption zone, the route passed

1. This project has been funded by the *Deutsche Forschungsgemeinschaft* (German Research Foundation)

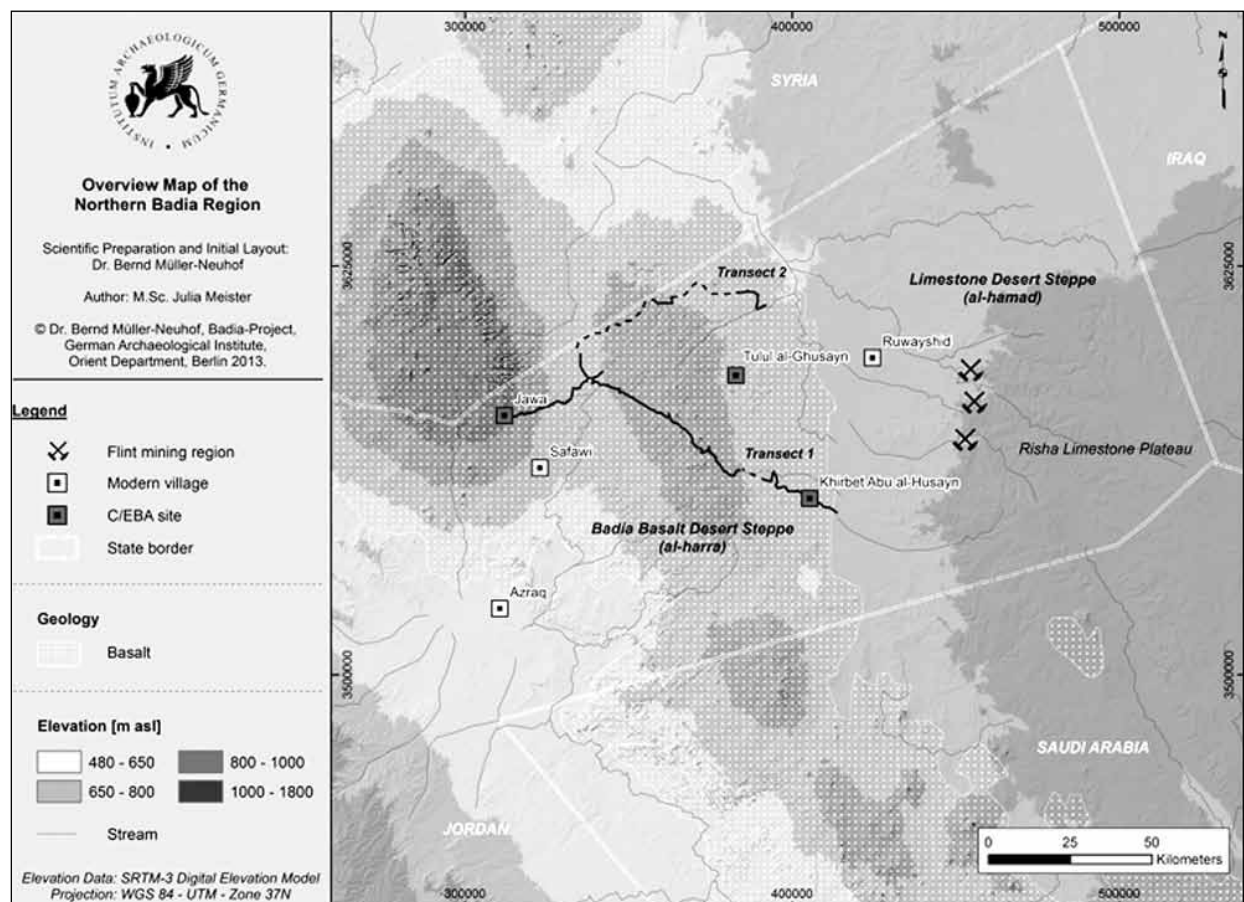
(MU 3075/1-2) since its start in 2010.

through Tulul ash-Shahba, following Wadi Zumeilat Umm el-Awaijl and crossing Qa' Umm el-Awaijl. It continued in north-westerly direction along Wadi al-Abd, Qa' at-Ra'at and Qitar el-Abd towards Wadi Salma and Marrab Salma. From there the transect shifted to the south-west and west, crossing Qa' Shubayka and finally stopping at the outlet of Wadi Rajil on to Qa' Shubayka (**Fig. 1**).

A second transect was also planned in a more east - westerly direction in the northern part of the basalt desert, orientated towards Wadi Rajil. It was initially planned to survey this transect in a westerly direction, via Wadi al-Khidari, the fissure eruption zone and Wadi Salma, moving towards Qa' Shubayka and then by means of Wadi Rajil to Jawa. However, when this survey was carried out in spring 2011 it was discovered that parts of the transect, between Wadi al-Khidari and Wadi Salma, were difficult to access. Therefore we changed its direction slightly and orientated the transect north towards the Syrian

border. From Marrab al-Khidari in the east, the new transect extended north-west via Wadi Tal' at-Zalat ash-Shamali, Qa' el-Misma, Tall el-Misma and Wadi Abyad. It also traversed parts of Wadi Shawiyya, Wadi Jathuri, Wadi Sara, Qa' es-Saul, Qa'el-Abd and Marrab Salma, before crossing Qa' Shubayka and following the entire Wadi Rajil from this point onwards towards Jawa.

For two reasons, we were only able to survey parts of this transect. First, because of the change to our plan, we had to apply for permission from the Jordanian authorities to visit the border region, which caused a few days' delay. Second, during this survey we identified evidence for C/EBA terraced gardens and rainwater harvesting irrigation at Jawa, which necessitated preliminary documentation and required more time than initially planned. The parts of this transect which were eventually surveyed were Marrab al-Khidari, Wadi Tal' at-Zalat ash-Shamali to the north-west, areas of Wadi Abyad



1. Map of the research region (©DAI-Orientabteilung, J. Meister and B. Müller-Neuhof).

and Wadi Shawiyya, parts of Qa' Shubayka and the entire Wadi Rajil from Qa' Shubayka towards Jawa (**Fig. 1**).

It should be stressed that, in most cases, we were able to reach all parts of the transects by vehicle, partly on natural surfaces (*wadi* beds, mudpans, basalt gravels) and partly on tracks within the *wadis*. In some cases there was no direct vehicle access to parts of the route, necessitating detours. However, in order to determine the likelihood of these routes having been used in prehistory, we always investigated the area prior to any detours in order to assess whether the direct route could have been accessed on foot.

Characterisation and Dating of the Habitation Sites

The main goal of the transect survey was to randomly sample, identify and date different types of human activity in the *al-Harra* region. As such, this survey focused on archaeological sites located within the confines of the transects. Consequently, sites located beyond the transect boundaries were ignored, even when visible on the satellite imagery.

Along these transects *ca* 208 sites, mostly habitation sites, were identified; the majority could be characterised as campsites with animal pens. The structures are evidence that people stayed in the same location for longer periods of time, whilst the surface finds help to date the occupation and activity.

The surface finds, consisting mainly of pottery for the later periods and lithic artefacts for the earlier periods, are suggestive of occupation in the Late Neolithic, Chalcolithic / Early Bronze Age, Roman and Byzantine periods, as well as into the Umayyad, Abbasid, Mamluk, Ayyubid and late Islamic / Ottoman periods².

Interestingly, material remains from the Middle Bronze Age to the Roman / Byzantine period have not been detected in the archaeological record, suggesting that there was (almost) no human activity in the region during that time frame. This fits with regional climate models which describe a long, dry period, especially from the

3rd millennium BC onwards, which is thought to have lasted more or less until the beginning of the common era (e.g. Weninger 2009: 7, Fig. 2).

For the sake of completeness, it should be mentioned that the earliest period of human activity that we were able to identify, on the basis of archaeological artefacts is the Late Acheulean (Lower Palaeolithic), which is represented by one basalt cleaver and one basalt scraper, discovered in the vicinity of Jawa³. Additionally, the remains of human activities dating to the Epipalaeolithic and PPN were frequently observed and have already been recognized by Alison Betts (Betts 1998), especially in the Wadi Rajil region⁴. Furthermore, it should be emphasised that the Late Neolithic, which is found at many sites on the transects, seems to have been a period during which the region was intensively occupied. This period is also represented at the southern edge of the Jordanian basalt desert in the areas of Wisad and Maitland's Mesa (Rowan *et al.* 2011; Rollefson *et al.* in prep.). However, most of the campsites encountered on the transect surveys can be attributed to the C/EBA on the basis of surface finds of lithic artefacts.

Late Roman / Byzantine and early Islamic pottery is frequently observed on these C/EBA sites. This implies that these campsites were reoccupied in later periods, perhaps because of their typically favourable location along the edges of mudpans. This is especially true for recent or sub-recent reoccupation of such sites, evidenced by (re)built animal pens, traces of modern *bedouin* encampments and truck tracks inside these camp areas. This is often the case at the edge of *wadi* confluences and mudpans, as well as along the edges of wide *wadis* which would, in the rainy season, have offered abundant grazing and opportunities for water-collection (**Fig. 2**).

Unfortunately, the multi-period occupation of several of these campsites with pen structures makes it difficult to distinguish the layout and building phases of the habitation structures on these sites without excavation.

Those campsites which can be dated to the C/EBA on the basis of surface finds and which

2. Ina Kehrberg has dated the pottery; her report will be published in the final survey report.

3. I have to thank Gary Rollefson, who visited us in spring 2011 and discovered a Palaeolithic basalt cleaver just

after stepping out of the car.

4. For instance Mugharet al-Jawa, Khallat Anaza and Khabrat Abu Hussein (Betts 1998: 11ff.)



2. C/EBA Campsite no. II-7 in the *Qa' Bakhita* (©DAI-Orientabteilung, B. Müller-Neuhof).

have not been affected by later occupations, or at least minimally so, typically consist of a cluster of different-sized enclosures, representing animal pens or camping areas. Just as today, these are typically constructed of the locally occurring small basalt boulders (Fig. 3)⁵.

Permanent C/EBA Occupation East of Jawa

Although evidence from the campsites hints mostly at limited periods of seasonal occupation, most probably during winter and spring in these regions, evidence for permanent C/EBA occupation was discovered at two sites; Khirbat Abu al-Husayn (KAH) and Tulul al-Ghusayn (TaG), both located east of Jawa. KAH was surveyed in detail, whilst TaG only briefly in spring 2013.

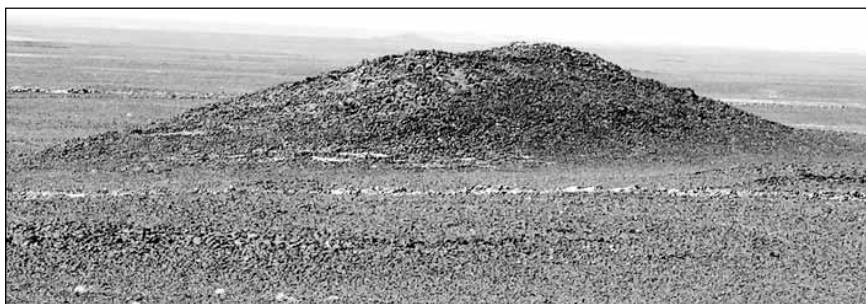
Khirbat Abu al-Husayn

During the first transect survey in autumn 2010 we identified the hillfort settlement of Khirbat Abu al-Husayn on the south-eastern edge of *al-Harra*, close to the large mudpan of *Qa' Abu al-Husayn*, after which we named the site. A second half-day visit was made in spring 2012. In March 2013 we spent almost five days at KAH for a closer investigation of the site, which included a site survey, kite photography and a detailed architectural survey of the structural remains on the surface.

KAH is located on a small volcano (Fig. 4), one of the easternmost in the long chain of volcanoes that forms the fissure eruption zone crossing *al-Harra* from south-east to north-



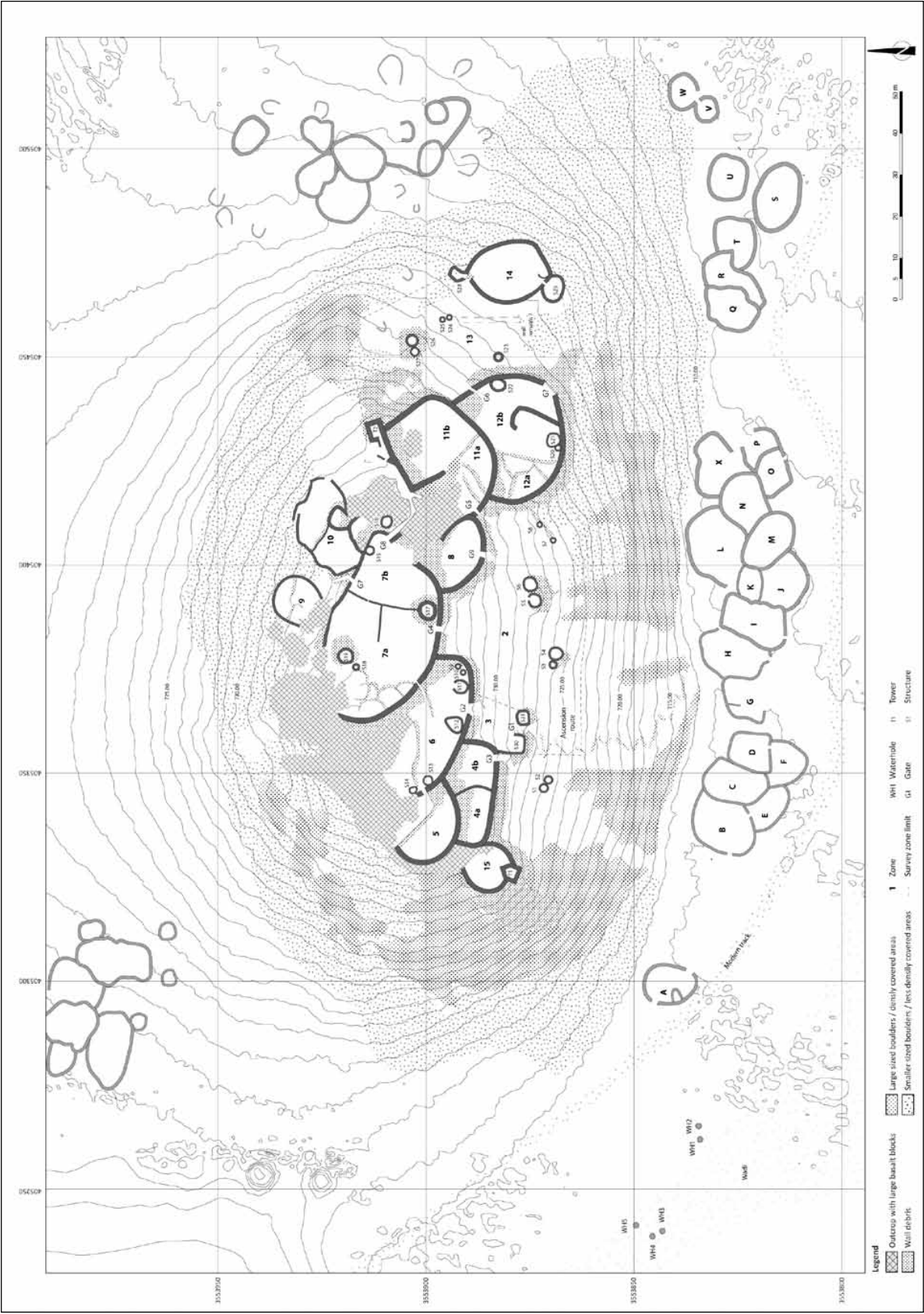
3. C/EBA Campsite no. VIII-48 in the *Wadi Rajil* (©DAI-Orientabteilung, B. Müller-Neuhof).



4. View of Khirbat Abu al-Husayn from Northeast (©DAI-Orientabteilung, B. Müller-Neuhof).

5. A detailed report on the campsites identified on both transect surveys will appear in the final publication of

the project (Müller-Neuhof forthcoming c).



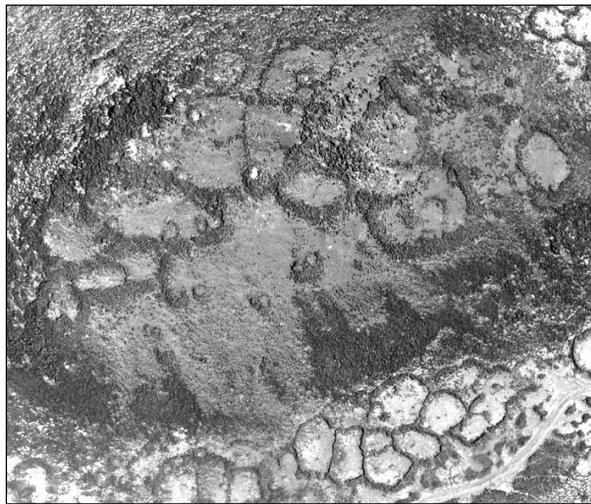
5. Plan of Khirbat Abu al-Husayn and its surrounding (©L. Abu-Azizeh).

west. This volcano chain is flanked to the south-west by a series of long mudpans which give relatively easy access deep into *al-Harra* from the south-east, whilst simultaneously providing pasture for pastoralists and their herds during the grazing periods of winter and spring. This fissure eruption zone was probably a major route for accessing and crossing *al-Harra* from east to west and *vice versa*. The motivation for establishing a fortified site in this location, in a region that currently receives an annual precipitation of 50 mm or less, may therefore have been strategic in nature, i.e. to control access to this route.

The volcano on which KAH is located has no visible crater. Instead, the summit consists of a series of flat areas at different levels. This is delimited to the west, north-west, north and north-east by basalt outcrops, characterised by very large and closely spaced blocks (Figs. 5, 6). The south-western, southern, south-eastern and eastern edges of the summit are delimited by very thick walls, enclosing large terraced areas. These walls, which are mostly double faced (Figs. 7 and 8) with a width of 1.3 m and a visible height of at least 1 m, are founded on the outcropping basalt blocks. Gaps between the natural outcrops are blocked by additional walls which, when viewed as a whole, form a protective fortification around the entire summit.

Additional smaller walls inside the protected summit areas divide them into different units (Fig. 9).

A distinctive feature of the site and its fortifications are the remains of two tower structures,

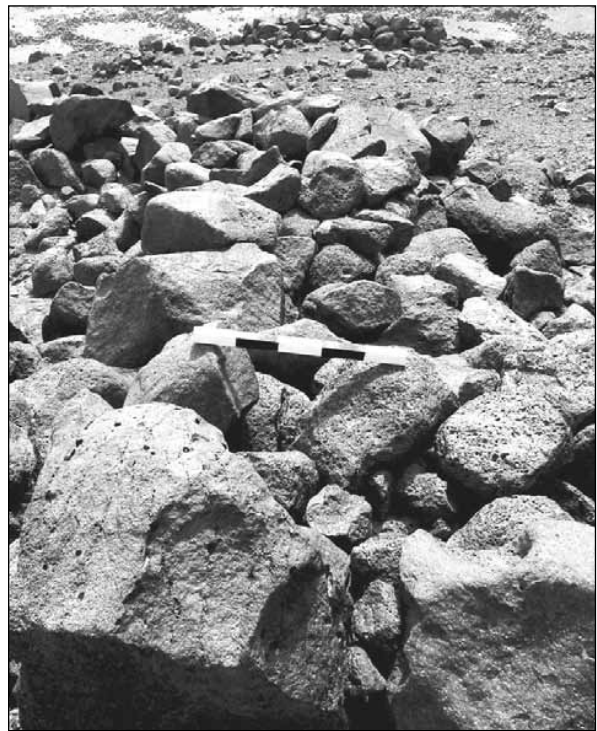


6. Aerial view on Khirbat Abū al-Husayn (©DAI-Orientabteilung, W. Abu-Azizeh).

which are located at strategic positions on the site (see Fig. 7). Together, these towers provide panoramic 360° views around the site and far into the surrounding landscape.

Tower T1 is a pentagonal structure embedded in the outer wall at the south-west corner of the site. The massive walls and abundant internal tumble hint at a much taller construction which subsequently collapsed.

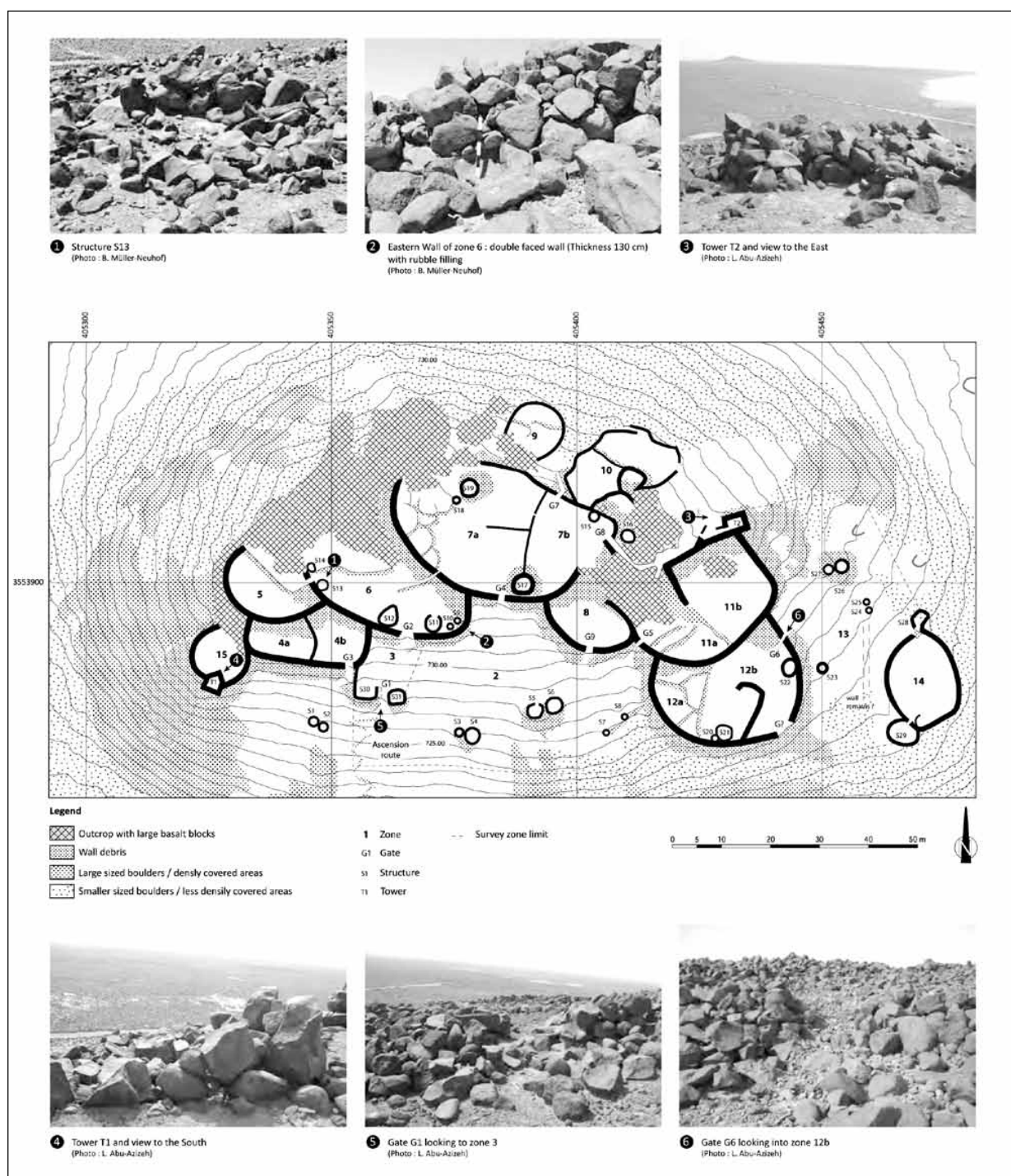
More or less on the opposite, north-eastern, side of the site is Tower T2. This is rectangular and, again, the massive walls and abundant tumble of massive stones inside the structure indi-



8. Section of a double faced wall at Khirbat Abu al-Husayn (©DAI-Orientabteilung, B. Müller-Neuhof).



9. Summit of Khirbat Abu al-Husayn with remains of partition walls in the centre (©DAI-Orientabteilung, B. Müller-Neuhof).



7. Plan of Khirbat Abu al-Husayn (©L. Abu-Azizeh).

cate that the structure was originally much taller.

There are at least nine points of access to the site, some of which have gate-like features (e.g. G1) (Fig. 10). Furthermore, gate G1 can be reached by a narrow path that winds up the southern flank of the volcano. Additional outer

walls are anticipated, especially on the southern and eastern flanks of the volcano, which have probably collapsed and eroded.

Approximately 31 small enclosure-like structures (S1-31) have been identified on the site. In most cases these are circular and resemble



10. View on gate no. 1 from the site of Khirbat Abu al-Husayn, with pen structures in the background (©DAI-Orientabteilung, B. Müller-Neuhof).

storage facilities, perhaps silos. Others, semi-circular and slightly larger, probably served as rooms.

A large area (S14) was discovered east of the summit on a terrace lower down the eastern slope. It seems to be an isolated structure, seemingly unconnected to the other settlement walls to the west. As a whole, this structure consists of a large, central roundish / rhomboid-shaped enclosure with two attached rooms, one to the north and a larger to the south. The entrance to the central enclosure is located close to the northern room, on the western side. The southern room is reached through a passageway close to the southern end of the enclosure.

This layout, with two attached rooms aligned on cardinal points (north and south), displays some parallels with Chalcolithic open sanctuary sites known from the Sinai, e.g. the Uvda valley (Avner 1984: 119ff.; 2002: Figs. 5: 77-79). Additionally, two campsite clusters have been identified at the foot of the volcano and on the lower parts of the slopes, one to the north-west and another to the east. There is also a long row of enclosures at the southern foot of the slope.

Further to the south, a small, shallow *wadi* runs from west to east into an adjacent small mudpan. Here possible water holes have been identified (see **Fig. 5**), which are both defined and reinforced by stone settings. These are characterised by the presence of shallow depressions, in which vegetation growth is much denser in comparison to the immediate surroundings (**Fig. 11**). These structures so far constitute the only possible evidence for a water supply at KAH. Unfortunately dating them is difficult, as no diagnostic material was encountered there.

Ascertaining the date of KAH itself is also no easy task; surface finds were extremely scarce. A few sherds were found in the pen structures

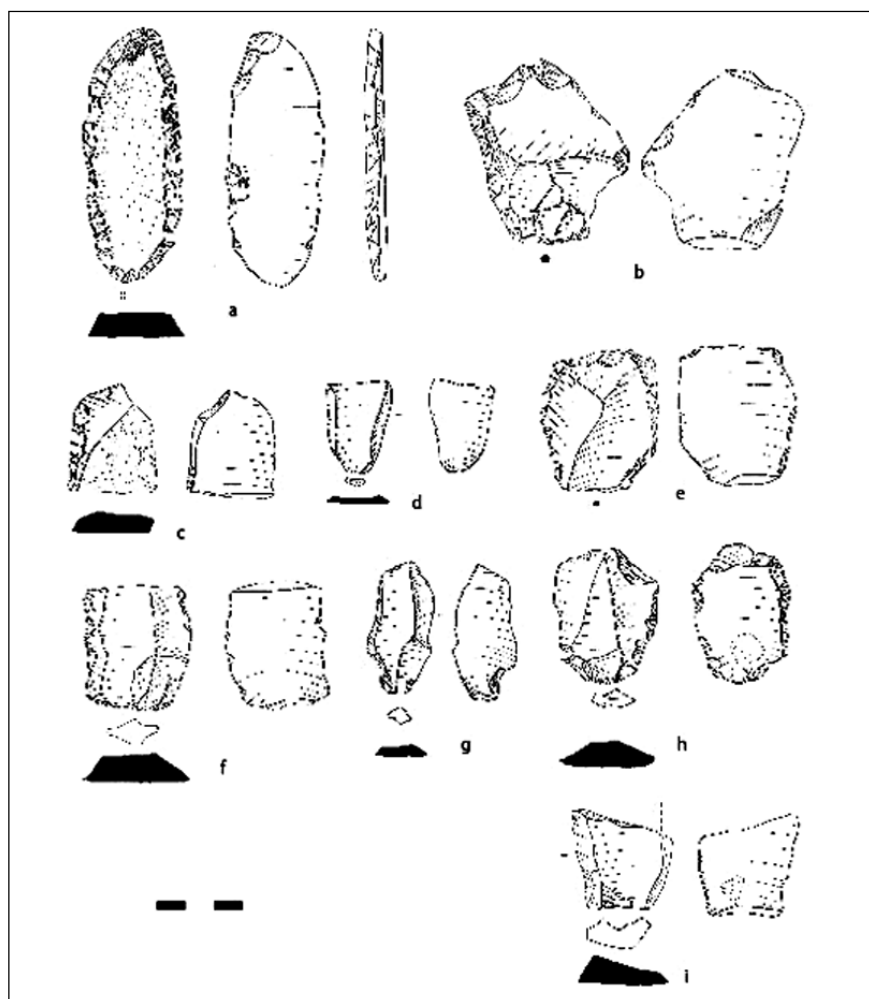


11. Remains of a water hole encircled by basalt stones in the small wadi adjacent to Khirbat Abu al-Husayn (©DAI-Orientabteilung, B. Müller-Neuhof).

at the southern foot of the hill. Some date to the Roman / Byzantine and early Islamic periods, and provide evidence for the reoccupation of these campsites. Others are body sherds of a dark coarse ware, probably of C/EBA date. On the site itself, just a single buff-orange coloured C/EBA sherd with the remains of a handle was found. Lithic artefacts were also relatively scarce on the site itself and were mostly undiagnostic. However, some remains of cortical tool blanks and large platform flakes and blades indicate a late prehistoric date. When the style of the architecture at the site is also taken into account, a C/EBA date for the structures seems likely (**Fig. 12**). Comparable lithic material was also found in the pen structures at the foot of the volcano, as was one complete cortical scraper (**Fig. 12a**). Further diagnostic lithic artefacts from the pen structures at the foot of the volcano date to the Late Neolithic.

In contrast to Jawa and Tulul al-Ghusayn, no evidence for agriculture, whether in the form of gardens or field structures, has so far been identified. Indeed, with the exception of the possibly contemporary water holes, the means by which the site was supplied with water is still not entirely clear.

Nevertheless, it can be assumed that agriculture was practiced on the mudpan close to KAH. Owing to the strategic nature and location of KAH and its fortifications, it seems likely that the site was permanently occupied, albeit perhaps with just a small number of people in the dry season. This would make KAH the eastern-



12. C/EBA lithic artefacts from Khirbat Abu al-Husayn (©DAI-Orientabteilung, B. Müller-Neuhof).

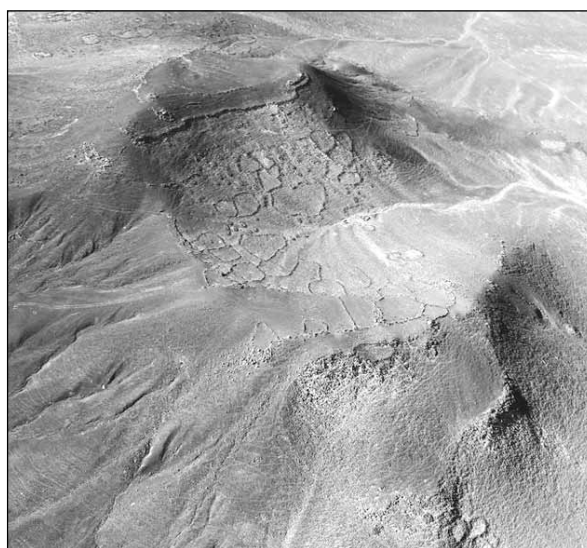
most permanently occupied C/EBA settlement in this region.

Tulul al-Ghusayn

Tulul al-Ghusayn (TaG) was discovered by D. Kennedy and R. Bewley of the APAAME aerial photography project in autumn 2011, during a helicopter flight over the region (Fig.13). In spring 2013 we were able to spend almost two days on the site for an initial archaeological surface investigation.

TaG is located on the eponymous volcano close to Wadi al-Ghusayn in the north-east part of al-Harra. It lies ca 20 km west of the eastern edge of the basalt desert and 9 km north of the Baghdad highway.

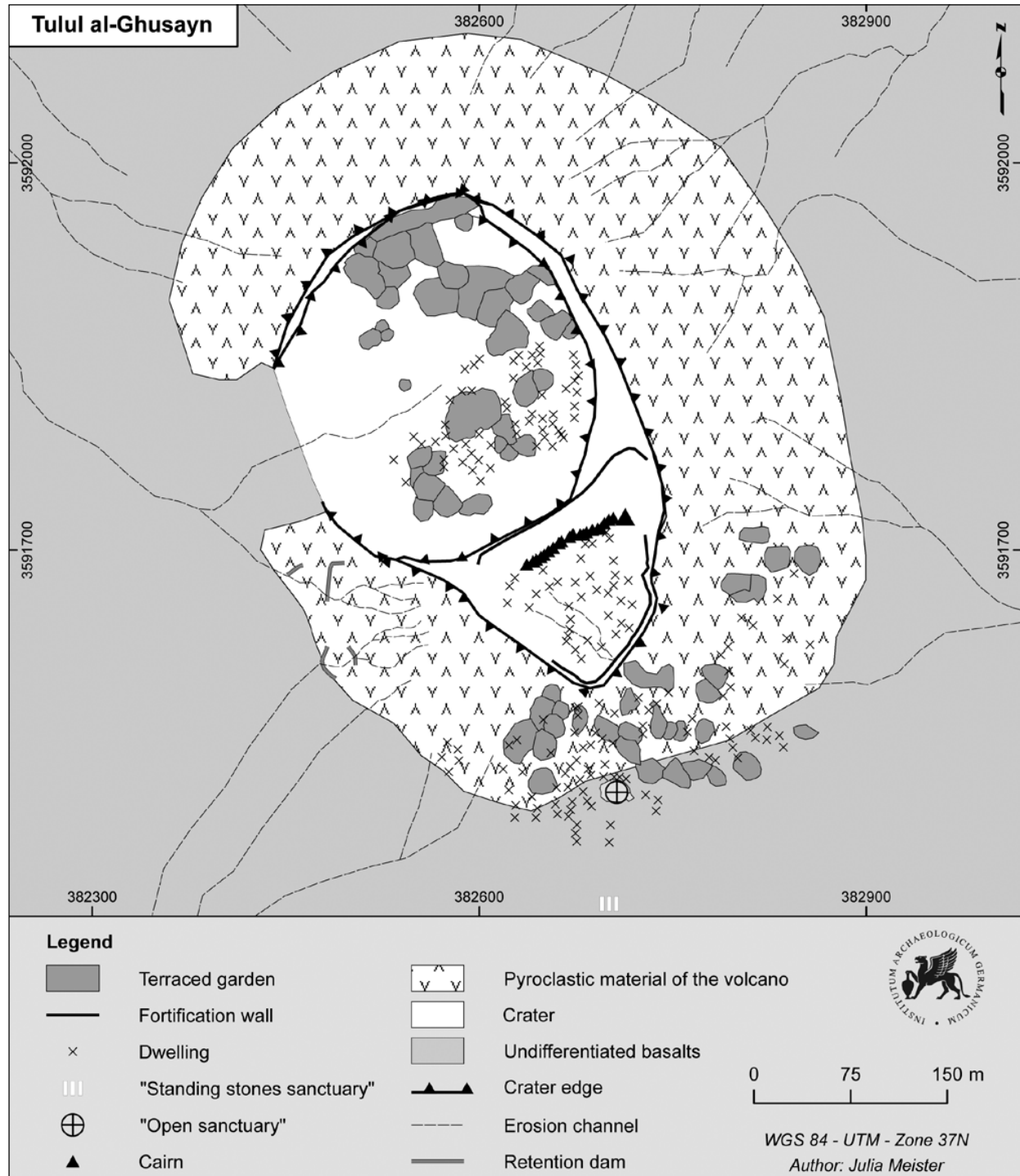
The site comprises three separate habitation areas and two areas of terraced gardens (Fig. 14). The main (upper) habitation area is located on the south-eastern rim of the crater (Fig. 15),



13. Aerial view of Tulul al-Ghusayn from NW with terraced gardens in the crater of the volcano and the upper part of the settlement on its southeastern rim (©DAI-Orientabteilung, B. Müller-Neuhof).

which opens towards the west. The *ca* 140m-wide rim at this part of the volcano slopes slightly towards the south-east. The edges of this area, which covers just over 1 ha, are characterised by steep slopes. In some places these form cliffs, which provide a degree of natural protection for

the habitation area. However, the remains of an enclosing wall, which probably functioned as a genuine fortification, are still visible in many places and would have reinforced the natural protection. In particular, the edge closest to the crater is reinforced by a *ca* 1 m-wide, double-



14. Plan of the site Tulul al-Ghuasayn (©DAI-Orientabteilung, J. Meister and B. Müller-Neuhof).



15. Aerial view of the fortified dwelling area on the crater rim of Tulul al-Ghusayn (©DAI-Orientabteilung, B. Müller-Neuhof).

faced wall (**Fig. 16**).

Possible entrances were identified on two sides of the upper habitation area.

A large cairn, unfortunately looted, with an attached 'tail' of smaller cairns is the most prominent feature of this upper area.

The dwelling structures themselves are scattered across almost the entire surface of the upper habitation area. During the survey we were able to identify at least 37 dwellings. These are very small structures, characterised by a double room or room and 'forecourt' feature. They are all similar in size, being *ca* 5.5 m long and 2.5 - 3 m wide. The buildings are typically constructed of double-faced walls, *ca* 0.5 m wide with rounded corners (**Fig. 17**). In parts, these are preserved to a height of 0.5 m. The entrance is always on the long side of the building, close to a corner, and leads into the smaller room or 'forecourt' from which the main room, generally measuring *ca* 2.25 by 1.5 m, is accessed. Comparable house structures have been discovered at Maitland's Mesa by G. Rollefson, Y. Rowan and A. Wasse, where they are referred to as 'ghura huts' (Rowan *et al.* n.d.).

The distribution of houses in the upper habitation area seems not to follow any clear plan, e.g. one linked to a system of pathways. However, all buildings are aligned north-west – south-east, probably because of the orientation of the natural slope and possibly in relation to the pre-

vailing wind.

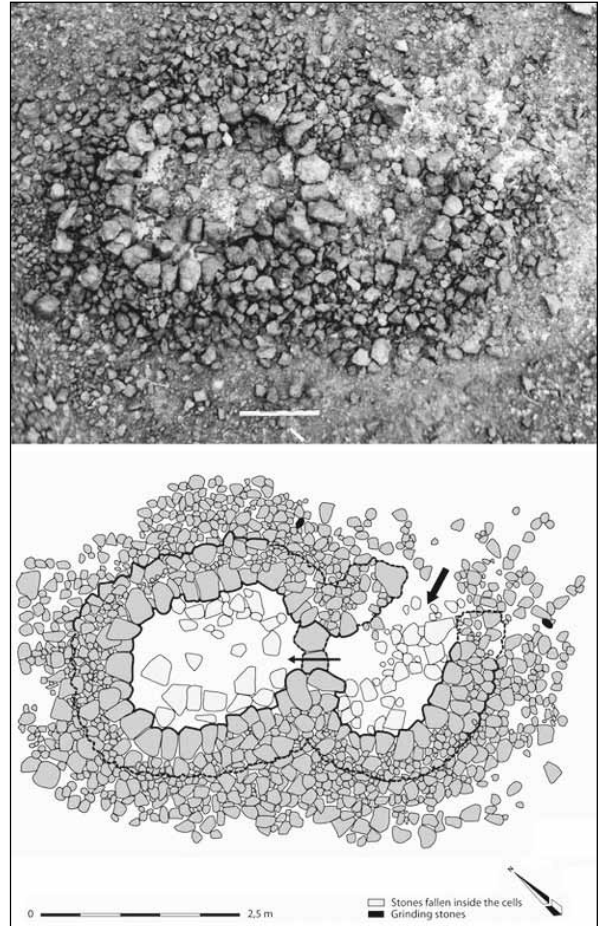
Additional dwellings were encountered on the southern and eastern slopes of the crater, where at least 54 dwellings have been identified. These resemble the houses of the upper habitation area in terms of structural features and size. In this area some terrace features were also encountered. These were probably constructed to level the area in order to facilitate the construction of dwellings and to afford easy access to them.

Comparable terrace features have been identified in the third habitation area, located at the foot of the southern and south-eastern slopes of the volcano. Here 89 dwelling structures have so far been recorded, but owing to a lack of time we were unable to examine all of the potential huts at the foot of the eastern slope.

Some metres to the south of this habitation area, a possible 'sanctuary' was discovered (**Fig. 18**). This feature is characterised by a row of flat, upright, standing stones with larger stones placed in the centre and smaller stones to both sides of these large ones. Located directly behind this front row are two other similarly orientated rows of flat, upright, standing stones. The rear of the central part of this feature is reinforced with stone packing. Taking the large central stone as an axis, the entire structure is orientated towards the east. Comparable standing stone sanctuaries have been identified in the Negev and Sinai,



16. Section of the double faced fortification wall of the upper settlement (©DAI-Orientabteilung, B. Müller-Neuhof).



17. Aerial view and drawing of one of the typical Tulul al-Ghusayn huts (©DAI-Orientabteilung, W. Abu Azizeh).



18. Row of standing stones ("standing stones sanctuary" at the eastern end of Tulul al-Ghusayn (©DAI-Orientabteilung, B. Müller-Neuhof).

e.g. at Uvda 69 (Beith-Arieh 2003: Figs 4:40-44), Wadi Mara and Wadi Aradeh (Avner 2002: Figs. 4:30-31), and by W. Abu-Azizeh and M. Tarawneh in al-Thulaythuwat area of southern Jordan, along the escarpment of Tarat Kabd.

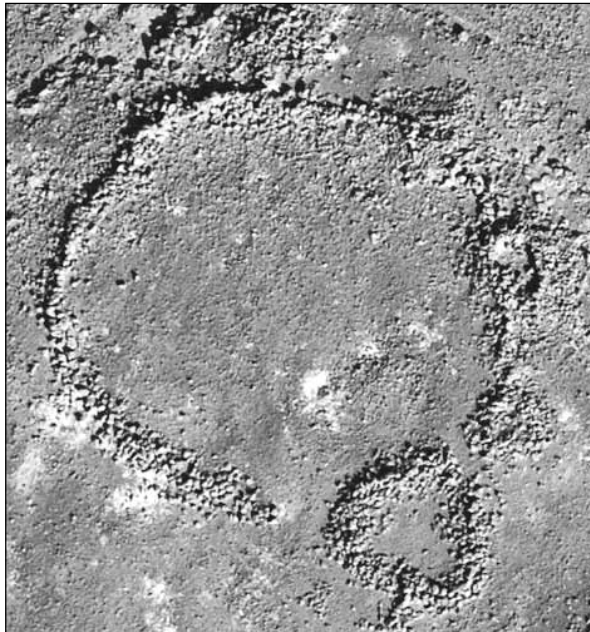
Whilst studying the aerial photos taken by the APAAME team (D. Kennedy, R. Bewley

and M. Dalton) and the author after the survey, another possible sanctuary structure was identified several metres west of the aforementioned example. This again clearly resembles the open sanctuaries from the Negev / Sinai region, especially those known from the Uvda valley, and probably also that known from KAH (see

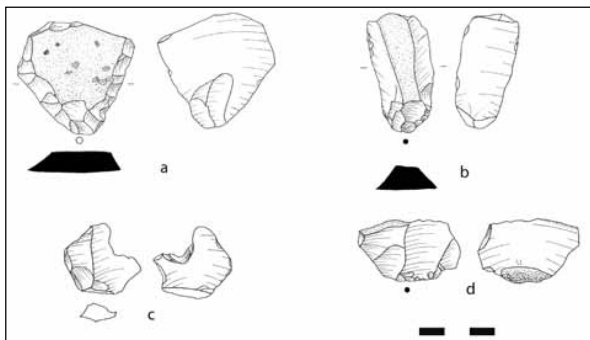
above). However, here the annexes are not orientated on clear cardinal points (**Fig. 19**).

Some lithic artefacts were found within the three habitation areas, mostly cortical tool blank fragments, along with large platform flakes and blade fragments (**Fig. 20**). These indicate a probable C/EBA date for the occupation and use of this site. Pottery was scarce and consisted solely of body sherds of a very coarse and dark ware. Additionally, many grinding stone fragments were found in or close to several of the dwellings.

The most interesting aspect of TaG is the remains of terraced gardens hinting at rain-fed agriculture. On almost all areas of the crater



19. Aerial view of the "open sanctuary" close to the dwelling area on the southern and eastern slope of Tulul al-Ghusayn (Tulul Ghusayn (Ghusein Settlement 2 APAAME_20130409_RHB-0082). Photo: R. Bewley).



20. C/EBA lithic artefacts from Tulul al-Ghusayn (©DAI-Orientabteilung, B. Müller-Neuhof).

slopes and, additionally, on extensive areas of the southern and eastern outer slopes of the volcano, terrace wall structures have been identified from aerial photographs (**Fig. 21**) and satellite imagery. These terraced gardens extend over a total area of approximately 2.2 hectares. Our surface investigations revealed terrace walls (**Fig. 22**) preserved to a height of 50 - 60 cm which, at least at the lower end of the garden plots, still retain a similar depth of soil. During our brief investigation of these structures, the potential remains of a few hydrological features were encountered. However, the location of these gardens within the crater and on the outer slope of the volcano shows that the catchment area of the entire terraced garden system was very small and consisted of just the volcano itself. This is in marked contrast to the terraced garden system at Jawa, where the water catchment area is much larger (see Müller-Neuhof 2012; forthcoming b). It would appear that the



21. Aerial view of a part of the terraced gardens in the crater of Tulul al-Ghusayn (©DAI-Orientabteilung, B. Müller-Neuhof).



22. View of some terraced gardens in the crater of Tulul al-Ghusayn (©DAI-Orientabteilung, B. Müller-Neuhof).

terraced garden system worked fairly well during the occupation phase of TaG; this supposition is supported by the discovery of grinding stones in several of the huts.

A preliminary observation is that different surface features within the gardens may be related to the different crops that were planted there. Some areas are cleared of basalt blocks, whilst others are not. Within the garden areas we even encountered small terrace-like stone settings, which may have marked planting pits for trees or shrubs.

Sediment and phytolith analyses of soil samples from the cleared gardens are currently being carried out in an attempt to gain more information about agricultural activities at the site. It seems that TaG represents the easternmost evidence for rain-fed agriculture in the wider region, at least during the C/EBA, and that this could only be achieved by constructing terrace gardens to retain both soil and water during the rare and short, but supposedly intense, rainfall events.

Conclusion

All of the observations and interpretations presented above derive from different surveys and are preliminary in nature. During the transect surveys, we ‘missed’ many sites which were not located directly on the transect routes but close to them and which, on the basis of their appearance on the satellite imagery, seem to be very interesting camp site structures. Owing to the fact that the main objectives of the survey were to identify possible routes through *al-Harra* and to gain a preliminary understanding about the economic utilisation of this region, more intensive survey in some of the transect legs was not possible. However, this is something for future research activities to focus on, with specific areas on the transect routes being identified for more detailed investigation. The same is true for KAH and TaG. At KAH we were able to map the structures on the site and carry out detailed investigations of some of the architectural features; the same is planned for TaG. However, a major – and as yet unresolved – problem is the dating of these structures. It will therefore be necessary to carry out excavations at these sites in the near future, at least on a small scale, in order to obtain C^{14} data. These data are also desperately needed for Jawa itself.

Despite these limitations, the transect sur-

veys and investigations at KAH, TaG and in the vicinity of Jawa have generated new and important information on the occupation of this region in the C/EBA. It is now possible to hypothesise that there was an intensive economic utilisation of the region during the C/EBA, characterised by flint mining and cortical tool production, long distance trade of these items, animal husbandry and intensive pastoralism and agriculture. The extent to which the northern *badia* of Jordan was connected to the neighbouring early urban cultures in Mesopotamia and the southern Levant is an issue for ongoing and future research. However, the identification of possible cultic ‘standing-stone structures’ and ‘open sanctuaries’, which are also known from other arid regions in south-west Asia, hints at the existence of a desert culture which extended, at least in ideological terms, over wide areas of the region.

Acknowledgements

First and foremost, I would like to thank the Department of Antiquities of Jordan and its acting director Mr Fares Hmoud and his staff for their continuous support and their permission to carry out this research project in the northern *badia*.

Many thanks are due to the *Deutsche Forschungsgemeinschaft* (German Research Foundation) which has funded the project since 2010 (MU 3075/1-2) and to the Council of British Research in the Levant (CBRL), with which this project is affiliated. I am also grateful for the logistical support provided by the *Deutsche Evangelische Institut für die Altertumswissenschaften des Heiligen Landes* (German Protestant Institute of Archaeology) in Amman, especially before and after the field seasons. Additional thanks are due to the *Institut Français du Proche Orient* (IFPO) for allowing their architect, Ms Lorraine Abu-Azizeh, to participate in the field season this spring.

Sincere thanks go to the Badia Research Program of the National Centre for Research and Development / Higher Council for Science and Technology in Amman and its director Dr Odeh al-Meshan. His support for the project, which included granting us access to the facilities of the research field station at Safawi, has been a major help. In this regard, sincere thanks also go to the staff of the Safawi field station for their hospitality and support.

Many thanks also to my co-author, architect Lorraine Abu Azizeh (IFPO Amman), for carrying out the architectural study of Khirbat Abu al-Husayn and for compilation of the final site plan. Additional thanks to my co-author, Dr Wael Abu Azizeh (Maison René Ginouvès, ArScAn - UMR 7041, VEPMO), for his participation in the entire survey season and especially for taking the aerial photos of Khirbat Abu al-Husayn. Further thanks to the geographer Dipl. Geogr. Jan Krause of the *Institut für Geographische Wissenschaften der Freien Universität Berlin* (Institute of Geographical Sciences of the *Freie Universität Berlin*) for his collaboration and for contributing his geographical expertise to the project. Special thanks go to my co-author, the geographer Ms Julia Meister MsSc., for her participation and contribution to the project, being responsible for GIS and sediment analyses.

Last, but not least, I would very much like to thank Dr Jennie Bradbury (Durham University) for taking on the burden of correcting the spelling of this contribution.

Dr Bernd Müller-Neuhof
Deutsches Archäologisches Institut
Orientabteilung
Podbielskiallee 69-71
D-14195 Berlin
Germany

Bibliography

- Avner, U.
1984 Ancient Cult Sites in the Negev and Sinai Deserts. *Tel Aviv* 11: 115-131.
2002 Studies in the Material and Spiritual Culture of the Negev and Sinai Populations, During the 6th-3rd Millennia B.C. Hebrew University PhD-thesis.
- Betts, A.
1998 *The Harra and the Hamad. Excavations and Explorations in Eastern Jordan*. Sheffield.
- Müller-Neuhof, B.
2012a Northern Badia. in: D.R. Keller, B.A. Porter and C.A. Tuttle (eds), *Archaeology in Jordan, 2010 and 2011 Seasons. American Journal of Archaeology* 116: 700-702.
2012b The Gardens of Jawa: Early Evidences for Rainwater Harvesting Irrigation. *Bulletin of the Council of British Research in the Levant*, 62-64.
- in press a The Wādī ar-Ruwayshid Mining Complex: Chalcolithic / Early Bronze Age Cortical Tool Production in N/E Jordan. *ADAJ* 56: 351-362.
- in press b Nomadische Ressourcennutzungen in ariden Regionen im 5. bis frühen 3. Jt. v. Chr. *Zeitschrift für Orientarchäologie* 5.
- in press c SW-Asian Late Chalcolithic / EB Demand for 'Big Tools': Specialised Flint Exploitation Beyond the Fringes of Settled Regions. *Lithic Technology* (2014)
- in press d Chalcolithic / Early Bronze Age Flint Mines in the Northern Badia. Syria 90, Thematic file on the proceedings of the workshop Current Research on Protohistoric Occupation in Peripheral Desert Areas of Jordan, organized by Abu-Azizeh, W. - Tarawneh, M. (Wadi Mussa, July 2011).
- forthc. a Preliminary results of the 2010 cortical scraper mine survey in the Greater Wadi Ruwayshid region (N/E Jordan). *SHAJ* XI.
- forthc. b Desert irrigation agriculture – Evidences for Early Bronze Age Rainwater Harvesting Irrigation Agriculture at Jawa (NE-Jordan). In: D. Morandi Bonacossi (ed.) *Settlement dynamics and human landscape interaction in the steppes and deserts of Syria*. *Studia Chaburensia* (2014?)
- forthc. c The Jawa Hinterland: Studies on the Chalcolithic / Early Bronze Age Mobile Subsistence, Communication, and Key Resource Use in the Northern Badia (NE-Jordan).
- Rollefson, G.O. – Y.M. Rowan – A. Wasse
in prep. A Preliminary Report on the First Seasons at Wisad Pools, Eastern Jordan. *ADAJ*.
- Rowan, Y.M. – G.O. Rollefson – M.M. Kersel
2011 Maitland's Mesa Reassessed: a Late Prehistoric Cemetery in the Eastern Badia, Jordan. *Antiquity* 85. 327
- Rowan, Y.M. – A. Wasse – W. Abu Azizeh – A.C. Hill – M.M. Kersel
no date Revelations in the 'Land of Conjecture': New Late Prehistoric Discoveries at Maitland's Mesa and Wisad Pools, the Eastern Badia Archaeological Project, Jordan.
- Weninger, B.
2009 Yarmoukian Rubble Slides. Evidence for Early Holocene Rapid Climate Change in Southern Jordan. *Neo-Lithics* 1/09: 5-11.

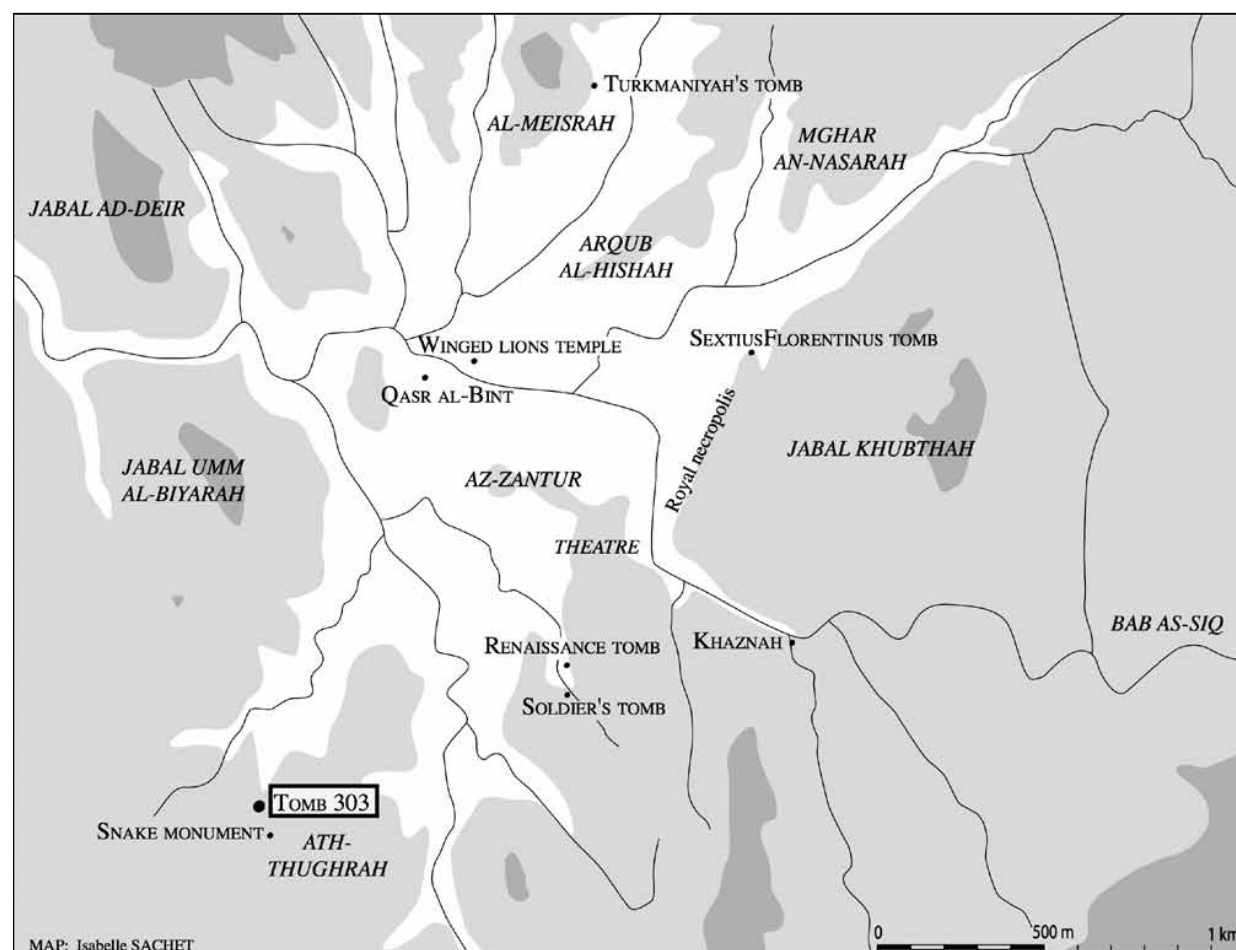
THE HELLENISTIC - NABATAEAN CRYPT IN TOWER TOMB 303 AT ATH-THUGHRAH IN PETRA: RESULTS OF THE ARCHAEOLOGICAL AND MULTI-DISCIPLINARY STUDIES

Isabelle Sachet, Nathalie Delhopital, Charlène Bouchaud and Carine Tomé Carpentier¹

South of the town of Petra, in the ath-Thughrah area, lies tomb Th303 (**Fig. 1**), numbered thus by R.E. Brünnow and A. von Domaszewski (1904: 289, figs 317-318). Just over 1 km away from the ancient city centre, it stands in a white sandstone massif that forms the southern entrance to the urban area of Pe-

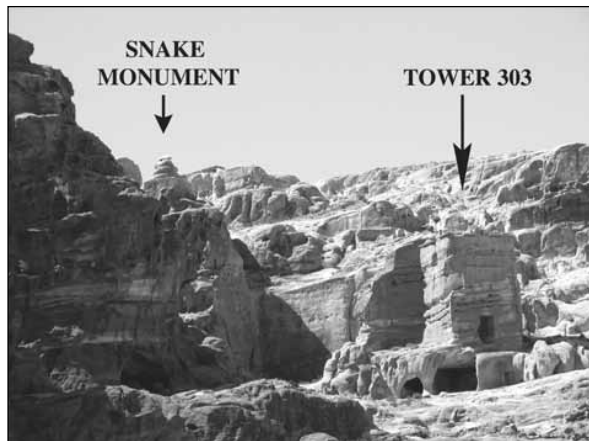
tra. This doorway was guarded symbolically by a raised cobra (no. 302), its head turned away from the city (**Fig. 2**).

In May 2006, as part of the French archaeological mission to Petra directed by C. Augé, a sounding was excavated at the foot of tower 303 to expose the access to the underground



1. Map of Petra, showing location of complex Th303 (I. Sachet).

1. Text translated by Isabelle Ruben.



2. Photograph of the snake monument and tower 303 (I. Sachet).

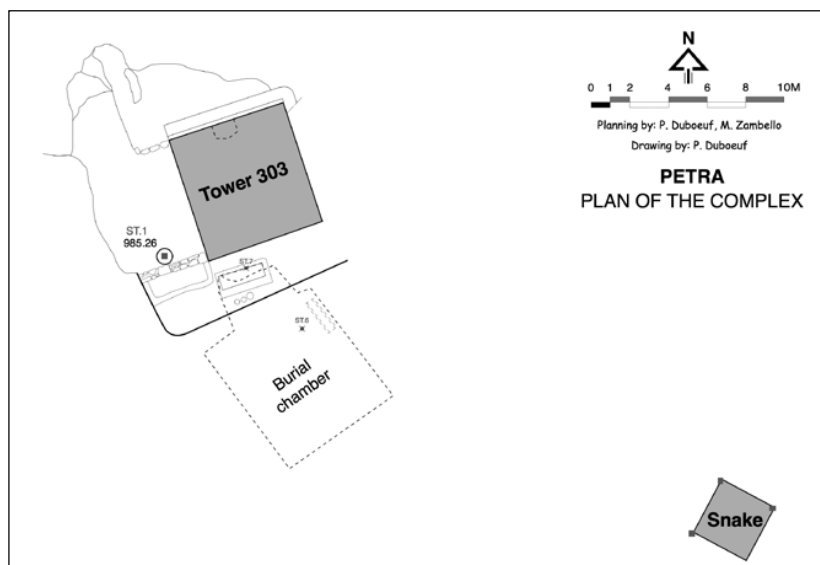
chamber, which was partly visible at the time (Mouton 2010: 280-281). In December 2006, the underground burial chamber was completely excavated (Sachet 2009: 100-103). The field team consisted of I. Sachet (archaeologist) and N. Delhopital (physical anthropologist), assisted by ten workmen from the village of Umm Şayhun overseen by A. Abu Saksuka and M. Haoude. The architectural plans were drawn by P. Duboeuf (topographer). F. Bernel (conservator) took care of the conservation of metal objects and M. Zambello (draftsman) drew some of the pottery and objects. Our Department of Antiquities representative, A. al-Shami, was assigned to us by the late Dr F. al-Khraysheh. The faunal remains were studied by C. Tomé Carpentier (archaeozoologist); the plant, seed and

charcoal remains were studied by C. Bouchaud (archaeobotanist), A. Gueli examined a series of pearls using Fluorescence X (Gueli *et al.* 2010) and N. Garnier undertook physio-chemical analyses on a libation cup (Garnier *et al.* 2009).

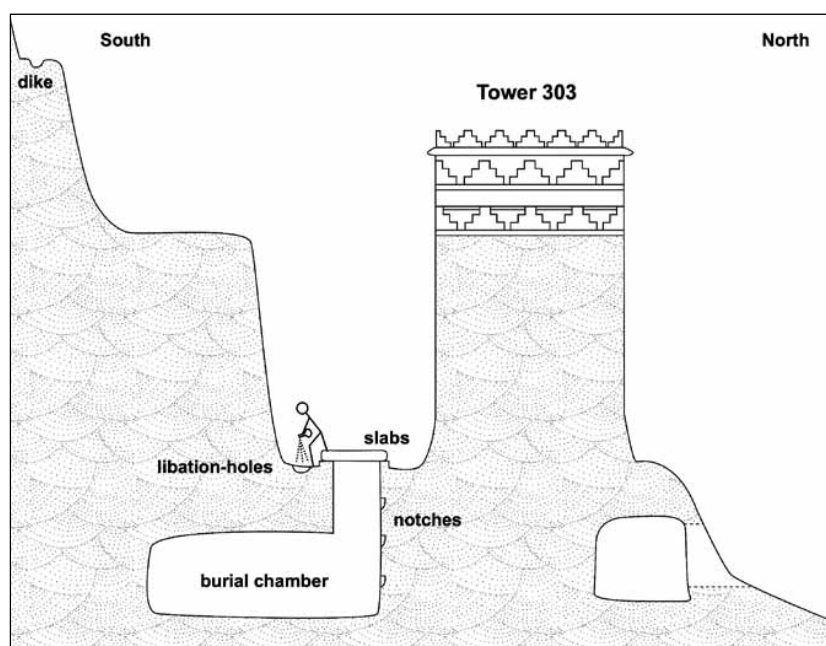
A. The Excavation (I. Sachet)

Funerary complex Th303 comprises a monolithic cenotaph tower carved out of the mountain and an underground burial chamber at the foot of the tower (Fig. 3). Each side of the tower measures 6.5 m; it is a little less than 10 m high. It is crowned by an 'Egyptian' cavetto cornice and free-standing crowsteps, partially collapsed onto the top of the tower. Two further rows of crowsteps, carved in bas-relief, decorate the four sides of the tower. The underground vault is 6.5 m wide by 7 m long and a little less than 2 m high (Fig. 4).

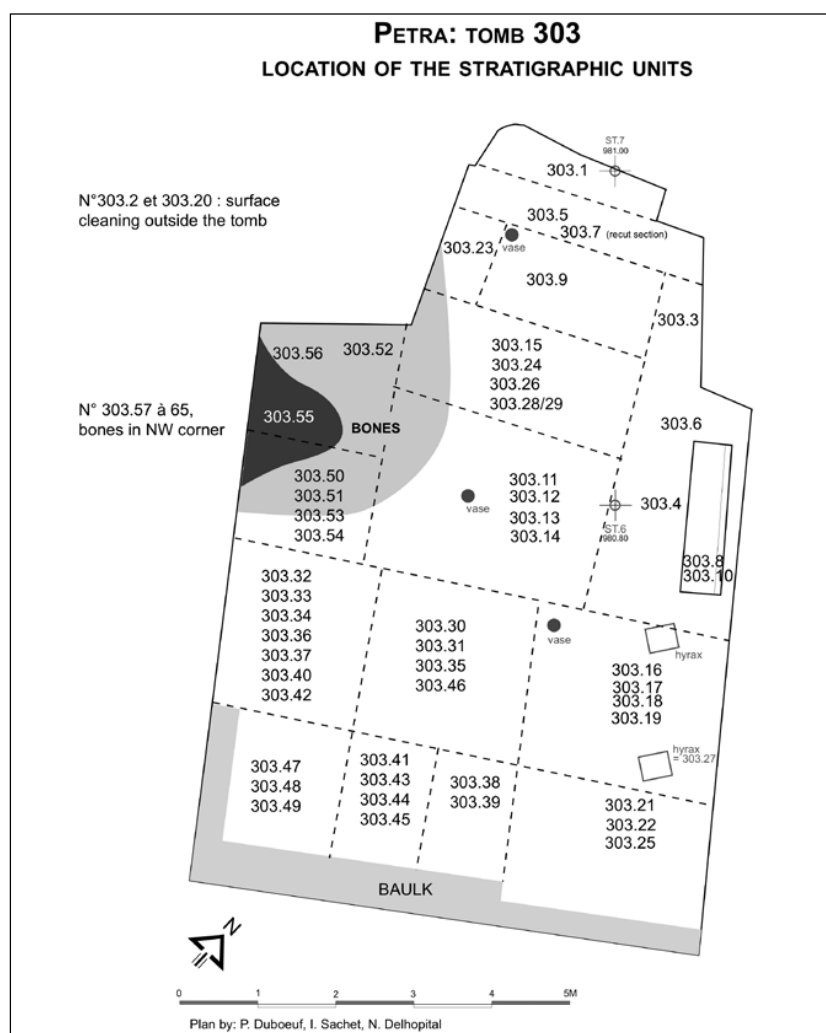
Prior to excavation, the vault was filled with sediment to within 50 cm of the ceiling, suggesting that it had remained undisturbed for a long time. The accumulation of sediment in the chamber consisted of fine alternating layers of sand and soil (Fig. 7), corresponding to the long-term deposition of silts by seasonal floods. During the excavation, the stratigraphic units (SU) were numbered sequentially from 1 to 65, (Figs. 5 and 6) the number being preceded by 'Th' to signify the ath-Thughrah massif and the figures '303' to indicate the tomb (Brünnow and von Domaszewski 1904: 289, figs. 317-318). Stratigraphic units Th303.2 and 20 were exca-



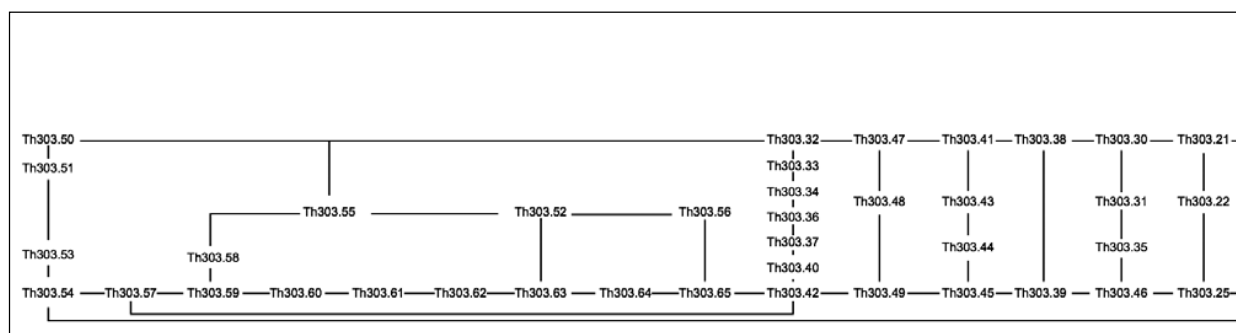
3. Plan of funerary complex 303: tower and underground chamber (French Archaeological Mission to Petra).



4. Sketch of the reconstructed complex in cross-section (I. Sachet).



5. Chamber 303: location of the stratigraphic units (SU) (I. Sachet).



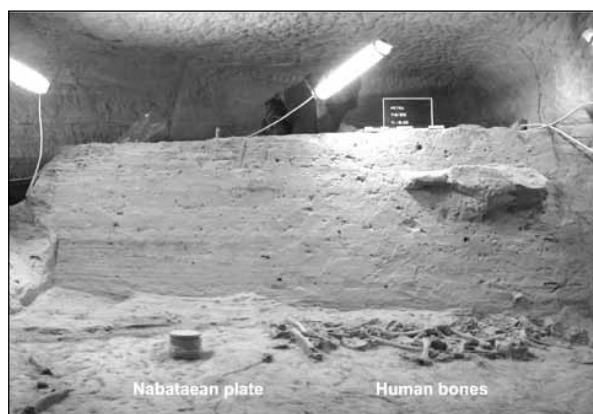
6. Excavation of chamber 303: Harris matrix (I. Sachet).

vated outside the vault, over the access shaft; all other units were inside the chamber.

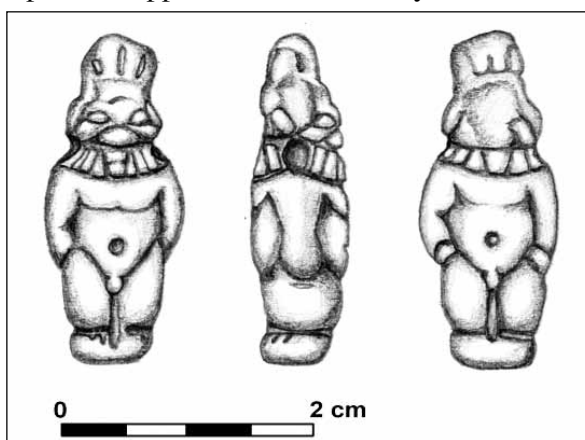
In the north-east corner, evidence of a recent robbery was visible but limited to about 10% of the total area of the chamber (US Th303.1 and 3-7). Clearing the disturbance from the robbery made it possible to excavate a pit (Th303.8 and 10), in which the only finds were a few teeth and a little figurine made of frit representing the Egyptian god Bes (**Fig. 8**). The bottom of the pit was filled with very black earth that probably resulted from the decomposition of a wooden coffin. Limited mediaeval occupation was then exposed in the upper layers in the northern part of the chamber (Th303.11-12, 14-16 and 51-53). Some pieces of mediaeval pottery, an early Islamic lamp and some charcoal were extracted from the sandy fill (**Fig. 9**). At the time of this occupation the chamber was already filled with sediments to within 1 m of the ceiling; it had not been cleaned out and the silts do not seem to have been dug into in this area. Presumably then, in mediaeval times this vault served as a temporary shelter or hiding place. Other than

these two disturbances – the recent robbing and the temporary mediaeval occupation – the chamber had silted up progressively ever since its abandonment in antiquity.

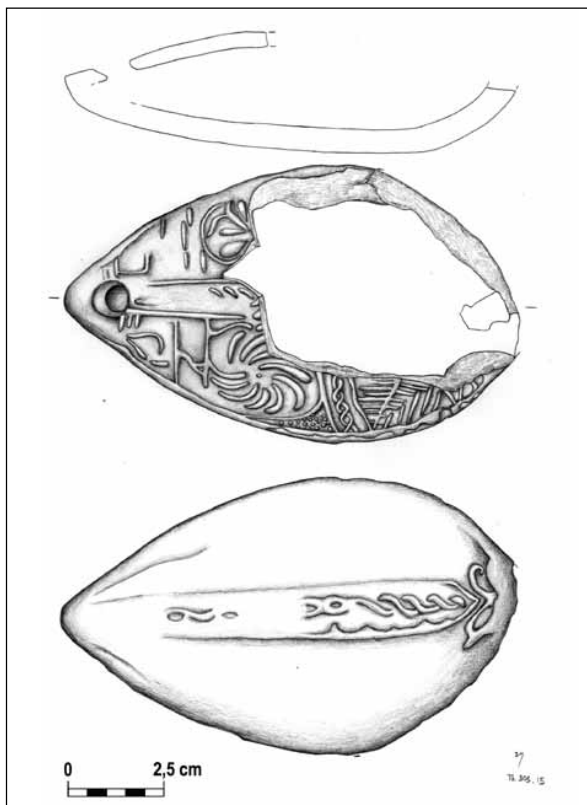
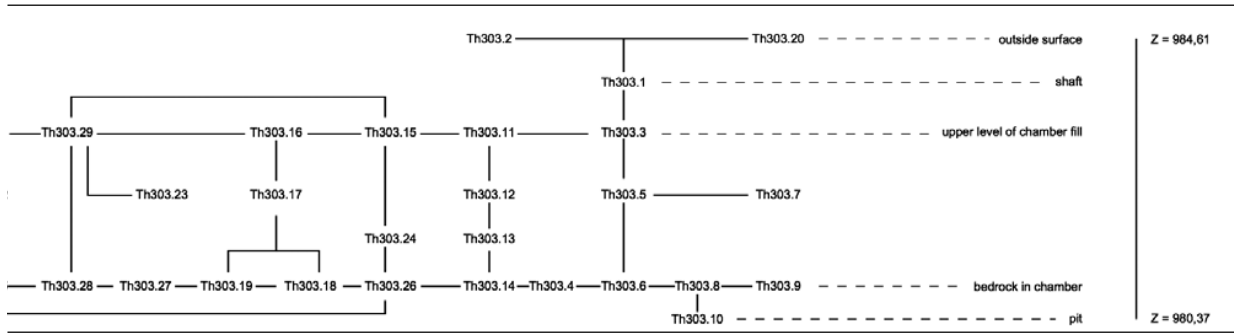
The funerary occupation, represented by a great many human bones on the floor of the chamber (Th303.18, 19, 25, 27, 28, 39, 42, 45, 46, 54, 57 and 59-65), had been severely disturbed in antiquity. Most of the bones were mixed up and piled together in the north-west corner of the chamber (**Fig. 5**: Th303.57-65; **Fig. 13**: area A). There may be several explanations for these disturbances: the need to clear some space on the floor of the chamber in which to lay a new corpse, clearing space in order to re-occupy the chamber, a robbery contemporary with use of the tomb or one that occurred soon after it was abandoned. According to the stratigraphy and pottery, the most recent funerary activities in the vault took place in the 2nd century AD and the most recent signs of disturbance appear to date from soon after. The bones from the burials on the floor of the chamber were piled up in no apparent order and any valuable ob-



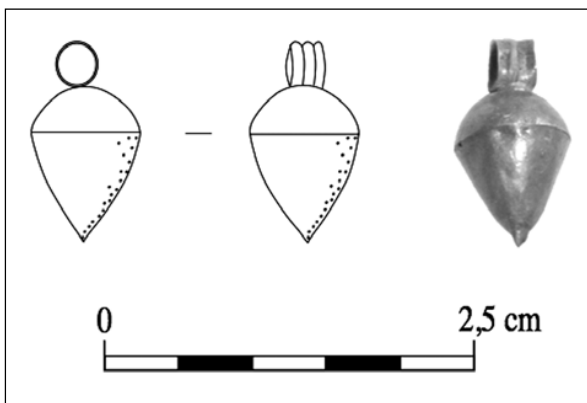
7. Section showing accumulation of fine horizontal sedimentary layers resulting from alternating floods and dry periods (I. Sachet).



8. Figurine representing the god Bes (drawing M. Zambello).



9. Early Islamic lamp (drawing M. Zambello).



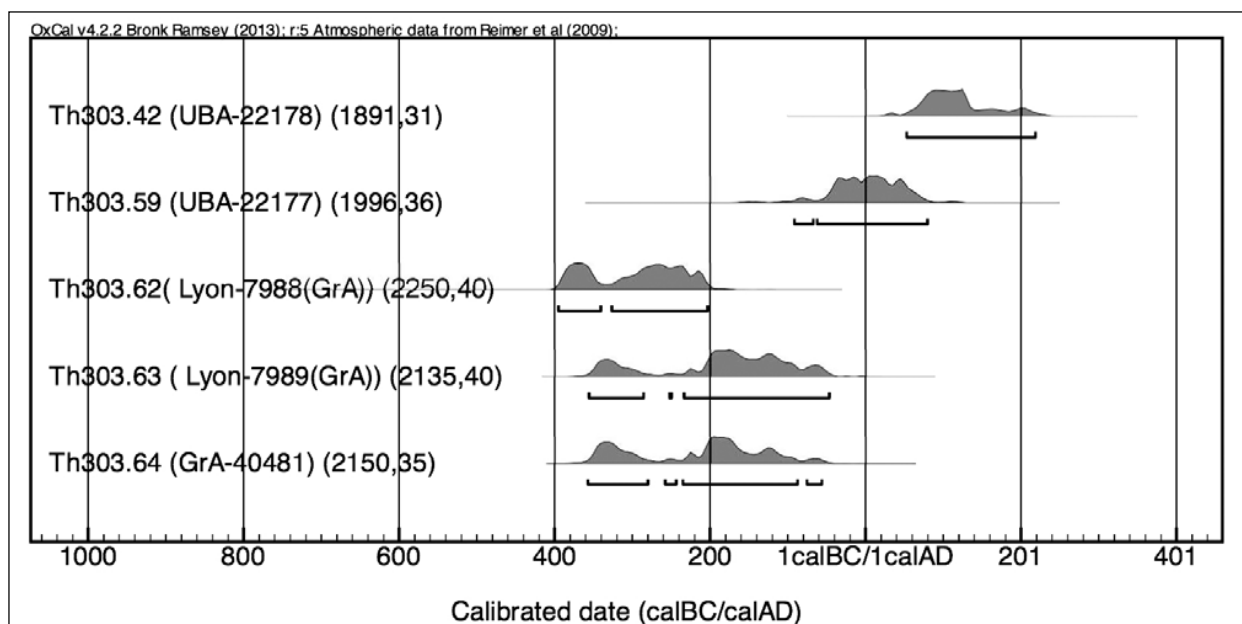
10. Gold pendant (I. Sachet).

jects had been taken. Nevertheless, a few small items escaped the attention of the robbers: a gold pendant (**Fig. 10**), some small bronze bells and some small emerald, amethyst and chalcidony beads (**Fig. 11**; Gueli *et al.* 2010). The extent of the fragmentation of sherds and bones would indicate that this was not the first time the inside of the tomb had been disturbed. The ceramic and archaeozoological studies reveal an initial clearing of the chamber floor during the Nabataean period.

The dating of the archaeological material in tomb 303, confirmed by radiocarbon analyses, provides additional information relating to the chronology of the early periods in Petra. In Th303.62, 63 and 64, a human bone and two pieces of charcoal were dated to between 2,135 and 2,250 BP \pm 40, while two seeds from Th303.42 and 59 were dated to around 1,900 BP \pm 35 (**Fig. 12**). The calibrated dates allow a distinction to be made between two succeeding periods, the first in the 4th to 2nd centuries BC and the second in the 1st century BC to the 3rd century AD. The radiocarbon dates, therefore, confirm two main phases of occupation of the tomb, which might be one to three centuries apart. These two phases were already suspected when the finds were being studied but were not clearly identified because of the stratigraphic disturbances caused by the numerous disturbances of the tomb. Taken together, the finds and radiocarbon analyses slightly reduce the chronological gap obtained by C¹⁴ dating alone and thus establish a first phase of occupation of the tomb in the 3rd to 2nd centuries BC, known as the 'Hellenistic-Nabataean' phase, and a second phase from the 1st century BC to the 2nd century AD, known as the 'classic Nabataean' phase.



11. Group of small beads of precious and semi-precious stones (emerald; chalcedony; amethyst; glass).



12. Summary of radiometric dating (J.-Cl. Lefèvre, Centre de Datation par le Radiocarbène, UMR 5138).

The construction of tower tomb 303 at ath-Thughrah is of necessity contemporary with or earlier than the oldest finds, and the carving of the complex therefore goes back at least to the 3rd century BC. Such an early date was indicated

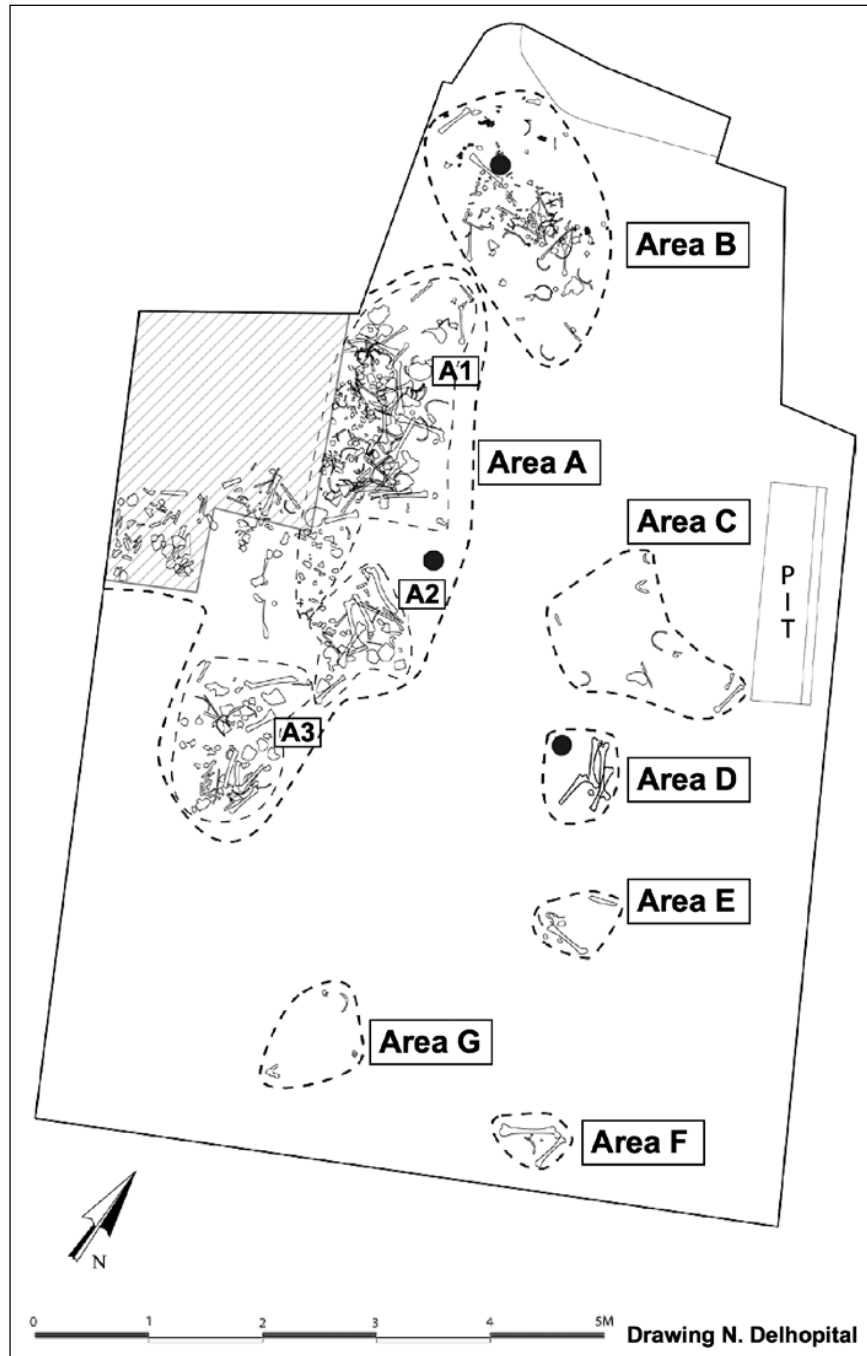
by the architectural studies, but previous dating of the tombs in Petra did not support it. Therefore, tomb Th303 is currently the earliest known tomb in Petra, built during the site's Hellenistic phase.

B. Archaeo-anthropology (N. Delhopital)

The funerary chamber Th303 was intended for the inhumation of multiple bodies; the bones of at least sixty individuals, both adult and immature, were found there. The disturbance and fragmentation of the bones has limited interpretation, but nevertheless the bones from ath-Thughrah constitute one of the largest collections from the Nabataean period.

Distribution of the bones (Fig. 13)

Most of the bones were piled up in the north-west corner of the tomb (area A), in the tomb entrance (area B) and scattered around the pit (area C); a small quantity were in the back of the tomb on the floor of the chamber (areas D, E, F and G). Virtually all the bones were disarticulated. Only two articulations were found: a skull with the first two cervical vertebrae, and three carpal

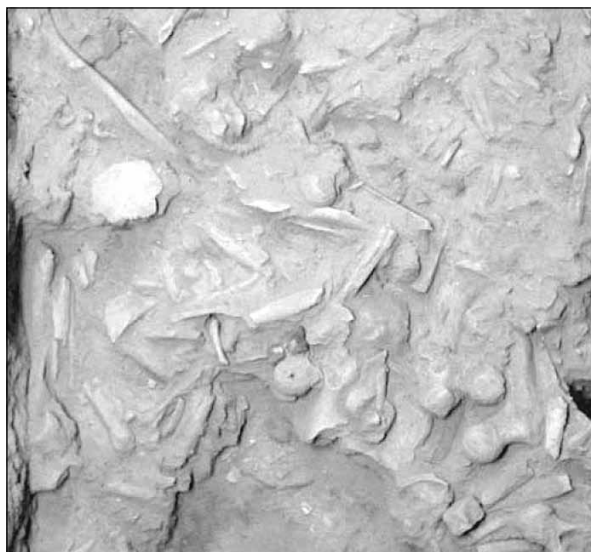


13. Plan of the tomb showing the different areas in which bones were found (area A: Th303.26, 42, 52, 54-55 and 57-65; area B: Th303.9; area C: Th303.14; area D: Th303.19; area E: Th303.28; area F: Th303.28; area G: Th303.45; la fosse: Th303.8) (N. Delhopital).

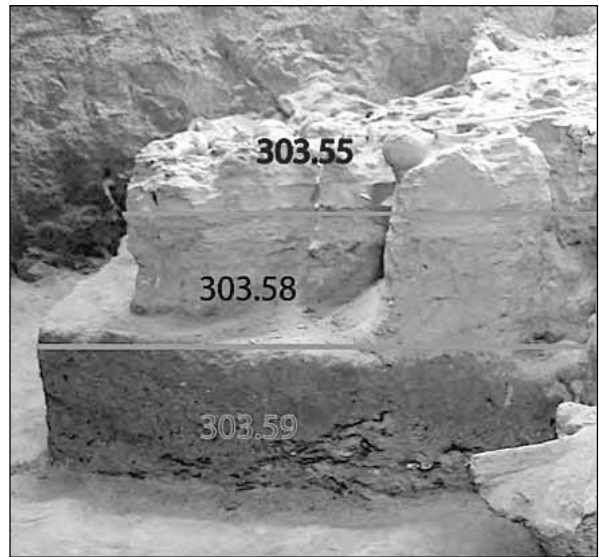
bones. The mixing of bones is no doubt due to the reuse of the tomb and its looting in antiquity.

The majority of human bones were found in area A. They represent the remains of fifty-five individuals, spread across a small area of about 2 × 3 m. Three groups were distinguished: A1, A2 and A3; the bones lay on the floor of the chamber. The other bones in area A were piled up against the north-west corner of the tomb, up to a height of 40 to 50 cm (Fig. 14). At the bottom of the deposit of bones in area A (Th303.57 and 59), a distinct level was noted, consisting of brown sediment containing very fragile bones of the same colour (Fig. 15). This colouring might be explained, as at Khirbat adh-Dharih (Lenoble *et al.* 2001), by the decomposition of coffins or shrouds that would have changed the colour of the bones. Area A3 is particularly interesting. On the floor of the chamber, several bones of the same type, left and right, were quite close to each other. Several bones are pathological, suggesting that they might belong to a single individual whose burial was disturbed.

In area B (Th303.9), a total of 164 bones, mostly upper limbs, belonged to a minimum of four individuals, two adults and two children. The pit (Th303.8) had been emptied of its contents and only two teeth were found in it. Near the pit, in area C (Th303.14), there were about a dozen bones. It is possible that these bones came from the pit and belonged to a single individual, but this remains difficult to determine. In



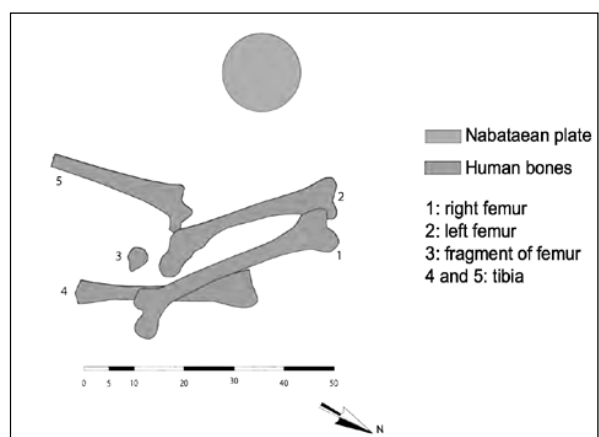
14. Detail of heavily fragmented bones from area A, Th303.55 (N. Delhopital).



15. Field photograph showing Th303.55 and 58-59 in section (N. Delhopital).

area D (Th303.19), five bones were found, a left and a right femur and two tibias; they perhaps represent the lower limbs of a single individual (Fig. 16). A complete Nabataean plate was laying next to these bones. Area D might thus be the burial of an individual with an associated funerary offering, the remains of which have been dispersed. In areas E, F and G, about twenty bones were found.

It is difficult to determine if the different areas A, B, C, D, E, F and G represent the same use of the chamber. Originally, the bones in area A could have come from burials placed on the floor of the chamber which might then have been pushed aside to the north-west corner for the reuse of the tomb. The use of area B is more



16. Human bones and a Nabataean plate found on the floor in area D, Th303.19 (N. Delhopital).

difficult to define: it might represent bones from the same origin as those in area A but which were not pushed aside as methodically into the north-west corner, or else it might represent a different use to that of area A, for example, a later burial phase.

Finally, the type of deposit, the presence of small anatomical elements such as carpal bones, and the two sets of articulated bones point to primary burials (Duday 2005). It is impossible to say whether there were any secondary burials. In any case, the chronological diversity of the archaeological material demonstrates that tomb 303 was used for multiple burials, with inhumations staggered over time.

Results of the physical anthropological studies

The estimated minimum number of individuals in tomb 303 is 60, with 51 adults including five males and six females, and nine immature individuals. Thus, the burials in the tomb do not seem to have been selected according to sex, though this interpretation is based on the sex determination of only 11 of the 51 adults.

All the bones from immature individuals come from area A, with the exception of at least two individuals found in area B. The lack of immature individuals, notably in the age range 0 to 1–4 years, probably indicates a certain selection of buried individuals. Indeed, it is common that young children are the object of different funerary practices and are buried in a different location. The lack of immature individuals noted in the age class 15–19 years could, in contrast, be explained by the poor preservation of bones in Th303, which makes the determination of bone maturity more difficult and leads to grouping together within the adult sample.

The size of the adults in Th303 varies from 1.49 m (± 4.83 cm) to 1.80 m (± 5 cm). This extensive variation in size of the individuals in the tomb is noteworthy. Such variation has already been noted in other Nabataean cemeteries, at Khirbat adh-Dharrah and in other tombs in Petra (Perry 1998; Bikai and Perry 2001; Perry 2002). Nevertheless, the results from Th303 are limited by the poor preservation of the bones and disturbances in the tomb. Indeed, the sample used to estimate size consists of only 14 adults and it was not possible to relate the size of the individuals to their sex.

Palaeopathology

Caries amongst the individuals buried in the tomb are few, at 2.47% (13 teeth out of 527). Amongst the teeth examined, 16.3% present linear hypoplasias of the enamel, that is a stoppage in the growth of the enamel following an episode of non-specific stress. Their position on the dental crowns shows that the episode occurred between 2 and 6 years of age.

Concerning disease of the skeleton, the adult individuals in the tomb are mainly affected by pathologies of the articulations, perhaps linked to age or to particular repetitive and difficult activities. Four consolidated fractures and some periostitis were recorded. The etiology of these traumas is difficult to pin-point but they are not surprising in Petra, with its rocky environment where accidental falls can occur and result in various fractures.

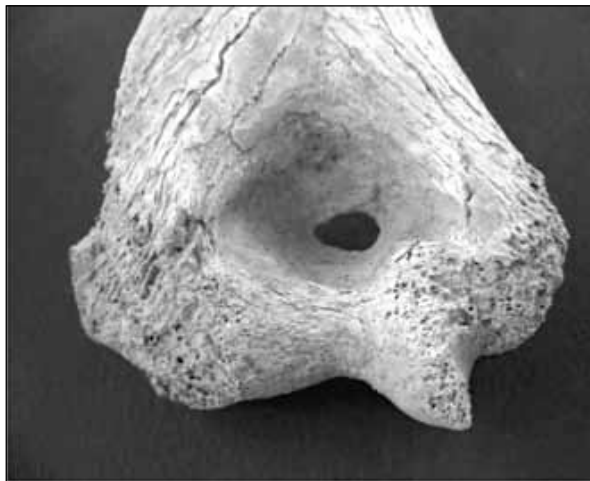
At least two individuals in Th303 were handicapped: one had limited manual activity following the deformation of one or both arms (area A3) and the other had limited mobility (area D). In area A3, several bones that were close together, though not articulated, and presenting similar pathology suggest that the bones belonged to a single individual. In addition, these bones were not mixed with the other bones in area A. Was the individual, affected by a handicapping pathology, buried apart from the others, or alternatively is this burial later than the others in area A? It should be noted that the two individuals in area A and area B lived to become adults despite their handicaps and that they were buried in the same tomb as the other individuals. These two points thus bear witness to a certain solidarity amongst the group.

Discrete traits

Discrete traits allow family groups to be identified (Crubézy and Sellier 1990b) and are good population markers for relatedness (Ossenberg 1976). In Th303, two discrete traits were recurrent: a notch on the patella is present in at least 16 individuals (**Fig. 17**), while at least ten individuals have a perforation of the olecranon of the humerus (**Fig. 18**). These two traits would thus be good population markers for individuals found in tomb Th303, indicating that the deceased would have enjoyed the same environment during their lifetimes.



17. Notch in patella (N. Delhopital).

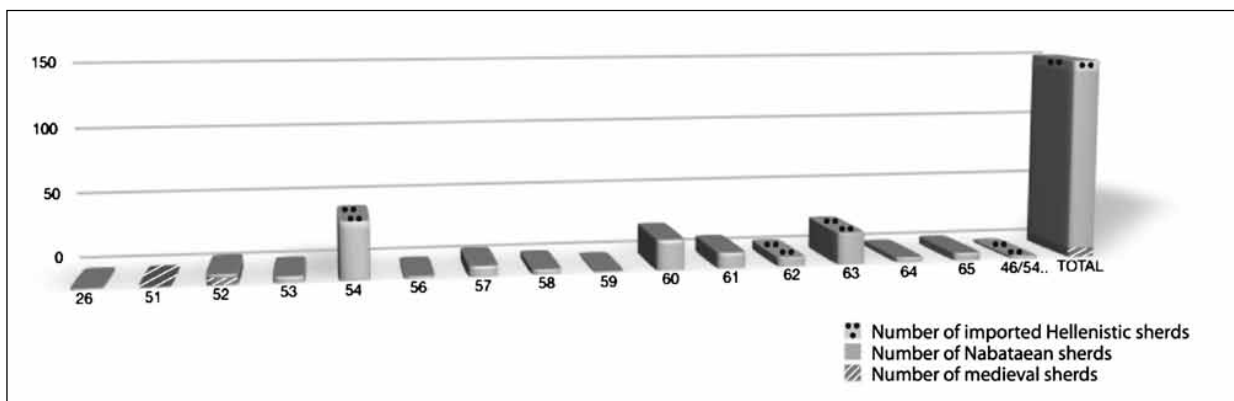


18. Perforation of the olecranon on a distal humerus epiphysis (Th303.42); posterior view (N. Delhopital).

C. The pottery (I. Sachet)

Several hundred sherds were recovered in the excavation of tomb Th303, the majority being found either outside the chamber (Th303.1-2 and 20; **Fig. 5**), or in the access shaft to the chamber (Th303.3, 5, 7 and 9) and in a corridor recently created by looters (Th303.4, 6, 8 and 10-11). Whether or not the sherds were linked to activities that occurred inside the burial chamber depends on their location when they were excavated. Pottery found at the entrance to the chamber could simply have fallen down the shaft when it was still open. In addition, near the pit and in the area close to the looting, there were a few mediaeval sherds (Th303.12, 14 and 16)². Given the wide extent of the corpus, the pottery was divided into two groups: (1) sherds which may not originally have been present inside the chamber and (2) sherds that were closely linked to the burial levels in the tomb. Only the second group is described here. It comprises 151 sherds associated with stratigraphic units in which human bones were found (Th303.26 and 51-65), in other words, from the earliest archaeological levels in chamber Th303 (**Fig. 19**).

Within this corpus of pottery, which came mainly from the north-west corner of the chamber (area A; **Fig. 13**), seven mediaeval sherds were found in the upper layers (Th303.51-52), above the pile of bones representing ancient funerary activities. These bear witness to a superficial occupation in mediaeval times when the chamber may have been used as a hiding place or temporary shelter. The earlier levels were not disturbed and no mediaeval sherds were found in the deeper levels.



19. Number of sherds by category (imported Hellenistic, Nabataean, mediaeval) in the funerary stratigraphic units in chamber 303 (I. Sachet).

2. For the pottery of Islamic period see the article of M.

Sinibaldi in this *ADAJ* volume (Sinibaldi 2013).

Chronological typology

In the earlier levels (Th303.62-64), dated radiometrically to the 4th - 1st centuries BC (**Fig. 12**), the pottery is very fragmented and difficult to recognise. Macroscopic study of the fabrics nevertheless enabled a few sherds of imported Hellenistic pottery to be identified. These characteristic sherds, notably the base of an *unguentarium* (**Fig. 20: 13**), were found only in the stratigraphic units lying on the bedrock floor of the chamber, at the bottom of the pile of bones (Th303.54 and 62-63). They were mixed with pottery from Petra from the 1st centuries BC / AD, which bear witness to some major disturbance of the tomb and its reuse at that time. Evidence from the first occupation of the tomb is extremely tenuous and seems to have been largely wiped out by the second funerary occupation in the 1st centuries BC / AD.

By the mid-1st century AD, workshops in Petra were producing large quantities of pottery and so there was no longer any need to import it. Therefore, apart from the earlier periods it is rare to find imported pottery at the site. The Petra workshops produced both fine and common wares. The fine painted wares, studied by Schmid (2000), provide a reliable dating tool, particularly for the 1st century AD. In tomb Th303, the painted pottery belongs only to Schmid phases 2a to 3a, that is between 50 BC and 70 / 80 AD. No painted sherds later than this have been found either inside or outside the tomb.

Unpainted pottery does not offer such precise dating as painted pottery. The Hellenistic-type bowls, some of which are probably imported, are dated to the 2nd - 1st centuries BC (**Fig. 20: 7-10**), perhaps even to the 3rd century BC. Otherwise, the corpus is essentially made up of Nabataean productions, dated mainly to the late 1st century BC and the 1st century AD. Three complete vessels were found set on the floor of the chamber: two plates and one cooking pot (**Fig. 20: 1-2**). The two plates are dated to between the mid-1st century BC and the late 1st century AD. The cooking pot, found near the

entrance to the tomb is dated to the first half of the 2nd century AD³. Thus, according to the pottery analysis, the peak of activity in tomb Th303 was between the mid-1st century BC and the last quarter of the 1st century AD. It seems likely that the tomb was subsequently abandoned, then perhaps reused briefly or looted in the 2nd century AD or shortly thereafter.

Discussion

Owing to the many disturbances in the tomb, the original location of the pottery vessels inside the chamber is difficult to determine. However, all the sherds are closely linked with the stratigraphic units which contained the remains of the burials: when the bones were pushed aside into the north-west corner of the chamber, the pieces of pottery were swept aside with the rest of the material. In area D, where the bones are best preserved, a Nabataean plate had been placed next to the legs of the deceased (**Fig. 16**). These remains show that the vessels were most probably placed next to the burials, on the floor of the tomb. In ancient burials, one or several vases were often placed close to the legs or head of the body.

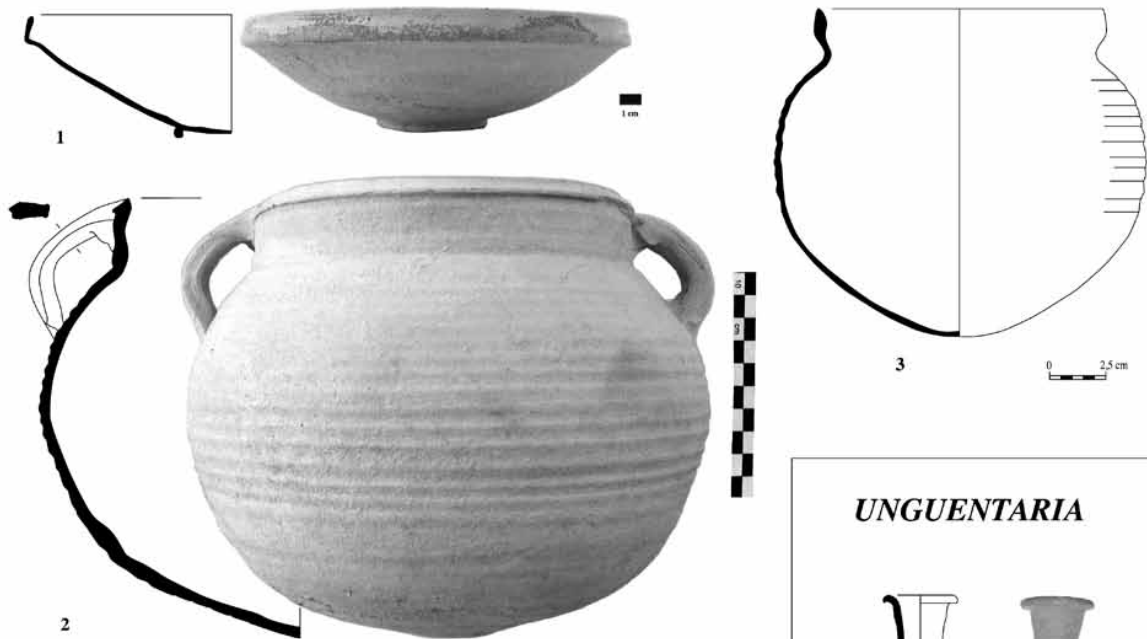
Tomb Th303 did not contain any new types: the funerary vessels are the same as the domestic ones. Thus, there appears to have been no pottery production that was, strictly speaking, dedicated to tombs or kept for funerary use. No analysis has been carried out to determine what the vessels found in the tomb might have contained, or even if they contained food. However, it seems likely that the pitchers contained liquids, while the plates were used for solid food and the *unguentaria* for perfumes or oils. If these vessels were deposited empty, at the very least they had symbolic value. The range of pottery forms found inside the tomb is interesting. Excluding the upper levels containing the mediaeval material (Th303.51-52), the closed pottery corpus came mainly from area A (**Fig. 19**) and produced a group of 94 sherds (after gluing), that fall into the following categories:

Cooking pot	Plate	Bowl	Pitcher	Goblet	Unguentarium	Indet.	TOTAL
12	14	17	7	1	23	20	94
12.8%	14.9%	18.1%	7.4%	1.1%	24.4%	21.3%	100%

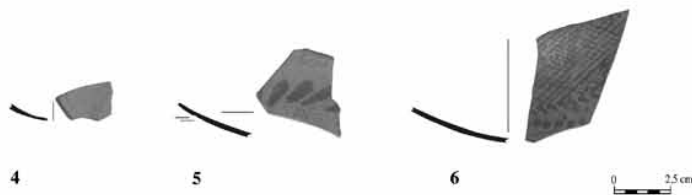
3. Our thanks to yvonne gerber for her help in dating cooking pots 2 and 3 (fig. 20). Her interpretation con-

tributed to establishing the chronology of the end of the funerary occupation in th303.

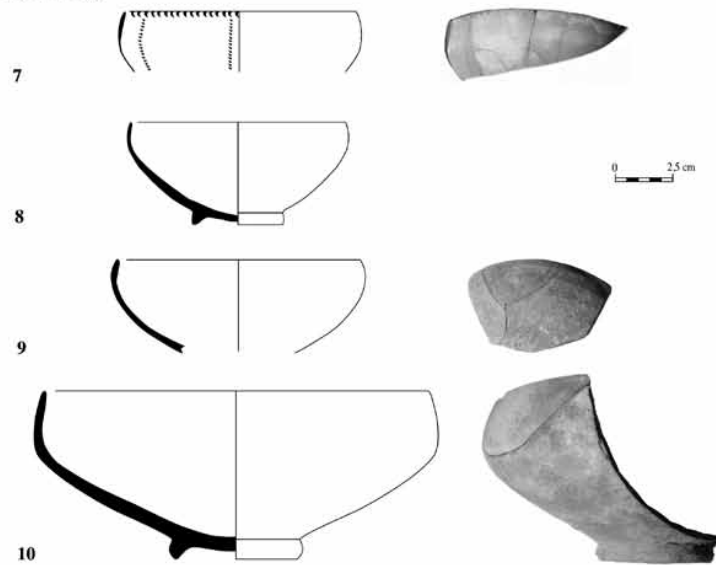
COMMON PLATES AND COOKING POTS



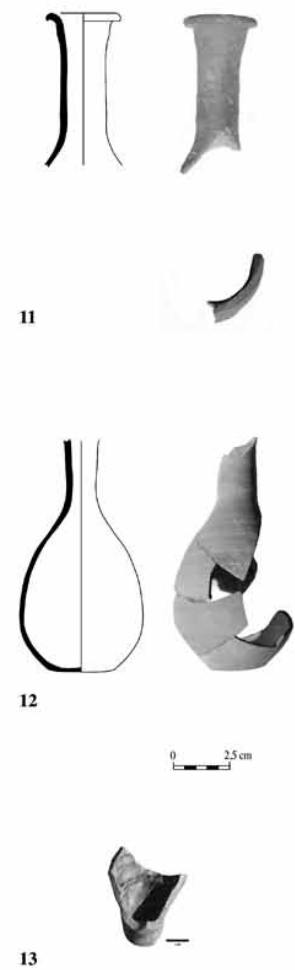
NABATAEAN PLATES



BOWLS



UNGUENTARIA



20. Pottery from tomb Th303, ath-Thughrah, Petra (drawn by I. Sachet).

1. Unpainted Nabataean plate. US 303.19. Pink fabric, quartz inclusions. Schmid group 6, phase 3b, 70-100 AD. (Schmid 2000, Abb. 49).
2. Nabataean cooking pot. US 303.9. Pink fabric, beige exterior surface. 2nd century AD. (Gerber 1997: fig. 7; Gerber 1994: fig. 16; Villeneuve 1990: pl. VI.1.2).
3. Nabataean cooking pot. US 303.54. Orange fabric, black inclusions, specks of lime. Second half of 1st century AD (Gerber 1997: 409, fig. 5, 6; F, G, I).
4. Painted Nabataean plate (or bowl). US 303.20. Decorated with rays of dotted lines. Perhaps a ring base. Schmid phase 2a-b, 50 BC-0. (Schmid 2000: Abb. 394-395).
5. Painted Nabataean plate. US 303.20. Vegetal decoration. Schmid phase 3a, 20-80 AD. (Schmid 2000, Abb. 199-200).
6. Painted Nabataean plate. US 303.20. Criss-cross and dot decoration. Base. Schmid phase 3a, 20-80 AD. (Schmid 2000, Taf. 2.4).
7. Painted Nabataean bowl, US 303.54. Decoration Schmid phase 2a-b, 50 BC-0. (Schmid 2000, Abb. 394-395).
8. Nabataean bowl. US 303.60. Schmid phase 1, 150-50 BC. (Schmid 2000, Abb. 41).
9. Hellenistic-type bowl. Imported? US 303.54. Fine orange fabric, red slip. Schmid unpainted forms, group 2, phase 1, 150-50 BC. (Schmid 2000, Abb. 19).
10. Hellenistic-type bowl. Imported. US 303.59. Pink fabric, voids, white specks. Traces of burning on the exterior and ash on the interior. Schmid, unpainted forms, related to group 5, phase 1, 150-50 BC. (Schmid 2000, Abb. 97).
11. Nabataean unguentarium. US 303.60. Pink fabric, a few inclusions. 1st century BC - early 1st century AD. (Johnson 1990, group I; Schmid 2000, fig. 316).
12. Nabataean unguentarium. US 303.54. Pink fabric, fine. 1st century AD (Johnson 1990, group II).
13. Unguentarium. US 303.63. Imported. Base. Beige fabric, brown slip inside. Probably before the 1st century BC.

The sherds from tomb 303 belong to three main families: vessels intended to hold perfume (*unguentaria*: 24.4%), those intended for liquids (pitchers, goblets and bowls: 26.6%) and those intended for solid foods (cooking pots and plates: 27.7%). Surprisingly, the main pottery categories are found in equal proportions in the tomb: about \square for drinking, \square for eating and \square for perfuming, the last quarter consisting of indeterminate forms. This range bears witness, firstly, to variety within the deposits but perhaps also to a particular intention for the types of offerings. The variety of the corpus and its composition suggest that very careful attention was paid to the dead. The pottery assemblage of tomb Th303 establishes the undertaking of specific rituals by the living, perhaps in order to feed, refresh and anoint the dead, or perhaps as ministrations intended to satisfy the gods. But the exact purpose of these funerary practices and how they functioned is difficult to determine. Outside Nabataea, food offerings are known from ancient texts and confirmed by archaeology, notably by the presence of vessels inside tombs (Toynbee 1971: 51 ss.; Cartron 2012: 178-186). However, it is not possible to transfer the eschatological thoughts from this or that population to that of Petra. Nevertheless, the study of the pottery from tomb Th303 attests to a community with rituals and practices that were current during the Hellenistic and Roman periods around the Mediterranean and to the care given the dead.

D. Archaeozoology (Carine Tomé Carpentier)

The faunal material from tomb Th303 was studied after the excavation, during a study season in Petra in May 2007. A more detailed analysis based on the inventory and preliminary field plans was then carried out at CEPAM the following September. In spite of the reasonable condition of the remains, several factors often made identification difficult: long bones of large mammals were heavily fragmented, bones were often vermiculated, the presence of very young individuals (foetuses) and reference material for the wild species was not available.

Taxonomic analysis

From a total of 8,526 specimens, only 22.1% could be identified to species level (**Fig. 21**). Nevertheless, it was possible to determine most of the remaining fragments to genus, family, order or class, thus providing important information.

The ovicaprids are the best represented species, with a total of 42% of the NR and 27.7% of the MNI, the majority being goats. Dogs and rock hyrax are also well-represented. Larger mammals, such as camels, are clearly under-represented because of the heavy fragmentation of their bones. Systematic sieving allowed the collection of many fragments of small animals (toads; jirds; snails; snakes; lizards; birds), as well as some foetal bones.

Analysis of the stratigraphic and spatial distribution of the taxa (**Fig. 22**) shows that the

Taxons (common names)	Taxa (scientific names)	NR	% NR	MNI	% MNI
Dromadary	<i>Camelus dromedarius</i>	98	1,1	2	0,9
Equid	<i>Equus</i> sp.	3	0,03	1	0,5
Large mammals	<i>Camelus / Equus</i>	287	3,4		
Sheep/Goat	<i>Caprinae</i>	3324	38,9	36	17,1
Goat	<i>Capra hircus</i>	258	3	14	6,7
Sheep	<i>Ovis aries</i>	6	0,07	4	1,9
Dog	<i>Canis familiaris</i>	91	1,1	11	5,2
Medium mammals	<i>Capra / Ovis / Canis</i>	1349	15,8		
Rock hyrax	<i>Procavia capensis</i>	394	4,6	4	1,9
Hare	<i>Lepus</i> sp.	2	0,02	1	0,5
Jird	<i>Meriones</i> sp.	70	0,8	22	10,5
Mouse	<i>Eliomys</i> sp.	1	0,01	1	0,5
Rodents	<i>Rodentia</i>	698	8,2		
Small Carnivore	<i>Carnivora</i>	4	0,05	1	0,5
Indeterminate mammals	<i>Mammalia</i>	58	0,7		
Chicken	<i>Gallus gallus</i>	2	0,02	1	0,5
Rails	<i>Rallidae</i>	47	0,5	1	0,5
Indeterminate birds	<i>Aves</i>	28	0,3	4	1,9
Green toad	<i>Bufo viridis</i>	978	11,5	61	29
Snakes	<i>Serpentes</i>	537	6,3	4	1,9
Lizards (Agamids)	<i>Agamidae</i>	29	0,3	2	0,9
Lizards (Lacertids)	<i>Lacertidae</i>	79	0,9	8	3,8
Indeterminate lizards	<i>Sauria</i>	5	0,05		
Marine bivalve	<i>Bivalvia</i>	1	0,01	1	0,5
Land snail (Helicids)	<i>Levantina spiriplana hierosolyma</i> (Mousson, 1854)	44	0,5	12	5,7
Land snail (Buliminids)	<i>Buliminus labrosus labrosus</i> (Olivier, 1804)	17	0,2	13	6,2
Land snail	<i>Gastropoda</i>	6	0,07	4	1,9
Milkweed bug	<i>Lygaeus pandurus</i>	1	0,01	1	0,5
Insects	<i>Insecta</i>	2	0,02	1	0,5
Indeterminate		107	1,2		
Total number of remains		8526		210	

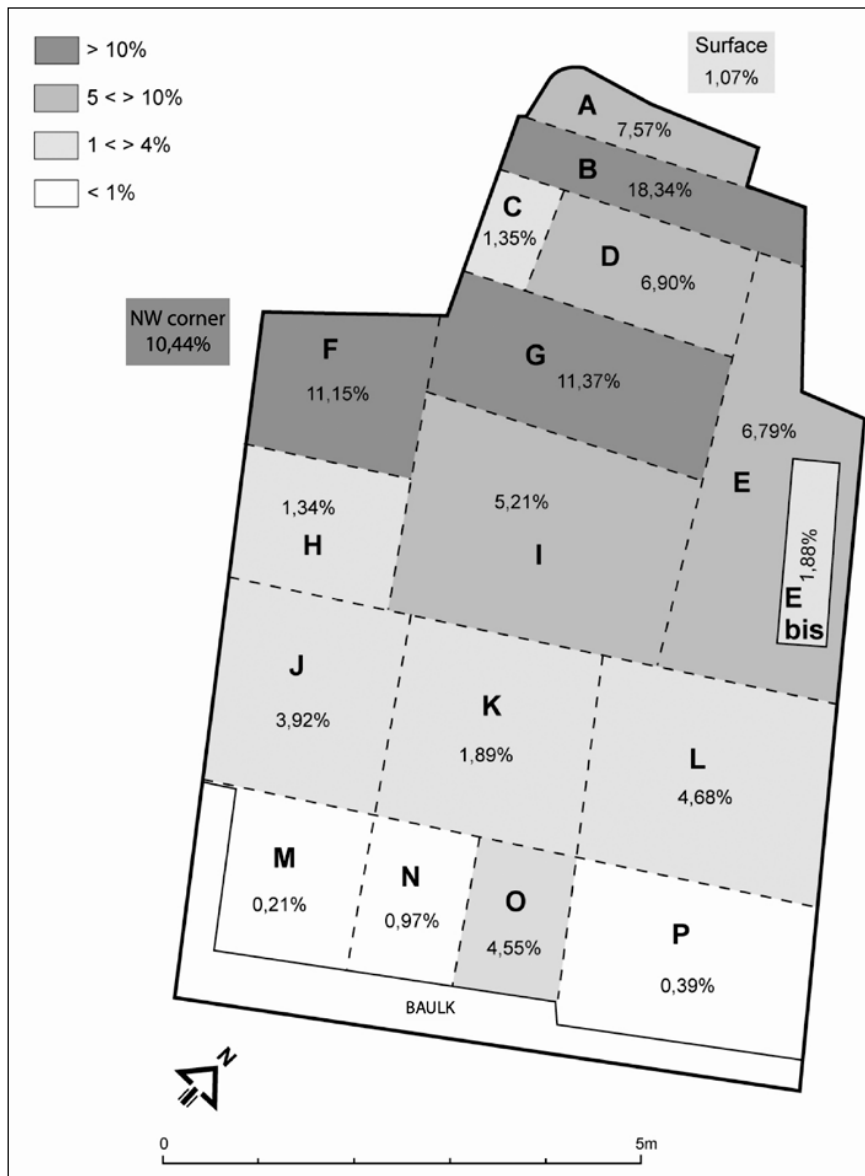
21. Faunal remains from tomb Th303: Number of Remains (NR) and Minimum Number of Individuals (MNI) (C. Tomé Carpentier).

tomb was used as a dump on two occasions. The first - located between the two burial spots - is represented by the remains of goats and dogs 'swept aside' with the microfauna and human bones into the north-west corner of the chamber. The second - after the tomb was abandoned - is represented by the dumping of camel and ovi-caprid bones. It also shows that the intrusion of small wild animals occurred preferentially between the two phases of funerary activity (the tomb was not sealed) and that rock hyrax fell into the chamber after it was abandoned.

Domesticated animals

The surfaces of the large mammal bones are

badly damaged and display traces of vermiculation. The position of the remains at and near the entrance to the chamber might explain this poor state of preservation through exposure to the elements, unless they were thrown into the tomb after having been outside on the ground surface for some time. A large part of the remains can be attributed to the dromedary and consist of isolated teeth, caudal vertebrae, parts of the feet (carpal and tarsal bones; phalanges) and long bones that are too fractured to be identified. There is a minimum of two individuals, an adult and a younger animal. Three fragments can be attributed to an indeterminate equid: the proximal half of a second metacarpal, a large sesa-



22. General distribution of faunal remains by area (% NR) (C. Tomé Carpentier, after site plan by P. Duboeuf, I. Sachet and N. Delhopital).

moid and a talus. Two pathologies were noted: (1) poor resorption of a fracture on a rib and (2) a morphological anomaly on the distal epiphysis of a metapodial.

The 287 remains attributable to the genus *Capra* belong to a minimum of 14 individuals of various ages (from 3 months to 4 or more years), of which four are female. Calculation of the withers height of the goats (after von den Driesch and Boessneck 1974) on the basis of a humerus (9 months old), a metacarpal and a metatarsal (>18 months) gives us 52, 62 and 69 cm. Only six fragments display sheep-like characteristics, representing at least four individuals aged between one and 20 months; this taxon is

quite likely to have been present in the rocky environment of Petra. To the four sheep and 14 goats can be added a further 36 indeterminate ovicaprids, of which 30 are foetuses. All anatomical parts are well-represented, suggesting that the individuals were probably complete at the time of their deposition. One fragment of a medial phalanx is burned and eight bones show cut marks typical of disarticulation. Only eight pathologies were noted, *viz.* periodontal disease, consolidation of fractures and (?) arthritis.

The spectrum of domestic species is completed by 91 fragments of dog, belonging to a minimum of 11 individuals (one of which is male): three individuals of <6 months, one individual of

>6 months and 7 foetuses. The best represented anatomical parts are the skull, anterior limb and foot. The presence of these dog remains scattered all over the chamber is difficult to explain.

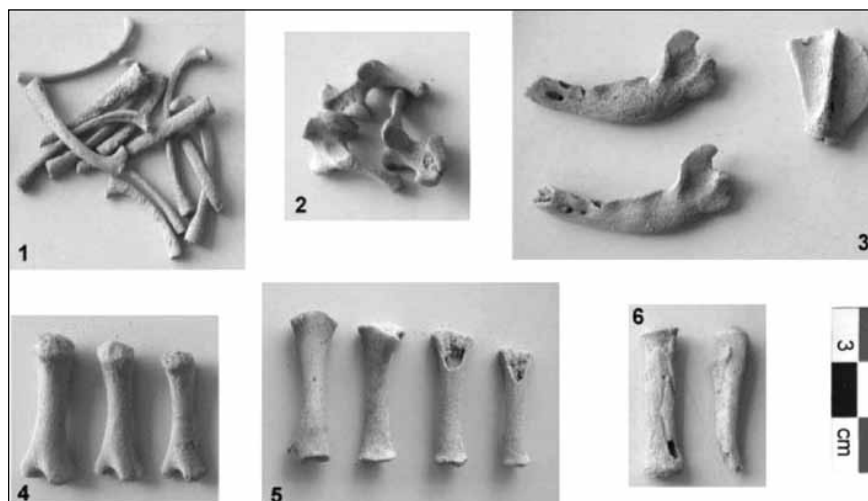
A minimum number of 30 ovicaprid and seven dog foetuses does not simply suggest the presence of pregnant females at the site, but rather the premeditated placing of the foetuses in the chamber (**Fig. 23**). The length of the long bone diaphyses allowed us to demonstrate the presence of ovicaprid foetuses from 80 - 90 days of gestation up to birth. Thus, the atypical number of foetuses in this context could perhaps be explained by the spread, in one or several herds, of an infection such as abortive chlamydophilosis, a disease common amongst small ruminants and which can also affect dogs living in close contact with infected herds. This disease colonises in the placenta from the 60th day, but the

pathological consequences of this colonisation only become visible after around 90 days.

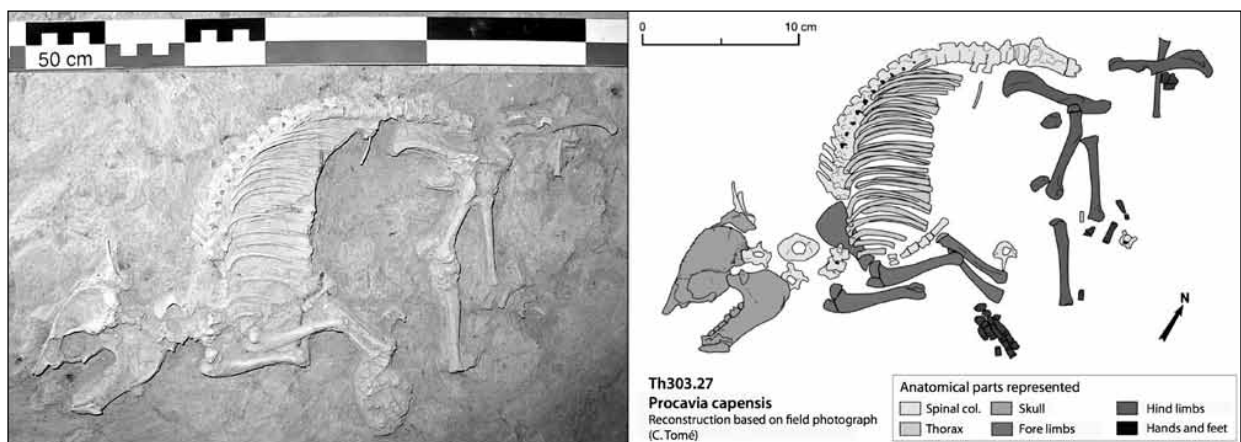
Finally, it should be noted that one fragment each of a sternum and right femur of domestic fowl (*Gallus gallus*) were found.

Wild animals

The rock hyrax (*Procavia capensis*), a species which is today on the road to extinction in the Petra region, must have been widespread in the Nabataean and Roman periods. The 394 remains come mainly from two well-preserved skeletons found *in situ* (**Fig. 24**) in Th303.18 and 27. The other remains come from two incomplete individuals scattered at the back of the chamber. Though their presence seems natural, these two articulated skeletons nonetheless show some striking similarities: they are fairly close to one another spatially (area L), they are



23. Remains of ovicaprid and dog foetuses (C. Tomé Carpentier): (1) Caprinae ribs, Th303.39; (2) Caprinae vertebra fragments, Th303.39; (3) two left *Canis* mandibles and one right *Canis* scapula, Th303.39; (4) three left Caprinae humeri, Th303.39; (5) one left Caprinae femur and three left Caprinae tibiae, Th303.37; (6) one left *Canis* radius and one left *Canis* ulna, Th303.39.



24. Incomplete skeleton of rock hyrax (*Procavia capensis*) from Th303.27 (modified field photo by I. Sachet and drawing by C. Tomé Carpentier).

both lying on their right side and in an almost identical posture (anterior and posterior limbs touching), their skulls are fractured and they are young individuals. They were positioned with their heads to the west, with a gap in the orientation of the two individuals of about 80°. The perfect preservation of their skeletons and absence of any man-made marks nevertheless suggest a natural death.

Hare is represented by only two lumbar vertebrae belonging to an adult individual.

Small rodent remains are numerous (NR = 769) and were mainly found in area F, the 'north-west corner', and in area D. All anatomical elements are present but species determination was carried out only on the teeth. Thus a mouse was identified (mandible with the natural perforation in the inferior process characteristic of the genus *Eliomys*) and a minimum of 22 jirds, based on left mandibles. Although it was not possible to identify the remaining 698 rodent fragments owing to the absence of a comparative collection, one can nonetheless suggest that they belong mainly to jird, an animal that lives in a dry environment and which is still present in Petra, represented by the species *Meriones crassus* (Ruben 2006: 162).

In the absence of reference material, the identification of the bird bones was similarly difficult. Of the 28 indeterminate fragments, there is a minimum of two immature and two adult individuals. An almost complete skeleton allowed the identification of a rail (family Rallidae), the presence of which suggests that there was probably some standing water near the site since this taxon usually frequents ponds, lakes and shallow bays with dense vegetation, as well as open water.

The second most represented animal on the site, with 978 remains, is another species typical of humid environments, the green toad (*Bufo viridis*). A minimum of 61 individuals were identified as follows (Bailon 1999): 34 adults (25 females; 14 males) and 27 immature (ten females; one male). This toad, the most common in Jordan, is the only one found today at Petra (Ruben 2006: 100). All its anatomical parts are represented.

The 537 snake remains could not be identified to species in the absence of reference material for the numerous species present in Petra.

The number of remains is large, but is over-represented because of the many ribs and vertebrae present in any one individual. A few cranial fragments (teeth) confirms the presence of a minimum of four snakes.

Remains of lizards are less frequent (NR = 113) and clearly belong to two families with several species found in Petra today, viz. Agamidae and Lacertidae.

Sixty-eight snail remains were recorded. The two main species noted are terrestrial gastropods: *Levantina spiriplana hierosolyma* (Helicidae) and *Buliminus labrosus labrosus* (Buliminidae). The presence of snails in the chamber once again confirms the existence of a humid environment. A single indeterminate marine bivalve was noted on the surface.

Of the remains of three insects, only one was in perfect condition and could be identified to species level: milkweed bug, *Lygaeus pandurus*, which is common in Petra and easily recognised by its black and red colouring.

Interpretation of results

The spectrum of wild species, consisting of animals that are basically the same as those that still inhabit the Petra area, sheds light on the immediate environment of the tomb.

Based on observations made during the course of the excavation, it would seem that the faunal remains are not contemporary with the funerary activities (they do not lie directly on the floor of the chamber) and that some animals found themselves trapped in the chamber after it was abandoned. The archaeozoological analyses partly corroborate this observation, but also introduce new considerations on which to reflect, e.g. the possible intrusion of some animals during the use of the tomb and more certainly between the two phases of funerary activity, the likely reuse of the chamber as a dump, the visible disturbance of material by burrowing animals, and a humid environment in at least at some periods.

The overlap of toads and jirds, animals with very different environmental preferences, is striking. It could suggest the alternation of at least one very humid phase with one very dry phase, which would also explain the neat fractures on several of the disturbed human bones. The presence of water in the sediments as well

as the scats of these small animals might also explain the modifications to the structure of several human remains (mineralisation).

It was equally possible to demonstrate ovicaprid herding near the tomb. The herd was probably affected by an infectious disease that caused premature abortion. The presence of several females shows that the herd was used for reproduction and perhaps also for milk production. An ability of herders to manage infections is also hinted at with the dumping of foetuses and still-borns in the chamber to avoid contagion.

E. Archaeobotany (C. Bouchaud)

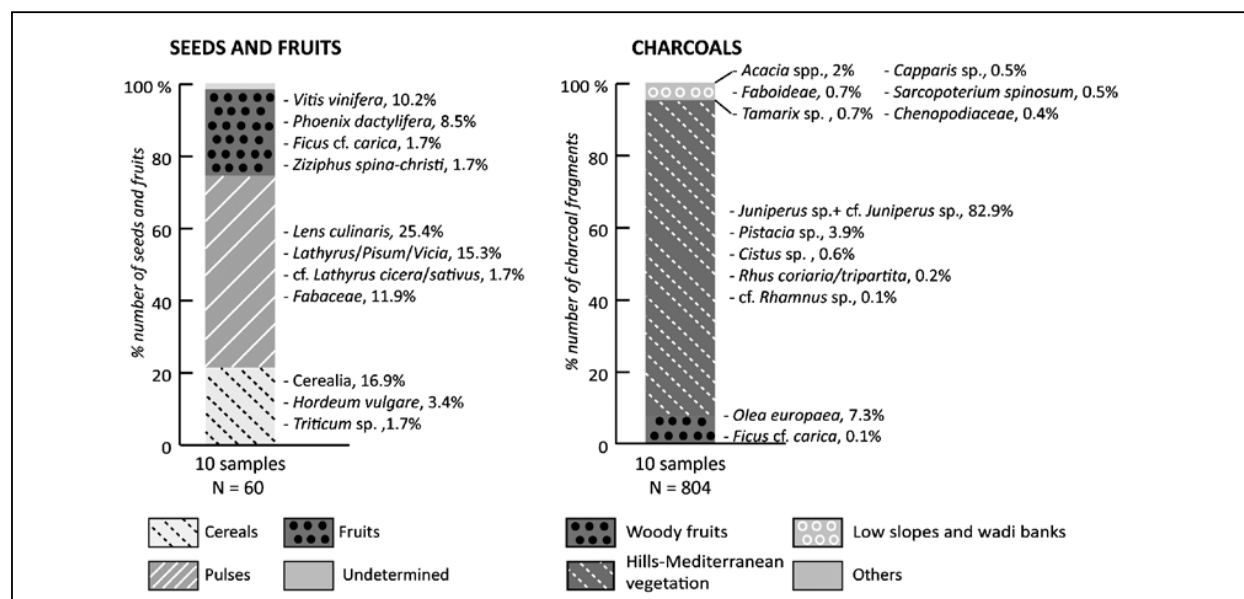
Twelve stratigraphic units were partially sampled during the excavation carried out by I. Sachet and N. Delhopital in November 2006. All were in area A (Fig. 13), in the north-west corner of the chamber, which contained most of the bones. These sediment samples, totalling a volume of 42.5 litres, were sieved and processed by flotation (mesh size 0.375 and 0.5 mm) in Petra in July 2008. The heavy fraction was then sorted in the archaeobotanical laboratory of the MAE (Nanterre, France) to extract plant, seed, fruit and charcoal remains, which were then identified by their morphological or anatomical characteristics using comparative atlases (Fahn *et al.* 1986; Schweingruber 1990) and reference collections of seeds and wood. The presence of burned plant matter in the deepest

stratigraphic units, below the layers of fill, suggests that it was contemporary with the ancient occupation of the burial chamber. Radiometric dating of the charcoal and seeds (juniper charcoal from Th303.62 and 63; cereal grains from Th303.42; legumes and fruits from Th303.59) confirms their antiquity, giving a date between the 4th century BC and 3rd century AD (Fig. 12). These results also show that the plant material was deposited over time and does not constitute a homogenous group. Though the chronology is well established, the functional link remains in question. These plants could have been brought in by people in connection with funerary activities but, as with the faunal remains, the notion of non-deliberate deposition (notably aeolian) must also be entertained.

Analysis of fruit and seed remains

Ten samples yielded a total of 60 specimens (Fig. 25), with a density of between 0.2 (Th303.58 and 62) and 13.1 (Th303.54) specimens per litre of sediment. Eleven taxa were identified in the form of seeds or fruits derived from the three main food groups of cereal, pulses and fruits.

Thirteen cereal caryopses were identified, that is 22% of the minimum number of individuals (Fig. 26), including two barley grains (*Hordeum vulgare* L.; Fig. 27) and a partial wheat grain (*Triticum* sp.). Their poor state of preser-



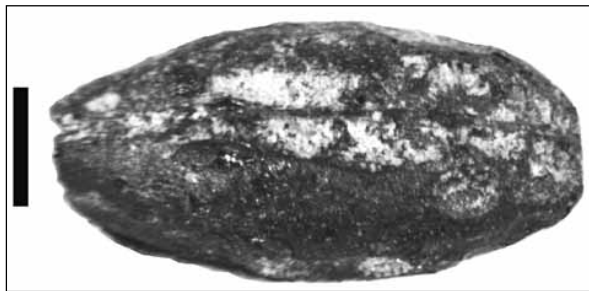
25. Results of analysis of fruits, seeds and charcoal: NR per sample by taxon (C. Bouchaud).

Zone Us Volume	Ath 303											
	26	42	54	56	57	58	59	61	62	63	64	65
	0,1l	4,7l	2,9l	0,7l	0,1l	4,5l	5,5l	8,5l	5,5l	2l	4l	4l
Fruits and Seeds analysis												
Cereals												
<i>Hordeum vulgare</i> , caryopsis			1			1						
<i>Triticum</i> sp., caryopsis fragment	1											
Cerealia, caryopsis	1	8	1									
Pulses												
<i>Lens culinaris</i> , seed	6	9										
cf. <i>Latyrus cicera/sativus</i> , seed		1										
<i>Lathyrus/Pisum/Vicia</i> , seed		9										
<i>Fabaceae</i> undetermined, seed		3				4						
Fruits												
<i>Ficus</i> cf. <i>carica</i> , agglomerate achenes												x
<i>Phoenix dactylifera</i> , seed		1										1
<i>Phoenix dactylifera</i> , seed fragment	1		3					1				
<i>Vitis vinifera</i> , seed			2									1
<i>Vitis vinifera</i> , berry			1		1						1	
<i>Ziziphus spina-christi</i> , endocarp			1									
Other												
Undetermined pericarp												1
Total	1	9	38	1	1	1	4	0	1	0	1	3
Seeds and fruits remains density	10,0	1,9	13,1	1,4	10,0	0,2	0,7	0,0	0,2	0,0	0,3	0,8
Charcoal analysis												
Woody fruits												
<i>Ficus</i> cf. <i>carica</i>								1				
<i>Olea europaea</i>	11	14	1			6	9	15	2	1		
Hills - Mediterranean forest												
<i>Cistus</i> sp.									1	1	3	
<i>Pistacia</i> sp.			3	1			1	3	1	6	4	12
<i>Rhus coriaria/tripartita</i>								1			1	
<i>Juniperus</i> sp.	85	135	95			75	116	26	34	31	14	30
cf. <i>Juniperus</i> sp.	4	19										
cf. <i>Rhamnus</i> sp.			1									
Low slopes and wadis banks												
<i>Acacia</i> spp.	3	5				6	2					
<i>Capparis</i> sp.							3				1	
<i>Chenopodiaceae</i>			1				2					
<i>Faboideae</i>			2	1		3						
<i>Sarcopoterium spinosum</i>			3						1			
<i>Tamarix</i> sp.	1					2	2				1	
Others												
Monocotyledon										1		1
Bark							2					
Indeterminable	1	15	2			8	18	5	2	4	6	9
Total	0	105	198	100	0	100	155	51	41	44	30	52

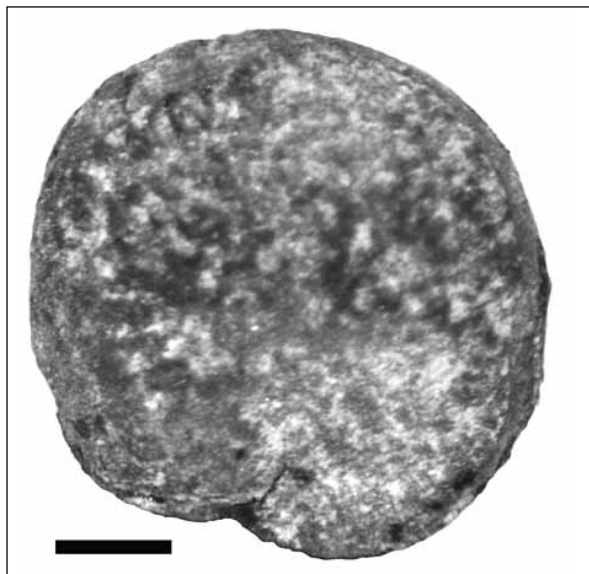
26. Fruit, seed and charcoal analysis as a percentage MNI relative to the total number of identified remains; indeterminate charcoal and bark fragments not counted (C. Bouchaud).

vation prevents a more accurate identification. In antiquity, the Near East produced mainly six-row barley (*Hordeum vulgare* spp. *vulgare* L.) and naked wheats (bread wheat [*T. aestivum* L.] and hard wheat [*T. turgidum* spp. *durum* L.]) (Crawford 2006; Willcox 2003), which could correspond with the cereals from the tomb.

Pulses are the largest group of remains amongst the seeds and fruits (54.2% of the minimum number of individuals). They consist mainly of lentils (*Lens culinaris* L.; 25.4%; **Fig. 28**), a common food from the Neolithic onwards that has already been identified in Late Roman levels at the residential area of ez-Zantur in Petra (Karg 1996). As with the cereals, carbonisation has limited identification of the other pulse remains. A vetch (cf. *Lathyrus cicero* / *sativus*) has been tentatively identified; this plant is known for its use as fodder and is eaten nowadays in India and Ethiopia (Nesbitt 2005: 143).

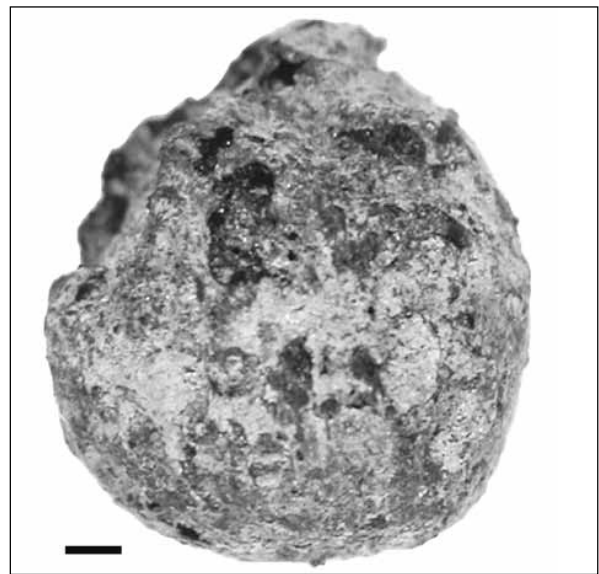


27. Grain of barley (*Hordeum vulgare*), ventral face. Th303.54. Scale: 1 mm (C. Bouchaud).

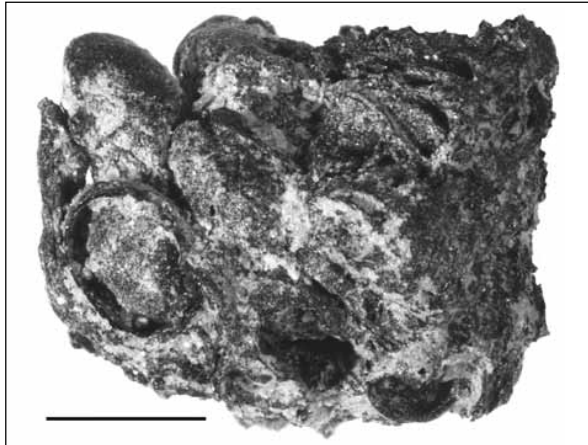


28. Lentil (*Lens culinaris*). Th303.54. Scale: 1 mm (C. Bouchaud).

Fruits represent the last quarter (22%) of plants found in the tomb. Dates (*Phoenix dactylifera* L.), figs (*Ficus* cf. *carica* L.) and grapes (*Vitis vinifera* L.) are frequently found in Bronze Age archaeobotanical assemblages from the Middle East (Tengberg 2012). These plants have already been identified in Late Roman levels at ez-Zantur (Karg 1996; Jacquat and Martinoli 1999) and in Nabataean levels at the chapel of Obodas (Tholbecq *et al.* 2008). The fig achenes are clumped together and form an amorphous mass that could be part of the fruit, even though no trace of the outside skin has been observed, or some foodstuff based on figs (**Fig. 29**). Individual grapes (**Fig. 30**) have part of their pericarp preserved, recognisable in the form of a black amorphous mass surrounding the pips, and could represent the remains of the fresh fruits (Margaritis and Jones 2006). These grapes may thus have been placed in the tomb shortly after the grape harvest, during the autumn, or later in the year. Indeed, Pliny the Elder states that grapes can be preserved over the winter if suspended from the ceiling or conserved in their own juice in sealed jars (*Natural History* XIV.3.16). The endocarp of Christ's thorn (*Ziziphus spina-christi* [L.] Desf.) probably indicates the presence of this plant in the natural environment of Petra, since it could, for example, have grown on the sandy plains in association with acacias (Ruben 2006: 92). This



29. Lump of fig achenes (*Ficus carica*). Th303.65. Scale: 1 mm (C. Bouchaud).



30. Grape (*Vitis vinifera*). Th303.57. Scale: 1 mm (C. Bouchaud).

tree, from the jujube family, produces small edible fruits, fleshy and yellow when ripe, which taste a bit like apples.

Charcoal analysis

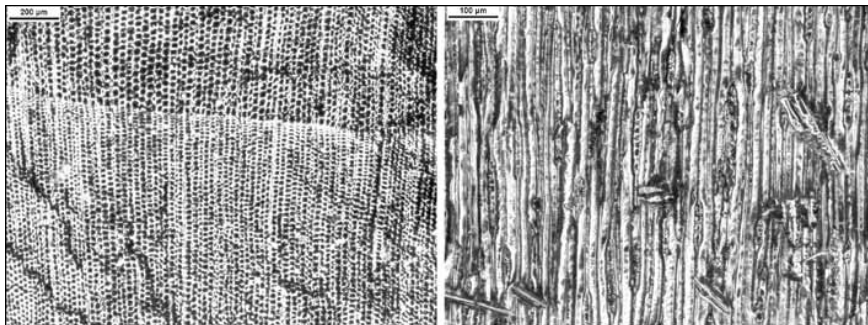
The charcoal analysis looked at 876 fragments from ten samples (Figs. 26 and 27). Fourteen taxa were identified and grouped according to their present-day habitats. They comprise fruit trees, woods characteristic of high elevation Mediterranean formations, and vegetation typical of rocky slopes and sandy plains.

The carbonised olive and fig wood (*Ficus* cf. *carica* L.) probably comes from cultivated plants. Their cultivation in Petra has already been noted in palynological (Fall 1990) and charcoal studies (Karg 1996). It is possible that these fragments were the burned remains of pruned branches - either to dispose of them, or used as fuel - following the maintenance of the trees. In addition, a number of wild taxa were recorded that reflect the different plant formations that might have evolved on the site of Petra. The presence of wooded vegetation of a

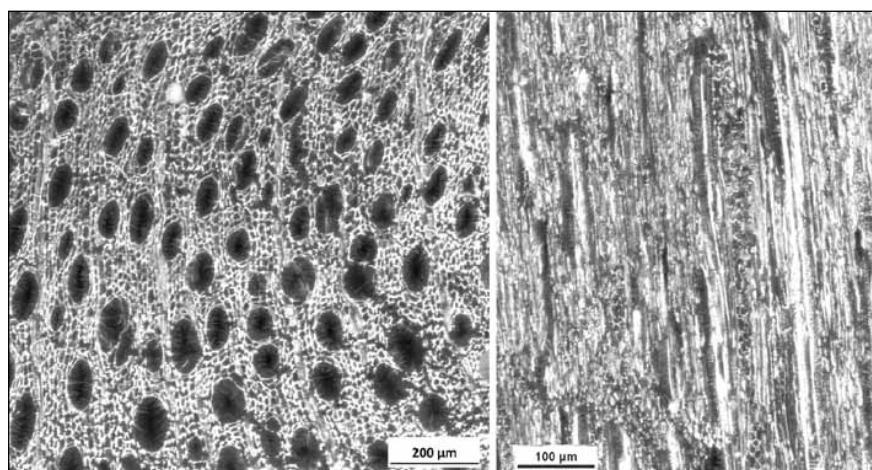
Mediterranean type typical of semi-mountainous landscapes is suggested by the shrub and tree species (cistus, *Cistus* sp.; pistachio, *Pistacia* sp.; sumac, *Rhus coriaria* / *tripartita*; juniper, *Juniperus* sp.; buckthorn, cf. *Rhamnus* sp.; Figs. 31 and 32). The acacias belong to desert flora typically associated with sandy plains. Prickly burnet (*Sarcopoterium spinosum*), brooms (such as *Retama raetam* [Forssk.] Webb., which is very common today) and chenopods grow particularly on degraded soils and are generally considered to be markers of human activities, notably grazing and firewood collecting (Zohary 1973). These species can also develop on the plains and in *wadis*, alongside tamarisk (al-Eisawi 1996: 78).

Discussion

The taxonomic identification of the carbonised plant remains allows several levels of interpretation. From an agricultural point of view, these new results complement previously published archaeobotanical data (Fall 1990; Karg 1996; Tholbecq *et al.* 2008) by indicating the presence of cultivated species within the Petra basin or in places nearby where cereals (barley; wheat), pulses (lentil; vetch) and Mediterranean fruit trees (fig; olive; grape) could be grown. The climate and topography of Petra are not suitable for the cultivation of date palms and it is possible that the stones found in the tomb came from areas with more favourable conditions, such as the shores of the Dead Sea. If the olive-wood charcoal from Th303.62 really is contemporary with the juniper charcoal from the same unit, dated by radiocarbon to the 4th or 3rd century BC, then it is the earliest indication of olive cultivation in Petra, the agricultural exploitation of the site in this period being still little known, even ignored (Tholbecq 2001 and. 2013; Kouki 2009). However, the complex stratigraphy of



31. Transverse (left) and longitudinal tangential (right) cuts of cistus (*Cistus* sp.). Th303.62 (C. Bouchaud).



32. Transverse (left) and longitudinal tangential (right) cuts of juniper (*Juniperus* sp.). Th303.54 (C. Bouchaud).

the tomb and the many disturbances that it has suffered spell the need for caution, since the two pieces of olive-wood charcoal found could be contamination from adjacent, more recent, but nevertheless ancient, stratigraphic units.

From an ecological point of view, the diversity of the assemblage of wild plants is a complete reflection of the formations of the Petra landscape. There are the cultivated orchards, the semi-mountainous wooded slopes, more steppic soils and desert plains where the vegetation is concentrated along the *wadis*. Semi-mountainous vegetation is best-represented, particularly by juniper. This can logically be explained by the location of the ath-Thughrah tomb within the altitudinal zone in which the juniper thrives. Today, the vegetation around the tomb is much reduced, but the presence of more significant wooded formations in the Nabataean period is quite conceivable. The sandy plains and Wadi ath-Thughrah below the study area are also potential sources for some of the species identified.

Finally, there is the question of the origin of these deposits. Aeolian deposition of waste from domestic hearths or fires certainly explains the presence of inflammable parts of these plants, which could have been mixed in with the sediment in the tomb. However, there is one indication in favour of a link with funerary activities: the assemblage of seeds and fruits contains only food plants which were - by default - not eaten. Several of them display evidence for carbonisation of the entire fruit, e.g. grapes and fig⁴.

These two observations are not often made in archaeobotanical assemblages from the Middle East; for example, neither is attested amongst the thousands of plant remains studied from the az-Zantur area (Bouchaud 2011: 162–187; Jacquat and Martinoli 1999; Karg 1996). Th303.54 produced the largest number of food remains and corresponds to a layer of sediment resting on the bedrock, which also contained a large amount of Hellenistic and Nabataean pottery. This concentration of material might represent the ‘swept’ remains of food offerings made during the first occupation of the tomb. Part of the charcoal could, in this case, represent the fuel that was used to burn the offerings. Like the pottery that was deposited, which comes from common production and is also found in domestic contexts, the cereals, pulses and burned fruits are in no way exotic, being routinely consumed in daily life. If this hypothesis is confirmed, it would demonstrate the existence of a practice so far unknown in the Nabataean world, for which the closest known parallel is that of the necropolis of the Greek colony of Apollonia at Pontus on the shores of the Black Sea. There, several hearths containing animal and plant (hazelnut and almond shells) remains have been found close to burials. These remains have been interpreted as possible uneaten sacrifices, a hypothesis based on the writings of the Greek philosopher Lucian of Samosata (*Charon sive contemplantes*, 22), who explains that the burning of food is intended to feed the souls (Hermay 2010: 161–165).

4. It could also be a fig-based food preparation.

Conclusion

Owing to the many disturbances inside tomb Th303, the chronology of the events that took place there is difficult to establish. Nevertheless, the phasing observed in the archaeological material indicates that there were at least two phases of funerary occupation in the chamber. The first occupation is ancient, belonging to the Hellenistic period, between the 4th and 2nd centuries BC. Though the evidence for this is tenuous, it is attested to by the pottery and confirmed by the radiocarbon dates. This is the first evidence for the construction of tombs and, thus, of funerary activity in Petra in the Hellenistic period. However, the details of this first funerary occupation, as well as the exact dates of its beginning and end, are uncertain. Following this, an initial clearance of the chamber occurred and the burial remains were pushed into the north-west corner of the tomb, along with the bones of small rodents, sheep, goats and toads. The presence of toads indicates that the tomb was open and unoccupied for an indeterminate length of time before being re-occupied. The discontinuity of occupation in a monumental tomb and its eventual abandonment is noteworthy. It might be indicative of a slowing-down of occupation across the entire site. The progression of urbanisation might not, therefore, have been continuous from the 3rd to 1st centuries BC and the construction of the town of Petra may have gone through phases of growth and slump during the Hellenistic period.

The second phase of occupation of tomb Th303 occurred during the so-called 'classical' Nabataean period, that is between the mid-1st century BC and the 2nd century AD. Based on the large amount of pottery and associated human bones found in the chamber, this second phase was the main period of funerary use. Such a dense occupation accords with the known peak in activity in the town at the end of the 1st century BC and in the 1st century AD. An urban boom during the reign of Aretas IV (9 BC - 40 AD) was associated with strong demographic growth and, therefore, with a greater number of dead to accommodate. Ancient burial spaces were reused, as was the case at tomb Th303, and new tombs were built. Subsequently, the burials were again disturbed and the bones pushed into the north-west corner of the chamber. The

most recent pottery found in the tomb is a complete cooking pot dated to the 2nd century AD, placed at the chamber entrance. It gives an approximate date for the abandonment of the tomb since nothing later was found on the floor of the chamber. The tomb seems not to have been reoccupied in the Late Roman or Byzantine periods. A localised and non-funerary use was recorded for the mediaeval period, during which the tomb might have been used as a temporary overnight shelter or hiding place.

Study of the material found in tomb Th303 shows that the chamber was used for successive burials of at least 60 individuals, including men, women and children. The population markers indicate that they were related or had at least lived in the same environment. The physical anthropological study cannot establish their kinship links, but the presence of recurrent discrete traits, along with epigraphic evidence known from Nabataean tombs in Hegra (Healey 1993), tends to suggest family use of tomb Th303. The presence in the tomb of two adult individuals with handicapping pathologies bears witness to solidarity at the heart of the group since they lived to be adults and were buried in the collective tomb. Bodies were placed on the floor of the chamber, perhaps in shrouds or in coffins, with vessels at their sides. The pottery represents the traditional vessel forms known from domestic contexts and the chamber was thus supplied, at least symbolically, with the vital necessities for eating and drinking. The vessels were empty but numerous animal and vegetal remains were identified, mixed in with the human bones. The archaeozoological study did not find evidence for meat offerings in the funerary levels. However, it informs us about the ancient environment of Petra, particularly with regard to ovicaprid herding and the management of infections such as abortive chlamydia in the herd. Finally, the seed assemblage consists solely of uneaten edible plants and some whole carbonised fruits found in association with inhumations of the Hellenistic and classical Nabataean periods. These vegetal remains are perhaps vestiges of sacrificial offerings intended for the pleasure of the deceased or the appeasement of the gods. The use of cereals in expiatory rites is known from Lycian inscription of the Hellenistic period (Schweyer 2002), notably in the case of the violation of a tomb.

Bibliography

Bailon, S.

- 1999 Différenciation ostéologique des anoures (Amphibia, Anura) de France. Animal osteological sheets for archaeology, Series C: Varia, under the direction of J. Desse and N. Desse-Berset, CNRS, Antibes: APDCA.

Bikai, P. M. and Perry, M. A.

- 2001 Petra North Ridge Tombs 1 and 2: Preliminary Report. *Bulletin of the American Schools of Oriental Research* 104: 58–78.

Bouchaud, C.

- 2011 *Paysages et pratiques d'exploitation des ressources végétales en milieux semi-aride et aride dans le sud du Proche-Orient : Approche archéobotanique des périodes antique et islamique (IVe siècle av. J.-C.-XVIe siècle ap. J.-C.)*. Doctoral thesis. University of Paris 1, Paris.

Brünnnow, R.E., von Domaszewski, A.

- 1904 *Die Provincia Arabia auf grund zweier in den Jahren 1897 und 1898 unternommen Reisen und der berichte früherer Reisender. Band I. Die Römerstrasse von Mâdebâ über Petra und Odruh bis el 'Akaba*. Strassburg: K.J. Trübner.

Cartron, G.

- 2012 *L'architecture et les pratiques funéraires dans l'Égypte romain*. BAR International Series, no. 2398. Oxford: Archaeopress, 2 vols.

Crawford, P.

- 2006 The plant remains. Pp. 453–461 in S.T. Parker (ed.), *The Roman Frontier in Central Jordan. Interim Report on the Limes Arabicus Project 1980-1989*. *Dumbarton Oaks*, Washington.

Crubézy, E. and Sellier, P.

- 1990 Liens de parenté et populations inhumés. *Les nouvelles de l'archéologie* 40: 35–38

Driesch A. von den, Boessneck, J.

- 1974 Kritische Anmerkungen zur Widerristhöhenberechnung aus Längemassen vor- und frühgeschichtlicher Tierknochen. *Säugetierkundliche Mitteilungen* 22: 325–348.

Duday, H.

- 2005 L'archéothanatologie ou l'archéologie de la mort. Pp. 153–207 in O. Dutour, J.-J. Hublin and B. Vandermeersch (eds.), *Objets et méthodes en paléanthropologie*. Paris: Comité des travaux historiques et scientifiques.

Al-Eisawi, D.

- 1996 *Vegetation of Jordan*. UNESCO-Cairo office, Cairo.

Fahn A., Werker E., Baas P.

- 1986 *Wood Anatomy and Identification of Trees and Shrubs from Israel and Adjacent Regions*. The Israel Academy of Sciences and Humanities, Jerusalem.

Fall, P.

- 1990 Deforestation in Southern Jordan: Evidence from Fossil Hyrax Middens. Pp. 271–282 in S. Bottema, G. Entjes-Nieborg, W. Van Zeist (eds.), *Man's Role in the Shaping of the Eastern Mediterranean Landscape*. A.A. Balkema, Rotterdam.

Garnier, N., Sachet, I., Zymła, A., Tokarski, C., Rolando, C.

- 2010 Biomolecular archaeology and analysis of artefacts found in Nabataean tombs in Petra. Pp. 263–274 in L. Weeks (ed.), *Death and Burial in Arabia and Beyond. Multidisciplinary Perspective*. Society for Arabian Studies Monographs 10, (BAR International Series; 2107), Oxford: Archaeopress.

Gerber, Y.

- 1997 "The Nabataean Coarse Ware Pottery: A Sequence from the End of the Second Century BC to the Beginning of the Second Century AD. *Studies in History and Archaeology of Jordan*. 6: 407–411.

Gerber, Y.

- 1994 in Stucky R.A., Gerber Y., Kolb B., Schmid S.G., "Swiss-Liechtenstein Excavations at ez-Zantur in Petra 1993. The Fifth Campaign", *Annual of the Department of Antiquities of Jordan* 38: 271–292.

Gueli, A.M., Dubernet, S., Burrafato, G., Chapoulie, R., Ristuccia, G.M., Sachet, I., Stella, G., Troja, S.O., and Zuccarello, A.R.

- 2010 Analysis of coloured beads from Petra (Jordan). Pp. 195–202. In *Colore e colorimetria: contributi multidisciplinari vol. VI, Atti della Sesta Conferenza Nazionale del Colore, Lecce, 16-17 settembre 2010*. Collana Quaderni di Ottica e Fotonica n. 19. Maggioli Editore, Santarcangelo di Romagna (RN).

Healey, J.

- 1993 *The Nabataean Tomb Inscription of Mada'in Salih*. *Journal of Semitic Studies Suppl.* 1, Oxford University Press.

Hermay, A. (ed.)

- 2010 *Apollonia du Pont (Sozopol): la nécropole de Kalfata, Ve-IIIe s. av. J.-C. Fouilles franco-bulgares, 2002-2004*. Errance. Paris.

Jacquat, C., Martinoli, D.

- 1999 *Vitis vinifera L.: Wild or cultivated ? Study of the grape pips found at Petra, Jordan; 150 BC–AD 40. Vegetation History and Archaeobotany* 8: 25–30.

Johnson, D.J.

- 1990 Nabataean Piriform Unguentaria. *Aram Periodical* 2: 235–248.

Karg, S.

- 1996 Pflanzenrest aus den Nabatäischen und Spätrö-

- mischen Schichten. Pp. 355–358 in A. Bignasca (ed.), *Petra. Ez Zantur I. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen 1988-1992*. Terra Archaeologica. von Zabern, Mainz.
- Kouki, P.
2009 Archaeological Evidence of Land Tenure in the Petra Region, Jordan: Nabataean-Early Roman to Late Byzantine. *Journal of Mediterranean Archaeology* 22: 29–56.
- Lenoble, P., Al-Muheisen, Z., Villeneuve, F., Augé, C., Boyer, R., Chambon, A., Desreumaux, A., Mort, F. L., Al-Muheisen-Tarrier, D. and Nehmé, L.
2001 Fouilles de Khirbat adh-Dharih (Jordanie), I : le cimetière au sud du Wadi Sharheh. *Syria* 78: 89–151.
- Margaritis E., Jones M.
2006 Beyond cereals: crop processing and *Vitis vinifera* L. Ethnography, experiment and charred grape remains from Hellenistic Greece. *Journal of Archaeological Science* 33: 784–805.
- Mouton, M.
2010 The monolithic *djin* blocks at Petra: a funerary practice of pre-Islamic Arabia. Pp. 275–287 in L. Weeks (ed.), *Death and Burial in Arabia and Beyond. Multidisciplinary Perspective*. Society for Arabian Studies Monographs, 10. BAR International Series, 2107. Oxford: Archaeopress.
- Nesbitt, M. (ed.)
2005 *The Cultural History of Plants*. Routledge, New York.
- Ossenberg, N. S.
1976 Within and Between Race Distances in Population Studies Based on Discrete Traits of the Human Skull. *American Journal of Physical Anthropology* 45: 701–716.
- Perry, M. A.
1998 *A Nabataean Tomb Found near Khirbet Nawafleh, Wadi Musa, Jordan*. Unpublished report for the Department of Antiquities, Wadi Musa, Jordan.
2002 Life and Death in Nabataea: The North Ridge Tombs and Nabataean Burial Practices. *Near Eastern Archaeology* 65: 265–270.
- Ruben, I with Disi, A.,
2006 *Field Guide to the Plants and Animals of Petra*. Petra National Trust.
- Sachet, I.
2009 “Refreshing and perfuming the dead: Nabataean funerary libations”. *Studies in the History and Archaeology of Jordan X, 10th International Conference on the History and Archaeology of Jordan held in Washington DC, May 2007*. Amman: Department of Antiquities, p. 97–112.
- Schmid, S.G.
2000 *Petra. Ez Zantur II, Teil 1. Die Feinkeramik der Nabatäer*. Terra Archaeologica, no. 4. Mainz: Philipp von Zabern.
- Schweingruber, F.H.
1990 *Anatomy of European Wood: An Atlas for the Identification of European Trees, Shrubs and Dwarf Shrubs*. Paul Haupt, Bern, Stuttgart.
- Schweyer, A. V.
2002 *Les Lyciens et la mort : une étude d'histoire sociale*, Varia anatolica 14, Istanbul: IFEA, Paris: De Boccard.
- Sinibaldi, M.
2013 The Ceramic Assemblage from the Later Phases at Tomb 303: Settlement in Wadi Thughra During the Islamic Period. *ADAJ* 57.
- Tengberg M.
2012 Fruit growing in the Ancient Near and Middle East. Pp. 181–200 in Potts D.T. (ed.) *A Companion to the Archaeology of the Ancient Near East*. Willey-Blackwell, Chichester.
- Tholbecq, L.
2001 The hinterland of Petra from the Edomite to the Islamic periods: The Jabal ash-Sharah Survey (1996-1997). *Studies in the History and Archaeology of Jordan* 7: 399–405.
2013 The Hinterland of Petra (Jordan) and the Jabal Shara during the Nabataean, Roman and Byzantine periods. Pp. 295–312 in M. Mouton, S.G. Schmid (eds.), *Men on the Rocks. The Formation of Nabataean Petra*. Berlin, Logos-Verlag.
- Tholbecq L., Durand C., Bouchaud C.
2008 A Nabataean rock-cut sanctuary in Petra: second preliminary report on the “Obodas chapel” excavation project, Jabal Numayr (2005-2007). *ADAJ* 52: 235–254.
- Toynbee, J.M.C.
1971 *Death and Burial in the Roman World*, Ithaca, New York: Cornell University Press.
- Villeneuve Fr.
1990. The Pottery of the Oil-Factory at Khirbat adh-Dharih (2nd century AD). A Contribution to the Study of the Material Culture of the Nabataeans. *Aram* 2: 367–384.
- Willcox, G.
2003 L'économie végétale à Bosra et à Si': résultats d'analyse de restes végétaux carbonisés des périodes romaine, byzantine et islamique. Pp. 177–195 in Dentzer-Feydy J. (eds.), *Hauran II*, vol. 1. Beirut.
- Zohary, M.
1973 *Geobotanical Foundations of the Middle East*. Fisher G., Stuttgart.

THE CERAMIC ASSEMBLAGE FROM THE LATER PHASES AT TOMB 303: SETTLEMENT IN WĀDĪ ATH-THUGHRAH DURING THE ISLAMIC PERIOD

Micaela Sinibaldi

1. Context and Characteristics of the Ceramic Assemblage

This report presents the ceramics from the last phases of activity recorded at Tomb 303 during the excavations carried out in 2006 by the French archaeological mission to Petra. The stratigraphic units containing the Islamic-period pottery analysed in this contribution were both preceded and succeeded by phases of abandonment. The excavators have identified some of the stratigraphic units as a phase of occupation during the Islamic period¹. However, the faunal analysis carried out by Carine Tomé² has also yielded evidence that most of the late stratigraphic units have the character of a dump. This interpretation is suggested by several lines of evidence, mainly the presence of a very large number of animal fetuses (interpreted by Tomé as the result of a sickness inflicting an entire group of nearby animals) and by the generally very good representation of all animal body parts (which suggests that most of the animals entered the cave in one piece rather than after slaughter, i.e. they were probably dumped inside or, possibly, fell into the tomb). This hypothesis is reinforced by the presence of the remains of several animals within the same stratigraphic units (despite the small size of the assemblage), by the fact that most of the animal bones are from species not normally consumed by humans and, finally, that - although some caprine remains have been found - most of them did not show signs of butchering or cooking, an uncommon situation in occupational contexts at Petra, where caprines are always recorded as an im-

portant component of the medieval diet³.

The conclusion that the material from the stratigraphic units containing the Islamic pottery was mostly dumped inside the tomb is also supported by their location close to the cave entrance. The fact that several ceramic fragments were found in the most superficial stratigraphic units might be attributed to the presence of burrowing animals during a post-depositional phase (whose presence was in fact confirmed by the faunal analysis). This may be partially responsible for the fact that in most cases the Islamic sherds were found mixed with Nabataean fragments.

Islamic-period pottery was found in 12 stratigraphic units, comprising a total of 139 fragments and a minimum of 62 reconstructed forms. No ceramic object is complete but a large number of fragments originate from only a few forms, *viz.* the reconstructed jug with *appliqué* decoration, the lamp and several cooking pots (**Figs. 2.1, 2.2, 3.1, 4 and 5**). Large parts of the cooking pots are missing, meaning that these objects were not used inside the tomb. In addition, some of the pot sherds entered the tomb as fragments which broke into a maximum of two or three pieces on impact. Nevertheless, it seems that several ceramic objects, such as the ones mentioned above, entered the tomb when a good part of the form was still intact and that they primarily fragmented on impact. The most likely interpretation is that they broke somewhere nearby and that someone walked to the tomb, which was occasionally used as a dump, to throw them inside. Most likely the isolated

1. See the article by Sachet *et al.* in this volume of *ADAJ*.
2. Observations drawn from the unpublished field report of Tomé.

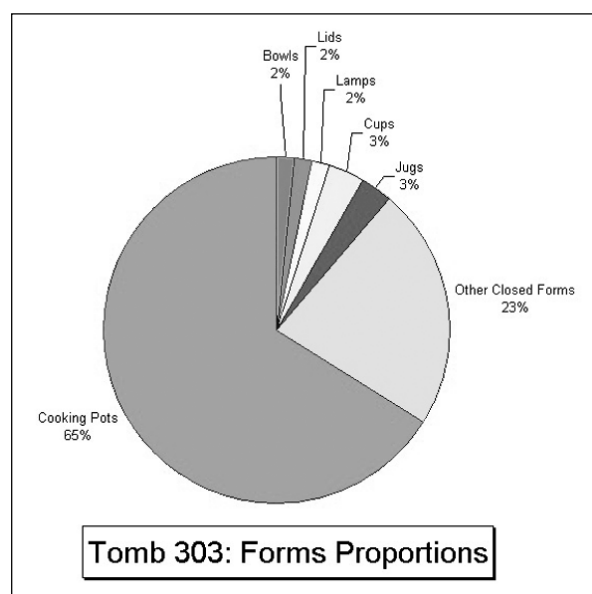
3. See for example Schmid and Studer 2003: 484-487 and Brown and Rielly 2010: 126-137 for Wādī Farasa and al-Wu'ayra respectively.

fragments entered the tomb along with other material being dumped.

In sum, the character of the ceramic assemblage supports the supposition that the tomb was mainly used as a dump during the Islamic period. The different stratigraphic units identified by the excavators, and therefore the different character, composition and consistency of the soil matrices, may be explained at least in part either by different phases of dumping or by the presence of excavating animals, or - most likely - by both. At least some of the charcoal found by the excavators may also have been discarded in the tomb, being derived from activities carried out nearby.

Since most fragments are diagnostic in terms of form, it is possible to present a quantitative analysis of this aspect of the assemblage, although the very small size of the latter must be taken into account (**Fig. 1**). The assemblage comprises mainly closed forms, in particular cooking pots (65%). Cooking pots, jars and water jugs outnumber bowls and cups.

A study of the proportions of closed and open



1. Proportion of forms in the Tomb 303 assemblage, calculated by minimum number of forms.

forms during the Islamic period is not yet available, although this would certainly be desirable in future. However, some results are available for specific sites and periods, e.g. the Crusader-period castle of al-Wu'ayra⁴. The high proportions of cooking pots and closed forms are similar to other assemblages from the Petra region that were occupied over several centuries during the Middle and Late Islamic periods, e.g. Bayḍa and Wādī Farasa (where cooking pots were found in very high percentages)⁵. Although the material described here is not derived from an occupation context and is therefore not directly comparable with these stratified data, it still seems that the high proportion of cooking pots reflects an intensive use of these forms during the Middle and Late Islamic periods (in particular the Crusader to Ottoman periods).

With the exception of a moulded lamp, all of the sherds belong to vessels of the so-called 'handmade' group. Only two are red-painted, while the rest of the assemblage is unpainted. The general characteristics of fabric, manufacture, firing, surface treatment and, where identifiable, form, all allow the handmade pottery fragments to be identified as belonging to types commonly in use in the Petra region between the 11th and the 20th centuries. Some recent work on this class of pottery has established some diagnostic characteristics on which to base a preliminary chronological framework⁶. This description, discussion and interpretation of the most significant elements of the Tomb 303 assemblage is based on this work.

2. Description of Selected Fragments

Cooking pots

Several types of cooking pot are included in the assemblage, with the two best-represented having close parallels at Petra. The fragment in **Fig. 2.2** represents a very common type, being a globular cooking pot characterized by ledge handles with an applied clay band connecting

4. Al-Wu'ayra castle was mainly occupied during the 12th century. For this site, data resulting from excavations by two different archaeological missions (Robin Brown and the University of Florence) do not completely match in several aspects; this may be due at least in part to different methods of analysis. According to my complete analysis of the data from Robin Brown's excavations of the 12th century phases, there was a higher proportion of open forms in the 12th cen-

tury than during the later periods in Petra (see Brown 1987 for some published forms; the full results of this study are discussed in Sinibaldi 2014).

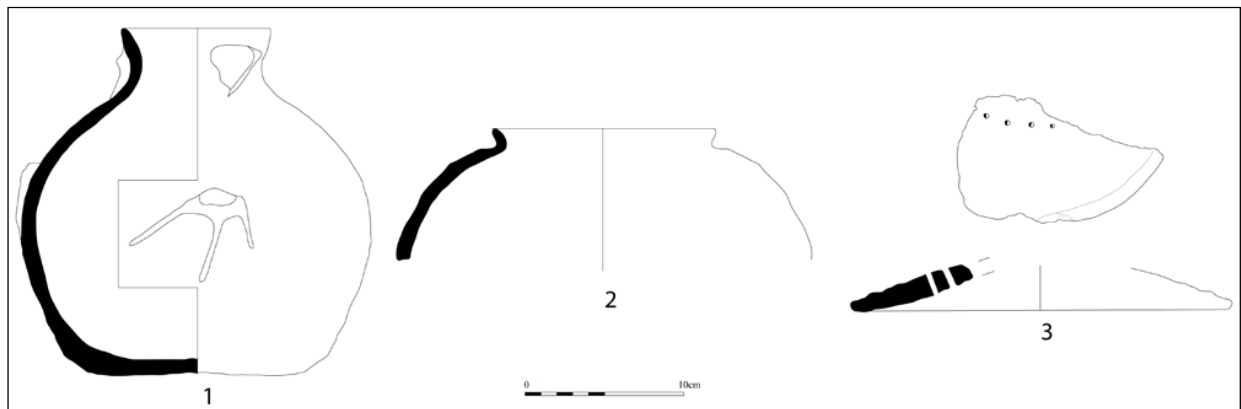
5. Preliminary proportions and observations are presented in Sinibaldi 2009a: 453, 457.

6. Some results of this preliminary study of the Petra material and the diagnostic aspects of its chronology are presented in Sinibaldi 2013a: 170-176.

them, no neck, an out-turned rim and a flat base. It has been found in large quantities at Ottoman Bayḍa and Khirbat an-Nawafla, Crusader al-Wu'ayra and pre-Crusader Khirbat al-Mu'allaq. This type was therefore both widespread and long-lived in the region, with the result that it is not currently possible to date it more precisely. It may be the product of unspecialized production since it often has quite irregular proportions⁷.

The second type (**Fig. 3.1**) typically has similar ledge handles, but is different in the sense that it does not have an applied band connecting them; it also has a narrower mouth, a neck, a globular body and a rounded base. It also tends to be characterized by a slightly higher manufacturing quality, obtained with the help of a turning tool. In comparison with the other type, it is often characterized by a high percentage of limestone inclusions in the fabric, added - as is often the case in cooking pots - to help the object withstand

the high temperatures to which it was exposed. For these two reasons, this type may be associated with a more specialized production; it might also not have been as long-lived as the first type. A similar example came from phase VIII (post-classical) of the Petra Pool Complex excavations, which has been dated to the 12th century on the basis of this specific ceramic object and its parallels with ceramic material from al-Wu'ayra⁸. However, in light of my more recent research on the Petra ceramics, the two cooking pots from the Crusader castle of al-Wu'ayra, which have significant differences, should now be assigned to two separate types⁹. Currently, both the cooking pot presented here and the example from the Petra Pool Complex excavations have their best stratified parallel at Wādī Farasa, in a 13th - 15th century context¹⁰. There is also another example from Bayḍa, found in association with material consistent with a Mamluk-period date¹¹.



2. A selection of pottery from the assemblage (illustrations M. Sinibaldi): (1) jug; (2) cooking pot; (3) lid.

2.1 (see also FIG. 5): Jug. Fabric: includes large chunks of limestone. Chaff proportion: high. Fabric surface colour: red. Manufacturing quality: medium. Firing: black core to no core, depending on the thickness of the different parts. Surface treatment: white slip of varying thickness on external surface except base. Other details: applied clay decorations to both lower and upper handle attachment. Height: 21.8 cm. Max width: 22 cm. Rim diameter: 10 cm. Base diameter: 14 cm. Wall thickness: 0.7 - 1.2 cm.

2.2 Cooking pot. Chaff proportion: medium. Fabric surface colour: orange. Manufacturing quality: medium. Firing: black core. Surface treatment: smoothed on external surface. Rim diameter: 14 cm. Wall thickness: 0.6 - 0.9 cm.

2.3 Lid. Chaff proportion: high. Fabric surface colour: buff. Manufacturing quality: medium. Firing: light grey core. Surface treatment: smoothed on external and internal surfaces. Other details: eight holes (four of which incomplete) arranged in two concentric lines; ridge on internal surface to fit pot rim. Diameter: ca 24 cm. Thickness: 1.5 cm.

7. See Sinibaldi 2009a: 452-453, Fig. 8, and 460-461 for a discussion of the longevity of this type at Petra, its occurrence at al-Wu'ayra and a full profile from Bayḍa. For Bayḍa, see also Sinibaldi and Tuttle 2011: 443-445, Fig. 15.2. For a full profile from Khirbat an-Nawafla, see 'Amr *et al.* 2000: 253, Fig. 26.2. The presence of this type in an Ottoman context has been reported in a personal communication by project director Khairieh 'Amr. For Khirbat Mu'allaq, see Lindner 1996: 124-125, figs 21 and 24.

8. See Bedal 2000: 144-145; Bedal 2003: 83, 84 and Plate XXVIb.

9. For examples of these different types of cooking pots at al Wu'ayra, see Vannini and Vanni Desideri 1995: 531, Fig. 16, Vannini and Tonghini 1997: 380, Fig. 16 and Sinibaldi 2009a: 461 for a discussion of the types.

10. My publication of the Wādī Farasa ceramic assemblage is forthcoming.

11. My publication of the ceramic assemblage from the Bayḍa Documentation Project is currently in progress.

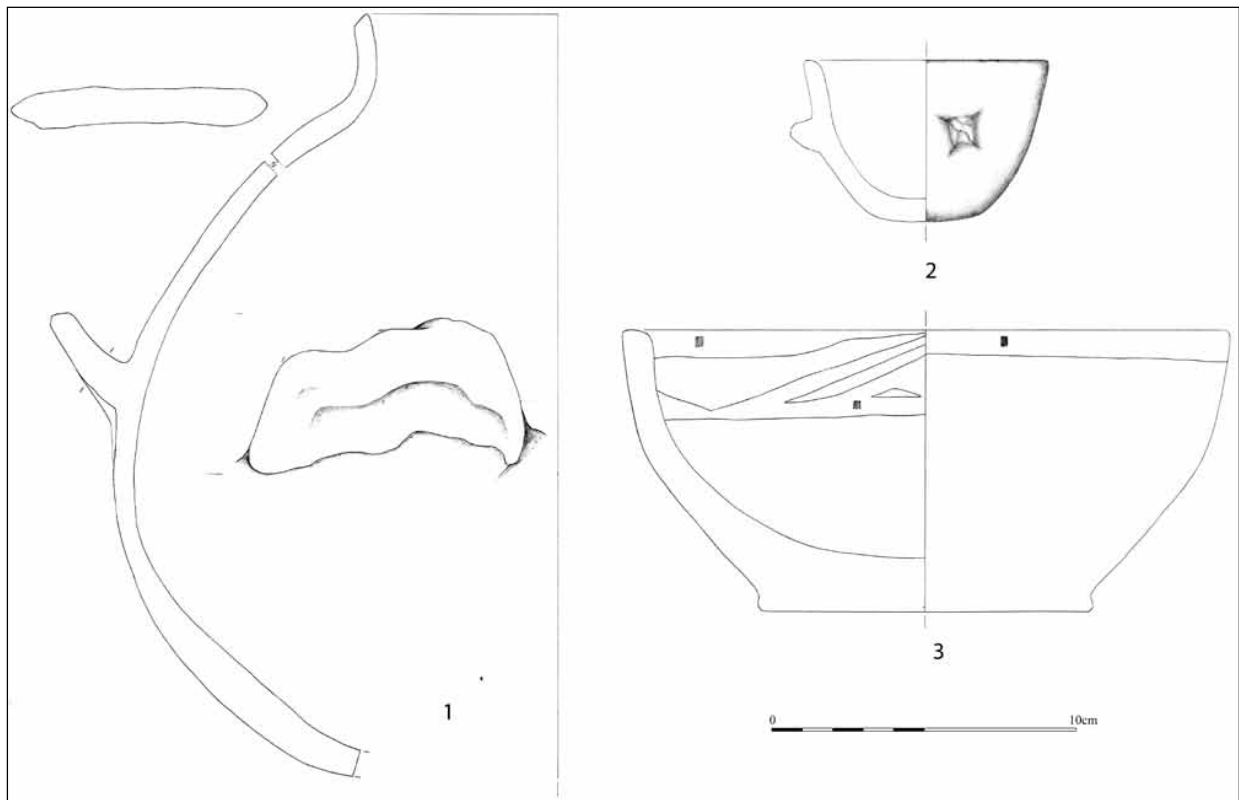
Lid

One completely hand-made lid was included in the assemblage (**Fig. 2.3**). It was formed by pushing a rounded piece of clay onto a flat surface; a concave ridge was then made around the rim of the lower surface, in order to make a better fit with the rim of the pot. Its surface still displays clearly visible traces of smoothing. The lid was pierced from its external surface in order to create a vent for steam; eight holes are visible, arranged in two concentric rows concen-

trated towards the centre of the lid. This very long-lasting basic form is known from the Petra area from at least the 11th century onwards and was in use throughout the whole Islamic period, albeit with many variations¹². For this reason, it is not possible to specify a date for the lid which may, in view of its very low manufacturing quality, be the result of non-professional production.

Knob-decorated cup

A small cup decorated with a knob (**Fig. 3.2**),



3. A selection of pottery from the assemblage (illustrations M. Zambello): (1) cooking pot; (2) cup; (3) bowl.

3.1 Cooking pot. Fabric: includes large chunks of limestone. Chaff proportion: medium. Fabric surface colour: red to grey. Manufacturing quality: medium. Firing: black core. Surface treatment: smoothed on external surface. Other details: ledge handles. Original height: ca 25 cm. Rim diameter: 12 cm.

3.2 Cup. Fabric: exploded chunks of limestone. Chaff proportion: medium. Fabric surface colour: buff. Manufacturing quality: medium / high. Firing: black core. Surface treatment: smoothed on external and internal surfaces. Other detail: applied knob decoration. Height: 5 cm. Rim diameter: 8 cm. Base diameter: 3 cm. Wall thickness: 0.5 - 0.8 cm.

3.3 Bowl. Chaff proportion: medium. Fabric surface colour: grey to pink. Manufacturing quality: medium. Firing: black core. Surface treatment: smoothed and covered with white slip on external and internal surfaces, thicker on external surface. Paint colour ranges from red to grey. Height: 9.2 cm. Rim diameter: 20 cm. Base diameter: 11 cm. Wall thickness: 0.9 - 1.9 cm.

12. See for example Lindner *et al.* 1996: 120, Fig. 12, 124, Fig. 21.1-2, Fig. 24.1-7 (Khirbat al-Mu'allaq, pre-12th century); 'Amr *et al.* 2000: 247, Fig. 18.1 (Khirbat an-Nawafra, Fatimid); Tonghini and Vanni Desideri 2001: 713, Fig. 8d (Crusader or immediately

pre-Crusader); Vannini and Vanni Desideri 1995: 532, Fig. 17.8-9 (al-Wu'ayra, chronology not indicated); Sinibaldi and Tuttle 2011: 445, 443, Fig. 15.4 (Bayda, Ottoman).

perhaps mirrored by another on the opposite side, is characterized by a medium / high manufacturing quality obtained with the help of a turning tool and by well-smoothed internal and external surfaces. Knob decoration is common at Wādī Farasa where the form has a parallel in a small cup, albeit shallower than the example from Tomb 303, from a context dated to between the 13th and 15th centuries.

Jug with appliqué decoration

A large jug has been almost completely reconstructed (**Figs. 5 and 2.1**). It may have been tossed into the tomb after its handle, which was not found by the excavators, broke off. It used to have a neck-to-body handle, connected to the body of the jug by means of two *appliqué* decorations; the one connecting it to the widest part of the body is characterized by three terminations. This specific decoration, used to connect a jug handle to the body of a pot, and the form itself both have close parallels at Wādī Farasa from a context dated to between the 13th and 15th centuries. However, a 20th century pot from Dana has exactly the same type of decoration, albeit on a different form of roughly the same size as the one from Thughrah (Biewers 1991 27). This kind of decoration therefore appears to be another example of extreme longevity in the region, necessitating caution when attempting a chronological attribution. It is noticeable that the surface treatment, *viz.* a white slip of varying thickness, as well as the low standard of manufacture are not paralleled in the Wādī Farasa assemblage.

Painted and slipped bowl

A bowl (**Fig. 3.3**) is one of two painted objects in the assemblage. It is characterized by its medium manufacturing quality and was formed with the aid of a turning tool. Several elements, including the rim shape (flattened on part of the diameter, but rounded and thickened on another), show that the manufacture is relatively irregular.

The uneven firing of the object, very common in Middle and Late Islamic pottery from Petra, is evident in the variations in colour (ranging from grey to red) of the paint used to decorate the bowl. Before the slip and paint were applied, both internal and external surfaces were carefully smoothed. Afterwards, the internal surface was covered with a light white slip and then painted with linear patterns in red, while the lip was decorated with a broad brushstroke. The external surface of the bowl was covered with a thick white slip, giving this area a sharp contrast of colour and decorative effect.

The bowl belongs to a type that, on the basis of recent observations, has considerable longevity at Petra (at least 12th to 15th centuries), but at the same time seems also to be characterized by variations in its chronological development. The decorative pattern was also long-lived, as it has been often recorded for Islamic-period handmade pottery produced at Petra¹³. Examples of this type originate from a context dated to the second half of the 12th century at al-Wu‘ayra; numerous other examples come from the Khirbat an-Nawafla assemblage in a context of late Mamluk date. Yet others are known from a 12th - 15th century context in Wādī Farasa, with several additional examples coming from the Jabal Harun survey assemblage¹⁴. On the basis of comparisons with other assemblages, a date of between the 13th and 15th centuries can tentatively be proposed.

Moulded lamp

This important piece (**Fig. 4**) belongs to the so-called Emmaus type, the last moulded type produced in Bilad ash-Sham. This type is often characterized by a fine but very fragile fabric, a slipper shape and roughly the dimensions of the example presented here. It is generally dated to between the 12th and 14th centuries¹⁵. The Emmaus type is also the last lamp with a slipper form to have been produced in the Palestine region¹⁶. In addition to the characteristic decorative patterns, such as rosettes, herringbone pat-

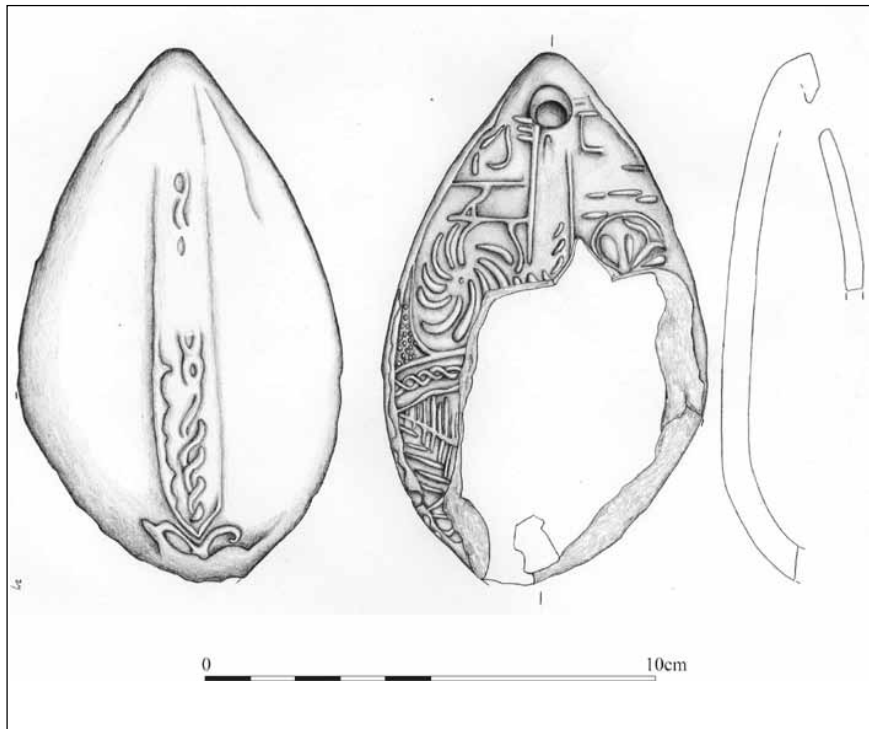
13. See for example the painted pottery from Bayda, which has some painted patterns of great longevity (Sinibaldi and Tuttle 2011: 441-443, Fig. 14).

14. See Sinibaldi 2013a: 180 and 191-192, Fig. 2.10, cat. nos 10, 12 and 13 for drawings and photos of the examples from Jabal Harun and a description of this type at Petra. Publication of the ceramic assemblage from

Khirbat an-Nawafla is in progress. For al-Wu‘ayra, see Brown 1987: 285-286, Fig. 10.29 and Vannini and Vanni Desideri 1995.

15. I am very grateful to Kate da Costa for her help with this identification. For a description of this type, see Da Costa 2012: 264, Fig. 583.

16. Kennedy 1963: 91 and pl. XXIX, 807, type 27.



4. Moulded lamp (illustration M. Zambello).

Moulded lamp. Type: Emmaus lamp. Fabric: very fine and soft. Fabric surface colour: cream. Other details: decorated under base; channel borders. Height: 3.5 cm. Length 13 cm. Width 8 cm. Wall thickness: 0.5 cm.



5. Jug in Fig. 2.1 (photo M. Sinibaldi).

terns, radial designs and pearls¹⁷, the lamp from Tomb 303 appears to have some features in common with examples found at Baysan, including the presence of channel borders (not normally present in this type) and an additional ridge around the filling hole¹⁸. Although a chronological subdivision has been attempted on the basis of the handle form¹⁹, this has not yet been confirmed by finds beyond Baysan. Therefore, the best date that can be proposed for the Tomb 303 lamp ranges from the 12th to the 14th centuries. The example presented here appears to be particularly complex in its decoration, which deviates from the more common geometric patterns, and is also characterized by the presence of decoration under the base. A close parallel for the elaborate decoration under the base, which is not always present in this type, comes from a late 14th century context from the Armenian Garden in Jerusalem (Tushingham 1985: 397, Fig. 45.1).

These being the only moulded lamps in the southern Levant during this period, it is to be expected that numerous manufacturing centres

17. See Kennedy 1963: 92, type 27; Hadad 1999: 217 and figs 9.31-33 and 4.16-17 (type 8); 217, figs 9.34-35 and 4.18 (type 9); Kedar and Pringle 1985: 178, Fig. 4.3.

18. Personal communication by Kate da Costa.

19. Hadad 1999: types 8 and 9; Tushingham 1985: 147, Fig. 37.6, Fig. 38.17, Fig. 39.24, Fig. 39.41, Fig. 37.13, Fig. 38.14 (type G.2); 151, Fig. 43.17, Fig. 45.1-3 (type N. 2).

were producing the Emmaus type, which has been found at several sites. Evidence for its manufacture in Jerusalem comes from the Armenian Garden in a context dated to the last quarter of the 14th century, from which some moulds for these lamps were recovered (Tushingham 1985: 151). Additionally, a lamp of this type and what has been interpreted as a mould for the same lamp were found at the Church of the Ascension in Jerusalem (Corbo 1965: Fig. 111.2; Mason and Milwright 1998: 187-188).

Apart from Jerusalem, other examples of this type come from sites elsewhere in Palestine and in Syria. In addition to the sites mentioned above, these include al-Qubayba where it was first identified²⁰, al-Fula (12th - 13th centuries) (Kedar and Pringle 1985: 178, Fig. 4.3), St Mary of Carmel (13th century) (Pringle 1984: 100, Fig. 5.9), the Red Tower (13th - 14th centuries) (Pringle 1986: 145, Fig. 47), Khirbat al-Lawza (12th - 13th centuries) (Ellenblum *et al.* 1996: 192, 194, figs 7-8), Jaffa (13th century) (Kletter 2004: 202-205, Fig. 16.10) and Yoqne'am (Avissar 1996: 195, Fig. XV.27, no. 28). The Emmaus type is also represented by examples from sites in Jordan, e.g. Tall Ḥisbān, where it is well-dated by a hoard of coins dating to 1260 - 1277 (Thompson 1973: 77), Karak, in a fabric which does not appear compatible with the typical Karak fabric (Mason and Milwright 1998: 177, Fig. 2.9, 187-188) and several examples from Ghawr as-Safi (the sites of Ṭawāḥān as-Sukkar and Khirbat ash-Shaykh 'Isa)²¹, where occupation at the sugar production site during the 13th - 14th centuries is evidenced by the presence of these lamps.

Discussion

The assemblage from Tomb 303 is of great interest for several reasons, including the fact that it presents an opportunity to analyse and publish a small group of objects from Islamic Petra - a period that needs much more investigation.

The first important contribution of the Tomb 303 assemblage is the evidence it presents for settlement in this part of the Petra valley during the Middle to Late Islamic period. It is possible

to hypothesize that the tomb was used primarily as a rubbish dump for a nearby settled community for a limited amount of time, since there seems to have been no obvious accumulation of dust (that would suggest a long period of abandonment) during the period in which the material was deposited. This and, as suggested by the excavators, any possible brief occupation of the space seems to have occurred in the Mamluk period. Thus, the possible date of the dump could extend from the late 12th century to the 15th century, but can most likely be narrowed down to the 13th - 14th centuries, primarily on the basis of the date of the lamp. Evidence for settlement in this area of Petra during the Mamluk period has been demonstrated by the case study of Wādī Farasa, where a Nabataean funerary complex (Schmid 2001, 2002; Schmid and Studer 2003) was frequented and inhabited at various times between the 12th and 18th centuries, with a significant occupation during the Mamluk period. A settlement was also present on Jabal Harun during the Mamluk period, perhaps in connection with the building of the *weli* in the 14th century (Sinibaldi 2013a: 183). It can also be noted that the path passing through Thughrah was historically one of the main routes leading to Petra from Wādī 'Araba; today this is also the main route leading from the ancient city centre of Petra to Jabal Harun. Additional evidence for Mamluk-period settlement in the Petra valley may also be present at the Petra Pool Complex, on the basis of the intact cooking pot described above. Beyond the Petra valley, the Mamluk period was important at the site of Khirbat an-Nawafila and recent archaeological evidence is suggestive of Mamluk-period settlement at Bayda (Sinibaldi, in press b). It is too early to speculate about the extent, distribution and intensity of Mamluk-period settlement compared to other periods in the Petra region; this will certainly be an important topic to explore in the near future. Nevertheless, the preliminary evidence described here suggests that its presence was significant.

The second important contribution of the Thughrah assemblage to our understanding of Islamic-period Petra relates to the trade and circulation of the imported ceramics. The Emmaus

20. Bagatti 1947: 140, pl. 28. This site, long identified as Biblical Emmaus, was the source of the original name for this lamp, but this identification can no longer be

supported.

21. Personal communication by Kate da Costa.

lamp is currently one of very few known chronologically bounded imports found in the Petra region for the Middle Islamic period; it is therefore particularly important. Currently available evidence suggests that the 'handmade' tradition was predominant in Middle / Late Islamic Petra, with a very limited presence of wheel-made or moulded pottery objects, which are therefore commonly assumed to be of non-local origin. The very few examples of imports in the Petra area that date to the 12th - 14th centuries have to date been identified at al-Wu'ayra as originating from the Syrian region, or more generally from the southern Levant (Vannini and Tonghini 1997: 382; Brown 1987: 284). The sources for imports at Bayḍa and Wādī Farasa have been identified as being the Lebanese coast, Red Sea, Syria / Egypt and Palestine²²; the lamp therefore adds some important information to this picture.

The possibility cannot be excluded that the Petra example belongs to the late 12th century, because the area was trading with Palestine during the Crusader period (Sinibaldi 2014), but it should be borne in mind that the other examples found in Jordan all date to the Mamluk period. The location of the sites at which they were found (Karak; Tall Ḥisbān; Ṭawāḥān as-Sukkar and Khirbat Shaykh 'Isa in Ghawr as-Safi) hints at how this object may have arrived in Petra. Karak, refortified as a major settlement by the Franks in 1142, increased its connection with Palestine and Jerusalem from this time onward, and these connections were maintained during the Ayyubid and Mamluk periods when the new rulers chose not to destroy the Crusader castle, but to refortify and use it as an important post on the Darb al-Hajj; the same strategy was also adopted at Shawbak. Ghawr as-Safi was likewise well-connected with the Palestine region; this is evident from the rich ceramic assemblages at sites dating to the early Mamluk period. These ceramics include, for example, some relief-moulded bowls, a well-known type of the 13th - 14th centuries²³ which is also represented by several examples at Tall Ḥisbān, a

very significant site during the Early Mamluk period (Walker and La Bianca 2003: 464-466). Numerous examples of these bowls have also been found at Karak castle and on the Karak plateau (Milwright 2008: 201-207; Brown 1991: 233, 278, nos 252-257). What is of interest is the fact that these bowls of the 13th - 14th centuries were produced in Jerusalem (See Avissar and Stern 2005: 23-24, type I.1.7), to which all these sites seem to have been well-connected; this may also have been the origin of some of the Emmaus lamps in Jordan.

The hypothesis that the lamp may have arrived in Petra from Palestine through Karak or Ghawr as-Safi is supported by the fact that several ceramic products created in early Mamluk Palestine have been found at all these sites²⁴. If the lamp was produced in Jerusalem, this example would fit very well with the preliminary evidence already gathered for the existence of trade connections between Palestine and the Petra region during the Middle Islamic period along the King's Highway, starting in the Crusader period and continuing until at least early Mamluk times. The fact that an Emmaus lamp has been found in Petra therefore supports the conclusion that Petra had a continuous, though not intense, connection with the castles located along the King's Highway (Karak and Shawbak) from the Crusader period into at least the early Mamluk period. At Shawbak, only *ca* 25 km from Petra, a preliminary ceramic assessment of survey and excavation material has demonstrated that traded products of the Early Mamluk period were rich and varied, and certainly included some from the Palestine region²⁵.

Concluding Remarks

A recent preliminary study of the characteristics of handmade pottery in Petra (the dominant group there in the Middle and Late Islamic periods), as well as the identification of its most diagnostic aspects, now makes it possible to propose a preliminary chronological framework for several sites in the region. It also casts some light

22. Such evidence is documented at Bayḍa and Wādī Farasa for the 12th - 15th centuries.

23. Personal observations from my examination of the excavated ceramic material from these sites (courtesy of director K. D. Politis and ceramic specialist A. Grey).

24. My study of ceramic imports to Petra is currently in progress.

25. See for example Walker 2009 and Sinibaldi 2009b for some of the imported early Mamluk fragments recovered from excavations and surveys at Shawbak, as well as the locally better-known handmade pottery.

on the important subject of the extent, nature and chronology of settlement in the Petra region in its post-urban phase and of its relationship with trade²⁶. While it is hoped that additional work will in future yield further information on these themes, currently available data, as shown for example by results from the Tomb 303 assemblage, already make it possible to demonstrate with certainty that (1) settlement in the Petra valley existed during the Mamluk period and (2) during this period imports to the Transjordanian region reached the Petra valley itself.

The decision of several researchers involved in recent work in Petra, which is normally focused on the study of earlier periods, to encourage the specialized study of pottery from later excavated contexts has been an important step in coming to a better understanding of the chronology of these sites²⁷. Evidence is gradually demonstrating that, although settlement certainly seems to have significantly decreased in the Petra valley after the Byzantine period, it did not stop completely²⁸. The commonly held view that the valley was abandoned sometime after the Nabataean period and was only briefly reoccupied during a period of revival under Frankish rule in the 12th century²⁹ now seems impossible to sustain. Instead, ceramic evidence is gradually providing a more nuanced and complex picture of continuing settlement in the valley during the Islamic period, with the Mamluk period beginning to emerge as a significant phase³⁰.

Bibliography

- Amr, K. *et al.*
 2000 Summary Results of the Archaeological Project at Khirbat an-Nawafra/Wādī Musa. *ADAJ* 44, 231-255.
- Avissar, M.
 1996 The Oil Lamps. Pp. 188-197 in A. Ben-Tor, M. Avissar and Y. Portugali (eds.), *Yoqne'am I. The Later Periods*. Qedem Reports n. 3, Hebrew University of Jerusalem.
- Avissar, M. and Stern, E.
 2005 Pottery of the Crusader, Ayyubid and Mamluk periods in Israel. *Israel Antiquity Authority Reports* n. 26, Jerusalem.
- Bagatti, B.
 1947 *I monumenti di Emmaus el-Qubeibe e dei dintorni*. Studium Biblicum Franciscanum, Collectio Maior 4, Jerusalem, Franciscan Printing Press.
- Bedal, L. A.
 2000 *The Petra Pool Complex. A Hellenistic Paradisios in the Nabatean capital*, M.A. dissertation presented to the University of Pennsylvania, Department of Anthropology.
 2003 *The Petra Pool Complex. A Hellenistic Paradisios in the Nabatean Capital*, Gorgias Press.
- Biewers, M.
 1991 *L'Habitat Traditionnel du sud de la Jordanie. Les villages de 'Aima. Dana et Khirbat Nawafleh, Amman*.
- Brown, R.
 1987 A 12th century A.D. sequence from Southern Transjordan Crusader and Ayyubid occupation at el-Wu'eira. *ADAJ* 31: 67-288.

26. Some preliminary observations on the subject of the relationship between ceramics and settlement in the Petra region will appear in Sinibaldi, in press a.

27. I am grateful to all project directors who asked me to include their ceramic material in my current study. In addition to the excavated assemblages from Thughrah Tomb 303 analyzed here (directors Christian Augé and Isabelle Sachet) and the assemblage from the Djin Blocks (director M. Mouton), both part of the wider *From Petra to Wādī Ramm* project (Institut Français du Proche Orient), my current analysis includes assemblages from Wādī Farasa (International Wādī Farasa Project excavations, Humboldt University [director Stephan Schmid]), Bayda (Beidha Documentation Project excavations, American Centre of Oriental Research [director Patricia M. Bikai]), surveys and excavations by the Brown University Petra Archaeological Project (directors Susan Alcock and Christopher Tuttle), Khirbat an-Nawafra (Department of Antiquities of Jordan excavations [directors Khairieh 'Amr and Ahmad al-Momani]), Jabal Harun (excavations and surveys by the Finnish Jabal Harun Project, University of Helsinki [director Jaakko Frösén]), al-Wu'ayra

(excavations directed by Robin Brown) and Ba'ja (excavations at Ba'ja I by the German Protestant Institute of Archaeology [director Dieter Vieweger]). For preliminary results see Sinibaldi 2009a and b; Sinibaldi and Tuttle 2011.

28. As already suggested by Fiema (2002: 241-242), at least for the 7th - 11th centuries.

29. According to this view, the Frankish presence in the area caused "a rapid though ephemeral re-emergence of the historical conditions that had already constituted twice in the past the basis of the fortunes of Petra." But "Afterwards, the fall of the Latin Kingdom caused Petra to become again merely the internal region of a vast dominion and to lose its strategic importance. For this reason, the area was deserted and the same phenomenon of decadence that had been caused by the Roman (and later Arab) conquest occurred all over again. In this manner Petra suddenly became a site of minor importance without a lasting settlement..." (Vannini and Vanni Desideri 1995: 513, 538).

30. See Sinibaldi 2013b and Sinibaldi, in press a for some preliminary observations on this subject.

- 1991 Ceramics from the Kerak plateau. Pp. 169-279 in Miller, M. (ed.), *Archaeological Survey of the Kerak Plateau*. American Schools of Oriental Research Archaeological Reports (ed. L. Herr), number 1, Atlanta.
 - 1992 Late Islamic Ceramic Production and Distribution in the Southern Levant: A Socio-Economic and Political Analysis. Unpublished PhD dissertation, Binghamton State University.
- Brown, R.M. and K. Rielly,
- 2010 A twelfth century faunal assemblage from al-Wu'ayra in the southern highlands of Jordan, *ADAJ* 54: 121-141
- Corbo, V.
- 1965 Ricerche archeologiche al Monte degli Ulivi, Studium Biblicum. Franciscanum, Collectio Maior, Jerusalem 16.
- Da Costa, K.
- 2012 The Ceramic Lamps. Pp. 223-291 in K. D. Politis (ed.), *Sanctuary of Lot at Deir 'Ain 'Abata in Jordan*. Excavations 1988-2003. Amman, Jordan Distribution Agency.
- Ellenblum, R., Rubin R. and Solar, G.
- 1996 Khirbat al-Lawza, a Frankish Farm House in the Judean Hills in Central Palestine. *Levant* 28: 189-198.
- Fiema, Z. T.
- 2002 Petra and Its Hinterland during the Byzantine Period: New Research and Interpretations. Pp. 191-252 in J. Humphrey (ed.), *Roman and Byzantine Near East: Some New Discoveries III*. Journal of Roman Archaeology Supplementary Series no. 49, Portsmouth, RI.
- Hadad, S.
- 1999 Oil Lamps from the Abbasid Through the Mamluk Periods at Bet Shean. *Levant* 31: 203-224.
- Kedar, B.Z. and Pringle, D.
- 1985 La Fève: a Crusader Castle in the Jezreel Valley, *Israel Exploration Journal* 35, 2-3: 164-179.
- Kennedy, C.
- 1963 The Development of the lamp in Palestine. *Berytus XIV (II)*: 67-115
- Kletter, R.,
- 2004 Jaffa, Roslan Street, 'Atiqot 47: 193-207.
- Lindner, M., Knauf E.A. and Zeitler, J.P.
- 1996 An Edomite fortress and a Late Islamic Village near Petra (Jordan): Khirbat al-Mu'allaq. *ADAJ* 44: 111-135.
- Mason, R.B., and Milwright, M.
- 1998 Petrography of Middle Islamic Pottery from Karak, *Levant* 30: 175-190.
- Milwright, M.,
- 2008 *The Fortress of the Raven. Kerak in the Middle Islamic Period (1100-1650)*. Leiden and Boston, Brill.
- Pringle, R.D.
- 1984 Thirteenth-century pottery from the monastery of St. Mary of Carmel, *Levant* 16: 91-111.
 - 1986 The Red Tower (Al-Burj al-Ahmar). Settlement in the plain of Sharon at the time of the Crusaders and Mamluks AD 1099-1516, London, British School of Archaeology in Jerusalem, (Monographs series 1).
- Schmid, S.G.,
- 2001 The International Wādī Farasa Project (IWFP): 2000 Season. *ADAJ* 45: 343-358.
 - 2002 The International Wādī Farasa Project (IWFP): 2001 season. *ADAJ* 46: 257-277.
 - 2005 The International Wādī Farasa Project (IWFP). Preliminary report on the 2004 season. *ADAJ* 49: 71-78.
 - 2007 The International Wādī Farasa Project (IWFP). Preliminary report on the 2006 season. *ADAJ* 51: 141-150.
- Schmid, S.G. and Barnasse, A.
- 2004 The International Wādī Farasa Project (IWFP). Preliminary report on the 2003 season. *ADAJ* 48: 333-346.
 - 2006 The International Wādī Farasa Project (IWFP). 2005 season. *ADAJ* 50: 217-228
- Schmid S.G. and Studer, J.
- 2003 The International Wādī Farasa Project (IWFP). Preliminary report on the 2002 season. *ADAJ* 47: 473-488.
- Sinibaldi, M.
- 2009 a The Franks in Southern Transjordan and the contribution of Ceramic Studies. A Preliminary Report on the Pottery Assemblages of Bayda and Wādī Farasa. *ADAJ* 53: 449-464.
 - 2009 b Entries n. 69-71. Artifacts descriptions: ceramics from Shawbak castle. Pp. 138-140 in G. Vannini and M. Nuccioti (eds.), *Catalogue of the Exhibition "From Petra to Shawbak, Archaeology of a Frontier"*, Florence.
 - 2013 a The pottery from the 11th-20th centuries from the FJHP survey. Ceramics, Settlement and Pilgrimage at Jabal Harun during the Late Islamic periods, in Pp. 169-197 P. Kouki and M. Laven- to (eds.), *Petra, the Mountain of Aaron. Vol. III. The Archaeological Survey*.
 - 2013 b Archaeology and History of Crusader-period Settlements: 12th century sites in Transjordan. *Bulletin of the Council for British Research in the Levant*, 62-65.
 - 2014 Settlement in Crusader Transjordan (1100-1189): a Historical and Archaeological Study. PhD thesis submitted to Cardiff University, U.K.
- in press a The ceramics from the later phases of occupation at the Monastic site of Jabal Harun, In Z.

M. Sinibaldi: The Ceramic Assemblage from the Later Phases at Tomb 303, Settlement in Wādī ath-Thughrah

- Fiema and J. Frosén (eds.), *Petra, the Mountain of Aaron. Vol. II. The Nabataean Sanctuary and the Byzantine Monastic Complex*.
 in press b The Islamic Bayḍa Project, Bayḍa (Petra Region), Season 2014. *Palestine Exploration Quarterly*.
 Sinibaldi, M. and Tuttle, C. A.
 2011 Brown University Petra Archaeological Project: 2010 Excavations at Islamic Bayḍa. *ADAJ* 55: 431-450.
 Tonghini, C. and Vanni Desideri, A.
 2001 The Material Evidence from al-Wu‘ayra: a Sample of Pottery. *SHAJ* 7: 707-719.
 Thompson, H.O.
 1973 “Heshbon 1971: Area C”. *Andrews University Seminary Studies* XI/1: 72-88.
 Tushingham, A.D.
 1985 *Excavations in Jerusalem 1961-1967*, Volume I, Royal Ontario Museum, Toronto.
 Vannini, G. and Tonghini, C.
 1997 Medieval Petra: the Stratigraphic Evidence from Recent Archaeological excavations at al-Wu‘ayra. *SHAJ* 6: 371-84.
 Vannini, G. and Vanni Desideri, A.
 1995 Archaeological Research on Medieval Petra: a Preliminary Report. *ADAJ* 39: 509-40.
 Walker, B. J.,
 2009 Entries n. 64-69. Artifacts descriptions: ceramics from Shawbak castle, in Pp. 136-138 G. Vannini and M. Nuccioti (eds.), *Catalogue of the Exhibition “From Petra to Shawbak, Archaeology of a Frontier”*, Florence.
 Walker, B. J., and La Bianca, O. S.
 2003 The Islamic Qusur of Tall Ḥisbān: Preliminary Report on the 1998 and 2001 seasons, *ADAJ* 47: 443-471.

QAṢR MUSHĀSH SURVEY: FIRST RESULTS OF ARCHAEOLOGICAL FIELDWORK IN 2011 AND 2012

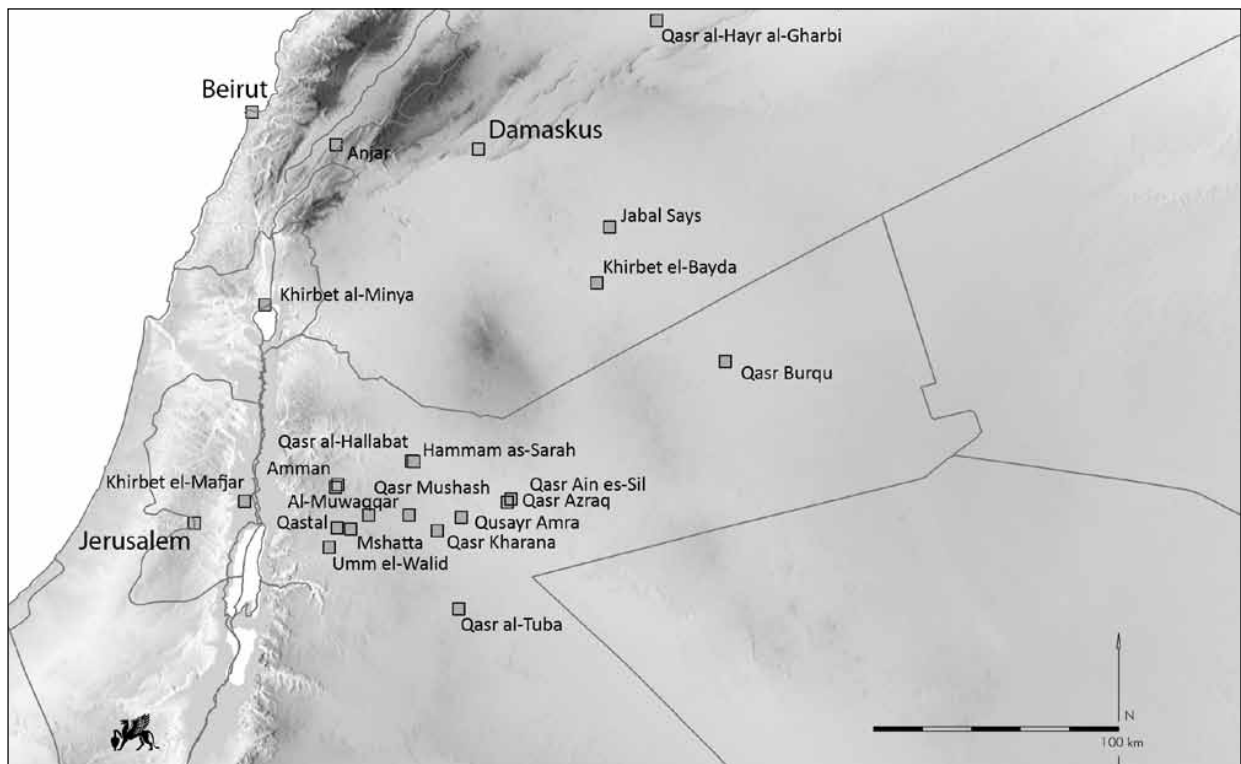
Karin Bartl, Ghazi Bisheh, Franziska Bloch and Tobias Richter

Introduction

Qaṣr Mushāsh lies *ca.* 40km east of Ammān in an arid zone without a permanent supply of water (**Fig. 1**). The site is actually comprised of two parts that are separated by *ca.* 1.5km from one another, Qaṣr Mushāsh West and Qaṣr Mushāsh East. The two settlement sections Qaṣr Mushāsh West and Qaṣr Mushāsh East differ in size and structure. Qaṣr Mushāsh West, where the small square building of the *Qaṣr* (arab.: castle, fortress) is located, forms the core of the complex and embraces an area of some nine hectares. Noteworthy in both settlement parts is

the large number of hydraulic complexes in the form of reservoirs, cisterns and dams.

Qaṣr Mushash has often been assigned to the group of Early Islamic “desert castles”. This designation signifies palace-like complexes located in remote regions of the desert, which served mostly as temporary seats of rulers of the Umayyad times (661–750 A.D.). The structure addressed as ‘*qaṣr*’ in Mushāsh, a square building with a side-length of 26m, lies on the north bank of Wādī Mushāsh and is still partly preserved. Alois Musil was the first to visit this complex in 1901 and to make a short de-



1. Desert castles in Bilād ash-Shām, location of Qaṣr Mushāsh (map: DAI, Orient-Department, Th. Urban, using USGS/ NASA 3-arc second SRTM data).

scription of it (Musil 1907:115; Abb.104-105). Aurel Stein documented it in detail during his *Limes* project in 1938 (Gregory and Kennedy 1985:286f., pl.64c). The site was visited a new and described only later, at the beginning of the 1980s, by Geoffrey King, during a large-scale survey on the documentation of early Byzantine and Early Islamic ruins in northern Jordan. The surveys carried out in the 1980s in the area of Qaṣr Muṣḥāsh were primarily in places, where at that time recognisable remains of buildings still marked the terrain. These remains were entered in a schematic plan so as to note their approximate location (King 1982:86-88, 1983:386-392). The excavations that followed in 1982 and 1983 under the direction of Ghazi Bisheh were focussed on the Qaṣr, the bath and a reservoir. The documentation of these ruins all together constitutes the most important data of the site (Bisheh 1989, 1992).

In 2011 a cooperation project between Jordan Department of Antiquities (DoA) and the Orient Department of the German Archaeological Institute began and has several and different aims: the documentation of all archaeological sites within a radius of 10 km from the settlement, the creation of a new plan of the entire settlement site that should serve as the basis for a 3D-model, and investigations on the water supply for the site, whose structure and function were hitherto hardly known.

In the current plan all further, newly discovered wall- and buildings remains should be recorded; it also documents all illicit excavations and looter pits, which have increased drastically during the past two decades and destroyed major parts of the ruins as far down as the foundations. Surveys of the terrain around Qaṣr Muṣḥāsh and vicinity are carried out basing on the assessment of high-resolution satellite images. The exact determination of the site coordinates was subsequently achieved through GPS and recordings of buildings with a total station. Surface finds were collected selectively. A topographic isohypse plan in 10cm intervals was created for the site Qaṣr Muṣḥāsh -West on the basis of satellite images and available plans in a scale of 1:25 000. Building remains visible on the surface were recorded photogrammetrically, drawn digitally and integrated in the topographic plan. These terrain and building recordings should

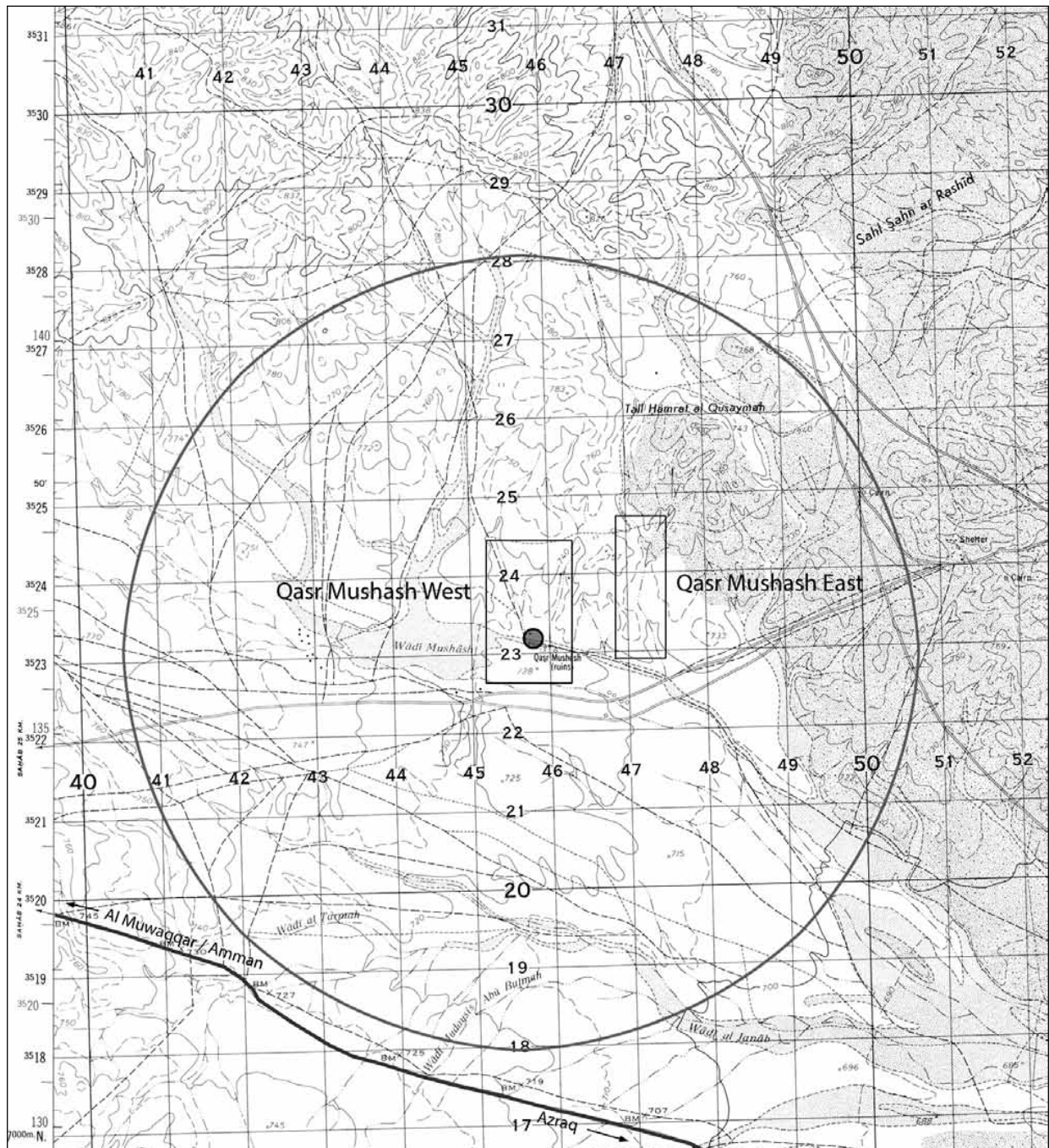
serve in creating a 3D-model of the terrain of the entire site. Geophysical investigations with the aid of geomagnetic and georadar are an aid in the search for further structural remains. The data achieved are integrated into the entire plan and, thus, augment the setting of the settlement, without necessitating any greater interventions in the remaining ruins. Specified soundings should aid in clarifying stratigraphic questions and the association of individual building elements. Geomorphological investigations at a local level should supply more exact information about regional water resources.

Results

Previous work at Qaṣr Muṣḥāsh concentrated, firstly, on conducting an archaeological survey and creating a topographical plan of the area under study. Consequently, with the expedition seasons of autumn 2011 as well as spring and autumn 2012 almost the entire area within 10 kilometres of the site was surveyed. Thereby, 164 findspots were plotted (**Fig. 2**). The data recorded at the site of Qaṣr Muṣḥāsh itself were focused on the settlement part in the west, the actual core of the complex. There numerous hitherto undocumented wall and building remains were plotted.

Of the 164 aforementioned findspots, 35 were located in the immediate vicinity of the settlement Qaṣr Muṣḥāsh West and Qaṣr Muṣḥāsh East. The dating of the surface material confirms that the sole historical settlement periods represented there are those of the early Byzantine and Early Islamic or Umayyad times, that is, the time span between the 4th and 7th and the 7th and 8th centuries A.D. (**Fig. 3**) (see contribution of F. Bloch). Almost no older or younger archaeological material has been attested until now.

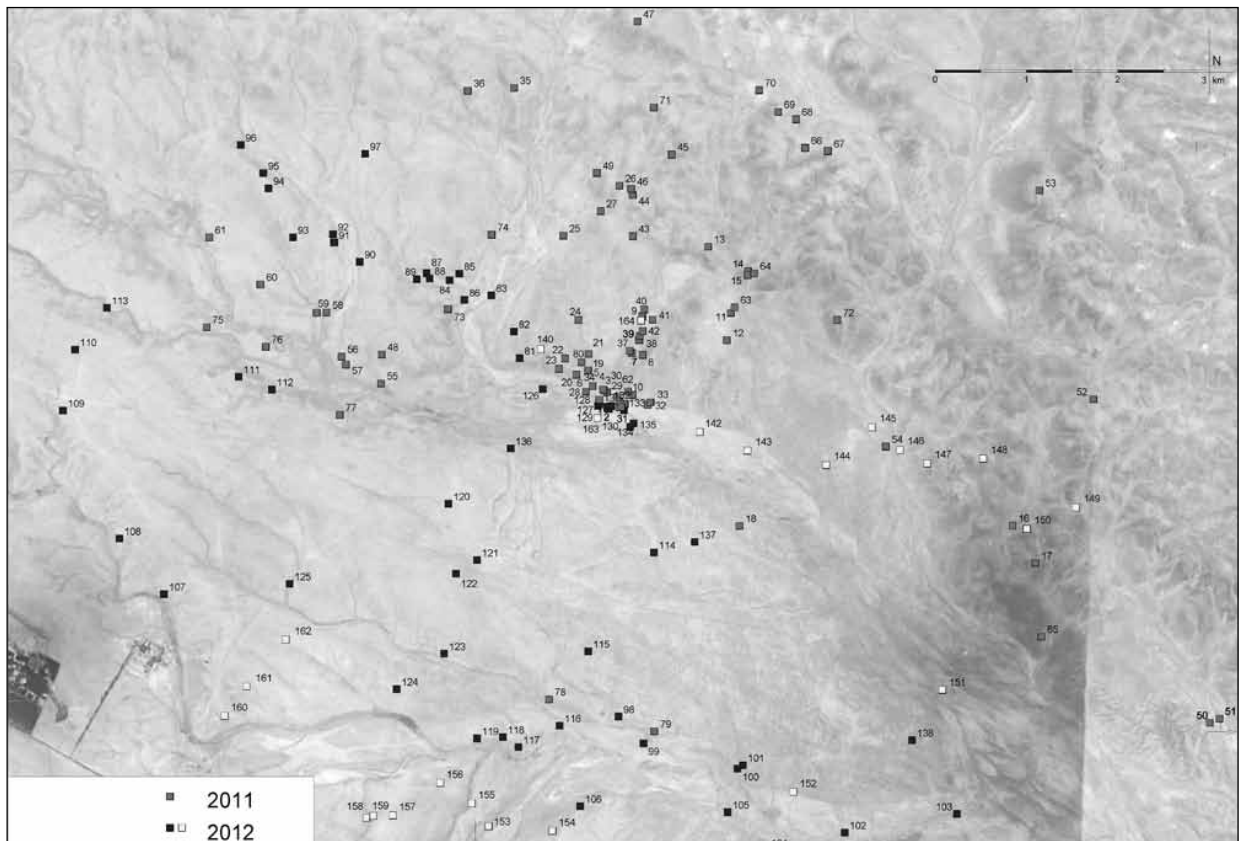
A total of 129 findspots yielded exclusively surface material from prehistoric periods. The majority of these finds stem from the time of the Old Palaeolithic to Epipalaeolithic periods (*ca.* 500,000 to 12,000 BP) (**Fig. 4**). However, in general, a clearly defined region cannot be assigned to these periods. Even though the finds were found in the region, their exact localisation is not possible, because they could have been widely dispersed by erosive processes (see contribution of T. Richter).



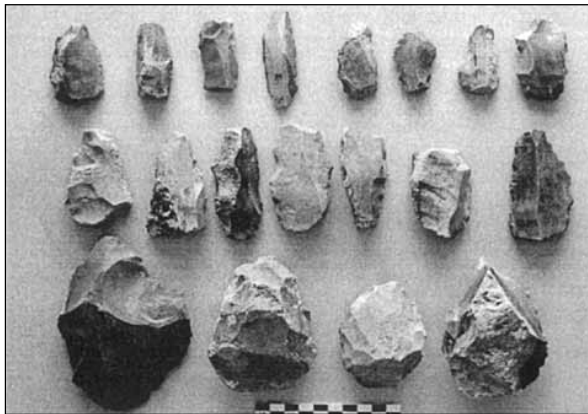
2. Location of Qaṣr Muṣḥaṣh with areas of research (map: Jordan 1:50,000, sheet 32531, Defense Mapping Agency, Washington DC, 1974).

In this regard, pottery finds collected during the field surveys have confirmed that the Qaṣr itself is unmistakably of an earlier origin than the rest of the buildings (**Fig. 5**). Several ceramic types point to an occupation since the 3rd century A.D. at least; perhaps even earlier. Observations of the settlement surface in the immediate surroundings as well as the results of geophysical

prospection attest a much larger size at the site than revealed by previous investigations. Several settlement parts could be differentiated in Qaṣr Muṣḥaṣh West: the Qaṣr itself with nearby smaller buildings and adjoining cisterns in the East, and to the west the central area with the bath, rectangular reservoir and a large square building. The last complex, discovered through



3. *Qaşr Mushāsh Survey 2011-2012, archaeological find spots (map: DAI, Orient-Department, Th. Urban).*



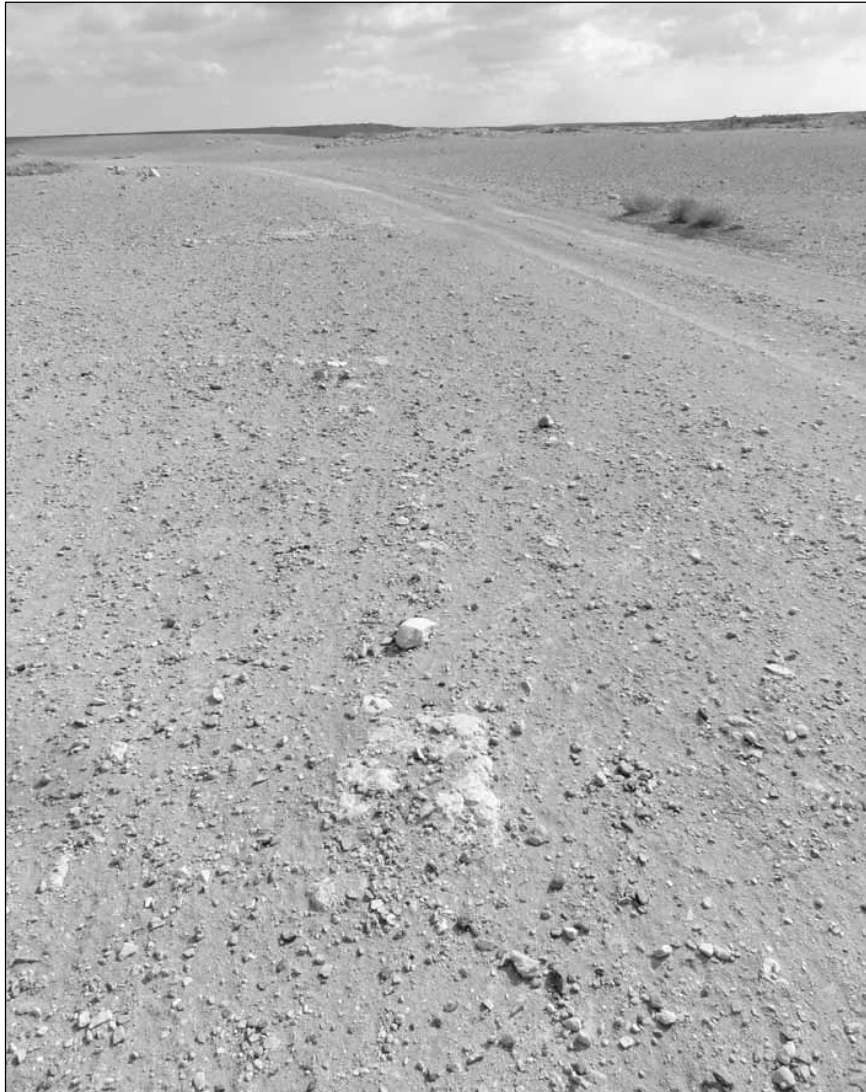
4. *Qaşr Mushāsh Survey, lithic tools, FP 94 fragment (photo: DAI, Orient-Department, K. Bartl).*



5. *Qaşr Mushash, view from the northwest (photo: DAI, Orient-Department, Th. Urban).*

geomagnetical prospecting, is constituted by a building (side-length of 40m) with a large courtyard enclosed by rows of rooms. Located to the west of the central area is another part of the settlement, composed of numerous small houses (**Fig. 6**). In addition, several large-sized buildings in similar direction stand to the northeast of the central area. A large, square water pool with a side-length of 21m is located to the west, outside of the settlement area. Further groups of buildings lie some 500m east and north of these complexes (**Fig. 7**). A very large reservoir with an original capacity of almost 2000m³ is situated *ca.* 900m north of the Qaşr (**Fig. 8**). Even more remains of walls, possibly once part of, stand on the southern bank of the Wādī. However, the rediscovery of a tower documented by A. Musil in 1901 was not yet possible.

Investigations on the water supply have revealed preliminarily that apparently only the winter rains that drained in small water courses from the north into Wādī Mushāsh were used. There was sufficient slope for these streamlets to flow into the settlement's cisterns and res-



6. *Qaṣr Mushāsh, house remains west of the Qaṣr (photo: DAI, Orient-Department, K. Bartl).*



7. *Qaṣr Mushāsh, large reservoir west of the central area (photo: DAI, Orient-Department, K. Bartl).*



8. *Qaṣr Mushāsh, large reservoir north of the Qaṣr (photo: DAI, Orient-Department, K. Bartl).*

ervoirs; in addition, they could be controlled more easily than the considerably larger Wādī Mushāsh. The latter lies distinctly lower than the facilities for storing water, so that the use of this water necessitated a means of raising water, such as a water wheel or lift, of which however no traces are present today. However, several remains of strong walls formerly crossing the Wādī Mushāsh in North-South direction might be indications for a barrier damming the water thus forming a kind of reservoir. Further investigations are necessary in order to determine the conduits to the water storage facilities of the site.

Investigations until now have shown that Qaṣr Mushāsh is a settlement site with several, spatially separate units of various function. The oldest part of the site is the Qaṣr itself in the East, which was already present in Late Roman or Roman times and perhaps used as a guard post in the desert steppe. This complex was obviously in further use in Umayyad times, perhaps for

the same purpose. At that time further buildings were erected in the immediate surroundings of the Qaṣr. These include in the central settlement area with the large square building, the bath, the adjoining reservoir and different structures. The square building with the large courtyard is the largest of the total of four square complexes. In later times this type of structure often represented the core of caravan stations, for example, on the Hajj route.¹ Together with the bath and reservoir it forms a likely uniformly planned complex. By comparison the neighbouring Quṣayr 'Amra is of rather modest design (Vibert-Guigne and Bisheh 2007). The settlement section to the west of the central area with smaller, multi-roomed houses can be interpreted as a simple residential area, while the buildings northeast of the central area, differing distinctly from the western houses in size and internal division, might have served as representational structures. The large reservoir in the west is located at rather a dis-

1. Another example of this type, probably originating from Late Roman times but mainly used in the Umayyad period is a square structure of similar size at Umm al-Walid (Kennedy 2004:230; Bujard 1997: 359ff.). A

very similar structure at Jabal Says is defined as service building for the Qaṣr (Schmidt 2012). At Resafa-Sergiopolis/Rusafat Hisham similar building types are named caliphal residences (Sack *et al.* 2010:112ff.).

tance from the residential and functional buildings, on the very edge of the settlement, and was possibly used for watering animals.

The present results render the assumptions already made by A. Stein and Gh. Bisheh, that Qaṣr Mushāsh was a caravan station on the route between 'Ammān/Philadelphia and Wādī as-Sarhān, quite plausible. Future research will be concerned foremost with questions about the time of the site's occupation, its resources and the economy, in addition to further documentation of the remaining buildings. (KB/GB)

Islamic Pottery Finds

The historical Balqā'-region, in which Qaṣr Mushāsh is located halfway between the Umayyad sites of al-Muwaqqar and Kharrāna, is well known for having been densely settled in the Early Islamic I Period (600-800 AD) and for having served as preferential place of residence for some members of the ruling Umayyad elite (significant archaeological data being available i.a. from 'Ammān Citadel, Quṣayr 'Amra, Qaṣr Kharrāna, Qaṣr al-Hallābāt, Ḥisbān, Tall Jāwa, Umm al-Walīd). Not surprisingly, an Umayyad settlement phase was established for Mushāsh during previous research. This assignment was i.a. based on ceramic evidence. With the new survey conducted in 2011/2012, the rather general picture of a settlement in the Umayyad period was sought to be specified and stated more precisely by identifying specific pottery-types, both familiar and lesser-known.

Because the material presented in this contribution is surface collected, no stratigraphy can be established and the analysis has to rely on typological comparison. Diagnostic criteria are techniques of decoration and the macroscopic appearance of the fabric. On the basis of approx. 1000 collected sherds, a solid spectrum of wares or functional groups could be defined, allowing a closer chronological assignment. Furthermore, from a more general view, the corpus also provides interesting indications of pottery – notably architectural ceramics – from the context of an early Islamic bath.

Corresponding to observations made at other qaṣr-sites, the complex at Mushāsh is characterized by a general scarcity of finds. The corpus presented here consists mainly of common ware production. Except for one single (somewhat enigmatic and

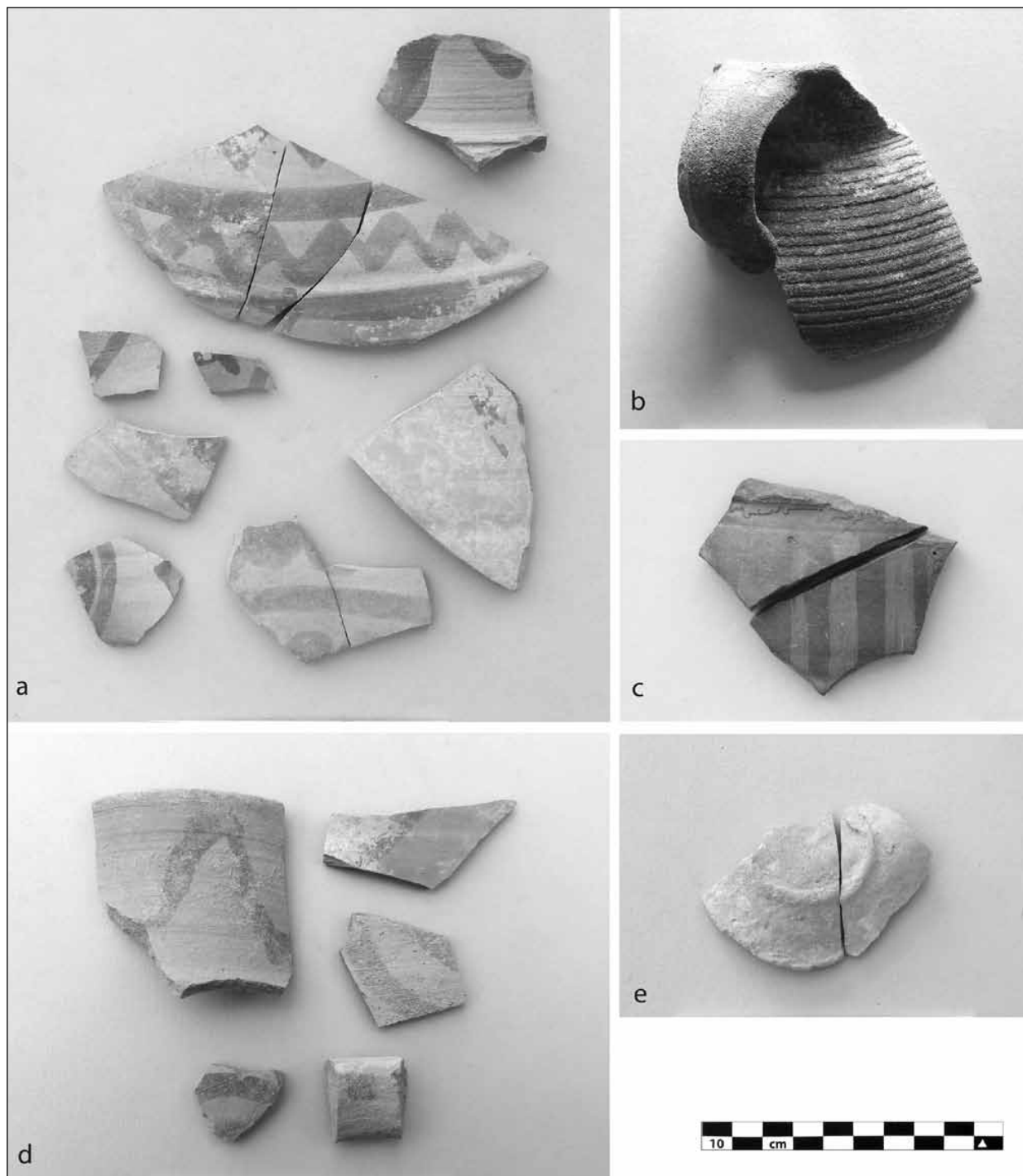
seemingly out of context) fragment of stonepaste, the recovered material is all domestic, non-glazed, with two wares showing painted decoration.

Red-Painted Ware: The examples are distinguished by a smooth, buff coloured fabric decorated with a cream coloured slip and dark red to brown paint. Patterns include linear, circular or waved motifs and alternating bands of geometric designs. As form, a medium size jar predominates, judging from the fragments with relatively sharp bend between shoulder and body and distinct ridge at the lower neck of the vessel (**Fig. 9a**). The ware dates from the late-seventh to mid-eighth centuries AD and has been called “a hallmark of the Umayyad period” (Smith 1989 113; recently Walker 2012: 529). The later (Abbasid) variant of painted cups, characterized by smaller and more intricate geometric designs, are not recorded in the Mushash material.

Bag-Shaped Jars: Several rim and body sherds are evidence of large, bi-ansulate, bag-shaped storejars. The buff fabric is covered by a cream to pale brown slip and reddish brown paint (**Fig. 9d**). The dark variant of this vessel type with white paint is also attested (**Fig. 9c**). Similar painted decoration of broad geometric bands and curls is applied on both wares. In sherd section, grey cores are frequently revealed. The dark type is usually dated slightly earlier than the buff ware and points to a mid-7th / early 8th c. context (cf. e.g. Daviau 2010: 263f.).

Cooking Pots: Ribbed cooking pots (**Fig. 9b**) and casseroles with lids and horizontal loop handles are the most frequent pottery in the assemblage. As the ware is known since Roman times and appears well up to the medieval period, a refined chronology is difficult to establish on the basis of the collected isolated and small-sized sherds. Fragments with ribbed exterior surface belonging to both forms appear in different fabrics: a red ware, a thin-walled and frequently grey slipped brown ware, and a relatively hard and crisp grey ware.

Gray Ware Basins: Handmade large and smaller basins with everted (triangular) rims and combed lines of straight or wavy bands already appear in the Byzantine age but occur com-



9. Pottery finds from Qaṣr Mushāsh Survey: a. red-painted ware; b. cooking pot ware; c. white-on-dark Bag Jar; d red-on-buff Bag Jar; e. lamp fragment (photos: DAI, Orient-Department, K. Bartl).

monly in Umayyad occupational levels and are considered as another key form of early Islamic utility wares. Several other basin sherds of a buff ware could belong to both the Late Roman and Umayyad period.

Common Plain Ware: Plain orange-buff pottery with and without slip is well attested in the assemblage and represents the transition from the Byzantine phase to the Islamic period. There are fragments of Late Roman Red Ware (found ex-

clusively at FP 1) pointing to pre-Islamic settlement activity at Muṣḥaṣh. A fragment of terra sigillata will be considered separately.

One fragment of a mould-made *ceramic lamp* was recovered (**Fig. 9e**). The preserved sherd belongs to a bottom half with a circular ring base. It can be reconstructed as lower part of an almond-shaped lamp-body, which has to be complemented to an upper part with shoulder decoration in low relief of the “channel nozzle” type and a nub handle (for the classification cf. Day 1942). The ring-base suggests a late antique/early Umayyad date, as later types are characterized by an almond shaped foot.

Architectural Ceramics: Another interesting subgroup of plain pottery could be documented in substantial quantity from the bath-context (**Fig. 10**). Two distinct forms were observed: The first is a rim of an object with a (round ?) opening of 6 cm in average, which widens rapidly to about 9,5 cm in diameter, bending sharply at the end of the short “shoulder” so that the continuing wall points vertically in relation to the opening (**Fig.10 a-b**). These fragments most certainly belong to tubular elements of a pipe system, where one tube section could be con-

nected to another by overlapping ends.

The other group of sherds is made up of body-fragments belonging to the same system. Notably, they show short sections of flattened edges running vertically opposed (!) to the turning grooves (**Fig. 10** arrow markings), in cases forming rounded corners. This feature might possibly be interpreted as *tubuli*, well known from Roman baths. In antiquity, these hollow earthenware tiles were connected to the hypocaust in order to channel hot gases through the wall for heating purposes. Laterally matching holes on the sides of the rectangular (“box-shaped”) tiles ensured the circulation of the heat (Yegül 1992 363-365). The fact that several fragments were soot-blackened on the inner surface further supports the assumption that the fragments belong to steam pipes of a wall heating system rather than to water pipes, and that they might have been installed close to the furnace of the bath. However, evidence for *tubuli*-heating has not been provided from other sites in the Islamic period so far.

Although itself not representing a veritable “desert castle”, Muṣḥaṣh certainly has to be seen in connection with the group of palatial estates of the eastern steppelands (*bādiya*). Historical reference points were pointed out by Gh.



10. Architectural ceramics from Qaṣr Muṣḥaṣh FP 3 (bath): a/b. constricted end of pipe element; arrows marking flattened edges, at times running opposed to the turning grooves (photos: DAI, Orient-Department, K. Bartl).

Bisheh in order to analyze the archaeological evidence of the site (Bisheh 1989: 88ff.). Given the difficulty in distinguishing certain Umayyad vessel types from Late Roman ones, the ceramic evidence indicates a strong continuity between the Byzantine and Early Islamic occupations of Mushāsh, and suggests that a pre-Islamic settlement has existed prior to the extensive development of the site under Umayyad rule. Contrariwise, the absence of clear later types (such as ICW or glazed pottery) suggests that the settlement did not continue beyond the eighth century. This seems especially true when compared to the Abbasid pottery from neighboring al-Muwaqqar (cf. Najjar 1989). (FB)

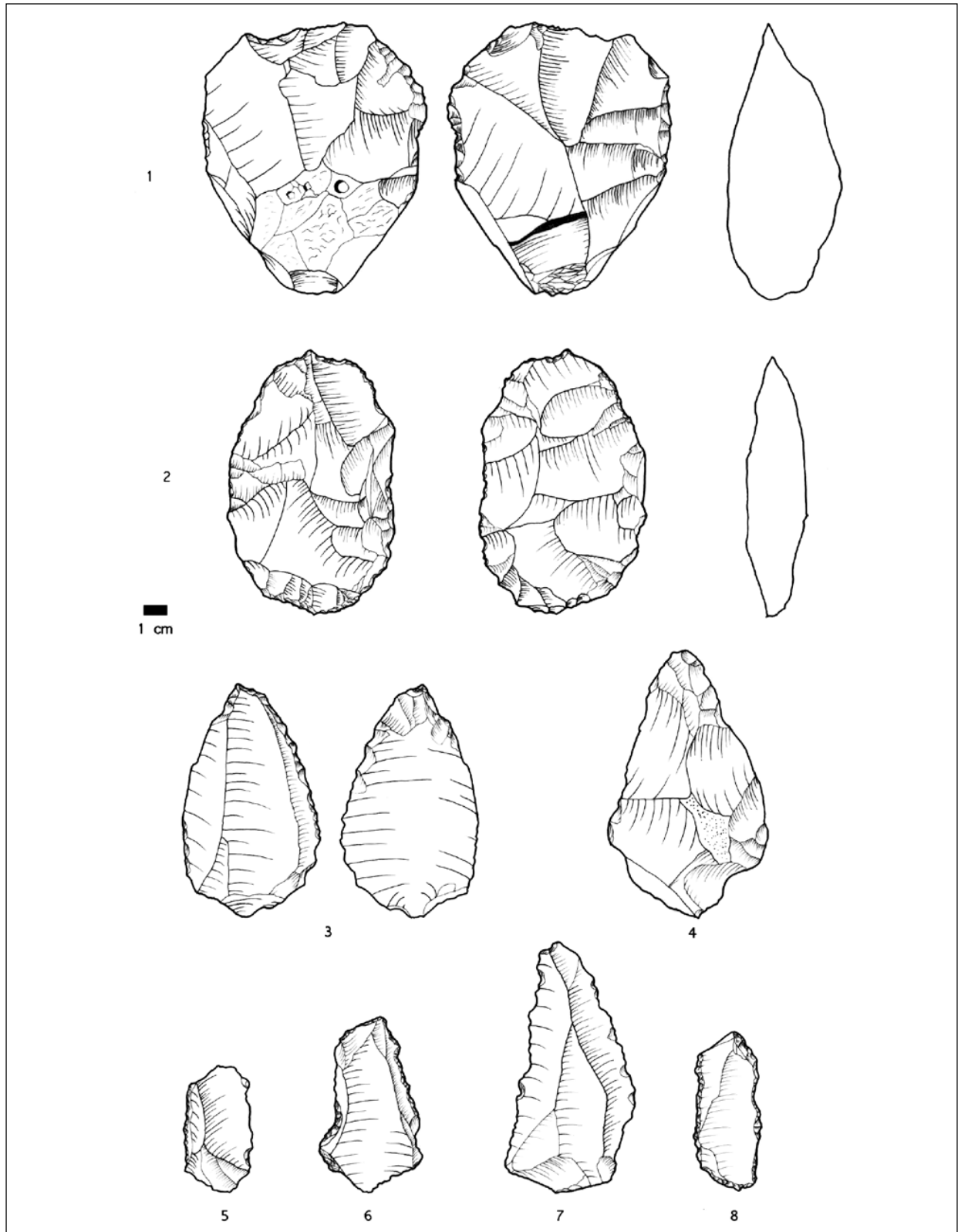
Lithic Artefacts

The material was collected from 131 find points located in a 5km radius around Qaṣr Mushāsh, stretching chronologically from the Lower Palaeolithic to the Chalcolithic/ Bronze Age. In all, 1235 artifacts were examined. The majority of the collection is comprised of wind abraded, rolled and/or re-patinated artefacts. Most artefacts were found in isolation on the surface and out of geomorphological context. While few of these artefacts therefore come from definable 'sites', they nevertheless provide some insights into the use of the Wādī Mushāsh landscape by past hominins and human groups. It should be noted that the natural flint pavements that cover most of the limestone bedrock surfaces in the study area make it very difficult at times to spot lithic artefacts or delineate the edges of dense scatters. Due to this strong background noise the results are very likely skewed towards larger and easily recognizable lithic artefacts, with cores and debitage being under-represented in the collection. Many find points produced mixed assemblages of material that date to more than one time period. This reflects the dispersed and indiscreet nature of the surface distributions of artefacts.

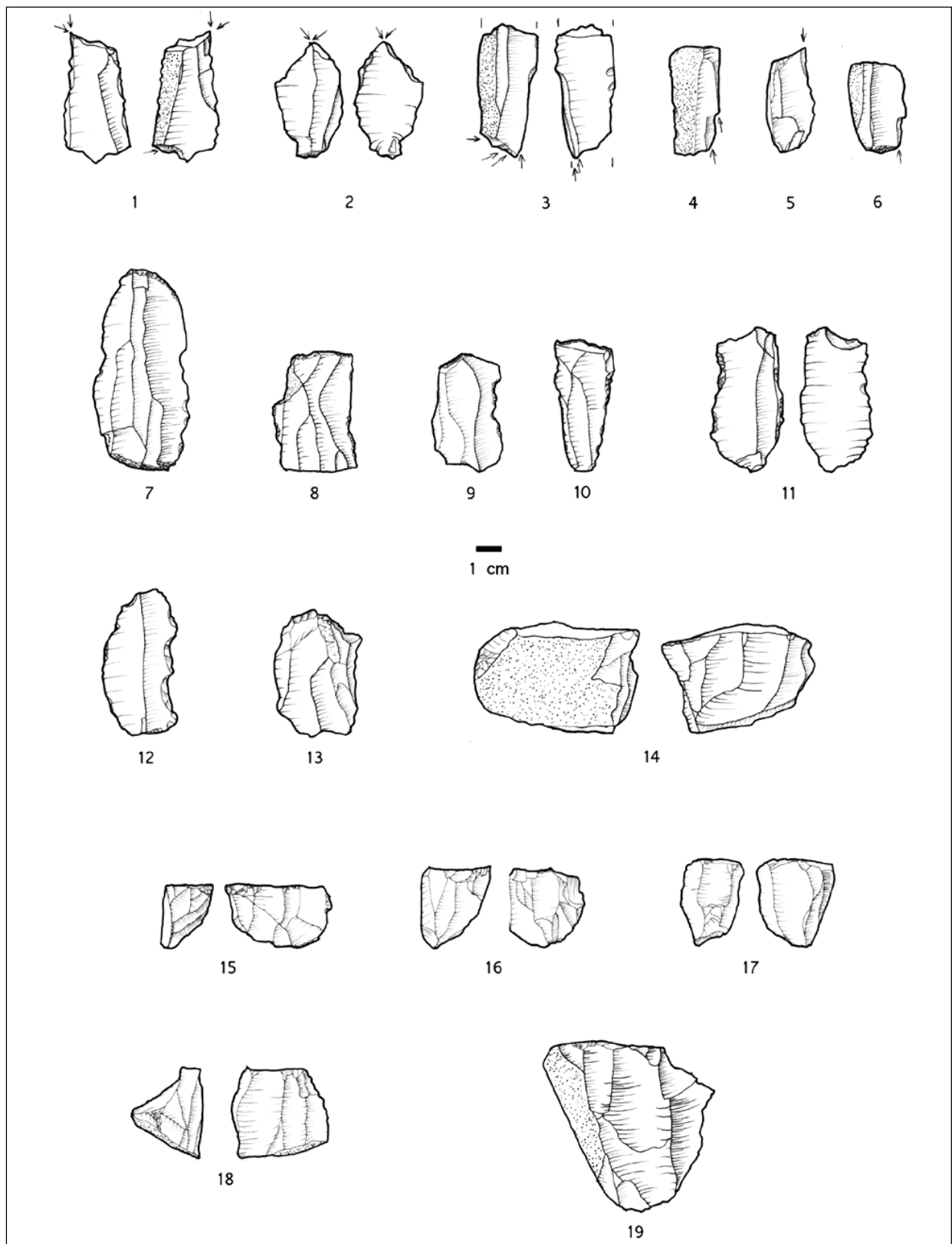
Localities with diagnostic Lower and Middle Palaeolithic artefacts are discussed together here, since in many cases a clear-cut separation of the two phases is very difficult and was often only possible on the basis of diagnostic retouched artefacts. None of the material derived from dense artifact concentrations or *in situ* contexts, but was found as dispersed surface material. This is

clearly reflected in the condition of a large part of the assemblage. Repatination, abraded edges and ridges, sandblasting and 'desert sheen' were common on most of the artefacts, suggesting suggests long-term exposure to the desert environment. 33 bifaces were collected which fall into the Palaeolithic bracket and are assumed to relate to the activities of Lower Palaeolithic hominins in the Qaṣr Mushash area. These included the odd Acheulean handaxe, ovates, several cleavers and some biface roughouts (**Fig. 11**). Apart from the roughouts the majority of tools appeared very worn and reduced by use. The interpretative value of the Lower Palaeolithic material is limited, due to its dispersed distribution and unprovenanced origin. The frequent occurrence of ovoids in conjunction with handaxes and cleavers would suggest Middle to Late Lower Palaeolithic dates for many of these occurrences, although the majority are likely to be Late Acheulean, corresponding with the dates of other sites in the Azraq Basin (Copeland and Hours 1989; Rollefson *et al.* 1997; Rollefson *et al.* 2006). The earliest settlement in the study area therefore probably occurred as early as 500,000 years ago. Cores consist predominantly of Levallois cores, which include uni-directional parallel and bi-directional opposed cores, radial/centripetal cores and unipolar convergent cores. 'Classic' tortoise radial/centripetal cores were rare, while unipolar convergent cores and bi-directional opposed cores were represented in equal numbers. All cores fall into the broad category of the Levantine Mousterian. Since the material represents collections from quite dispersed finds loci it is difficult to identify a more fine-grained chronology. However, the relative lack of radial/centripetal cores may hint at a lack of occupation during Oxygen Isotope Stage 5 (OIS). Conditions during OIS 5 are thought to have been hyper arid and warm initially, which would have made the interior parts of southwest Asia rather hostile and difficult environments. Conversely, the presence of early MP and late MP Phase 1 and Phase 3 uni-directional parallel/ bi-directional opposed and unipolar convergent cores may reflect the more suitable cooler and wetter conditions of OIS7-6 and OIS4 respectively.

Sixteen find spots produced lithic artefacts that could be clearly identified as Upper or Epi-palaeolithic. The differentiation of Upper and/



11. Lower and Middle Palaeolithic lithic artefacts from the Qaşr Mushash Survey. 1: Cleaver, 2: ovate, 3: Levallois point, 4: bifacial foliate, 5-6: Levallois flakes, 7: Levallois point, 8: Levallois blade (drawings: DAI, Orient-Department, T. Richter).



12. Lithics from Findspot 163. 1-6: burins, 7: endscraper, 8-9: flakes, 10-13: retouched flakes and blades, 14-18: multi-platform flake cores, 19: single platform flake/blade core (drawings: DAI, Orient-Department, T. Richter).

or Epipalaeolithic often depends on the degree of microlithization in an assemblage. This indicator was impossible to use in the present case since, as noted earlier, find spots often did either not produce sufficiently large collections or because the material from individual findspots was spatially widely dispersed. Eight of the sixteen find spots produced mixed collections, which included Lower and Middle Palaeolithic or later prehistoric finds. Three findspots were classed as Upper Palaeolithic and/or Epipalaeolithic (#'s 47, 79 and 166). All produced retouched blades and endscrapers on blades that would not be out of place in either the Upper or the Epipalaeolithic. Seven localities produced clearly distinguishable Upper Palaeolithic material, consisting predominantly of retouched artefacts. Cores and debitage were exceedingly rare. Findspot 71 is noteworthy, since this locality produced a highly uniform collection of seventeen pieces, including many retouched blades, an endscraper and a retouched bladelet. Although far less numerous than the Lower/Middle Palaeolithic findspots there are several instances of Upper and Epipalaeolithic occupations in the survey area. Since these reflect a much shorter period of occupation from c. 50,000 – 11,500 years ago, as compared to the much longer period of time represented by the Lower and Middle Palaeolithic findspots, they show that the area was probably inhabited throughout the latter part of the Pleistocene. No clear evidence for late Epipalaeolithic settlement was found, but given the existence of a large Early and Middle Epipalaeolithic site at Kharaneh IV (Maher *et al.* 2012; Muheisen 1988a, b), it is not surprising to see a reasonable representation of Upper and Epipalaeolithic findspots. This shows that occupation appears to have been thin, but constant in the study area throughout the Late Palaeolithic.

24 find spots produced material that is grouped here as 'late prehistoric' flint. In the majority of cases (15 find spots) this material could not be dated in any more detail since it lacked more diagnostic elements. The remaining sites could be more precisely dated. Findspots 22, 112 and 163 are the only two clearly identifiable aceramic Neolithic localities. Findspot 163 is a Late PPNB 'burin site', which will be discussed in more detail below. Findspot 112 produced several bipolar retouched blades and

a blade core. A burin, denticulate and retouched blade, as well as several retouched flakes from Findspot 22 suggest that this is also a PPNB locality. Five further findspots produced material that is diagnostic of the Late Neolithic/ Chalcolithic. These are 36, 50, 51, 84, 105. Findspot 50, in particular, produced a nice bifacial knife, as well as a thumbnail scraper. Findspot 51 also produced a nice collection of 4 bifaces, including three bifacial knives and two fragmented bifacial knives, as well as 32 retouched pieces. The latter included several denticulates, notches and burins. Although Late Prehistoric material is comparatively rare across the study area, the collection nevertheless shows that there was some sporadic settlement in the Mushāsh area from at least the LPPNB onwards (c. 9250 cal BP). The dispersed and low density character of this occupation clearly reflects patterns of transhumance and mobility in what was then an increasingly arid and steppe environment.

Findspot 163 is located c. 250 meters southwest of Qaşr Mushāsh between two tributaries of the Wadi Mushash. This is the only clearly identifiable prehistoric 'site' located during the survey with a concentrated spread of chipped stone and a sharp boundary. The site measures c. 3000 square meters. No architecture or other features were observed. A surface collection was carried out in a 2x2 meter area in the approximate centre of the site. This produced a collection of 151 chipped stone artefacts, including 16 (10,6%) cores, 38 pieces of debitage (25,17%) and 97 retouched pieces (64,24%, see **Table 1**). A reasonable number of burins in the retouched artifact assemblage suggests that this may be a LPPNB burin site, which have been documented at numerous other locations in the Azraq Basin (Rollefson and Muheisen 1985; Rollefson and Frohlich 1982; Betts 1998; Finlayson and Betts 1990). The presence of multiple blade/ bladelet cores and ad hoc flake cores, as well as many ad hoc retouched flakes, and one pressure-flaked fragment of a tanged blade support this idea (**Fig. 12**). This site represents one of many temporary specialized LPPNB campsites in the eastern desert of Jordan. Although the burin aspect is not as characteristic or well represented at this site as at some others the lithic technology and retouched artefacts fall within the same spectrum of material. Findspot

Table 1: Qasr Mushāsh – Detailed analysis of findspot 163.

Cores	Count	%
Single platform bladelet core	2	1.32
Opposed platform bladelet core	1	0.66
Double platform bladelet core	1	0.66
90 degree opposed platform bladelet/ flake core	2	1.32
Pyramidal single platform flake core	1	0.66
Multi platform flake core (ad hoc)	1	0.66
Single platform flake core	3	1.99
Single platform blade core	2	1.32
Core fragment	1	0.66
Bifacial discoidal cores	2	1.32
Sub-Total	16	10.60
Debitage		
Burin Spalls	4	2.65
Cortical Flakes	2	1.32
Blades	6	3.97
Bladelets	4	2.65
Plunging blade (angle correction)	1	0.66
Plunging flake	1	0.66
Hinge step removal blade	2	1.32
Lateral Core Trimming Flake	1	0.66
Unprepared Initial Blade	1	0.66
Flakes	16	10.60
Sub-Total	38	25.17
Tools		
Endscraper	5	3.31
Sidescraper	1	0.66
Scraper/Burin	1	0.66
Burin on truncation	1	0.66
Dihedral Burin	2	1.32
Burin on break	6	3.97
Double burin on truncation	2	1.32
Truncation	3	1.99
Notched	7	4.64
Multiple notches	6	3.97
Denticulate	1	0.66
Retouched Blade	6	3.97
Retouched Bladelet	7	4.64
Retouched Flakes	48	31.79
Tanged blade (unfinished projectile point?)	1	0.66
Sub Total	97	64.24
Total	151	100.00

163 suggests that there was relatively intense, seasonal occupation of the Qasr Mushāsh area during the LPPNB. (TR)

Karin Bartl, German Archaeological Institute, Orient Department

Ghazi Bisheh, Department of Antiquities of Jordan

Franziska Bloch, German Archaeological Institute, Orient Department

Tobias Richter, University of Copenhagen, Faculty of Humanities

Bibliography

Bartl, K. and Bisheh, G.

Forthc. Water Management in Desert Regions. Qasr Mushash as an Example in Early Islamic times. In S. McPhillips and P. Wordsworth (eds.), *The Materiality of the Rural Islamic World: Archaeological and Historical Approaches*. Proceedings of a conference held in Copenhagen 2012.

Betts, A.V.G.

1998 *The Harra and the Hamad. Excavations and Surveys in Eastern Jordan Volume 1*. Sheffield: Sheffield Academic Press.

Bisheh, G.

1992 The Umayyad Monuments between Muwaqqar and Azraq: Palatial residences or caravanse-rais?. In S. Kerner (ed.), *The Near East in Antiquity* Vol. III: 35-41.

1989 Qasr Mshash und Qasr 'Ayn al-Sil: Two Umayyad Sites in Jordan. Pp. 81–103 in A. Bakhit and R. Schick (eds.), *The History of Bilad al-Sham during the Umayyad period* (Fourth International Conference: 24–29 October 1987, Amman), Proceedings of the Third Symposium.

Bloch, F.

2011 Jabal Says. Keramik und Kleinfunde, *Damaszener Forschungen* 14. Philipp von Zabern, Mainz am Rhein.

Bujard, J. avec collaboration de Trillen, W.

1997 Umm el-Walid et Khan ez-Zabib, cinq qusur omeayydes et leur mosques revisites. *ADAJ* 41: 359-382.

Copeland, L. and Hours, F.

1989 *The hammer on the rock. Studies in the early Palaeolithic of Azraq, Jordan*. Oxford: British Archaeological Reports International Series.

Daviau, M.

2010 *Excavations at Tall Jawa, Jordan, Vol. 4, The Islamic House*.

Day, F.

1942 Early Islamic and Christian Lamps. *Berytus* VII: 65-79.

Finlayson, B. and Betts, A.,

1990 A functional Analysis of Chipped stone Artifacts from the late Neolithic Site of Gabal Na'ja, eastern Jordan. *Paléorient* 16(2):.13–30.

Gregory, S. and Kennedy, D.

1985 *Sir Aurel Stein's Limes Report*. BAR International Series 272 (i)

King, G., Lenzen, C.J. and Rollefson, G.O.

1983 Survey of Byzantine and Islamic Sites in Jordan, Second Season Report, 1981. *ADAJ* 27: 387-436, plates 85-98.

King, G.

1982 Preliminary Report on a Survey of Byzantine and Islamic Sites in Jordan. *ADAJ* 26: 85-95, plates: 433-444.

Maher, L.A. et al.

2012 Twenty Thousand-Year-Old Huts at a Hunter-Gatherer Settlement in Eastern Jordan. *PLoS One*, 7(2), p.e31447.

Muheisen, M.

1988a. Le gisement de Kharaneh IV, note sommaire sur la phase D. *Paléorient* 14(2):.265–282.

- Muheisen, M.
 1988b The Epipalaeolithic Phases of Kharaneh IV. Pp. 353–367 in A. N. a. H. G. G. Garrard, (ed.) *The Prehistory of Jordan. The state of Research in 1986*. Oxford: British Archaeological Reports International Series 396.
- Musil A.
 1907 *Kusejr 'Amra*, I. Text, Kaiserliche Akademie der Wissenschaften, Wien.
- Najjar, M.
 1989 Abbasid Pottery from al-Muwaqqar. *ADAJ* XXXIII: 305-322.
- Rollefson, G.O. et al.
 1997 Ain Soda and 'Ayn Qasiya: New late pleistocene and early Holocene sites in the Azraq Shishan area, eastern Jordan. Pp. 45–58 in H.G.K. Gebel and G.O. Rollefson (eds.), *The Prehistory of Jordan II. Perspectives from 1997*. Studies in early Near Eastern production, subsistence, and environment. Berlin: ex oriente.
- Rollefson, G.O. and Frohlich, B.
 1982 A PPNB Burin Site on Jabal Uweinid, Eastern Jordan. *ADAJ* 26: 189–198.
- Rollefson, G.O. and Muheisen, M.
 1985 Chipped Stone Artifacts from a Specialized Camp near Kharaneh Castle, Eastern Jordan. *ADAJ* 29: 141–150.
- Rollefson, G.O., Quintero, L.A. and Wilke, P.J.
 2006 Late Acheulian variability in the southern Levant: a Contrast of the Western and Eastern Margins of the Levantine Corridor. *Near Eastern Archaeology* 69(2): 61–72.
- Sack, D., Sarhan, M. and Gussone, M.
 2010 Resafa-Sergiupolis/Rusafat Hisam, Syrien. Pilgerstadt und Kalifenresidenz. Neue Ansätze, Ergebnisse und Perspektiven. *Zeitschrift für Orient-Archäologie* 3: 102-129.
- Schmidt, K.
 2012 Jabal Says. Die Architektur, *Damaszener Forschungen* 13, Philipp von Zabern, Mainz am Rhein.
- Smith, R.H. and Day, L.P.
 1989 *Pella of the Decapolis II. Final Report on the College of Wooster Excavation in Area IX*.
- Walker, B.
 2012 The Islamic Period. Pp. 507-593 in J.A. Sauer and L.G. Herr (eds.), *Ceramic Finds: Typological and technological studies of the pottery remains from Tell Hesban and vicinity, Hesban 11*.
- Yegül, Fikret
 1992 *Baths and Bathing in Classical Antiquity*. New York.

GHAWR AŞ-SĀFĪ EXCAVATIONS 2011 - 2012

Konstantinos D. Politis

Introduction

Archaeological work continued in Ghawr aş-Sāfī during 2011 and 2012 by the Hellenic Society for Near Eastern Studies (HSNES) in collaboration with the Department of Antiquities of Jordan (DoAJ). The project was funded by Aramex LLC with support of the above-mentioned institutions and directed by Dr Konstantinos D. Politis.

The Ghawr aş-Sāfī survey and excavation project has been conducted at various areas of the region since 2000. The overall objective has been to understand human settlement and land-use patterns in the region during the last 12,000 years. Particular emphasis has been devoted to agriculture, as the mouth of the Wadi al-Hasa - where Ghawr aş-Sāfī is located - is a soil-rich and relatively well-watered place.

Ṭawāḥīn as-Sukkar

During 2012, work continued to focus on

understanding the development of the sugar industry, particularly at the factory complex of Ṭawāḥīn as-Sukkar (TeS). The western pressing room that was excavated in 2010 (by DoAJ) and re-exposed in 2011 (by HSNES) was fully excavated this season (by HSNES). This revealed a lower chamber with an arched entrance (similar to the eastern one) below the pressing room (**Fig. 1**) and several external stone-built walls, one of which led to the north-flowing underground water channel (**Fig. 2**). This clarified our understanding of the hydraulic system that powered the crushing stones and the irrigation of the agricultural fields in the immediate environs. A new composite plan of both the crushing chambers was made (**Fig. 3**). It is hoped that future excavations will reveal additional structures associated with the sugar refining process.

A multi-chambered building with evidence of intense burning, located at the north-west side of the sugar factory excavated in 2010 (by



1. Ṭawāḥīn as-Sukkar from the east (photo: K. D. Politis).



2. *Tawāḥīn as-Sukkar from the north (photo: K. D. Politis).*

DoAJ), was presumed to be the place where sugar-cane juice was refined through boiling. This structure was excavated in 2012 (by HSNES), revealing a floor with some broken sugar pots *in situ*. Its associated ash dump at the north-eastern end of the site was excavated in 2002 and 2004 (by HSNES), and was sampled for botanical and phytolythic remains in 2011 (by HSNES). This yielded evidence of actual sugar-canes for the first time.

Further study of other finds from TeS indicate a *ca* 15th - 16th century post-industrial occupation (mostly represented by burial graves) in the disused sugar factory (**Fig. 4**) and a final phase of occupation in the early 20th century when structures associated with the Ottoman Army were constructed, as evidenced by many cartridge shells / cases inscribed in Turkish Arabic and dating from 1915 - 1917 (**Fig. 5**). A few other British cartridge shells / cases probably came from fighters of the Great Arab Revolt who came into conflict with Ottoman forces.

Khirbat ash-Shaykh ‘Īsa

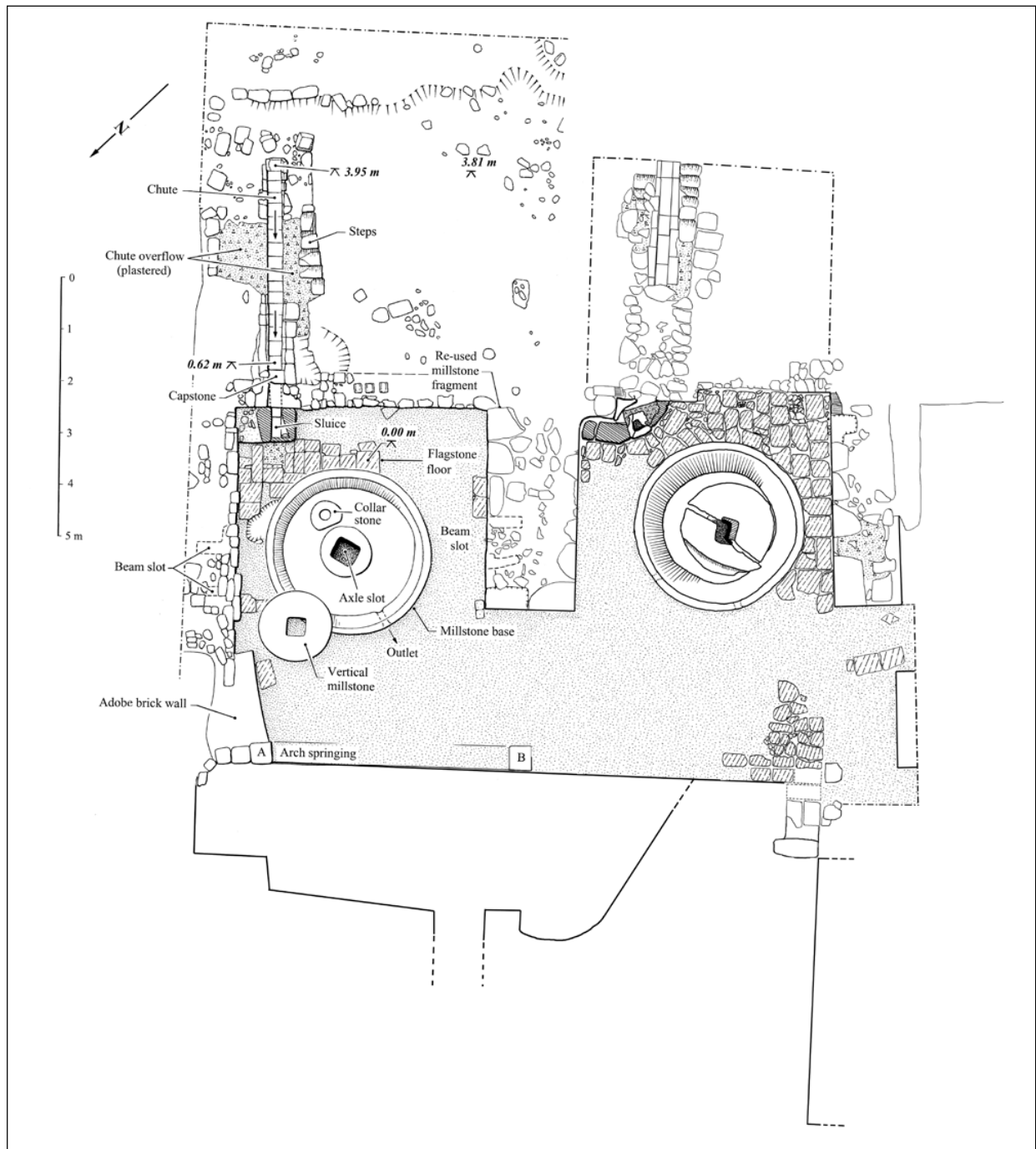
At Khirbat ash-Shaykh ‘Īsa (KSI), the walled city-centre of Roman - Byzantine Zoara and mediaeval Islamic Zughar, excavations resumed in Trenches II and VIII (worked on by HSNES in 2002, 2004, 2006-7 and 2008) in order to better understand the Ayyubid - Mamluk and Abbasid period occupations. Two sections of Trenches II and VIII were cut back by one metre and exca-

vated. Samples of the abundant charred remains were taken for an in-depth botanical study currently being conducted.

In Trench II excavations reached the level of the paving slabs, revealing a sedimentation tank and conduit below the road (**Fig. 6**). Several slabs were also lifted and a sondage was dug to a depth of about half a metre, yielding no pottery later than early Byzantine thereby giving us a *terminus post quem*.

A similar sondage was excavated at the level of the mosaic pavement in Trench VIII; this yielded similar results. Careful examination of the mosaic revealed its bedding technique and clearly showed it running underneath the fine ashlar block-built wall dating to the Abbasid period. Residual ecclesiastic evidence (altar table fragments, Prokonessian marble columns, architectural elements engraved with crosses and glass mosaic cubes) (**Fig. 7**) alludes to the presence of a reasonably-sized and well-adorned church (perhaps the seat of the bishopric) that was associated with the mosaic pavement. The mosaic was re-photographed at right angles, cleaned and reburied under a new 5 x 4 metre open-weaved polystyrene sheet (to enable water evaporation). It was also assessed by mosaic conservators who planned its future conservation.

Exposure of the upper levels of the city walls at KSI was extended further to the south, confirming the *misr*-type plan originally postulated during the 2002 excavations.



3. Composite plan of two crushing chambers at ʿAṭāhīn as-Sukkar (plan: A. Silkatcheva and J. M. Farrant).

Conclusions

All the pottery and other finds (**Fig. 7**) were studied, photographed and drawn, and plans were made to continue and expand excavation trenches at TeS and KSI within the coming year.

Rescue collections were made at an Naq' and

Arḍ Ramlat Ghālib (on the north bank of Wādī al-Ḥasā), where a Roman - Byzantine cemetery lies unprotected on private property.

Konstantinos D. Politis,
Hellenic Society for Near Eastern Studies,
kdpolitis@hsnes.org



4. Six small (children's) coloured glass bracelets, 14th - 15th century AD (photo: A. Silkatcheva).



5. Ottoman and British cartridge shell / cases, early 20th century (photo: A. Silkatcheva).



6. Khirbat ash-Shaykh 'Isa Trench II from the east (photo: K. D. Politis).



7. Glass tessera with gold paint, ca 6th century AD (photo: A. Silkatcheva).



8. Carved bone pin, 8th - 9th century AD (photo: A. Silkatcheva).

Bibliography

- K. D. Politis, A. Sampson and M. O'Hea
Ghawr aş-Sāfi Survey and Excavations 2008-2009 at Ṭawāḥīn as-Sukkar and Khirbat ash-Shaykh 'Isa in Ghawr aş-Sāfi. *ADAJ* 46: 591-614.
- Politis, K. D.
2009 The Conservation and Heritage Management of the Sanctuary of Lot at Deir 'Ain 'Abata. *SHAJ* X: 259-268. Department of Antiquities, Amman.
- Politis, K. D., Kelly, A. Foote, R. and Hull, D.
2005 Survey and Excavations in the Ghawr aş-Sāfi, 2004. *ADAJ* 49: 313-326.
- Politis, K. D., O'Hea, M. and Papaioannou, G. A.
2007 Survey and Excavations in the Ghawr aş-Sāfi, 2006-07. *ADAJ* 51: 199-210.
-

THE INTERNATIONAL AŞLAḤ PROJECT (IAP) 2011-2012: REPORT ON THE SECOND AND THIRD SEASONS

*Laurent Gorgerat and Robert Wenning
with a note by Laila Nehmé*

Introduction and Acknowledgments

The second and third field seasons of the International Aşlah Project (IAP) were carried out between the 7th and the 28th of April 2011 and the 12th and the 29th of March 2012. The IAP was initiated and organized by Professor Dr Stephan G. Schmid, Co-director of the French - German research project 'Early Petra' (sponsored by the German Research Association [DFG], the Excellence Cluster TOPOI at the Humboldt University Berlin, the Freiwillige Akademische Gesellschaft Basel [FAG], the Association for the Understanding of Ancient Cultures [AUAC] and the *Stiftung für das Antikenmuseum Basel und Sammlung Ludwig*). The seasons were co-directed by Professor Dr Robert Wenning on behalf of Münster University and Laurent Gorgerat of the Antikenmuseum Basel und Sammlung Ludwig. We would like to thank the Department of Antiquities of the Hashemite Kingdom of Jordan for its support and permission to undertake the work. We would also like to thank IFPO 'Ammān, especially its director Dr Jacques Seigne, and GPI 'Ammān, especially its director Dr Jutta Haeser, for accommodating the team during its stay in 'Ammān. In Petra we were kindly supported by Dr Emad Hijazeen, Commissioner of the Petra Archaeological Park and Cultural Heritage, and Tahani Salhi, Director of Cultural Resources.

The team comprised the following archaeologists and students: Professor Dr Robert Wenning (Münster), Laurent Gorgerat (Basel), Aurélie Gorgerat (Basel), Dr Rolf Egli (Basel), Sebastian Hoffmann (Berlin), Thomas Kabs (Berlin) and Wiltrud Wenning (Münster).

The Department of Antiquities representatives were Haroun Amarat (2011) and Samiah Falahat (2012), whose help and advice was most welcomed. During the team's sojourn at Naz-

zal's Camp, Ali Chalaf al-Bdool was our camp manager and Suleiman Mohammad al-Bdool and his wife Aziza were our cooks.

Based on the results of the 2010 season (Gorgerat and Wenning 2010: 255-269), the following objectives for 2011 and 2012 were set: (1) completion of the mapping the site (**Fig. 1**), (2) excavation of the Northern Terrace,, (3) cleaning and investigating Tomb BD 24, (4) extending the excavation towards BD 26 in the north and, finally, 4)(5) analyzing the relationship between the Southern Terrace with Triclinium D17 and the Northern Terrace with Tomb BD 24.

The Northern Terrace

General Situation

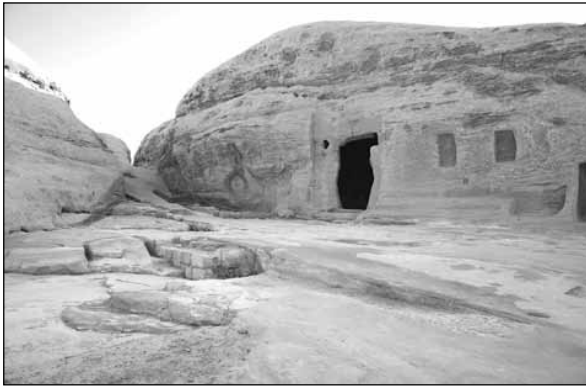
The Northern Terrace was partially excavated in 2010 (Gorgerat and Wenning 2010: 264-268) and forms the northern end of the complex (**Fig. 1**). It consists of a rocky plateau, delimited to the east by an elongated rock running north to south (**Figs. 1 and 2**), while the western area comprises a low inclined slope surmounting the entrance to the Sīq., and by a steep rocky formation in the north. The main structure of this plateau is undoubtedly tomb BD 24, which was cut into the eastern elongated rock, similar to the triclinium D17 on the Southern Terrace. More than 50 pit graves in several low hillocks form a boundary to the south and west, parallel to the path along Wādī Mūsā.

Tomb BD 24

Although the tomb was briefly mentioned in earlier studies (Brünnow & von Domaszewski 1904: 199; Zayadine and Farajat 1991: 278), it was never measured or excavated. The recessed high façade measures *ca* 4.7 m in width (**Fig. 2**). Although a fragment of an attic moulding



1. General plan of the site (J. Falkenberg, L. Gorgerat, D. Koller).



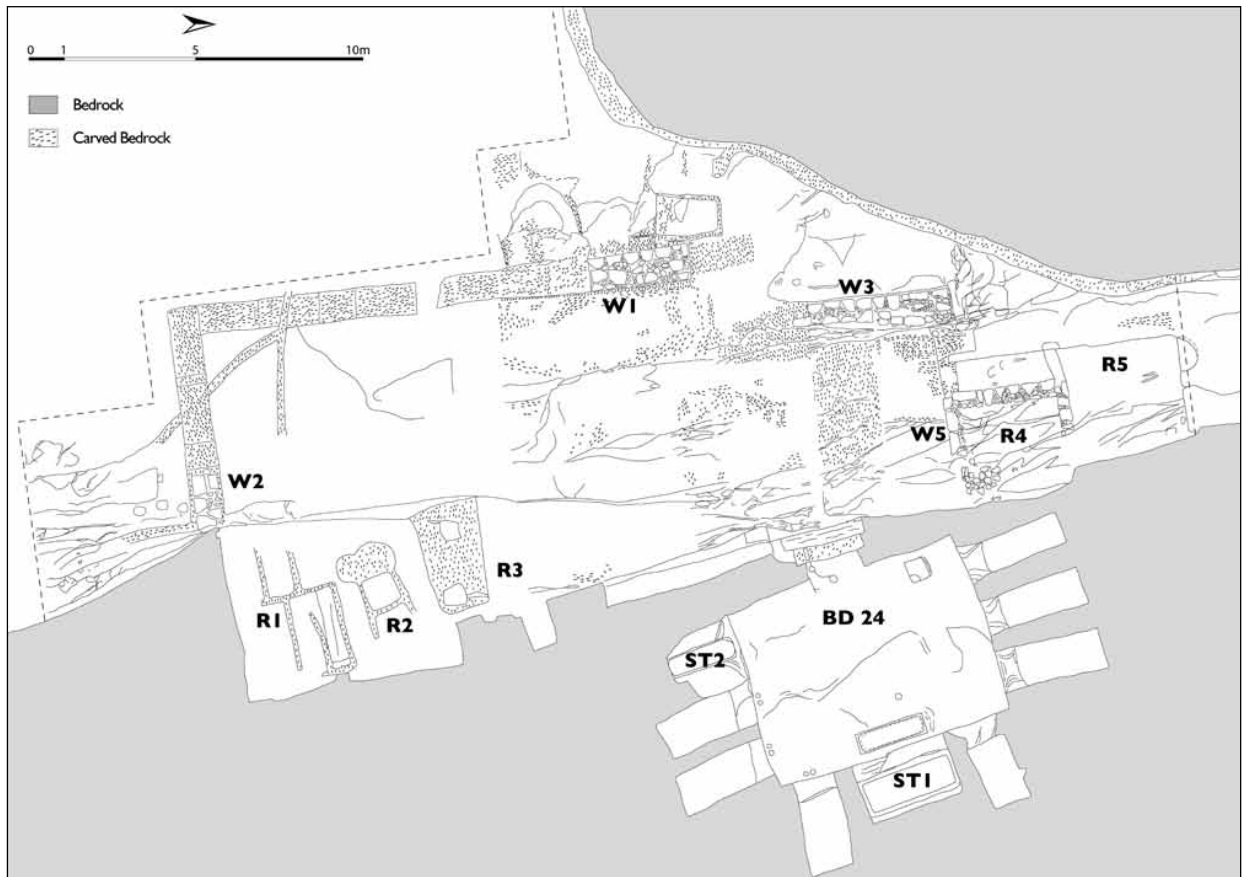
2. Northern Terrace with the entrance to BD 24 (L. Gorgerat).



4. BD 24. Eastern Wall with arcosolium (L. Gorgerat).

was found in front of the entrance (Gorgerat and Wenning 2010: 266 Fig. 23) it could not be proven that the façade and the entrance were decorated. The entrance measures 1.82 m wide and leads into a large, *ca* 40 m², broad room with three *loculi* on each of the three sides (Figs. 3 and 4). The *loculi* measure 1.7 m in height. The cutting of the *loculi* started at 60 cm above

the floor. The central niche in the eastern wall is framed by an *arcosolium* and is oriented parallel to the room (Fig. 4); this is in contrast to all other *loculi* which are cut at right angles into the walls. It is well-known that the *loculus* opposite the entrance seems to be the most important, but there are only a few examples with such an *arcosolium* (Bessac 2007: 37, 74, 77).



3. Plan of the Northern Terrace (A. Gorgerat, L. Gorgerat).

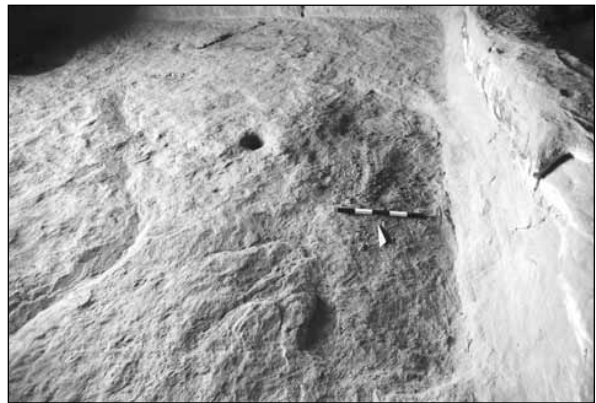
The entrance to the tomb is by two steps (**Fig. 5**). Part of the upper step has a large rectangular depression cut into it, which is wider than the entrance. A groove of 12 cm in width and 7 cm in depth has been cut at right angles into the depression near the southern edge of the entrance. We suppose that this feature was associated with closing and protecting the entrance. Libation cups are cut in and around the threshold and are connected by a small channel – a common feature among the tombs (Sachet 2009: 97-112). A further installation, consisting of a shallow depression, 56 x 70 x 10 cm, cut into the floor to the left of the entrance, may have been used for funerary ceremonial purposes.

The tomb shows different tooling than that used in the triclinium D17 on the Southern Terrace (Gorgerat and Wenning 2010: 261, 2013: 227- 228.). The back wall of the central niche of BD 24, in the right upper corner of the *arcosolium*, is tooled in opposing bands of fine diagonal lines tilted at forty-five degrees (McKenzie 1990: 43. 152 Fig. 51a). This might be an indication for the date of the construction of the tomb. Other walls are more roughly and irregularly quarried.

Most rock-cut features in Petra were (and still are) used as shelters for animals and as such we first had to clear the tomb of dung. During this work, double cup-holes, possibly used for libations, were discovered in the floor directly at the foot of three of the *loculi*. The cleaning also revealed the presence of a pit grave located in front of *loculus* ST1 (**Figs. 4 and 6**). During its excavation, it became apparent that the pit grave had been looted. As with most tombs, the robbers proceeded in the most efficient way,



5. BD 24. Threshold (L. Gorgerat).



6. Tomb BD 24. Pit grave in front of *loculus* ST1 before excavation (L. Gorgerat).

looking for the cranial remains where most of the grave goods would have been located. In this case, the cranium should have been positioned in the northern part of the grave, according to the libation cup on the floor of BD 24 (**Fig. 3**). It could clearly be observed, that the northern section of the grave was broken up, while the southern part remained more or less intact (**Figs. 7 and 10**). The pit grave is typical of Nabataean rock-cut graves (**Fig. 9**). At a depth of approximately 1.9 m, a protruding ledge of 5 - 10 cm in width was cut into the rock to support the heavy covering slabs, which were still *in situ* in the southern part of the pit (**Fig. 8**). The covering slabs were sealed with a layer of smaller stones and hard lime mortar. Comparison with similar excavated graves suggested that the pit grave in BD 24 had a slightly different type of fill. Usually in single burials, above the slabs there would have been either a thick layer of sand completely filling the pit (see Schmid 2008: 137 **Fig. 6**) or, if the grave was used for multiple burials, vertical standing slabs would have delimited the interspaces (Schmid 2008: 141 **Fig. 15**). In this case, a second layer of covering slabs were laid directly on the mortar of the first layer and therefore left no space for a second burial. This procedure was obviously repeated three times to fill up the pit (**Fig. 10**), but no human remains were found in these upper layers. Although the pit grave was looted, the presence of Nabataean sherds, which originally were mixed within the hard lime mortar and belong to Schmid's Phase 3b (Schmid 2000: 29), allow us to date its last burial to the end of the 1st century AD or beginning of the 2nd century AD.



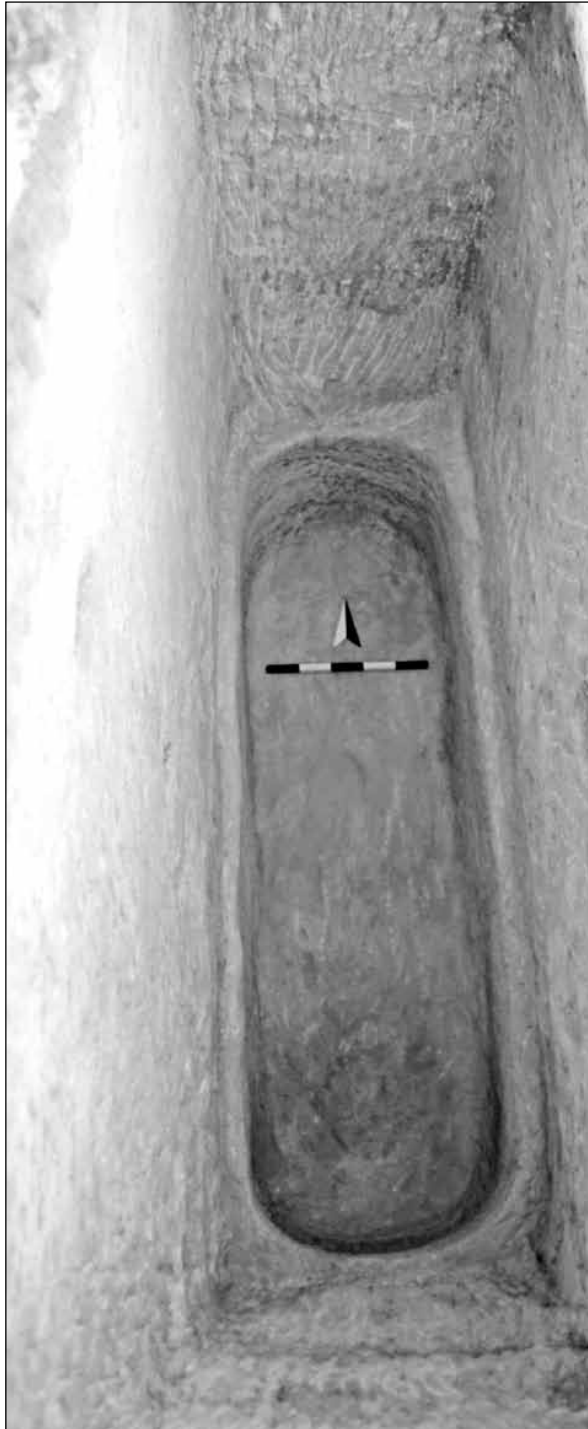
7. BD 24. Pit grave. Stone and mortar filling in the southern section, -70cm (L. Gorgerat).

The second grave excavated in BD 24 is ST1, and is situated in the *loculus* below the *arcosolium* (Figs. 3 and 11). Due to the prominent location within the *arcosolium* one must assume that this was the main burial of BD 24. It was quite obvious that ST1 was looted in a similar way to the pit grave situated in front of it. Again the focus was on the northern end of the grave where most of the finds were expected. At the southern end of the grave we found two covering slabs, which originally sealed the burial, still *in situ* (Figs. 12 and 13). Although they were broken, they lay on the protruding ledge in the lower part of the pit (Fig. 14). The fill of the pit comprised mixed fragments of covering slabs, small stones, bone and mortar fragments, attesting to



8. BD 24. Pit grave. Covering slabs in the southern section, -160cm (L. Gorgerat).

the looting of the feature (Fig. 15). Nevertheless, various elements in the grave allow some conclusions concerning its dating. First, the mortar used to seal the covering slabs consists of lime,



9. BD 24. Pit grave after excavation, -220cm (L. Gorg-
erat).

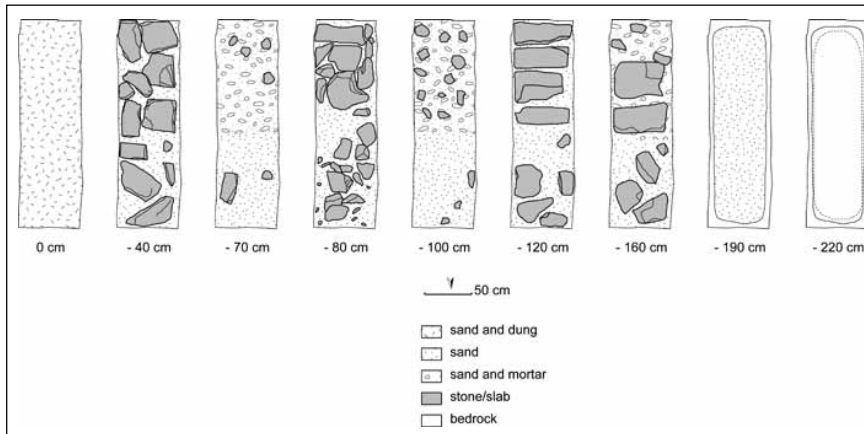
pebbles, charcoal and small fragments of pottery used as temper (**Fig. 16**), characteristic of other burials in Petra (Schmid 2010). The sherds used for this purpose are of Nabataean painted fine ware and provide an indication of the date of the

last burial (**Fig. 17**). The greatest proportion of the pottery temper belongs to Schmid's Phase 3b, indicating that the earliest possible date of the last use of the grave was toward the end of the 1st century AD or the beginning of the 2nd century AD. This *terminus post quem* was corroborated by several other finds, for example, an oil lamp of the later Negev 1a-type (**Fig. 18**) and 19 *unguentaria* (**Fig. 19**) which escaped the attention of the robbers and which also belong to Schmid's Phase 3b (Schmid 2000: 77).

Although not all the *loculi* were uncovered within BD 24, the dating for the use of the tomb is quite clear. The pottery found between the entrance of BD 24 and Room 4 (**Figs. 1, 3 and 20**) is of special interest. There, an area of debris yielded many fragments of pottery, mainly plain ware, including cooking pots. The earliest group belongs to Schmid's Phase 2b or the late 1st century BC (Schmid 2000: 28, 38, 148–150). This may well be the date of the carving of the tomb. These observations suggest that the northern part of the Aşlah triclinium complex, for of which BD 24 is the main structure, was probably built around the end of the 1st century BC or the beginning of the 1st century AD and was used until the beginning of the 2nd century AD at the latest. A similar abandonment took place at other rock-cut 'sanctuaries' in Petra, such as the veneration place of Isis in the Wādī as-Siyyagh (Merklein and Wenning 2001: 427) and the Obodas Chapel (Tholbecq and Durand 2005: 310).

Further Structures on the Northern Terrace

Excavation of some parts of the Northern Terrace in 2010 (Gorgerat and Wenning 2010) revealed the existence of built architecture in front of BD 24, and in 2011 and 2012 the plateau of the Northern Terrace was completely excavated (**Figs. 3 and 21**). This could be done easily as the bedrock was covered by only a thin layer of sand and rubble washed in from the higher north passage. The packing of earth and stones, only a few centimetres thick in the south, was around 75 cm in the north. We noticed that the plateau has suffered from water damage, which had caused cracks and fissures. Natural features and depressions in the rock had been filled in antiquity with stones and earth to create a level surface. Even in Rooms 1 - 2 (**Figs. 3 and 22**),



10. BD 24. Layers of the pit grave in front of loculus ST1 (A. Gorgerat, L. Gorgerat).

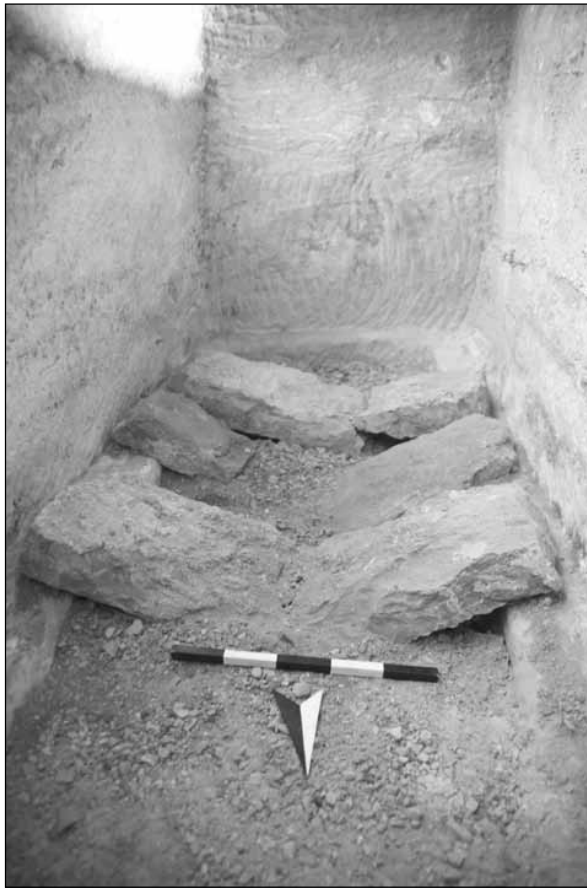


11. BD 24. Loculus ST1 before excavation (L. Gorgerat).

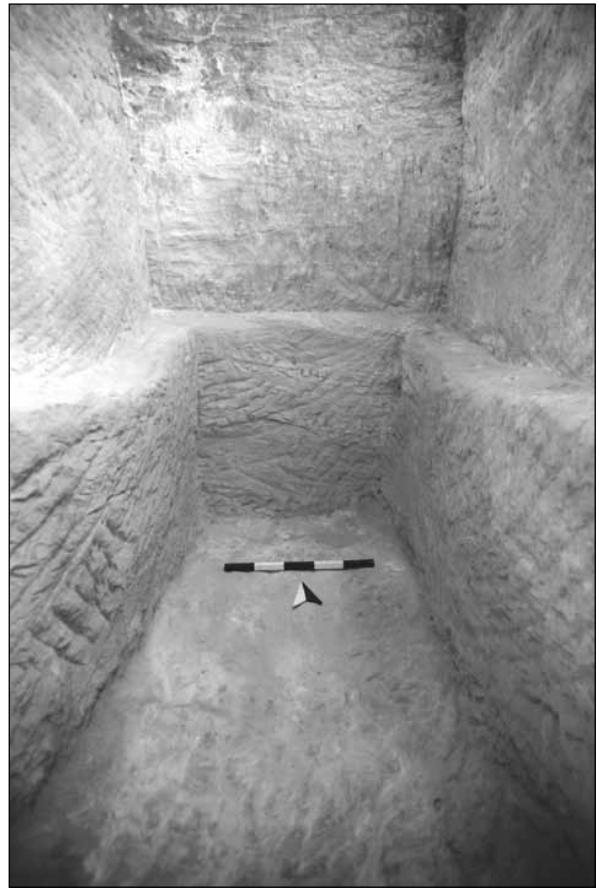
which had been carved out like a quarry, the remaining grooves had been packed with a hard material. At the bottom of one of the grooves we found a well-preserved lamp, a local imitation of the 'Broneer XXI' type (**Fig. 23**) and which is dated *ca* AD 100 (Grawehr 2006: 291-294). On the basis of the presence of fragments of some paving slabs among the debris in the



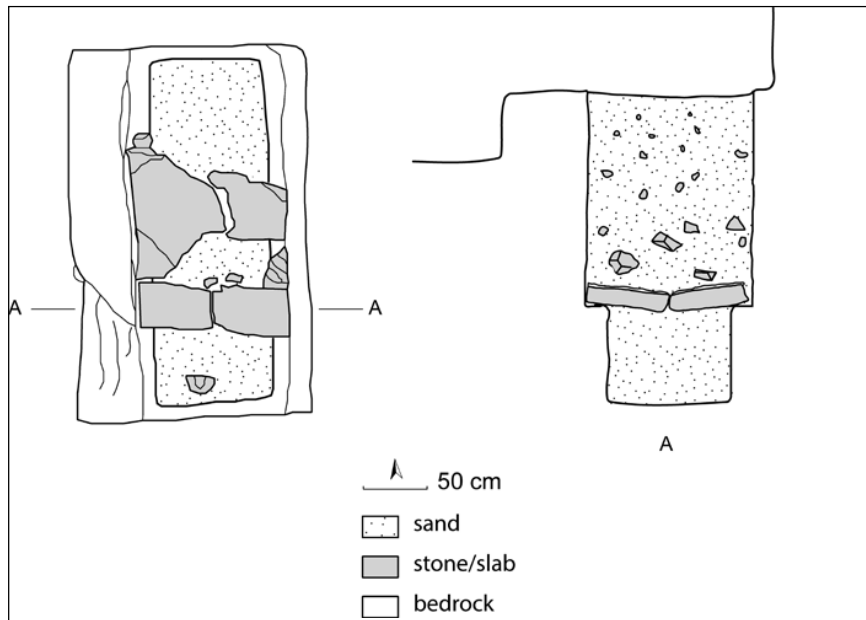
12. BD 24. Broken covering slabs and mortar in loculus ST1 (L. Gorgerat).



13. BD 24. Broken covering slabs and mortar in loculus ST1 (L. Gorgerat).



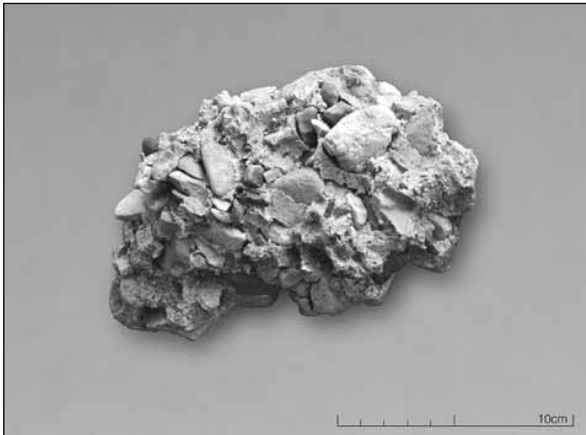
14. BD 24. Loculus ST1 after excavation (L. Gorgerat).



15. BD 24. Plan and section of loculus ST1 (A. Gorgerat, L. Gorgerat).

north it is assumed that a fine covering of slabs overlaid the packing. The entrance to Room 3 is postulated to have been located where the

foundation trench of Wall 1 is interrupted and rises up to the floor-level. This interpretation is supported by a hole for the door pivot. Together



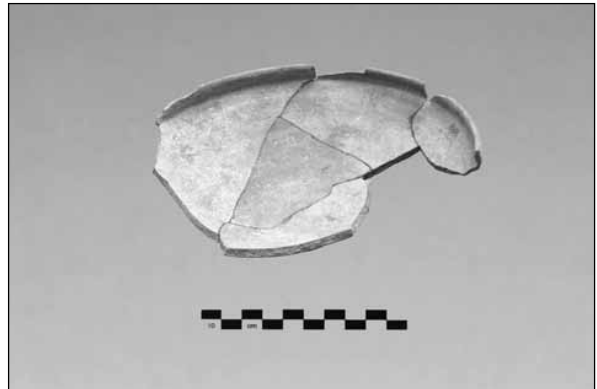
16. BD 24. Mortar from the covering layer in locus ST1 (L. Gorgerat).



19. BD 24. Unguentaria from locus ST1 (L. Gorgerat).



17. BD 24. Nabataean fine ware from the mortar in locus ST1 (L. Gorgerat).



20. Nabataean plate found in front of BD 24 (L. Gorgerat).



18. BD 24. Lamp from locus ST1 (L. Gorgerat).

with Walls 1 - 2, a new water channel was cut into the bottom of the foundation trench of Wall 1 and continued for some distance almost parallel to Wall 2 towards the old fissure at the foot of the higher Rooms 1 - 2. From here water could naturally follow the fissure under Wall 2 and be collected in a large rough depression just to the south of Wall 2. To the north of the entrance of



21. Panoramic view of the Northern Terrace (L. Gorgerat).

BD 24 (**Figs. 24 and 25**), further built structures and rock-cut features were excavated during the 2011 and 2012 seasons. The rectangular Room 4 (**Fig. 25**) is attached on its eastern extent to



22. Northern Terrace. Rock-cut rooms R1, R2 and R3 (L. Gorgerat).



23. Northern Terrace. Lamp from the groove of R2 (L. Gorgerat).

the tomb, while the western extent comprises a built wall. It might be that an entrance existed in the south-eastern corner, which had been later closed. A narrow rock-cut corridor leads to Room 5, which marks the northern extent of the area. The corridor could have been closed by a wall or a door in the north. At the northern limit of Room 5 there was a well-preserved basin which had been cut into the rock (**Fig. 26**).



24. Northern Terrace. Rock-cut rooms R4 and R5 from the south (L. Gorgerat).



25. Northern Terrace. Rock-cut rooms R4 and R5 from the east (L. Gorgerat).



26. Northern Terrace. Rock-cut basin in room R5 (L. Gorgerat).

To the right of the basin, the higher passage to the north would probably have been dammed by a wall, of which only the lower layers appear in the section. Four abutment niches in the rock face point to arched rooms roofed with slabs resting on the arches, and which can be compared to Rooms 1 and 2 (Gorgerat and Wenning 2013: 233-234).

Natural water channels running along the foot

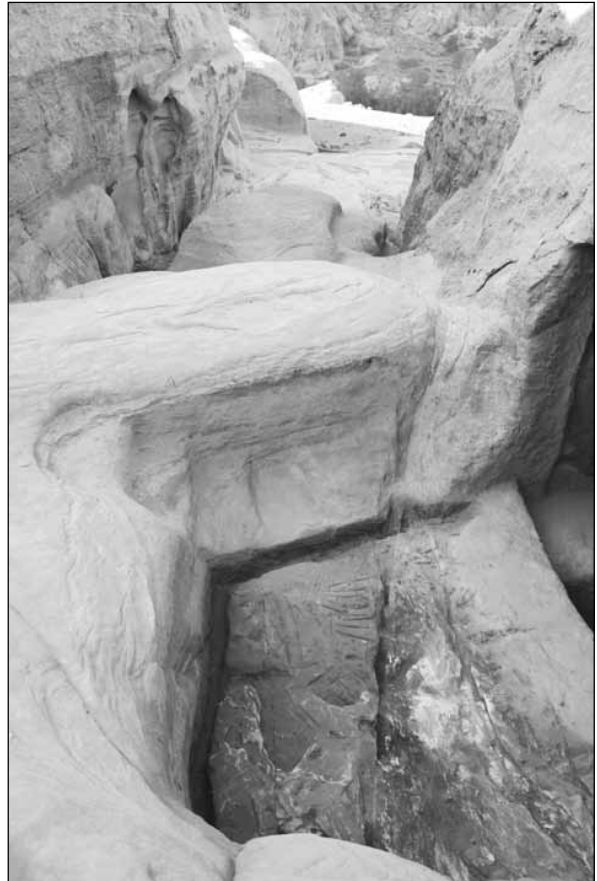


27. Northern Terrace. Rock-cut reservoir BD 26 (L. Gorgerat).

of the high rocks indicate that the heavy winter rains poured down over the plateau of both terraces from the higher area in the north, dammed in depressions and intruded into the rock, which has become very weak only a few inches below the surface. The Nabataeans tried to prevent such damage by keeping out the water. They cut grooves and simple channels all around for water flow. This can be best seen in the part between the Northern Terrace and the ar-Ramla plateau (**Fig. 1**). Here the reservoir BD 26 is cut into the rock (**Fig. 27**) along with four votive niches and a small niche basin. Although we were not able to excavate the reservoir, which is full of earth, stones and rubble today, we made a sounding but had to stop at *ca* 2.5 m. Considering the steps leading down, we suggest that the chamber could be about 5 - 6 m deep. The chamber itself measures 6 x 6.28 - 6.43 m. The walls had been roughly carved using a 'tooth' chisel. A thick layer of grey plaster, with small pebbles and tiny pottery fragments covers the walls to a thickness of *ca* 4.5 cm. The capacity of the reservoir appears too large in relation to the amount of water estimated from the relatively small area around. A few mediaeval characters are painted on the plaster. We suggest that in this period the steps were truncated (**Fig. 28**). The opening of the reservoir measures 2.5 m wide by 1.75 m high. An open settling tank with four steps is cut in front of the opening into the rock, measuring 3 m x 2.3 m (**Fig. 29**). The bottom of the basin is 70 cm below the opening of the reservoir, but the side walls of the basin reach a height of *ca* 1.3 m. When the basin was filled with water it flowed into the reservoir. There are traces of a natural channel along the foot of the



28. BD 26. Remains of the steps leading into the reservoir (R. Wenning).



29. Settling tank in front of reservoir BD 26 (L. Gorgerat).

rock between the basin and the built installations around Room 4. This channel begins to the north of the basin and originally fed the cistern D19, while the basin interrupted its course. The water has deeply eroded the rock in some parts. The danger this water presented to the built architecture was noticed by the Nabataeans, who

cut an artificial channel almost 13 m long to direct the water to cistern D19 (**Fig. 1**). The new channel begins at the level of Room 4. When the site was abandoned in the 2nd century AD and the channels were no longer maintained, the water broke the interface and found its way down to the Northern Terrace along the southern face of Wall 3, eroding the rock here as well.

Conclusions

The results of the 2010 - 2012 seasons of excavation by the International Aşlah Project allows more precise conclusions regarding the use of the complex. First, it must be noted that the Southern Terrace with the triclinium D17 and the Northern Terrace with the chamber tomb BD 24 and other architectural structures are of two different periods and cannot directly be put in one coherent plan. The triclinium is dated *to ca* 96 BC. If the new suggestions by numismatists are correct, i.e. that we have to delete Obodas II (62 - 60 BC) from the list of Nabataean Kings, then the argument to relate the inscription to Obodas I is even stronger. The Nabataean fine ware from the Northern Terrace is not older than the late 1st century BC and can be attributed to Schmid's phase 2b (30/20 - 5/4 BC) (Schmid 2000: 38). This means there is a chronological gap between the inscription (Wenning and Gorgerat 2012: 132-136; Gorgerat and Wenning 2013: 223-225) and the architecture on the Northern terrace dated by pottery. Therefore, we have to accept two main phases of construction at the site. It is not only the gap between the inscription and the pottery that defines the two periods. The structures of the Southern Terrace and Northern Terrace do not follow a coherent plan. While the chambers of the Southern Terrace are cut into the natural rock, the architecture in front of the chamber tomb on the Northern Terrace was built after the rock had been dismantled.. The rock of the Aşlah triclinium is sharply cut towards the west to enlarge the area in front of the tomb. The outer wall of the Northern Terrace isolated the structures in front of the tomb from the open area in front of the triclinium. There is no attempt to correlate the two terraces and there is no alignment which corresponds with the older installations. An old water channel running diagonally across the Northern Terrace is cut by the foundation trenches for the outer wall and thus testifies to the two periods as well (Gorgerat and Wenning 2013: 267-268). Thus, chamber

tomb BD 24 does not belong to the Aşlah triclinium and we are left with a conundrum: that is, a rock-cut triclinium but no tomb belonging to it. Triclinia are not identified *per se* as parts of tomb sites. On the contrary, among the more than 100 triclinia, biclinia and stibadia in Petra, less than a quarter belong to burial places, but the Aşlah triclinium is situated in a necropolis and there is no other monumental tomb nearby which could be related to it. Therefore, we have to consider that the tomb of Aşlah and other members of that clan are amongst the large number of pit graves in the hills, may be. None of the pit graves is of outstanding size or construction, or is orientated towards the triclinium to such an extent as to be designated a possible grave of Aşlah.

The excavations of the Aşlah triclinium complex have produced an example of an early clan assembly place within a necropolis. It is a 'burial complex' without a monumental tomb but with a monumental triclinium. The site is enclosed by rocks and hillocks, not by masonry-built structures. The chambers of the Southern Terrace are without boundary structures, porticos and monumental entranceways, and are more functional than luxury architecture. This seems to be typical for the earliest tomb complexes, as opposed to later tomb complexes. In front of the triclinium, there was a large open space free of installations. Nevertheless, the triclinium, the small rooms beside it, the niches for betyls, the various water installations and the pit graves formed a 'sacred space' which is different from the later tomb complexes. A discussion of function has proposed that this early grouping was already a multifunctional complex (Wenning and Gorgerat 2012: 136-138). For the first time, its early beginnings could be studied. Additionally, the chamber tomb and structures in front of it, which were added at a later stage, are different from contemporary tomb complexes constructed following a more homogeneous plan.

Note by Laila Nehmé

As promised in our first report L. Nehmé kindly gave us her reading of the second inscription of the Aşlah triclinium in October 2011 for this report. Although the inscription is now published (Nehmé 2012: 163-164 no. MP 4), we can present her full note here and we would like to thank her for this helpful support.

MP 4

This inscription is carved in the middle of the right (south) wall of the triclinium (**Fig. 30**). It was copied by J. T. Milik in 1955, and photographed and copied again in 2002 by L. Nehmé. It is 1.38 m long, the first □s 13 cm and the average height of the letters is 12 cm. J. T. Milik's reading is as follows:

'nt □b ly g"nt

□n

□n □m

which he translates:

"You compensated me by giving the klinè to me, Ge', you, Šalim, Šalim, may be safe".

He interprets this as the brief summary of a legal act between two persons who may have been slaves because they do not give their patronym. He adds that it may refer to the cession of a seat in the *triclinium* to a person who was not part of the owner's family.

In Milik's reading, 'nt is the second person personal pronoun, □b is a "death bed", attested in the form m□b' in Nabataean (JSNab40, "resting bed"; on this word, see Nehmé 2005-2006: 206) and ly is the preposition l- + the enc-

litic pronoun of first person singular -y. Ge' and Šalim are interpreted as personal names. Finally, Milik suggests that the third line may have been written by different hand to the first two. According to him, this line may be the signature of a partner of the legal act.

However attractive this reading and interpretation are, they conflict with the traces of the letters, which are currently visible on the stone. Indeed, as one can see in the photograph, the reading of the text is very difficult because it is obscured by traces left by stone-cutting tools on the wall. The facsimile we propose is based both on the copy we made *in situ* and on a careful examination of several digital photographs taken in 2002 (**Fig. 31**).

If Milik's reading were not available, we would only be able to read the following sequence of letters:

'{l/n}{t}----škb'{l/n}'g{d/r}'š{b/n}t

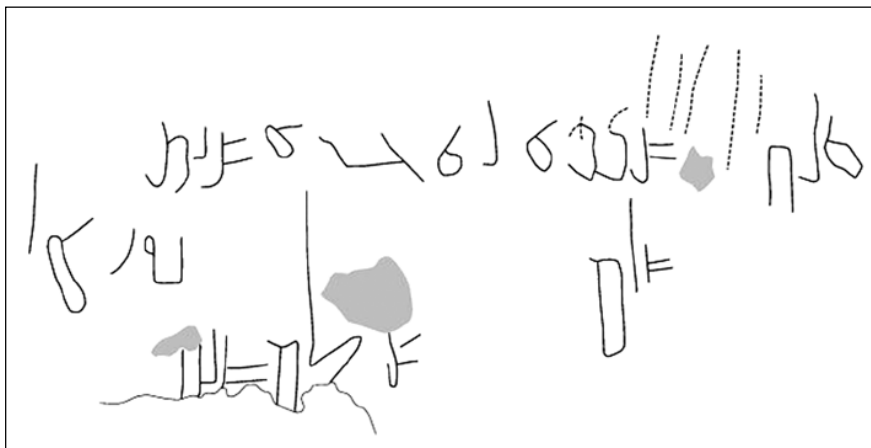
{b/n}wb{.}'l

šlm šlm šlm

We may recognize, with some uncertainty, '{nt}', "you" but '{lt}'. □b' can also safely be read and a m before the □ erased by the chip in the



30. Southern Terrace. Second inscription in Triclinium D17 (L. Nehmé).



31. Southern Terrace. Facsimile of the Second inscription in Triclinium D17 (L. Nehmé).

rock, is not completely impossible. The mention of a “resting bed”, a couch or bench, would not be surprising in a triclinium. Contrary to Milik’s reading, the *d* or *r* after the *g* is certain and the same is true for the □ that follows. Therefore, the rest of Milik’s reading cannot be accepted, especially since he missed the few letters which were traced below the end of the first line, in which we may see, {l}{r}{b’}{l} if the second letter does not have a loop (it is very difficult to say from the photograph).

As for lines 2 and 3, they are in fact more or less aligned and since they clearly form three times the sequence of letters □m, there is no particular reason to think that some of them are personal names (*šālim* for instance) while others would be the greeting word “may be safe”.

Thus, all that can safely be said about this text is that it probably mentions one of the benches of the Aṣlah triclinium, but it is futile to speculate on the meaning of the rest because there are too many uncertainties in the reading.

Laurent Gorgerat
Antikenmuseum Basel und Sammlung Ludwig
St Alban-Graben 5
CH-4010 Basel
Switzerland

Prof. Dr Robert Wenning
Institut für Altorientalische Philologie und Vorderasiatische Altertumskunde
Westfälische Wilhelms-Universität Münster
Rosenstrasse 9
D-48143 Münster
Germany

Bibliography

- Bikai, P. M. and Perry, M. A.
2001 Petra North Ridge tombs 1 and 2. Preliminary report. *BASOR* 324: 59-78.
- Bessac, J.-C.,
2007 Le travail de la pierre à Pétra. Technique et économie de la taille rupestre. Paris.
- Brünnow R.E. and Domaszewski, A. von,
1904 *Die Provincia Arabia auf Grund zweier in den Jahren 1897 und 1898 unternommenen Reisen und der Berichte früherer Reisender*, Vol. I, Strassburg.
- Gorgerat L. and Wenning R.
2013 The International Aṣlah Project in Petra (2010-2012). The Contribution to “Early Petra”. Pp. 223-235 in M. Mouton and S. G. Schmid (eds.), *Men on the Rocks. The Formation of Nabataean Petra*, Proceedings of a Conference held in Berlin 2-4 December 2011, Berlin.
- Gorgerat L. and Wenning R.
2010 *The International Aṣlah Project (IAP) 2010. Preliminary Report on the First Season*, ADAJ 50: 255-269.
- Grawehr, M.
2006 *Die Lampen der Grabungen auf ez Zantur in Petra*. Petra Ez Zantur III, Teil 2, Mainz.
- McKenzie J.
1990 *The Architecture of Petra*. Oxford.
- Merklein H. and Wenning R.
2001 The Veneration Place of Isis at Wādī as-Siyyagh, Petra. New Research. *SHAJ VII*: 421-432, Amman.
- Mouton M.
2010 The monolithic dīn blocks at Petra: a funerary practice of pre-Islamic Arabia, Pp. 275-287 in L. Weeks (ed.), *Death and Burial in Arabia and Beyond*, Oxford.
- Nehmé L.
2006 *Inscriptions vues et revues à Madā’in Ṣāliḥ*, *Arabia* 3: 179-225 [text], 345-356 [Figs.].
2012 Pétra. Atlas archéologique et épigraphique. 1. De Bāb as-Sīq au Wādī al-Farasah, Paris.
- Sachet, I.
2009 Refreshing and Perfuming the Dead: Nabataean Funerary Libations, *SHAJ X*: 97-112.
- Schmid S. G.
2000 Petra, Zantur II. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen. Teil 1. Die Feinkeramik der Nabatäer. Typologie. *Chronologie und kulturhistorische Hintergründe*, Mainz.
2009 Überlegungen zum Grundriss und zum Funktionieren nabatäischer Grabkomplexe in Petra. *Zeitschrift des Deutschen Palästina-Vereins* 125.2: 139-170.
- Schmid S.G. et al.
2008 New insights into Nabataean funerary practices, Pp. 135-160 in J.M. Córdoba, M. Molist, M. C. Pérez et al. (eds.), *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East*. Vol. III. Madrid.
- Tholbecq L. and Durand C.
2005 A Nabataean Rock-Cut Sanctuary in Petra. Preliminary Report on Three Excavation Seasons at the “Obodas Chapel”, Jabal Numayr (2002-2004), ADAJ 49: 299-311.
- Wadson L.
2011 Nabataean Tomb Complexes at Petra, Proceedings of the *Annual Conference of the Australasian Society for Classical Studies* 32: 1-24.

L. Gorgerat and R. Wenning: The International Aslah Project (IAP) 2011-2012

Wenning R. and Gorgerat, L.

- 2012 The International Aşlah Project, Petra: new research and new questions, Pp. 127-145 in L. Nehmé and L. Wadeson (eds.), *The Nabataeans in Focus: Current Archaeological Research at*

Petra, Supplement to the Proceedings of the Seminar for Arabian Studies 42, Oxford.

Zayadine, F. and Farajat, S.

- 1991 Excavation and Clearance at Petra and Beidha, *ADAJ* 35: 275-311.
-

PRELIMINARY REPORT ON THE EIGHTH (2012) SEASON OF EXCAVATION BY 'LA SAPIENZA' UNIVERSITY OF ROME AT KHIRBAT AL-BATRĀWĪ (UPPER WĀDĪ AZ-ZARQĀ')

Lorenzo Nigro and Maura Sala

1. Introduction

The eighth season (2012) of archaeological investigation and restoration at the Early Bronze Age site of Khirbat al-Batrāwī (32°05'218" N, 36°04'237" E), a major EB II - III fortified centre in the upper Wādī az-Zarqā' (Nigro 2011, 2012a; Nigro ed. 2012; Nigro and Sala 2010,

2011, 2012), was carried out under the aegis of the Department of Antiquities of Jordan between 13 May and 14 June 2012 (**Fig. 1**)¹. Financial support was provided by 'La Sapienza' University of Rome², the Italian Ministry of Foreign Affairs³ and the Italian Ministry of University and Scientific Research.



1. General view of the site of Khirbat al-Batrāwī, with the EB II-III triple line of fortifications, the EB II city-gate and the EB IIIB Palace erected inside the Main City-Wall, from north.

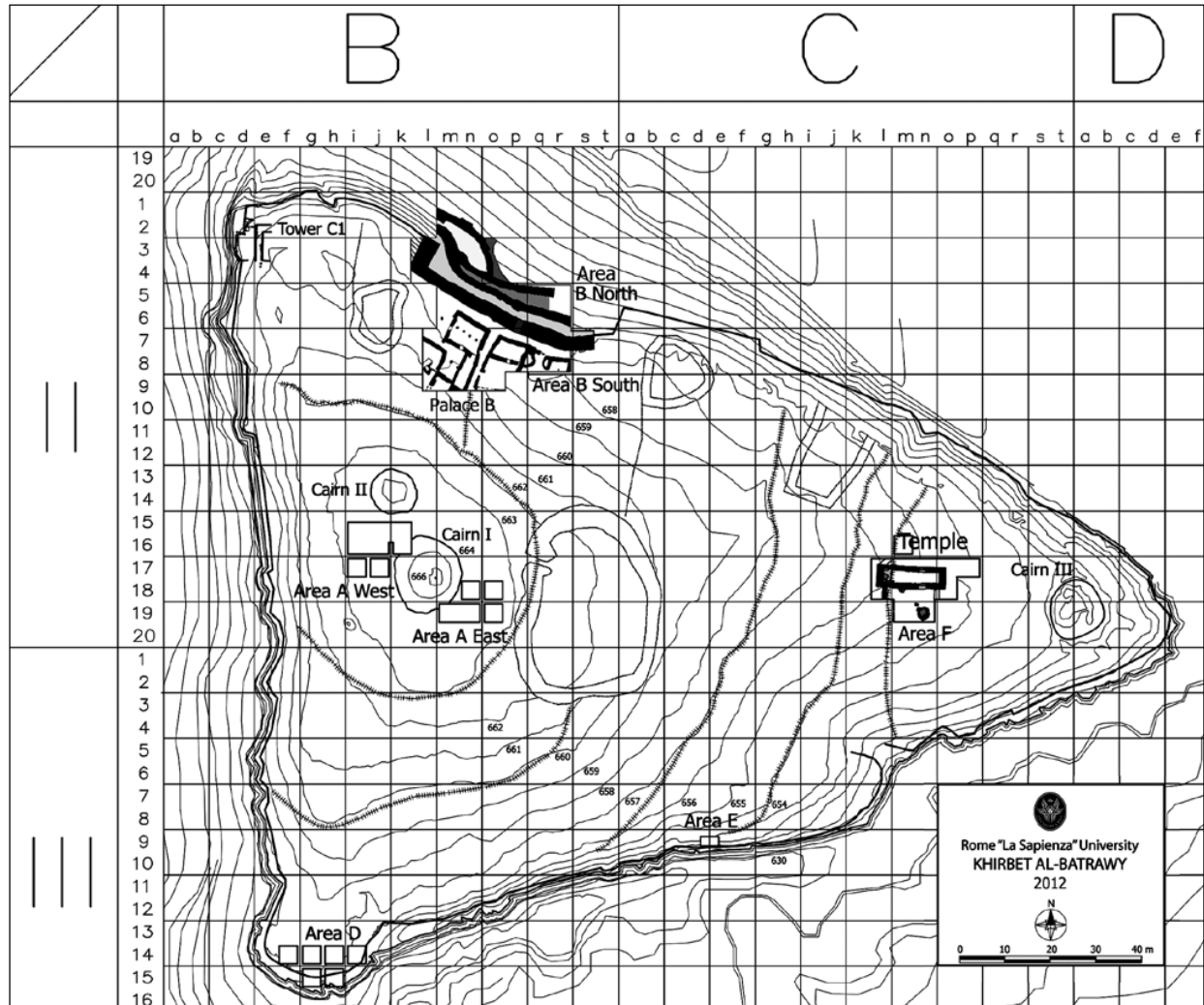
1. The 'La Sapienza' University of Rome team during the eighth (2012) season included: L. Nigro, Director; M. Sala, Field Director; L. Caiafa, E. Casadei, C. Ficaccavento, D. Ghigi, V. Pierini, M. Tamburrini, G. Tucci, P. Vitolo and S. Tricoli (restorer). The representative of the Department of Antiquities, who gave helpful collaboration to the project in the field, was Inspector Romil Gharib.
2. The project expresses its grateful thanks to all personnel of the DoA for their invaluable support, as well as to the Academic Authorities of 'La Sapienza' University

- of Rome, the Rector, Prof. Luigi Frati, the Dean of the Faculty of Human Sciences, Prof. Roberto Nicolai, and the Director of the Department of Sciences of Antiquity, Prof. E. Lippolis, who strongly supported the project.
3. The authors would also like to thank the Italian Embassy in Amman, in the persons of HE Francesco Fransoni, former Ambassador of Italy, and HE Patrizio Fondi, current Ambassador of Italy, and Dr Natalia Sanginiti and the Italian Ministry of Foreign Affairs - Directorate General for the Promotion of the Country System (DGSP), Office VI.

During the eighth season⁴, archaeological investigations and restoration works were focused on the northern side of the site and were carried out in two areas, respectively located outside (Area B North) and inside (Area B South) the EB II - III Main City Wall.

Activity focused on the excavation and res-

toration of the EB II - III multiple fortification line on the northern slope of the *khirbat* (in Area B North) and on the excavation and restoration of the wide palatial building erected in EB IIIB inside it (in Area B South), known as Palace B (the 'Palace of the Copper Axes'; Nigro 2010) (Fig. 2).



2. Topographic map of Khirbat al-Batrāwī with the areas and main monuments excavated in seasons 2005-2012.

4. In previous seasons (2005 - 2009; Nigro ed. 2006, 2008, 2012; Nigro and Sala 2010) the main topographical and architectural features of the site were surveyed and seven areas were opened: (1) on the Acropolis (Area A), where parts of both the EB IVB village, and buildings and storage facilities of the EB IIIB city were unearthed (Nigro ed. 2006: 63-116, 2008: 9-36); (2) on the northern slope (Area B North), where the monumental EB II - IIIB fortification system, consisting of multiple defensive lines, was investigated (Nigro ed. 2006: 175-196, 2008: 65-104, 2012: 13-54); (3) inside it (Area B South), where EB II - IIIB deposits and structures, and parts of the EB IVB village were excavated (Nigro ed. 2008: 127-176, 2012: 145-210); (4) - (5) in the north-

western and south-western corners (respectively Area C and Area D), where the massive angular bastions of the Main City Wall were identified (Nigro ed. 2006: 25-27, 32-33, 2008: 241-244); (6) on the southern side (Area E), where the earliest EB II City Wall and related deposits were investigated (Nigro ed. 2008: 245-255); (7) on the easternmost terrace of the *khirbat* (Area F), where the EB II - III city temple was brought to light (Nigro ed. 2008: 276-293). After the discovery of the EB IIIB Palace in Area B South in 2009, the last two years have focused on the exploration and restoration of the Palace itself, and its finds (Nigro 2010; Nigro and Sala 2011; 2012).

2. Aims of the Eighth Season (2012)

The eighth season (2012) of archaeological investigation and restoration at Khirbat al-Batrāwī had the following goals:

- a. Excavation of the northern EB II - III multiple line of fortifications, with associated defensive bastions and towers, in Area B North;
- b. Excavation of the EB IVB village on the northern side of the site, in Area B South;
- c. Continuation of excavation in the Western Pavilion of EB IIIB Palace B, discovered in the 2009 - 2011 seasons in Area B South, namely:
 - 1) Completion of excavation of Hall L.1110 and destruction layer F.1128;
 - 2) Excavation of yard L.1100, west of Pillared Hall L.1040;
 - 3) Excavation of room L.1250 with destruction layer F.1248 (west of Hall L.1110);
 - 4) Excavation of L.1230 with destruction layer F.1238 (south of L.1250);
- d. Resuming work in the Eastern Pavilion of EB IIIB Palace B, investigated in the 2006 - 2009 seasons in Area B South, by excavating southern yard L.1046 with destruction layer F.1154;
- e. Continuation of restoration work in the Western Pavilion of Palace B, namely:
 - 1) Completion of the restoration of Hall L.1110 and Storeroom L.1120;
 - 2) Starting restoration in room L.1250;
- f. Continuation of restoration of the western stretch of the EB II - III Main City Wall in Area B North, especially the area associated with pit P.819;

- h. Restoration of EB III Outer Wall W.155 towards the west.

3. Area B North: the Early Bronze II - III fortification system

The investigation of the monumental EB II - III fortification system resumed in 2012 (**Fig. 3**), exposing a series of terraced city walls erected on the northern slope of the hill as a composite fortification system, increasingly strengthening the defence of the site in the main gate area up to a maximum width of 16 m.

Further exploration of the EB II - III triple fortification system was carried out by expanding the excavation area towards the west, including squares BIII4 (eastern half) + BmII4 + BIII3 (eastern half) + BmII3 and, to the north, squares BmII2 + BnII2.

The exposure of the EB II - III Main City Wall and that of EB IIIA - B Outer Wall W.155 (after its sharp turn northwards in association with Buttress W.825) continued towards the west while, to the north, Exterior Wall W.827, which ran parallel with the Outer Wall on the lowest terrace of the defence system, was unearthed.

3.1. Stratigraphy of Area B North

During the 2012 excavations, the five stratigraphic phases established in previous seasons⁵ were further investigated, from the uppermost layer of abandonment (Phase 1), to the earliest phase that illustrates the foundation of the defensive system during EB II (Phase 5). Excavations in 2012 allowed extensive excavation of



3. Khirbat al-Batrāwī, Area B North: the stretch of the fortifications excavated in season 2012, with Tower T.830 abutting from the Inner Main City-Wall, from east.

5. For previous stratigraphy in Area B North see Nigro and

Sala 2010: 238-240; Nigro ed. 2012, 14-30.

deposits related to the final destruction of EB IIIB, as well as superimposed layers associated with the use and destruction of each major building phase of the multiple EB II - III fortification system.

Phase 1 (topsoil) represents the long period of abandonment of the site after the end of the Early Bronze Age, during which a 10 - 30 cm-thick deposit accumulated over the remains of the EBA fortifications.

Under the topsoil, Phase 2 corresponds with a partial reutilization of the collapsed EB II - III fortification works, consisting of a stone embankment (W.811) aimed at regularizing the slope and sustaining the EB IVB village built on the top of it.

Phase 3 is the latest stage of the EBA defensive system. Three activities were distinguished (from top to bottom): (1) Activity 3a, the definitive abandonment of the EBA fortifications and their collapse, including the breach opened by pit P.819 in the outer face of the EB II - III Main City-Wall; (2) Activity 3b, a destruction layer with ash, charcoal and carbonised beams, which marks the end of the life of the EB IIIB city, excavated both in between the Main City Wall and Outer Wall W.155 (F.834), between Outer Wall W.155 and Exterior Wall W.827 (in rhomboidal court L.824 / F.832), and against the northern face of the latter; (3) Activity 3c, the latest reconstruction and use of the Batrāwī fortifications, including a refurbishment of the EB II - III Main City Wall and Outer Wall W.155 (kept in use from the previous phase), and a further enlargement of the defensive system with additional outer lines of fortification: Scarp Wall W.165 with Transverse Wall W.177 to the east and Exterior Wall W.827 to the west.

Phase 4 includes layers and structures associated with the EB IIIA defensive system; two different activities were distinguished: (1) Activity 4a, the destruction which marks the end of the EB IIIA city, excavated between the Main City Wall and Outer Wall W.155 (F.839), and north of the latter (F.820); (2) Activity 4b, including the refurbishment of the EB II - III Main City Wall (with the blocking of Phase 5 city gate), the erection of Outer Wall W.155 with annexed curvilinear Outwork W.185, and the repair of the outer street running along the Main City Wall.

Phase 5, which corresponds to the establish-

ment of the city in EB II, includes: (1) Activity 5a, the collapse marking the end of the first city, illustrated by a layer of compact yellowish-grey soil with limestone chips and fragmentary mudbricks; (2) Activity 5b, the erection of the earliest Main City Wall, with City Gate L.160 and plastered street L.144, lying directly on the bedrock.

3.2. *The Main City Wall and Great Northern Bastion (Tower T.830) of Batrāwī Period II - III (Early Bronze II - III)*

The Main City Wall, a 2.9 - 3.2 m-wide stone wall founded directly on the bedrock and which supported a mudbrick superstructure up to 4 m high, was exposed for a further stretch of 6 m in squares BmII4 (western half) and BIII4 (eastern half). Its outer face had partly collapsed in antiquity (P.819), but towards the edge of the excavation area, it was again preserved on the edge of the hill at an elevation of 658.72 m asl. Also along this stretch, large limestone blocks formed the battering foot of the structure, firmly anchoring it to the bedrock.

In square BmII3 (associated with the distinct turn to the north of Outer Wall W.155), a monumental rectangular structure was uncovered built up against the outer face of the Main City Wall. The latter was a massive tower (T.830), designated the Great Northern Bastion, constructed of huge limestone boulders (around 0.5 m high), especially in its lower stone courses (**Fig. 3**). It perpendicularly abutted the Main City Wall, extending out 5.5 m in a north-easterly direction. Its eastern (W.835) and northern (W.837) walls were 1.65 m wide and had a preserved height of more than 1.5 m. The Great Northern Bastion was erected on the upper terrace of the fortifications, with the aim of protecting the Main Gate of the city, located to its west. The rectangular plan of this device is a common feature of defensive architecture in the EB II - III Southern Levant.

3.3. *The Double Fortification Line of Batrāwī Period IIIa (Early Bronze IIIa): reconstruction of the Main City Wall and erection of Outer Wall W.155*

On the northern slope, i.e. the most exposed side of the site, the defensive system was reinforced at the beginning of EB IIIA with the ad-

dition of a 1.6 - 2 m-wide Outer Wall (W.155) about 1.7 m from the Main City Wall and running parallel to it, thereby doubling the line of fortifications⁶. The addition of outer walls at the beginning of EB III, i.e. the doubling and thickening of the defensive systems, is a feature common to several South Levantine sites. At Khirbat al-Batrāwī (as at Tell Ta'annek and et-Tell)⁷, the addition only involved the more exposed (northern) side of the site, while on the western and southern flanks the steep cliffs provided a natural defence to the hill.

Outer Wall W.155 stood on the middle terrace of fortifications and was characterized by a battering outer face of polygonal boulders (laid in superimposed, intermingled courses), preserved to a height of 2.7 m, with a fill of small stones and limestone chips. To the west, the Outer Wall turned sharply northwards, neatly diverging from the Main City Wall owing to the presence of Tower T.830.

3.4. The Triple Fortification Line of Batrāwī Period IIIb (Early Bronze IIIB) and the Destruction of the City Walls

In Batrāwī Period IIIb, the Outer Wall was strengthened in its eastern section with the addition of Scarp Wall W.165, a further structure running parallel to and ending against it (in square BnII4) with round Bastion W.825 (2.65 m-wide and protruding 0.5 m at its base)⁸, as the Outer Wall turned neatly northwards in order to protect the Great Northern Bastion (**Fig. 4**).

A fourth line of fortification was investigated in 2012: a north - south oriented Transverse Wall (W.177), 1.2 - 1.7 m-wide, extending north from Scarp Wall W.165 for a distance of around 7 m, and joining a forward north-west — south-east oriented structure (W.827) which ran parallel to the Outer Wall, thereby also renovating the triple line of walls to the west, where the Outer Wall distinctly protruded from its original alignment. This structure, designated W.827, was reinforced at its juncture with W.177 by means of a buttress (W.826) and had another offset (W.841) on its northern face, some metres to the west. It had a thickness of 1.6 - 1.8 m and, in BIII2,



4. Khirbat al-Batrāwī, Area B North: the EB IIIB triple line of fortifications, from west; in the left foreground, EB IIIB Exterior Wall W.827; in the middle, EB III Outer Wall W.155; to the right, Tower T.830 abutting from the Main City-Wall.

also exhibited an inner offset (W.842) towards the Outer Wall. Wall W.827 was designated the Exterior Wall, since it was the most external defensive structure of the city, being constructed on the lower terrace of the fortification system. Exterior Wall W.827 delimited a rhomboidal court (L.824) between it and the Outer Wall, which yielded a great quantity of EB III pottery.

Both the Great Northern Bastion on the upper terrace and Outer Wall W.155 were buried under a thick destruction layer (F.834) with ash, charred material and the remains of carbonised beams. The same destruction layer (F.832), with a dense concentration of ash and pottery sherds, was excavated to the north between the Outer Wall and Exterior Wall W.827, within rhomboidal court L.824, testifying to the fierce fire which marked the end of the life of the 3rd millennium BC city⁹.

4. Area B South: EB IIIB Palace B and the EB IVB Rural Village

Inside the Main City Wall, in Area B South, underneath dwellings and installations of EB IVB (2200 - 2000 BC), the exploration of both Pavilions of the EB IIIB Palace discovered in 2009 continued in the 2012 season (**Fig. 5**). Both the Eastern and Western Pavilions were further exposed. The Western Pavilion was excavated towards the west, in squares BIII7 + BIII8 + BIII9 (northern half), completing the excavation of Hall L.1110 and including two new

6. Nigro 2011: 68; Nigro ed. 2012: 38-40; Nigro and Sala 2010: 244.

7. Lapp 1967: 7-10, 1969: 9-14; Callaway 1980: 147-158.

8. Like Outer Wall W.155 and Scarp Wall W.165, Buttress

W.825 also had a battering face: Nigro 2011: 69; Nigro ed. 2012: 46-52; Nigro and Sala 2010: 240-244.

9. Nigro 2011: 73; Nigro ed. 2012: 52; Nigro and Sala 2010: 240.



5. *Khirbat al-Batrāwī, Area B South: general view of EB IIIB Palace B, from south, with the Eastern (right) and Western (left) Pavilion.*

rooms (L.1250 and L.1230), while the Eastern Pavilion was investigated in the northern half of square BoII9, exposing the southern sector of yard L.1046.

4.1. *Stratigraphy of Area B South*

The 2012 season of excavation in Area B South allowed us to refine the stratigraphic sequence and occupational phases of both the EB IV village and the underlying EB III Palace on the northern side of the site¹⁰. The outlined sequence extends from the uppermost layer of soil (Phase 1), through successive stages of the EB IV village (Phase 2) and activities of EB IIIB Palace B (Phase 3), down to the earliest layers preceding the erection of the Palace, identified over the bedrock in two probes opened inside and outside the building (Phase 4).

Phase 1 is represented by a hard layer of sandy soil, produced by erosion and aeolian activity after the final abandonment of the site at the end of the 3rd millennium BC.

Under the topsoil, Phase 2 groups all stratigraphic units related to the EB IV occupation of the area, with two major EB IVB architectural stages (Activities 2a - d and 2e - f), preceded in some areas by ephemeral interventions (Activity 2g) associated with the initial EB IV reoccupation of the hill. In the western squares (BIII7 + BIII8 + BIII9) investigated in 2012, only layers and structures belonging to the latest stage of village, illustrating its construction, use and definitive abandonment / collapse (Activi-

ties 2a - 2c), were detected. Here, the latest EB IVB village was built on top of a 20 - 40 cm-thick layer of rubble (F.1228) and friable brown sandy soil (Activity 2d) which lay directly over the collapsed remains of the underlying EB IIIB structures. Conversely, in the eastern squares (northern half of BoII9 + BpII9), the latest rural village and its leveling layer (F.1252) concealed an earlier architectural phase, belonging to the construction and use of an initial village stage (Activities 2e - f). The latter was in turn preceded by some activities marking the earliest reoccupation of the hill, after the short period of abandonment that followed the destruction of the EB IIIB city. These activities were illustrated in the 2012 season in the form of a deep robber pit (P.1283 / F.1271), which cut through the EB IIIB layers and structures of Palace B down to the bedrock.

The underlying strata belonging to Phase 3 group the activities and stratigraphic units related to the construction, use and destruction of the EB IIIB palatial building, designated Palace B (Activities 3a - d). Activity 3a illustrates the abandonment and progressive obliteration of the ruins of the EB IIIB Palace, consisting of a layer of friable greyish-brown sandy soil, with occasional ashy lenses, fallen stones and gravel (F.1236). Activity 3b marks the final destruction of the EB IIIB Palace, being characterised by thick layers of reddish-brown soil with calcined yellowish mudbricks and plaster fragments, ash, charcoal and burnt beams (F.1128; F.1154; F.1238; F.1244; F.1248; F.1286). Activity 3c represents the use of and some architectural work / refurbishment carried out inside the Palace during EB IIIB. Finally, Activity 3d is associated with the erection of the Palace in EB IIIB.

Previous activities in the Palace area are represented by shallow layers of compact buff yellowish clayey soil and small stones lying, together with a few installations, directly over the bedrock, grouped in Phase 4.

4.2. *The 'Palace of the Copper Axes' (EB IIIB Palace B)*

The exploration of EB IIIB Palace B (the 'Palace of the Copper Axes'; Nigro 2010) con-

10. For previous stratigraphy in Area B South see Nigro ed. 2012: 146-167; Nigro and Sala 2010: 244-246;

2011: 88.

tinued in the eighth season, both in the Eastern and Western Pavilions (**Fig. 5**).

In the Western Pavilion, four-pillared Hall L.1040 was completely restored, thereby clarifying the structure of door L.1150, opening in the western side of the room, and door L.1160, opening in the southern side. Just to the south, the excavation of Hall L.1110 was completed with the exposure of its western half, including the entrance (L.1272) onto courtyard L.1100, as well as several places where the destruction layer (F.1128) still covered the floor. Hall L.1110 measured 6.5×3.7 m, with a central pillar (W.1163) supported by a stone-built footing and a bedrock step along the shorter east-west axis (**Fig. 6**), beside which a row of eight medium-sized jars and hole-mouth jars, with small cups alongside, was uncovered. One of them (KB.11.B.1128/43) contained a bone ring (KB.11.B.88) and a group of five sea-shells (KB.11.B.90), probably part of a necklace or bracelet.

The main entrance, L.1272, was in the north-west corner and opened on to a court (or portico) to the west of the Pavilion. Just in front of the entrance, a fifth copper axe was found (KB.11.B.120) deposited in a bedrock depression, while opposite it there was a built-up stone installation with a seat or a bench (W.1189), over which gemstone necklace KB.11.B.101 was found deposited in hole-mouth jar KB.11.B.1128/69 (Nigro 2012b). Just to the right of door L.1272, against western wall W.1249, a bench (B.1253) made of two rectangular limestone blocks (one with a small cup-mark) was also uncovered. It was placed in as-



6. Khirbat al-Batrāwī, Palace B: the Western Pavilion, from west; to the left, Pillared Hall L.1040; in the middle, Hall L.1110 with seat B.1189; to the right, room L.1250; in the background, the Eastern Pavilion behind entrance lane L.1050.

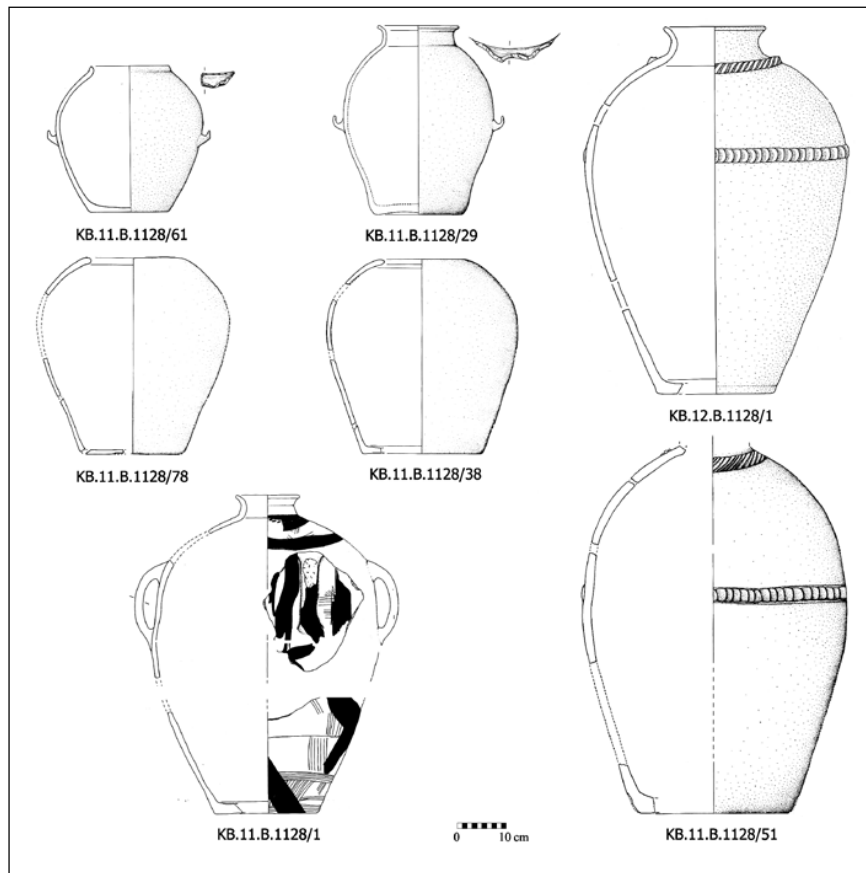
sociation with a rectangular depression adjacent to central pillar base W.1163, which was in turn aligned with a flat stone (W.1183) flanking eastern wall W.1149.

The southern side of the hall was made by cutting into the bedrock to a depth of around 1 m; the actual southern wall (W.1201) was erected on this step. In this wall there was a niche with a bench (B.1188) incorporating a huge *pithos* (**Fig. 7**). West of B.1188, a round hole (B.1251) was dug into the bedrock in order to house a hole-mouth jar (KB.12.B.1128/4); west of it, another hole-mouth jar (KB.12.B.1128/5) was set against the southern edge of the room. A *pithos* (KB.12.B.1128/1) was placed in the south-west corner, with two other *pithoi* (KB.11.B.1128/77; KB.12.B.1128/8) just to the north. Other vessels were distributed in the central area, above the bedrock step, including a highly red-polished and burnished jug (KB.11.B.1128/49). The overall ceramic assemblage of Hall L.1110 included around fifty complete vessels, viz. miniature vases, simple ware cups, bowls and vats, small- and medium-sized necked jars, and red-burnished jugs and juglets, as well as storage containers (hole-mouth jars, loop-handled jars and *pithoi* (**Fig. 8**).

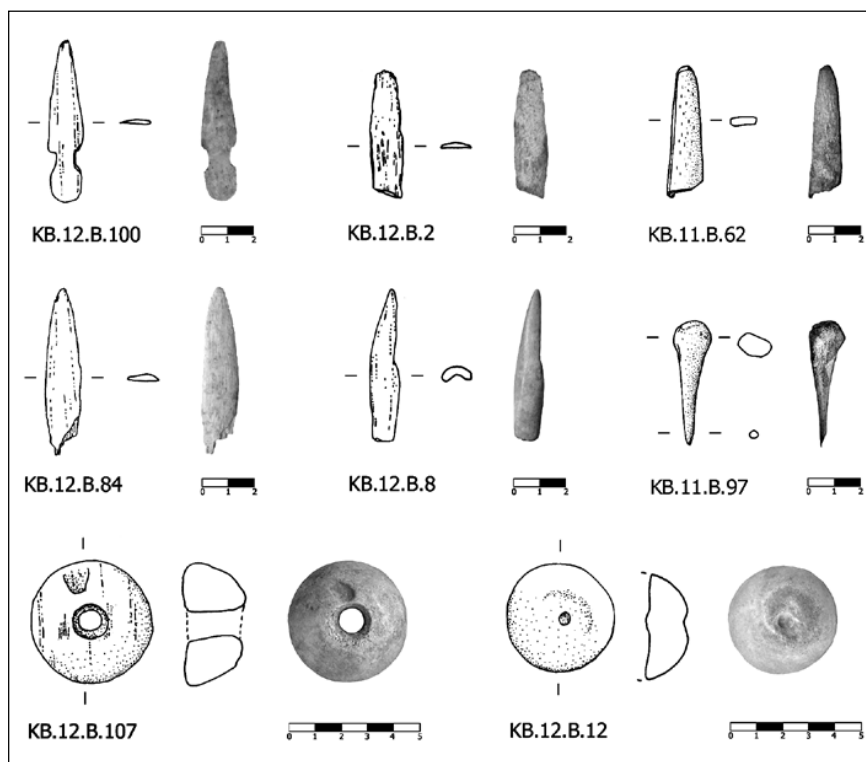
Several bone tools were also found in the southern part of Hall L.1110, including palettes, awls and shuttles, as well as spindle whorls (**Fig. 9**). A rich collection of lithics, including two flint sickles (KB.11.B.99; KB.11.B.114), Canean



7. Khirbat al-Batrāwī, Palace B: detail of southern sector of Hall L.1110, with built-up bench B.1188, from north-west.



8. Pottery from Hall L.1110: medium size jars, hole-mouth jars, loop-handled jars and pithoi.



9. Khirbat al-Batrāwī, Palace B: bone tools from Hall L.1110.

blades, flint blades and tabular scrapers, as well as pierced sea-shells, small mortar bowls, pestles and polishing pebbles, were found all over the room.

West of Hall L.1110 was another large room (L.1250) with completely separate access: no entrances were identified between it and the rest of the Pavilion (**Fig. 6**). The floor of this latter room consisted of regularized bedrock, punctuated by a series of six round holes (pulping holes and cup-marks). It was connected by means of a ramp (L.1240) with the upper terrace of the Palace located further to the south, where there was another group of rooms (L.1230). Here a large vat was discovered, consisting of the lower half of a *pithos* with a natural rim and a couple of ledge handles.

The Eastern Pavilion of Palace B was laid out on similar, if not symmetrical, lines to that of the Western Pavilion (**Fig. 10**). A 6.5×3.6 m hall (L.430) occupied the northernmost line of rooms¹¹, while a southern yard (L.1046) was investigated in square BoII9, thus evidencing a different function for this part of the Palace. The latter space was a 7.5×5.2 m open area, accessible from entrance lane L.1050. In its destruction layer (F.1154), a third fragmentary basalt potter's wheel was found (KB.12.B.140) along with some ceramic vessels¹².

4.3. The Domestic Quarter of the Batrāwī Period IVb (Early Bronze IVB) Village



10. Khirbat al-Batrāwī, Area B South: general view of EB IIIB Palace B, from north; to the left, the Eastern Pavilion with Halls L.430 and L.1046; to the right, the Western Pavilion with Pillared Hall L.1040, Storeroom L.1120, Hall L.1110 and room L.1250.

Exploration of the EB IVB (2200 - 2000 BC) village continued in 2012, towards the west in squares BIII7 + BIII78 + BIII79 (northern half) and towards the south in the northern half of squares BoII9 + BpII9¹³.

In BIII8 + BIII9 a rectangular domestic unit (L.1210) was uncovered in a fairly good state of preservation, with a main wall on the southern side (W.1207) preserved to a height of three courses of medium-sized stones, a northern wall (W.1209) made of large rectangular stones set as headers and its western limit coinciding with an apsidal structure (W.1211). The latter enclosed a large space (L.1216) connected to a second curvilinear precinct (W.1213) to the north-west, in square BIII7, delimiting yard L.1224 (**Fig. 11**). Both enclosures consisted of walls a single stone wide (W.1211; W.1213) and can be interpreted as pens for domestic animals. The rectangular house was entered from a door (L.1190) in the middle of its northern side. Next to the entrance there was a platform (B.1226), where three smashed complete jars (simple ware jars KB.12.B.1206/41 and /47, and hole-mouth jar KB.12.B.1206/43) were recovered (**Fig. 12**). On the opposite side of the room, there was another storage device (B.1221) with two hole-



11. Khirbat al-Batrāwī, Area B South: EB IVB domestic units excavated in season 2012, with House L.1210, and curvilinear precincts W.1211 and W.1213, from south.

11. Nigro ed. 2008: 151-157, 2012: 178-183; Nigro and Sala 2010: 248.

12. Unfortunately this part of the Palace was deeply cut by EB IV pit P.1183.

13. For results of previous excavations of the EB IVB village on the northern side of the site see: Nigro ed. 2008: 164-176, 2012: 189-209; Nigro and Sala 2010: 246-248, 2011: 88-89; Sala 2012.



12. *Khirbat al-Batrāwī, Area B South: EB IVB House L.1210, with in situ pottery vessels and small finds.*

mouth jars (KB.12.B.1206/39 and /46). In the middle of the room, a beautifully decorated jar (KB.12.B.1206/31) was recovered. Other installations were uncovered in the eastern part of the house, viz. two circular juxtaposed bins (S.1223; S.1225) at its eastern end, which was paved with flagstones. A series of objects and tools were found in L.1210, including two mortar bowls, two basalt grinding stones, a basalt pestle, a limestone pestle, two flint blades and a bone awl (**Fig. 13**). Domestic unit L.1210 and the apsidal enclosures attached to it were attributed to Phase 2c, i.e. the latest reconstruction of the EB IVB rural village.

In BoII9 + BpII9 (northern half) two different construction phases were investigated. In the latest one (Phase 2c), the southern continuation

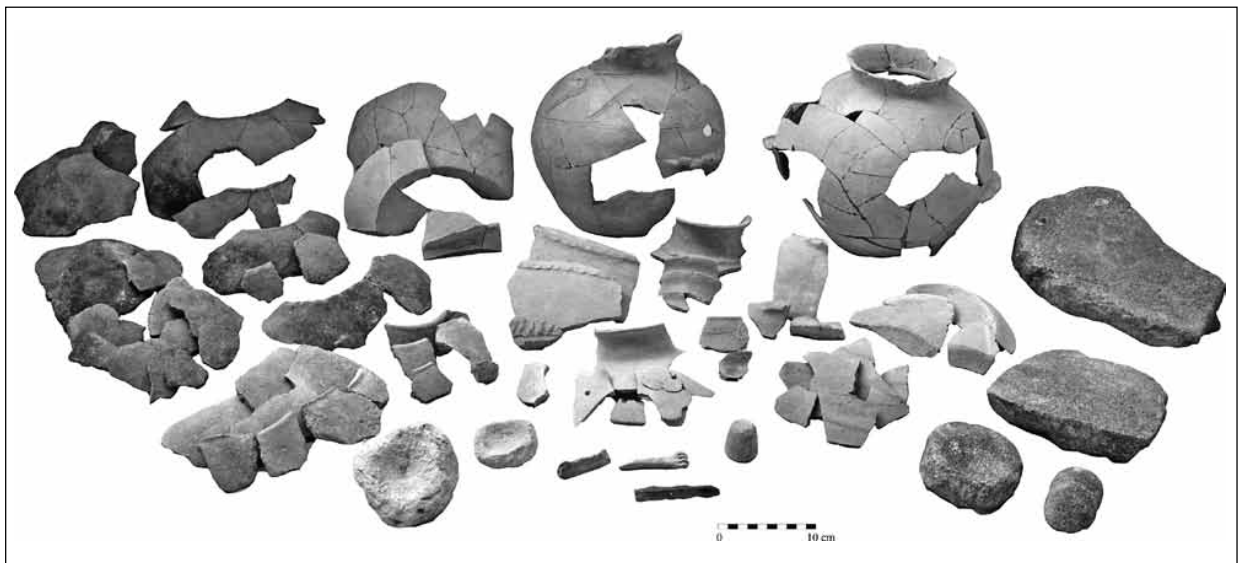
of structures previously excavated in the 2006 - 2009 seasons was revealed, i.e. wall W.1005 plus W.1235, W.361 plus W.1229, and W.353. The latter delineated the north-west corner of unit L.1234, joining with perpendicular NE -e SW wall W.1233. A thick levelling fill (F.1252) buried the earliest phase of occupation (Phase 2f) represented by a rectangular unit (L.1270), made of large stones laid as headers on the same orientation as L.1234, and an open yard (L.1260) with benches and working platforms made of small stones. An additional rectangular domestic unit (L.1290) was uncovered to the east, in BpII9.

5. Restoration

During the eighth season (2012), restoration works were carried out in both Area B North (on the multiple lines of fortifications) and in Area B South (on Palace B).

In Area B North, all of Outer Wall W.155 was restored from east to west, consolidating its upper courses using an antique-like mortar. Another stretch of the Main Inner City Wall was also restored, especially on its outer face where the curtain wall had partly collapsed where it was cut by pit P.819.

In Area B South, restoration of the stone walls of Palace B continued, focusing on Store-room L.1120, Hall L.1110 (where door L.1272, connecting the hall with yard L.1100, and seat B.1189 were restored), and room L.1250 (exca-



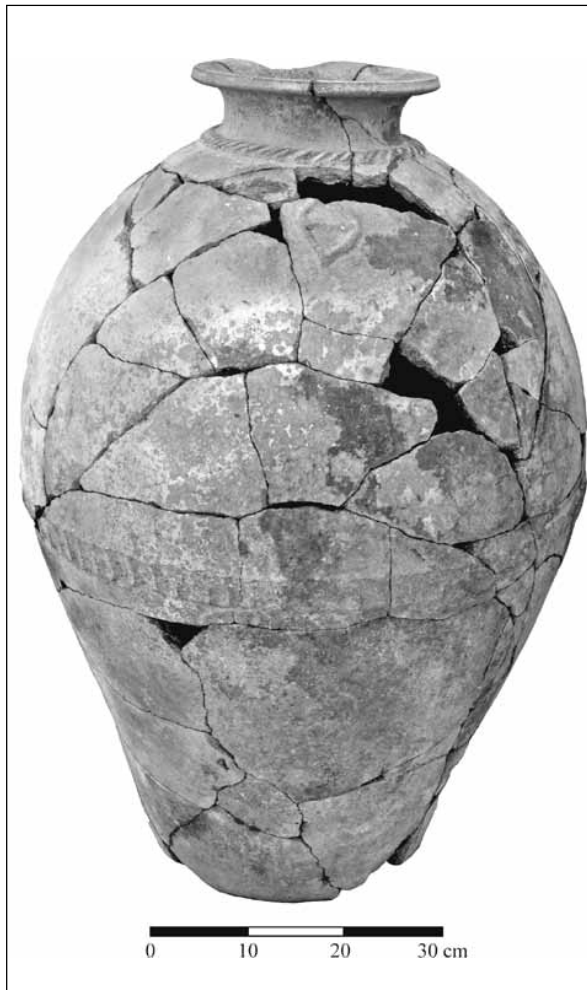
13. *Khirbat al-Batrāwī: EB IVB pottery vessels, tools and small finds from House L.1210.*

vated in 2012), where walls W.1245 and W.1249 were only preserved to a height of two or three courses with a height of around 0.4 - 0.5 m.

During this season, a major focus of the project was once again the restoration of finds recovered from Palace B, especially the numerous smashed pottery vessels (including those with applied decoration (**Fig. 14**) from the destruction layers of each room of the Palace.

6. Conclusions

The eighth season at the site further increased our knowledge of this Early Bronze Age city, in the form of the extraordinary finds from Palace B and the impressive architecture of its multiple fortifications, presenting a vibrant example of urban culture in Jordan during the 3rd millennium BC.



14. Khirbat al-Batrāwī: restored pithos KB.10.B.1040/6 from Pillared Hall L.1040; to be noted the applied sign on the shoulder of the vase.

Bibliography

- Callaway, J.A.
1980 *The Early Bronze Age Citadel and Lower City at Ai (et-Tell). Report of the Joint Archaeological Expedition at Ai (et-Tell). No. II* (ASOR Excavations Reports), Cambridge Mass.: American Schools of Oriental Research.
- Lapp, P.W.
1967 The 1966 Excavation at Tell Ta'anek. *BASOR* 185: 2-39.
1969 The 1968 Excavations at Tell Ta'anek. *BASOR* 195: 2-49.
- Nigro, L.
2010 *In the Palace of the Copper Axes/Nel Palazzo delle Asce di Rame. Khirbet al-Batrāwy: the discovery of a forgotten city of the III millennium BC in Jordan/Khirbet al-Batrāwy: la scoperta di una città dimenticata del III millennio a.C. in Giordania* (Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan, Colour Monographs I). Rome: «La Sapienza» Expedition to Palestine & Jordan.
2011 Dominating the River: Khirbet al-Batrāwy, an EB II-III City in North-Central Jordan. *Syria* 88: 59-74.
2012a Khirbet al-Batrāwy: Rise, Flourish and Collapse of an Early Bronze Age City in Jordan. Pp. 609-628, Volume 1, in R. Matthews and, J. Curtis (eds.), *Proceedings of the 7th International Congress on the Archaeology of the Ancient Near East. 12 April – 16 April 2010, the British Museum and UCL, London*, Wiesbaden: Harrassowitz.
2012b An EB IIIB (2500-2300 BC) gemstones necklace from the Palace of the Copper Axes at Khirbet al-Batrāwy, Jordan. *Vicino Oriente* XVI: 227-243.
- Nigro, L. (ed.)
2006 *Khirbet al-Batrāwy. An Early Bronze Age Fortified Town in North-Central Jordan. Preliminary Report of the First Season of Excavations (2005)* (= Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan, 3). Rome: «La Sapienza» Expedition to Palestine & Jordan.
2008 *Khirbet al-Batrāwy II. The EB II city-gate, the EB II-III fortifications, the EB II-III temple. Preliminary report of the second (2006) and third (2007) seasons of excavations* (= Rome «La Sapienza» Studies on the Archaeology of Palestine & Transjordan, 6). Rome: «La Sapienza» Expedition to Palestine & Jordan.
2012 *Khirbet al-Batrāwy III. The EB II-III triple fortification line and the EB IIIB quarter inside the city-wall. Preliminary report of the fourth (2008) and fifth (2009) seasons of excavations*

(= Rome “La Sapienza” Studies on the Archaeology of Palestine & Transjordan, 8). Rome: “La Sapienza” Expedition to Palestine & Jordan.

Nigro, L. and Sala, M.

2010 Preliminary Report of the Fifth Season (2009) of Excavations by the University of Rome “La Sapienza” at Khirbat al-Batrāwī (Upper Wādī az-Zarqā’). *ADAJ* 54: 237-253.

2011 Preliminary Report on the Sixth (2010) Season of Excavation by “La Sapienza” University of Rome at Khirbat al-Batrāwī (Upper Wādī az-Zarqā’). *ADAJ* 55: 85-100.

2012 Preliminary Report on the Seventh (2011) Season of Excavation by “La Sapienza” University of Rome at Khirbat al-Batrāwī (Upper Wādī az-Zarqā’). *ADAJ* 56: in press.

Sala, M.

2012 An EB IVB (2200-2000 BC) farmers’ community at Khirbet al-Batrawy (North-Central Jordan). Pp. 697-706, Volume 3, in R. Matthews and, J. Curtis (eds.), *Proceedings of the 7th International Congress on the Archaeology of the Ancient Near East. 12 April – 16 April 2010, the British Museum and UCL, London*, Wiesbaden: Harrassowitz.

THE 2011 SEASON OF THE LATE ANTIQUE JARASH PROJECT : RESULTS FROM THE SURVEY SOUTHWEST OF THE Umayyad CONGREGATIONAL MOSQUE

Louise Blanke, Hugh Barnes, Marie Broendgaard Jensen, Rune Rattenborg and Elise Thing

Introduction

The present article reports on the 2011 survey season of the Late Antique Jarash Project – a new initiative within the Islamic Jarash Project (henceforth IJP), directed by Alan Walmsley. IJP commenced in 2002 as a collaborative project between University of Copenhagen, Denmark and the Department of Antiquities of Jordan. The project began with the principal objective of establishing the presence of a congregational mosque in central Jarash, built in the Umayyad period, and examining a Late Roman bathhouse that occupied the site prior to the construction of the mosque. From this starting point, the IJP developed to include a broader investigation of central Jarash in the Late Antique transition into the Early Islamic Period by expanding east across the *Cardo*, south toward the *Macellum* and west along the line of the *South Decumanus*. Our excavations in these areas have brought forth a rich assemblage of archaeological data – architecture, stratigraphy and finds – and have extended our understanding of Islamic Jarash well into the Abbasid Period (Blanke *et al.* 2010).

In recent years, the IJP has expanded beyond central Jarash to include an examination of the architectural remains southwest of the Early Islamic mosque. The Late Antique Jarash Project commenced with a three week survey of surface remains in 2011, during which the area between the mosque, the *South Decumanus* and the city wall was examined. Particular attention was paid to a hilltop, where five areas containing distinct architectural features (A-E) were surveyed in detail (Fig. 1).

The aim of our investigation southwest of the mosque is to move towards an understanding of the residential urban history of Jarash during the

Late Antique transition into the Early Islamic period and, thereby, cast light on a hitherto little explored part of life in the ancient town. Our principal research questions address logistics of daily life, such as the organisation of domestic spaces, rubbish disposal and the supply, distribution and drainage of water. The non-intrusive nature of our work thus far means that these questions have been addressed within the limitations presented by the surface remains and future excavations will significantly increase our understanding of the area. This new research initiative not only supplements our results from central Jarash, but allows us to address questions relating to the broader organisation of the town in the Early Islamic Period and tie the Umayyad congregational mosque into its contemporary urban setting.

Landscape and Methodology

The southwest part of Jarash is characterised by a gradually rising landscape that slopes upwards west of the *South Decumanus* and the Umayyad congregational mosque towards the town wall. From the south, a series of terraces overlook the *South Theatre*. The hilltop is defined by a relatively flat area that measures some 100 by 80 metres at the summit of the main slope. The location of the hilltop at some distance from the major thoroughfares means that modern activity has largely been restricted to grazing goats and a partial conversion of the area to a football field. Tourists seldom make their way to the hilltop, partly owing to the steep climb and partly to the limited archaeological work conducted in this part of the town.

The occupational history of the hilltop and its immediate surroundings has been traced from the Hellenistic Period – where natural caves



1. 1928 aerial photo from Yale University archive. Showing general survey area and hilltop.

were modified to accommodate tombs – to the eighth century AD. The latter date was produced in the excavations of the Mortuary Church and the Church of St. Peter and St. Paul (built in the early 7th century (Gatier 1987: 135)) where it was defined through secondary architectural use

and the discovery of two coins. When we began our survey, little was known of the periods between these two dates.

Our survey contained two main components. The first component entailed a comprehensive recording of the area between the mosque, the

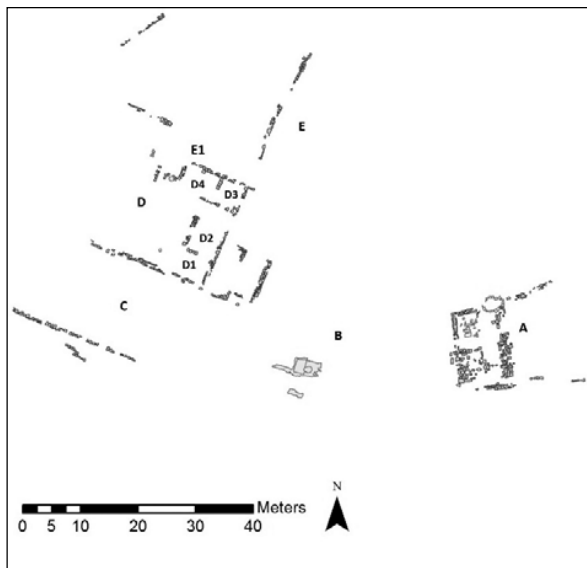
South Decumanus and the town wall where all visible wall lines, cisterns, previous excavated areas, bedrock cuts, terracing and dumps of excavated soil were recorded and mapped with a total station. These data were combined with excavation plans from the IJP using GIS (Geographical Information System) software and superimposed on a recent Google Earth image of the site. An aerial photo of Jarash from 1928 from the Yale University archive was used to trace land use and its impact on the archaeological landscape during the past 80 years.

The second component comprised a focused study of five adjoining areas, all located on the hilltop or immediately adjacent to its main features. These areas were first cleared of vegetation and, thereafter, recorded in detail, using written description combined with a full drawn and photographic record.

The five areas on the hilltop are (**Fig. 2: A-E**):

- a) A building on two levels and a cistern.
- b) A plateau with a series of bedrock cuts.
- c) A rectangular space, defined to the south and west by long, straight cuts into the bedrock.
- d) A building complex with a cistern, located on the northern edge of the hilltop.
- e) A street that runs from the South Decumanus to the hilltop.

These areas are addressed thematically below and supplemented by results from the larger area survey.



2. Architectural remains on hilltop showing Areas A-E. Copyright Louise Blanke and IJP.

Thoroughfares, Streets and Alleys (E)

In Late Antiquity, one of the primary access routes to the hilltop was a street that runs south from the triple church of St. Cosmas and St. Damien, St. John and St. George across the South Decumanus and continues at least another 175 metres. The street is aligned with the Roman Period grid system and appears to have been among the town's larger thoroughfares. It is visible on the 1928 aerial photo and has been identified in excavations where it intersects with the South Decumanus and again slightly south of the Decumanus (Barghouti 1982: 219). Columns still in situ were uncovered in these two trenches, demonstrating that at least a section of the street was colonnaded (**Fig. 3**). The width of the street remains roughly the same throughout its length with only minor variations, as it was observed to be 7.30 metres in the excavation immediately south of the Decumanus and 7.60 metres at its southernmost extent on the hilltop.

During our survey, the continuation of the street south of the Decumanus was examined in detail (**Fig. 2: E**). Farming and modern dumping have obscured the majority of the east side of the street, except from the southernmost end at the hilltop, which has seen less modern activity than most other parts of the town. Three distinct areas of larger walls with associated structural collapse can be identified along the western side of the street. The southernmost of these is Area D, which will be discussed below. The three collapsed structures are separated by alleys that run westwards from the street E. The north alley has been identified on the 1928 aerial photo, but extensive dumping has obscured its ground



3. Section of street in the excavation south of the South Decumanus. Notice walls that protrude from original façade. View south.

plan. The south alley (width 5.20 metres) is located immediately north of Area D and can be traced for 25 metres before it disappears below the spoil heaps from the excavation of the two churches (**Fig. 2: E1**).

The southernmost section of the street is partially covered by encroaching architecture, which forms a secondary building façade and narrows the street to only 3.80 metres. The same situation can be observed in the excavation south of the Decumanus, where disused architectural components, such as column drums and dressed stones, were reused to expand buildings on either side of the street, thereby reducing its width to 4.10 metres (**Fig. 3**). By comparison, the width of the street adjacent to the triple church complex is 3.90 metres.

Structural Remains (A and D)

Two building complexes were recorded as part of our examination of the hilltop. The outer limits of Area D are defined by the above mentioned street and south alley, and by a large rectangular feature to the south (Area C). The eastern extent of Area D is obscured by spoil heaps from the excavation of the two churches. At first sight, Area D resembles a field of collapsed building material, but closer inspection reveals several minor walls defining an enclosed area that covers some 20x25 metres (**Fig. 4**). Three rooms span the eastern end of the building and flank the street, while a fourth room has been identified along the north wall (**Fig. 2: D1-D4**). The collapsed building material slopes towards a depression in the southwest end of the building, which could have resulted from a lack of

structural collapse indicating the possible location of an open courtyard.

A cistern has been cut into bedrock at a break in the north wall. The northern half of the opening is delineated by limestone blocks, while the opening itself is cut into the bedrock below and extends for a metre before it expands into a pear-shaped void. The bottom of the cistern is obscured by accumulated soil, rubbish and building stones, but it was possible to estimate its depth to about 4.5 metres. A thick layer of plastering is preserved on the bottom half of the cistern as well as in patches on the sides of the opening. The opening is slightly oval and measures 90x80 centimetres, while a narrow ledge suggests that the cistern could have been closed off with a lid. The cistern was fed through a drain inlet that was cut into the south side of the opening.

The second building complex, Area A, is located on a slope between a flat plateau (Area B) and a lower terrace that opens towards the east and south. Area A measures 13x17 metres and consists of a rectangular building and a cistern that is situated immediately adjacent to the building's northwest exterior corner (**Fig. 2: A and Fig. 5**). The interior southwest and northwest corners contain platforms that could be interpreted as foundations for arches. The building's east wall stands out from the remaining structure due to the use of remarkably large stones combined with an irregular coursing. The width of the wall is 2 metres and the largest stone used is 1.5x0.32 metres. The unusual layout of the east wall could be related to a drop in the landscape, as the area further east slopes



4. Area D. View northwest.



5. Area A. Notice oval feature in foreground and capping stone to the far right. View southwest.

down to a level some 2.5 metres below the main features in Area A; the east wall acting as a retaining wall while at the same time supporting the building's superstructure.

An oval stone feature taking up 3x2.15 metres is located where the northeast corner should have been. The north and east walls stop abruptly some 20-40 centimetres before the feature and there are no signs that they were ever interlinked. Rather it seems that the northeast corner was removed to make room for a new use, meaning that the oval feature represents a later phase that postdates the collapse of the original building. The stonework on the northern side of the feature curves inwards slightly, possibly to form a low dome. The interior is filled with tumble from the collapsed superstructure and there are no visible remains of plaster that could connect the feature to the adjacent cistern and thereby to the use of water.

The cistern was found with a capping stone still halfway *in situ*. The stone has been partially lifted in recent years as indicated by wear marks on its side, allowing it to be examined in detail (Fig. 6). The capping stone has a diameter of 1.20 metres and is 33 centimetres thick. A round hole in the centre of the stone with a diameter of 39 centimetres gave access to the cistern when the stone was fitted in place. On the upper side of the stone, a larger square cut (44x44 centimetres) would have fitted a lid to close off the cistern when it was not in use. The capping stone has a slight angle to its sides, so that the lower half would sit inside the cistern, while the upper half would remain visible.

Examinations of the cistern with a camera on an extended string line have revealed that it con-

sists of a narrow shaft that leads 2-3 metres into the ground after which it opens in three directions. The full depth of the cistern is 6.20 metres. Patches of plaster are preserved in the shaft and further into its interior void.

During our general survey of the area, extensive structural remains were found along the line of the street towards the South Decumanus and at least one of these structures was associated with a cistern. For now, the walls of these structures have been recorded and added to our map of the area. Future work will include detailed recording to compare the layout and architectural organisation with the structures on the hilltop.

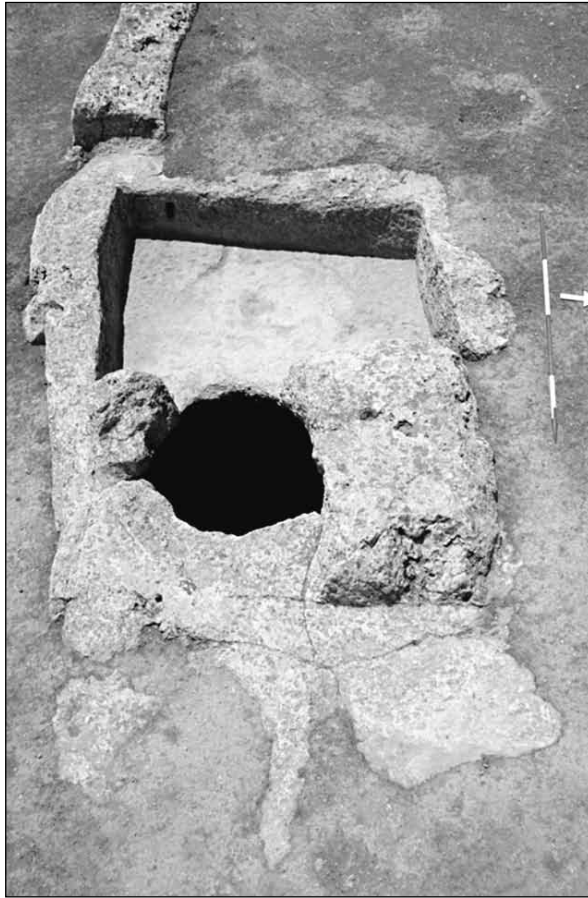
The Water System (B and C)

Throughout the hilltop, the bedrock has been cut and actively used as an integral component in the built environment. The most elaborate use of the natural rock formation is found in Areas B and C, which constitute central elements of the water supply system for the southwest part of Jarash. Area B comprises a roughly rectangular plateau (50x40 metres) that contains a series of bedrock cuts. The most notable of these cuts is a pear-shaped cistern with an interior stone and plaster lining, an associated basin and several adjoining cuts that could be part of a system involving collection or distribution of water (Fig. 7). Similar to Area D, the lower half of the cistern is filled with building stones and other accumulated material; none the less the depth of the cistern can be estimated at about four metres. The opening is surrounded by a small platform with a narrow channel that either comes from or leads to the south. The western part of the cistern opens onto a basin, which was fed through a drain hole. This drain is cut into the bedrock and would have supplied water from a feature located farther to the west. Further cuts in the bedrock are found both south and north of the cistern and appear to be of a similar type as the basin, implying a series of water related and possibly interconnected features.

The plateau that surrounds the area of bedrock cuts contains no evidence of tumbled stones or other structural collapse. This situation resulted from later use of the area, as plough marks document past cultivation, while improvised football goals reveal the area's most recent



6. Capping stone from cistern in Area A. View south.



7. Cistern and adjoining basin in Area B. Notice drain hole in top left corner of basin. View west.

use. Both activities require a flat, cleared area, meaning that collapsed building material was removed for a purpose. A brief examination of the immediate vicinity explains the current lack of tumble stones. The cistern for example, contains a large number of stones, which were not a result of natural collapse, but rather, because the area provided a convenient and easily accessible dumping ground. Similarly, Area A is covered in loose tumble, which clearly does not originate from the collapse of the building.

Area C spans 45x17 metres and lies immediately west of the plateau (**Fig. 8**). Area C is defined on the western and southern sides by long straight bedrock cuts that join at a 90 degree angle. The southern cut can be traced over a distance of 19 metres, after which it disappears below an area of dumped soil. Walls of one or two courses in height and a single stone in width were constructed on top of the bedrock cuts. The landscape rises on both sides so it is



8. Area C overview. Notice bedrock cuts. View west.

possible that these walls served as retaining walls to allow use of the adjacent land and at the same time prevent collapse into Area C. The north end of Area C is defined by the south wall of Area D. A cut in this wall resembles a narrow channel that could have led water towards the north, into the building complex, most probably to feed the cistern. Modern dumping has obscured the eastern extent of Area C and the connection with Area B is, therefore, not clear. The southwestern part of Area C contains a scatter of tumble, but has otherwise been cleared of building stones.

Combining this archaeological evidence would suggest that Area C was a reservoir intended for the collection and further distribution of water towards (at least) the north and east. The sources of water have not been identified to date, but the reservoir could likely have been fed by a combination of rainwater and water from sources that lie beyond the walls of Jarash. Water from these sources would have been led through channels in the western city wall to be collected and further distributed here. This solution resembles the water supply from nearby Birkatein that was delivered through a channel in the northern part of the town wall. There are no architectural remains to indicate that the reservoir was once spanned by a roof. The high level of evaporation in Jarash (1900 millimetres with just 400-500 millimetres rainfall (Fardous *et al.* 2004)) would suggest that Area C was not used for permanent water storage, but should rather be considered as a temporary container or as a catchment area for rainwater with further distribution to nearby subterranean cisterns.

Alternative water supply strategies can be

found in the contemporary Decapolis towns of Gadara and Abila, where water was carried through extensive systems comprising a combination of channels that were cut into bedrock and subterranean aqueducts (Al Karaimeh 2011, 2012; Kerner *et al.* 1997; Mare 1995; see also Watson 2001: 487 for a reservoir at Pella supplied with water from a nearby wadi though an aqueduct).

A total of nine cisterns have been identified in the survey area. All but two of these are located on, or in the immediate surroundings of the hilltop. They vary in shape and size from the smaller pear-shaped subterranean cisterns of Areas B and D to rectangular cisterns with roofs constructed with stone built arches. The largest cistern identified thus far is located about 50 metres south of Area C and is immediately recognisable by the barbed wire that has been piled on top of the opening to repel thrill-seeking visitors. This cistern has a large square opening with straight plastered walls that extend for about two metres before it expands in all directions. The depth of the cistern is at least 7.5 metres. It has not been possible to estimate its width.

This variety of forms may result from functional considerations – whether the specific cistern served a communal purpose or was storing water for an individual household – or from variations in the dates of construction. It is likely that it was common practice that new structures in Jarash included a cistern to supply the individual building or household and its associated activities. Unfortunately, the exclusive focus of earlier archaeology on monumental public architecture means that little is known of the water supply of non-civic buildings. The excavations of the so-called “Umayyad house” on the north side of the South Decumanus, across the street from the Early Islamic mosque, as well as the houses west of the Church of St. Theodore revealed advanced water supply systems with both drainage channels and cisterns (Fisher 1938: 282ff; Gawlikowski 1986: 109ff; See also Blanke *et al.* 2010, 324f). It seems evident that the hilltop and its surroundings were instrumental for the water supply of the southwest quadrant of Jarash, but the interconnected relationship is still to be resolved; excavation is required to achieve a better understanding of this essential aspect of life in the ancient town.

Farming and Other Later Uses of the Town

Our survey of the area southwest of the Early Islamic mosque resulted in noteworthy observations about the most recent development of the site. Comparison of our survey results with the 1928 aerial photo revealed substantial alterations to the landscape. Among the more significant changes is the complete disappearance of the line of the western half of the South Decumanus, which appears in the aerial photo leading all the way to the west gate in the town wall. In this photo, the Decumanus is flanked by a series of ruined buildings that open onto field systems (Fig. 1). The organisation of the buildings and associated fields appears to maintain the integrity of the town planning. The excavations on the Decumanus (Barghouti 1982: 219-220) and on the slope towards the Temple of Artemis show that the field systems were created on deposits of soil lying 20-50 centimetres deep above the ruined buildings. Given the relatively clear outlines of the buildings, this soil may have been deliberately deposited rather than being a product of natural accumulation over time. This implies a conscious transition from townscape to agricultural zone, where buildings were deliberately left in ruins rather than rebuilt to maintain the urban space. Today, the western half of the Decumanus, the buildings and the field systems have been entirely obscured by deposition of spoil from excavation and restoration work in Jarash.

The hilltop and the terraces towards the South Theatre have, however, remained relatively unspoiled, and here plough marks clearly reveal the use of this area for agriculture. The field systems would have required a substantial amount of water. The most likely source for the terrace system and the hilltop fields would be the reservoir in Area C and the associated water system. It can, therefore, be suggested that the water supply system was still in use at a point in time when the majority of the area southwest of the Early Islamic mosque was in ruins and had been transformed for agricultural uses. As suggested above, rainwater was probably the main source of water for the reservoir. It should, however, be noted that if the water supply was supplemented by sources delivered through channels in the town wall, this would suggest that sections of the town wall were still standing. With the col-

lapse of the town wall, the water supply would have been cut off and cultivation of the fields would no longer have been tenable. These questions can only be solved through excavation.

Concluding Remarks

The non-intrusive nature of the survey carried out thus far means that we still lack stratified contexts with associated datable material finds. To attempt to link the hilltop structures to buildings else where on site at this early stage would be both speculative and potentially misleading. However there are a few datable indicators that should be mentioned here. Ceramic sherds dating from the Abbasid period were found among the surface assemblage, documenting a presence well into the Islamic Period – a presence that has already been well established in Central Jarash in the main IJP excavation area (Blanke *et al.* 2010; Gawlikowski 1986). The architecture encroaching onto the streets on the hilltop and in Barghouti's excavation on the South Decumanus continues a trend seen on the Tetraklion Piazza and south along the Cardo. The process of narrowing the streets had already begun in the 5th and 6th century, but certainly continued during the time of use of the Early Islamic congregational mosque – possibly resulting from a surplus of reusable building materials from derelict and abandoned parts of town. The latest pre-modern activity in the survey area is comprised by the field systems located along the line of the South Decumanus, on the terraces facing the South Theatre and on the hilltop. Based on the evidence presented above, these fields clearly represent a period of use that post-dates a general abandonment of urban life in this part of town. These different strands of archaeological observation all point towards a late occupation of the hilltop, although the specific dates of its use remain to be determined.

The two buildings described in this text (Area A and D) are very different in layout, but both contain an elaborate cistern. The smaller pear-shaped cisterns associated with Area B and D are often found in relation to single households (Wilkinson 2003: 51). Once the cisterns have been examined and measured in detail, it will be possible to calculate the maximum capacity of water held in each cistern and to estimate how

large a population could be supported and for how long (Connelly and Wilson 2002). It is not yet possible to elucidate the functions of the two buildings. However, these data combined with the proximity of two churches might suggest that the hilltop area should be perceived as a residential quarter, but further investigation would be required to confirm this designation.

With nine cisterns and one reservoir identified, it does appear that the hilltop and its surroundings played a central role in supplying water to the southwest part of Jarash. The internal relationship between the water features and the logistics of channeling water from the hilltop downhill to central Jarash require further investigation.

The area southwest of the Early Islamic mosque has proved to be a rich source of archaeological data that can shed light on significant aspects of life in the ancient town and on its development through the centuries. We hope to build on our good relations with the Department of Antiquities in the future by collaborating on a joint project that will allow us to explore the full implications of these exciting new discoveries together.

Louise Blanke (Corresponding author), University of Copenhagen, Denmark (lblank@hum.ku.dk)

Hugh Barnes

Marie Broendgaard Jensen

Rune Rattenborg

Elise Thing

Acknowledgements

The Islamic Jarash Project is funded by University of Copenhagen, Denmark and is carried out under the direction of Dr Alan Walmsley in close collaboration with the Department of Antiquities of Jordan (DOA). We especially thank HE Dr. Ziad Al-Saad, former Director-General of the Department of Antiquities, and Mrs Samia Khouriour DOA representative in 2011. We are grateful for the invaluable help and hospitality of Mr Abdul Majid Mejali who offered logistical and technical support. We also thank Mr Ahmed Shami, former inspector at DOA, Jarash for his help and support. Also thanks to the British Institute in Amman for ongoing logistic assistance and equipment, and finally the team of the Late Antique Jarash Project (including

our Copenhagen officer Hanne Nyman and our daily fieldsupport Pernille Bangsgaard Jensen), without whose continuous hard work and enthusiasm, this work would not have been possible.

Bibliography

- Al Karaimeh, S.
 2011 Irrigation Systems in the Umm Qays Region: an Ethnographic Case Study. *ARAM* 23: 601-618.
- Al Karaimeh, S.
 2012 Roman Law and Archaeological Evidence on Water Management. Pp 41-48 in M. Zuchowska (ed.), *The Archaeology of Water Supply*. BAR International Series 2414. Oxford: Archaeopress.
- Barghouti, A.N.
 1982 Urbanisation of Palestine and Jordan in Hellenistic and Roman Times. *SHAJ* 1: 209-29.
- Barnes, H. Blanke, L., Damgaard, K., Simpson, I., Sørensen, M.L. and Walmsley, A.
 2006 From 'Guard House' to Congregational Mosque: The Danish-Jordanian Islamic Jarash Project. *ADAJ* 50: 285-314.
- Blanke, L.
 2007 A Newly Discovered Bathhouse in Byzantine Jarash. An Archaeological Interpretation. *Roman Archaeology Group* 2.
 Forthc. The Central Baths in Gerasa. An Archaeological Interpretation of the Stratigraphic Development of a newly discovered Bathhouse in Central Gerasa in M-F Boussac and T. Fournet (eds.), *Proceedings of the Balneorient Conference held in Amman 2008*.
- Blanke, L., Damgaard, K., Simpson, I. and Walmsley, A.
 2007 From Bathhouse to Congregational Mosque: further discoveries on the urban history of Islamic Jarash. *ADAJ* 51: 177-97.
- Blanke, L., Lorient, P.D., Rattenborg, R.
 2010 Changing Cityscapes in Central Jarash – Between Late Antiquity and the Abbasid period. *ADAJ* 54: 315-327.
- Connelly, J.B. and Wilson, A.I.
 2002 Hellenistic and Byzantine Cisterns on Geronisos Island. *Report of the Department of Antiquities, Cyprus* 2002: 269-92.
- Crawfoot, J.W.
 1938 The Christian Churches. Pp 171-264 in C.H. Kraeling (ed.), *Gerasa, City of the Decapolis*. New Haven, Connecticut: American Schools of Oriental Research.
- Damgaard, K.
 2011 Sheltering the Faithful: Visualising the Umayyad Mosque in Jarash. *ARAM* 23: 191-210.
- Damgaard, K. and Blanke, L.
 2004 The Islamic Jarash Project. A Preliminary Report on the First Two Seasons of Fieldwork. *Assemblage* 8 (<http://www.assemblage.group.shef.ac.uk/>).
- Damgaard, K., and Blanke, L.
 2005 Moskéen i Jarash. *SFINX* 28, 3:134-8.
- Fardous, A.-N. Mudabber, M., Jitan, M. Badwan, R.
 2004 Harnessing Salty Water to Enhance Sustainable Livelihoods of the Rural Poor in Four Countries in West Asia and North Africa: Egypt, Jordan, Syria and Tunisia. Jordan National Report. National Center For Agriculture Research and Technology Transfer. http://www.iwmi.cgiar.org/assessment/files_new/research_projects/ICBA%20NationalReport_Jordan.pdf
- Fisher, C.S.
 1938 Buildings of the Christian Period. Pp 265-296 in C.H. Kraeling (ed.), *Gerasa, City of the Decapolis*. New Haven, Connecticut: American Schools of Oriental Research.
- Gatier, P.-L.
 1987 Une lettre du pape Grégoire le Grand à Marianne-sévêque de Gerasa. *Syria* 64, 1: 131-135.
- Gawlikowski, M.A.
 1986 Residential Area by the South Decumanus. Pp 107-136 in F. Zayadine (ed.), *Jarash Archaeological Project 1981-1983*. Amman: Department of Antiquities.
- Kerner, S., Krebs, H. and Michaelis, D.
 1997 Water Management in Northern Jordan: The Example of Gadara Umm Qays. *Studies in the History and Archaeology of Jordan* VI: 265-270.
- Mare, W.H.
 1995 The Technology of the Hydrological System at Abila of the Decapolis. *Studies in the History and Archaeology of Jordan* V: 727-736.
- Walmsley, A.
 2003a The Newly-Discovered Congregational Mosque of Jarash in Jordan. *al-'Usur al-Wusta. The Bulletin of Middle East Medievalists* 15: 17-24.
 2003b The Friday Mosque of Early Islamic Jarash in Jordan: The 2002 Field Season of the Danish-Jordanian Jarash Project. *The Journal of The David Collection* 1:111-31.
 2003c Searching for Islamic Jarash. A report on the 2002 field season of the Danish-Jordanian Islamic Jarash Project. *Unpublished report for the University of Copenhagen*.
- Walmsley, A. and Damgaard, K.
 2005 The Umayyad Congregational Mosque of Jarash in Jordan and its Relationship to Early Mosques. *Antiquity* 79, 305: 362-78.
- Walmsley, A., Bessard, F., Blanke, L., Damgaard, K., Mellah, A., McPhillips, S. and Simpson, I.
 2009 A Mosque, Shops and Bath in Central Jarash: the 2007 Season of the Islamic Jarash Project. *ADAJ* 52: 109-137.

ADAJ 57 (2013)

Watson, P.M.

- 2001 Roman Water Installations in the Vicinity of Pella. *Studies in the History and Archaeology of Jordan* VII: 485-491.

Wilkinson, T.J.

- 2003 *Archaeological Landscapes of the Near East*. Tucson, Arizona: The University of Arizona Press.
-

RECYCLING THE VALLEY PRELIMINARY REPORT OF THE 2012 EXCAVATIONS AT TALL DĀMIYAH

Lucas Petit

Introduction

Recent archaeological and associated research has demonstrated intriguing short-term occupation activities in the Central Jordan Valley during the first millennium BC (*e.g.* Petit 2009a, and references therein). Being exceptional in Near Eastern-archaeology and even beyond, this remarkable pattern of sedentary occupation forces scientists to widen their geographical scope in order to understand how people in antiquity interacted with the surrounding areas. Inhabitants with a sedentary way of life were avowedly involved in a continuing process of migration and return migration to search for the most favourite areas. Due to a lack of research in the foothills and on the plateau directly east of the Central Jordan Valley, archaeologist can only guess where the migrating people went to in times of difficulties. The project *Recycling the Valley*, initiated by the Dutch National Museum of Antiquities, intends to investigate the ways in which the valley was recycled by inhabitants during the Iron Age II and Persian Periods (*c.* 950–330 BC). Furthermore, it will try to raise public awareness about the value of archaeological sites in vulnerable areas in modern Jordan. Recycling the valley was not solely a significant issue for inhabitants in antiquity, but is still relevant today.

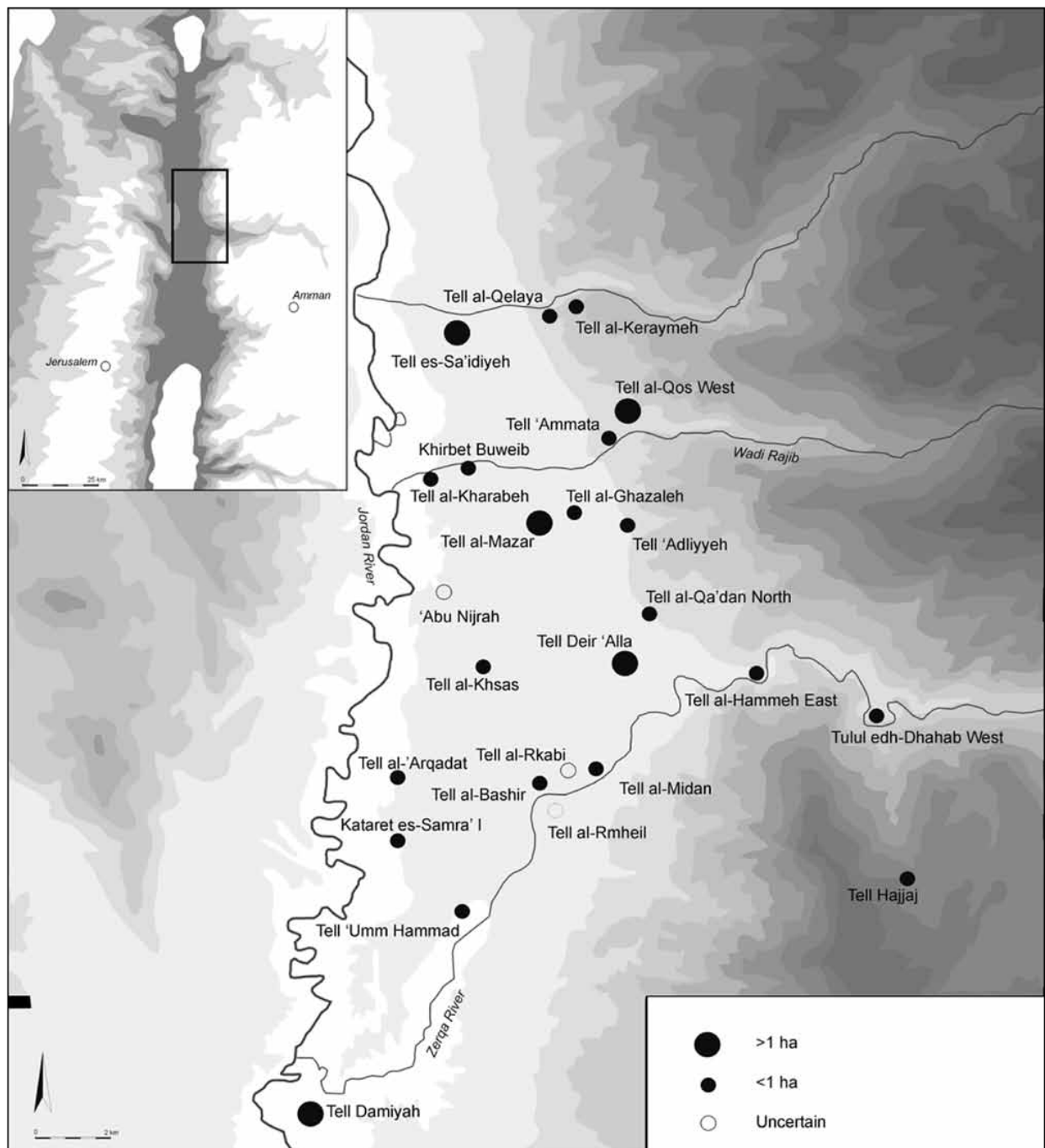
The project *Recycling the Valley*

Previous archaeological expeditions at sites like Tall as-Sa'idiyeh, Tall al-Mazār and Tall Dayr 'Allā (*e.g.* Franken 1969; 1992; Yassine 1984; 1988; Pritchard 1985; Tubb 1988; 1990; Van der Kooij 2001; 2006; Yassine and Van der Steen 2012) have stated that the Central Jordan Valley was extensively, but not continuously, inhabited during the first millennium BC (**Fig. 1**). The area is considered a semi-arid region with insufficient precipitation for sustainable rain-fed agriculture (Wirth 1971: 92).

Even the existence of an irrigation system in the area (Kaptijn 2009; 2010) could not overcome all extremities in climate; the inhabitants were regularly forced to leave the area. Also other processes have influenced the occupation history, such as natural catastrophes, periods of political instability and economic malaise. Occupation in the Central Jordan Valley followed a complex pattern of settling and abandoning during the first millennium BC (*e.g.* Petit 2009a).

Theoretical Background

Migration of sedentary people in ancient societies is regarded by most archaeologist as highly important in affecting cultural evolution (Young 2002). Archaeologists do have, however, difficulties of identifying these human movements. During the last decades, the study of human migration was intensified especially due to the use of models developed by geographers, biological anthropologists, anthropologists and sociologists. An important result was the acceptance that migration can be viewed as a structured behaviour, that “tends to develop in a broadly predictable manner once it begins” (Anthony 1990: 896). The number of publications about human migration in ancient societies increases, but the actual identification in the archaeological record remains rare. Hard evidence derived mainly from other disciplines, like the spatial distributions of human genes and languages (Renfrew 1987; Fix 1991; Cavalli-Sforza *et al.* 1994). It seems time to tackle these difficulties in identifying medium- and short-distance migration archaeologically by investigating associated ancient settlement activities in two restricted geographic areas with different environmental conditions. Migration and return-migration is expected when there are negative stresses in the home region and positive attractions in the destination region (Lee 1966; Gmelch 1980). Former stud-



1. Topographic map of the Central Jordan Valley with location of Tall Dāmiyah and other Iron Age sites.

ies in the research area have indeed stated the existence of stress and attraction, but fail to identify human movements archaeologically (Van der Kooij 2001; Petit 2009a). Excavations in both the home and destination regions will open a new chapter in understanding migration, return-migration and village life in this part of the Near East during Iron Age II and the Persian Period.

Objectives and Methodological Framework

The project *Recycling a Valley* intends to systematically investigate the role of the Central Jordan Valley within a larger area during Iron Age II and the Persian Period. It continues at the point where other projects stopped and includes the investigation of settlements on the eastern plateau. Ceramic analyses did confirm the previously suggested cultural

relationship between the Central Jordan Valley and the eastern plateau (Groot 2011). The project differs in theoretical, methodological and geographical aspects from previous work. Whereas the plateau immediately east of the Central Jordan Valley is largely unknown, the main focus in the valley from the beginning onwards lies on individual sites. Hardly any attempts were directed at studying the area as an intertwined and interrelated system, except maybe for the project *Settling the Steppe* (Kaptijn *et al.* 2005; Petit *et al.* 2006; Hourani *et al.* 2008). A detailed reconstruction of the occupation history of the eastern plateau and the Central Jordan Valley is necessary to test the sweeping theories proposed until now.

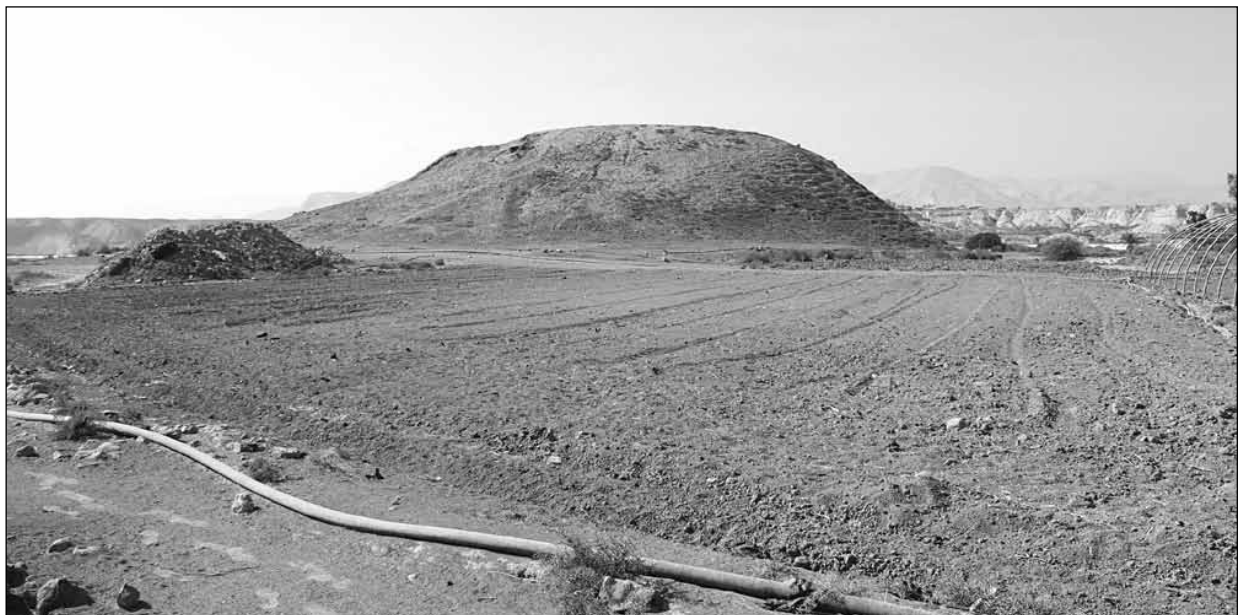
Preliminary Results of the 2012 Season

One of the sites that is expected to generate significant information about the role of the Central Jordan Valley in the Southern Levant is Tall Dāmiyah (Fig. 2). This settlement mound is located in the Zor, very close to the confluence of the Zarqa and the Jordan River. Previous excavation work by Dr. Omar al-Ghul of the Yarmouk University and the author in 2004 and 2005 revealed extensive Iron Age occupation, pits from the Persian Period and two undated, but post-Persian burials (Kaptijn *et al.* 2005; Petit *et al.* 2006; Hourani *et al.* 2008; Petit 2008; 2009a: 103-151; 2009b). However, the discovered, almost continuous Iron Age occupation did not correspond to habitation cycles of temporary sites in the area.

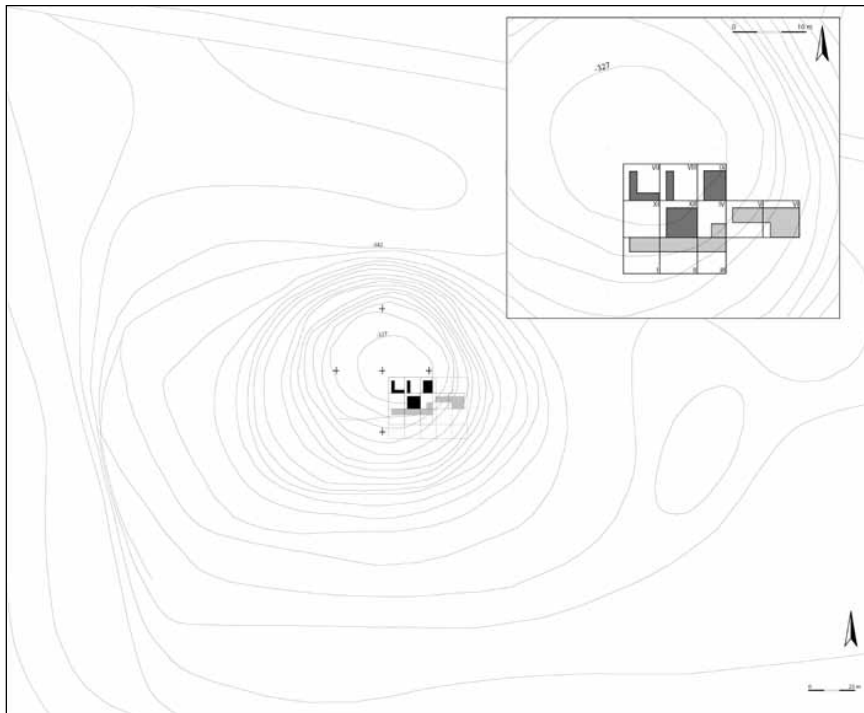
The exceptional situation at Tall Dāmiyah had to be investigated in order to understand the way people interacted with the eastern plateau.

Excavation work at the site, headed by the author, was conducted from the 30th of September until the 8th of November 2012. The work was organised as a joined project between the Yarmouk University and the Dutch National Museum of Antiquities. Due to changes within the board of the Faculty of Archaeology of the Yarmouk University, members of the university were unable to attend the fieldwork. Regular contact kept the university informed about the excavation progress. The team in 2012 included Tine Rassalle, Mariette Driessen, Yannick Boswinkel, Jeroen Rensen, and Lucas Petit (director), assisted by eight local workers. The team members stayed in the Station for Archaeological Research in Dayr ‘Allā. The representative of the Department of Antiquities was Mrs. Sannaa Khalil al Bóbbó.

The primary objective of this season was to investigate the role of the settlement at Tall Dāmiyah in the Jordan Valley during the late Iron Age and Persian Period (c. 950-330 BC). The focal points were threefold: first, to investigate the seventh century BC occupation at the site and its relationship with the Neo-Assyrian Empire; second, to elucidate the chronological relationship between the late Iron Age occupa-



2. General view of Tall Dāmiyah in 2012 from the northeast.



3. Contour map of Tall Dāmiyah and areas of excavation, (based on a drawing by Bataineh).

tion and the succeeding storage pits; and third, to study the post-Persian occupation remains at Tall Dāmiyah. In order to achieve these goals four excavation units were opened: three 5x5m squares and one 5x4m trench (**Fig. 3**).

A post-Persian Cemetery (Phase 2)

The team encountered more than twenty burials in the uppermost layers during the 2012 season (**Fig. 4**). The occurrence of so many burials was somewhat surprising, since previous excavations in 2004 and 2005 produced only two graves with the skeletal remains of two children (Petit 2009a: 123-124). Associated pottery and small finds, such as beads (**Fig. 5**) and a glass

vessel (**Fig. 6**), indicate a Late Roman or Byzantine date for the cemetery. Except for one, all skeletal remains were buried oriented east to west, with the head at the western end. However, the position of the body differed considerably among the graves. Some burials were secondary, with partly dis-articulated bones at the moment of disposal; one grave with the remains of an adult person contained an extra skull, posi-



4. A burial with one adult in square IX.



5. Beads from a burial in square VII.



6. Glass vessel from a burial in square VII.

tioned near the lower legs (**Fig. 7**); and regularly two individuals were buried on top of each other in one and the same, oval-shaped pit.

The discovery of a cemetery at Tall Dāmiyah is very interesting concerning the rather meagre evidence of Late Roman and Byzantine occupation remains in the area. The surface has been scattered with pottery shards from these periods as was stated by numerous on- and off-site surveys (e.g. Ibrahim *et al.* 1975; Yassine *et al.* 1988; Kaptijn 2009), but clear remains of villages, cities or towns are rare (Kaptijn 2009: 259). Tall ‘Ammata is probably one of the few exceptions (Kaptijn 2009: 210-230; Petit 2009a: 33-63). However, this site is located more than twenty kilometres away from Tall Dāmiyah. In the 1960s one of the team members of the Tall Dayr ‘Alla expedition, Diana Kirkbride, had discovered several Byzantine graves during her search for an Iron Age cemetery (Franken 1960; Kaptijn 2009: 252-256). Most of the skeletons she uncovered lay extended on their backs with arms straight along the body and orientated



7. A burial in square IX with the skeletal remains of an adult and an ‘extra’ skull.

northeast-southwest. Some of the graves were lined with stones and covered with stone slabs. The finds include beads, rings and glass bottles with long necks (Kaptijn 2009: 255). It is suggested here that the cemetery on the summit of Tall Dāmiyah was used by mobile groups. It was the place with which they were historically associated and emotionally related, and remained the home for their deceased group-members.

The latest feature at the cemetery was a grave with standing stones along the sides and slabs on top. The pit was dug through one of the Roman-Byzantine graves. Three rings, one iron toggle pin and a mirror accompanied the skeletal remains of an older man. The finds and the stratigraphic position assume a post-Byzantine date.

Persian Remains (phase 6)

The graves of phase 2 wrought havoc with several large storage pits, some of them mudbrick-lined (**Fig. 8**). Similar pits were found during the 2004 and 2005 seasons and were preliminary dated to the Persian Period (Kaptijn *et al.* 2005; Petit *et al.* 2006; Petit 2009a: 121-122). The contents of the pits comprise a mixture of settlement debris, grey-coloured, fine organic material and objects used in textile production. The presence of Late Iron Age and Persian pits on settlement mounds in the Central Jordan Valley is well known, but little understood. Tall as-Sa‘idiyah Stratum IV and IIIE-F (e.g. Pritchard 1985: 39-42; Tubb 1990: 24-25; 1998: 130-131; Tubb and Dorrell 1991: 74), Tall ‘Ammata phase 9-8 (Petit 2009a: 42-45), Tall Dayr ‘Allā phase IV/V (Van der Kooij and Ibrahim 1989; Ibrahim and Van der Kooij 1997; Groot 2006; 2011; Van der Kooij 2006) and Tall al-Mazār Stratum I (Yassine and Van der Steen 2012: 14-15) reveal lined- and unlined-pits



8. A mudbrick-lined pit in square XII dated to the Persian Period.

filled with older settlement debris, organic residues and an exceptionally high number of loom weights and spindle whorls (*e.g.* Tubb 1985; Petit 2009). No evidence of architecture was discovered associated with those features and it is assumed that the pits were used by semi-nomadic or nomadic pastoralists using the summits of the mounds as camp-sites.

In square VII three pits were encountered of which two were mudbrick-lined. While organic material was exposed at the bottom, no objects related to textile production were discovered. The most northern pit is 1.40 meters deep and the southern mudbrick-lined pit only reaches a depth of one meter. The unlined pit in square IX did match the traditional characteristics with organic residues and loom weights (**Fig. 9**). Located on the eastern slope the original depth of the pit is difficult to reconstruct since sediments have been eroded from the top. A large, perfectly round and mudbrick-lined pit in square XII was documented, but not excavated. The pottery assemblage inside the excavated pits at Tall Dāmiyah is mixed.

Late Iron Age Occupation (Phase 9)

At the end of the 2012 season the excavation team reached undisturbed layers dated to the seventh century BC on a few locations. The excavation of the burials had taken most of the time and the destruction debris of phase 9 could only partly be investigated. The evidence equals the situation as was discovered in 2004 and 2005: a sudden conflagration accompanied by fire that gutted down the seventh century BC houses (Petit 2009a: 117-120). A spectacular find in 2004 was a clay bulla with cuneiform writing (Petit 2008; 2009a: 118, Fig. 8.38: 20). The minor excavation work in 2012 revealed this destruction debris



9. Loom weights from a Persian pit in square IX.

and a collection of restorable pottery (**Fig. 10**). A stone roof roller was discovered in square VIII (**Fig. 11**). The rich Iron-Age finds recovered in the limited excavation area at Tall Dāmiyah are very promising for the future.

General Acknowledgement

I would like to thank the Department of Antiquities for their support before during and after the fieldwork. Without the help of the Director General and all other staff-members of the department this project would not have been so successful. Also many thanks to Rami Freihat and his crew of the Dayr 'Allā office and the representative of the Department of Antiquities of Jordan, Mrs. Sannaa Khalil al Bóbó. We appreciate the efforts and help of Dr. Nabil Bader, the dean of the faculty of archaeology and anthropology of the Yarmouk University. Further thanks should go to the military in and around the Dāmiyah area and the inhabitants of the Dayr 'Allā village.

Dr. Lucas P. Petit
National Museum of Antiquities
Papengracht 30
PO Box 11114
2301 EC, Leiden, The Netherlands
l.petit@rmo.nl



10. Iron Age pottery from the destruction debris.



11. A stone roof roller from roof debris in square VIII.

Bibliography

- Anthony, D.W.
1990 Migration in archaeology: the baby and the bathwater. *American Anthropologist* 92: 895-914.
- Cavalli-Sforza, L.L., Menozzi, and Piazza, A. P.
1994 *The history and geography of human genes*. Princeton: Princeton University Press.
- Fix, A.G.
1991 *Migration and colonization in human microevolution*. Cambridge: Cambridge University Press.
- Franken, H.J.
1960 The excavations at Deir 'Alla in Jordan. *Vetus Testamentum* 10: 386-393.
1969 *Excavations at Tell Deir 'Alla I: stratigraphic and analytical study of the Early Iron Age pottery*. Leiden: E.J. Brill.
1992 *Excavations at Tell Deir 'Alla. The Late Bronze Age sanctuary*. Louvain: Peeters.
- Gmelch, G.
1980 Return migration. *Annual Review of Anthropology* 9: 135-159.
- Groot, N.C.F.
2006 Persian Period Pottery in Transjordan: towards a characterisation of ceramic traditions of an obscure period. *Leiden Journal of Pottery Studies* 22: 87-100.
2011 *All the works of artisans: reconstructing society at Tell Deir 'Alla through the study of ceramic traditions. Studies of Late Bronze Age faience vessels and Iron IIc-III ceramics from Tell Deir 'Alla, Jordan*. Unpublished PhD Thesis, Faculty of Archaeology, Leiden University.
- Hourani, F., Kaptijn, E., Petit, L.P., al-Ghul, O. and van der Kooij, G.
2008 Dayr 'Alla Regional Project: Settling the Steppe (Third Campaign 2006). *ADAJ* 52: 427-444.
- Ibrahim, M.M., Sauer J.A. and Yassine, Kh.
1975 The East Jordan Valley Survey, 1975. *BASOR* 222: 41-66.
- Ibrahim, M.M. and van der Kooij G.
1997 Excavations at Tell Dayr 'Alla; seasons 1987 and 1994. *ADAJ* 61: 95-115.
- Kaptijn, E.
2009 *Life on the Watershed. Reconstructing subsistence in a steppe region using archaeological survey: a diachronic perspective on habitation in the Jordan Valley*. Leiden: Sidestone Press.
2010 Communalism and power: irrigation in the Zarqa Triangle, Jordan. *Water History* 2: 145-163.
- Kaptijn, E., Petit, L., Grootveld, E., Hourani, F., Kooij, G. van der and al-Ghul, O.
2005 Dayr 'Alla Regional Project: Settling the Steppe (First Campaign 2004). *ADAJ* 49: 89-99.
- Lee, E.S.
1966 A theory of migration. *Demography* 3: 47-57.
- Petit, L.P.
2008 Late Iron Age Levels at Tell Damieh. New excavation results from the Jordan Valley. Pp. 177-187 in J.M. Córdoba, M. Molist, M.C. Pérez, I. Rubio and S. Martínez (eds.), *Proceedings of the 5th International Congress on the Archaeology of the Ancient Near East, Madrid, April 3-8 2006*. Madrid: Universidad Autónoma de Madrid.
2009a *Settlement Dynamics in the Middle Jordan Valley during Iron II*. BAR International Series 2033. Oxford: Archaeopress.
2009b A wheel-made anthropomorphic statue from Iron Age Tell Damieh, Jordan Valley. Pp. 151-160 in E. Kaptijn and L.P. Petit (eds.), *A Timeless Vale. Archaeological and related essays on the Jordan Valley in honour of Gerrit van der Kooij on the occasion of his sixty-fifth birthday*: ASLU 19. Leiden: Leiden University Press.
- Petit, L.P., Kaptijn, E., Hourani, F., al-Ghul, O., Grootveld, E. and van der Kooij, G.
2006 Dayr 'Alla Regional Project: Settling the Steppe (Second Campaign 2005). *ADAJ* 50: 179-188.
- Renfrew, C.
1987 *Archaeology and language: the puzzle of Indo-European origins*. New York: Cambridge University Press.
- Tubb, J.N.
1988 Tell es-Sa'idiyeh: preliminary report on the first three seasons of renewed excavations. *Levant* XX: 23-88.
1990 Preliminary report on the fourth season of excavations at Tell es-Sa'idiyeh in the Jordan Valley. *Levant* XXII: 21-42.
1998 *Canaanites. Peoples of the Past*. London: British Museum Press and University of Oklahoma Press.
- Tubb, J.N. and Dorrell, P.G.
1991 Tell es-Sa'idiyeh: interim report on the fifth (1990) season of excavations. *Levant* XXIII: 67-86.
- Van der Kooij, G.
2001 The vicissitudes of life at Dayr 'Alla during the first Millennium BC, seen in a wider context. *SHAJ* VII: 295-303.
2006 The Jordan Valley and the vicissitudes of life at Deir 'Alla during the Bronze and Iron Ages. In Nigro and Taha (eds.), *Tell es-Sultan/Jericho in the context of the Jordan Valley*: 41-60. Rome.
- Van der Kooij, G. and Ibrahim, M.M.
1989 *Picking up the threads... A continuing review of excavations at Deir 'Alla, Jordan*. Leiden: RMO and RUL.

Wirth, E.

- 1971 *Syrien. Eine geographische Landeskunde*. Wissenschaftliche Länderkunden Band 4/5. Darmstadt: Wissenschaftliche Buchgesellschaft.

Yassine, Kh.

- 1984 *Tell el-Mazar. Vol. I. Cemetery A*. Amman: University of Jordan.
- 1988 Tell el-Mazar, Field I: preliminary report of areas G, H, L, and M. Pp. 75-135 in K. Yassine (ed.), *The Archaeology of Jordan: Essays and Reports*: Amman: University of Jordan.

Yassine, Kh., Sauer, J. and Ibrahim, M.M.

- 1988 The East Jordan Valley Survey II. Pp. 189-207

in K. Yassine (ed.), *The Archaeology of Jordan. Essays and Reports*. Amman: University of Jordan.

Yassine, Kh. and van der Steen, E.

- 2012 *Tell el-Mazar II. Excavations on the Mound 1977-1981. Field I*. BAR International Series 2430. Oxford: Archaeopress.

Young, D.A.

- 2002 A new space-time computer simulation method for human migration. *American Anthropologist* 104 (1): 138-158.

THE FUNERARY TOPOGRAPHY OF PETRA PROJECT (FTPP): PRELIMINARY REPORT ON THE 2011 SEASON

Lucy Wadeson

Acknowledgements

The second field season of the 'Funerary Topography of Petra Project' (FTPP), which took place in April 2011, was kindly funded by the Wainwright Fund (University of Oxford) and the British Foundation for the Study of Arabia (BFSa). I would like to thank the former Director General of the Department of Antiquities of the Hashemite Kingdom of Jordan, Dr Ziad al-Saad, for granting me the permission to study the tombs in Petra, while holding a Council for British Research in the Levant (CBRL) Visiting Fellowship in Amman. I am also grateful to Professor Stephan Schmid (Humboldt University, Berlin) for allowing me to stay with his team at Nazzal's Camp in Petra and providing logistical support. The second field season of the FТПP could not have been a success without the aid of Qais Twaissi, whose assistance with the planning of the funerary complexes was invaluable.

Introduction

The author's doctoral thesis, *The Façade Tombs of Petra: from Exterior to Interior* (University of Oxford, 2010) involved the first detailed examination of the interiors of the Nabataean façade tombs at Petra. Complementing previous research on the façades (e.g. McKenzie 1990; Netzer 2003), this study elucidated the funerary practices associated with these tombs and shed new light on the development of the funerary architecture (Wadeson 2010a; 2011a). This was achieved through comparative studies with the inscribed and dated tombs at Madâ'in Sâlih and monumental rock-cut tombs in Alexandria and Jerusalem. In order to complete the study of the tombs, the 'Funerary Topography of Petra Project' (FTPP) was set up in 2010 to investigate their topographical setting, with a

particular focus on the area outside the façades. Specific aims of the project include:

1. To understand how the cemeteries at Petra developed;
2. To ascertain the relationship between the façade tombs and the urban environment, including houses, quarries, religious installations and hydraulic features, in order to shed light on the development and nature of the city;
3. To establish the architectural and chronological relationship between the monumental and non-monumental tombs;
4. To determine to what extent Petra's natural environment played a role in the form, layout and location of the tombs;
5. To understand the area immediately outside the façade tombs, how it relates to the tomb interiors, and how it functioned in the funerary tradition (i.e. to reconstruct funerary practices taking place outside the tombs);
6. To understand the funerary landscape of Petra in its wider regional context through a comparison with other sites with a similar urban character and funerary architecture.

The results of the first season of fieldwork were reported on in the previous issue of *ADAJ* (Wadeson in press) and have also been discussed in several recent articles (Wadeson 2012a; 2012b; 2013b). In that season, work focused on resurveying *ca* 500 façade tombs to record carefully the physical relationship between tombs of different façade types, between the façade tombs and other tomb types (e.g. block tombs / 'djinn blocks', shaft tombs and pit graves), and between the tombs and other rock-cut installations, such as houses, religious structures, hydraulic features and quarries. New insights were gained into the importance of Petra's topogra-

phy and geology in determining the form and location of the tombs, and into the chronological relationship between different types of tombs. Furthermore, the apparent close relationship between the type of a tomb or façade, and its location in the city, was discussed.

The second season of fieldwork for the FTTP, which is reported on here, involved the documentation and examination of the exterior structures and installations that are considered part of the surrounding ‘property’ of the façade tombs. While some of this work had been achieved during the recording of the tombs for the author’s doctoral research, fieldwork in 2011 focused on completing the planning and documentation of several tombs belonging to so-called ‘funerary complexes’ at Petra. Over a period of approximately five days, we documented and studied eight tombs with the primary aim of understanding the architectural layout of their complexes and how they functioned in the funerary tradition. We wanted to determine the effect of the landscape of Petra on their plan and architecture as well as to explore other ideological concepts and architectural influences involved. In terms of function, we attempted to reconstruct the sorts of activities taking place at the tomb in honour of the dead by examining individual installations and how the various components worked together. Some of these results have already been presented in recent publications (Wadeson 2011b; 2012b; 2013a) and the basis for the ideas can be found in the author’s doctoral thesis (Wadeson 2010b). The final results of the FTTP are currently being incorporated with those from the author’s dissertation, which will be published as a major monograph on the Nabataean façade tombs at Petra and their associated funerary practices.

FTTP Season Two: Fieldwork Strategy

As mentioned above, in order to complete the study of the façade tombs undertaken in the author’s dissertation, the FTTP was created to focus on the area outside the façades and their topographical setting. While all the accessible façade tombs at Petra had been documented during the author’s doctoral fieldwork, most

attention was given to the tomb interiors and their façades since this was the basis of the research. However, the basic external features of the tombs were recorded in general terms and the extent to which a tomb could be considered as belonging to a complex was noted. This made the task of returning to document specific tomb complexes much easier, as the groundwork had been laid and the examples chosen well in advance. The interiors of these tombs had already been planned during the 2006 doctoral fieldwork and a significant photo archive already existed. Thus, the 2011 fieldwork involved making detailed plans and drawings of the chosen examples, updating the photo documentation and studying the installations and their layout on site. The plans of the tomb complexes were later digitised by Qais Twaissi. The eight tombs chosen for detailed study were selected as representative examples of funerary complexes, each with a different location and layout, and characteristic features (**Fig. 1**). In addition, other tomb complexes were revisited and studied in more detail so as to update the catalogue that will be provided in the author’s forthcoming monograph.

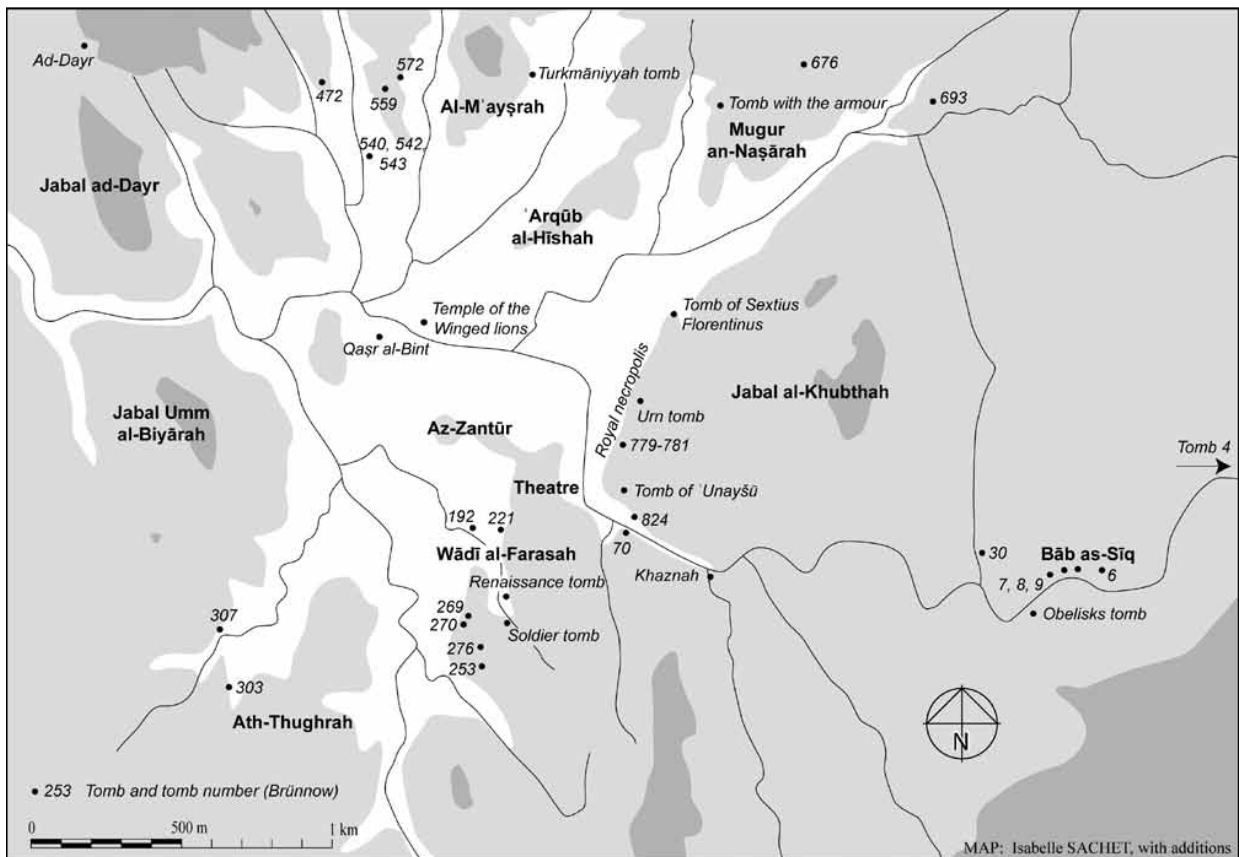
In the report that follows, the eight case studies will be described and discussed, which will then allow us to make some concluding remarks on the layout of the complexes, the conception of the funerary space and the sorts of activities taking place at the tombs. Firstly, however, in order to contextualise the new research, a brief introduction to Nabataean tomb complexes is provided.

Nabataean Tomb Complexes

Since the excavation of the Soldier Tomb Complex in Wādī Farasah by Stephan Schmid, within the framework of the ‘International Wādī Farasah Project’, research on the tomb complexes of Petra has intensified, with studies focusing on the relation of monumental Nabataean funerary architecture to luxury architecture of the wider Mediterranean world¹. It is now accepted that tomb complexes are a common occurrence in Petra and the information they can provide about Nabataean society is at present being highlighted in scholarship (Schmid 2013: 251–254).

1. For example, see the recent work of Schmid (2009b; 2013). A doctoral thesis has also recently been initi-

ated on the architectural influences on these complexes (Petrovsky 2013).



1. Map of Petra showing tombs mentioned in the text (Map after I. Sachet).

The most crucial piece of evidence for the identification of tomb complexes and the structures that form them is the Nabataean inscription on the façade of the *Turkmāniyyah* Tomb (Br. 633)² (CIS II 350; McKenzie 1990: 58 n. 30, 167-168; Healey 1993: 238-242). It can be translated as follows:

This tomb and the large burial-chamber within it and the small burial-chamber beyond it, in which are burial-places, niche-arrangements, and the enclosure in front of them and the porticos and rooms within it [i.e. the enclosure] and the gardens(?) and triclinium-garden(?) and the wells of water and the cisterns(?) and walls(?) and all the rest of the property which is in these places are sacred and dedicated to Dushara, the god of our lord, and his sacred throne and all the gods, (as) in the documents of consecration according to their contents. And it is the order of

*Dushara and his throne and all the gods that it should be done as in these documents of consecration and nothing of all that is in them shall be changed or removed and none shall be buried in this tomb except whoever has written for him an authorisation for burial in these documents of consecration for ever.*³

This inscription reveals that the property of a tomb was conceived of as much more than just the façade, chamber and burial places. Although some of the terminology is still being debated⁴, it seems that the *Turkmāniyyah* Tomb complex included an enclosure, porticoes, additional rooms, gardens, triclinia, walls and sources of water. Unfortunately, most of the features listed no longer survive in front of this tomb, since it is carved at the level of the *wadi* floor and has been ravaged by flooding over the centuries. All that remains is the large area in front of the

2. The numbering system of Brünnow and von Domaszewski (1904) is used in this study for the tombs at Petra (Br. #) and all tombs mentioned can be found in this volume.

3. Translation in Healey (1993: 238-239); note that Healey (2009: 66) later translates *pqdw* as "order".

4. For terminological notes, see Healey 1993: 239-242.

façade, partially enclosed at the sides by rock walls, and a heart-shaped column in its eastern corner indicating a colonnade along three sides of the courtyard.

Fortunately, structures such as walls, porticoes, triclinia, chambers and cisterns do survive with numerous other tombs at Petra allowing us to identify them as tomb complexes similar to that of the *Turkmāniyyah* Tomb. The Tomb of Unaishu (Br. 813) is a notable example with remains of a colonnaded courtyard, a triclinium to the north of the tomb façade and a cistern, neatly arranged into a coherent unit (Zayadine 1974: 142-45; McKenzie 1990: 169-70, Pl. 164). The Soldier Tomb, mentioned above, is another well-known complex, with an elaborate triclinium opposite the tomb façade, multiple cisterns, a colonnaded courtyard and a monumental masonry-built entrance building, the remains of which have been excavated over the last decade (Schmid 2009a: 95-105, Fig. 1; 2009b: 144-152). The abundant remains also demonstrate how rock-cut and built architecture were combined to create these multifaceted complexes. Although there is no obvious associated triclinium, the following tombs are also referred to as complexes in scholarship: ‘Al-Khan’ / Tomb Br. 4 (Brünnow and von Domaszewski 1904: 195-97, Fig. 222; Schmid 2009b: 153, Fig. 8.), Tomb Br. 361 (Petrovsky 2013: 197-198), Tomb with the Armour’ / Tomb Br. 649 (McKenzie 1990: 168; Schmid 2009b: 156, Fig. 1), Tomb Br. 676 (Johnson 2010: 538-40; see also Schmid 2009b: 154-155, Fig. 9) and the ‘Urn Tomb’ / Tomb Br. 772 (McKenzie 1990: 144-147, Pl. 93). Numerous other examples were noted during the author’s fieldwork, with variations on the arrangement of the complexes and the features found within them.

It should be noted that the tombs that form part of the largest funerary complexes at Petra have the largest and most elaborate types of façade, that is either the Double Pylon, Hegr or Complex Classical types (for façade typology see Wadeson 2010a: 51-52, Fig. 2). We know from the inscriptions on Nabataean tombs at Madâ’in Sâlih that tombs of this type were owned by the wealthiest sector of Nabataean society (Wadeson 2013b: 180-184; Healey 1993), as can also be deduced from their size and decoration. In addition, the extent of the property and installations accompanying those that form funerary complexes

confirms this. Many of these large funerary complexes are located in prominent positions around the city, where they dominate their surroundings and command views from afar (Fig. 1). For example, Tomb Br. 559 commands the high plateau between Wādī Mu‘aysara East and West and is visible from the city centre, while the complex of Tomb Br. 276 dominates the area of Wādī Farasah West (Fig. 2). Likewise, the Soldier Tomb complex acts as a gateway between Wādī Farasah East and the path up to the High Place (Schmid 2013: 252). As such, the possibility can be raised that they acted as territorial markers for certain families or other groups.

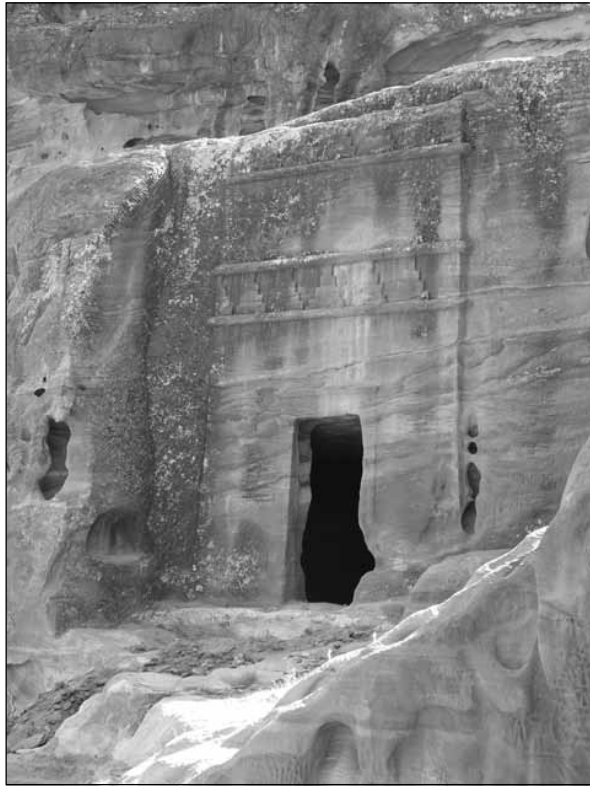
Although the smaller tombs (e.g. Single Pylon, Step, Proto-Hegr, Simple Classical and Arch types) do not typically belong to the large complexes just described, they do have a platform or forecourt in front of their façades, which was a natural by-product of the carving process. Also, they often have further features carved into this area or in the enclosing rock-walls, such as niches, basins, receptacles and benches (Fig. 3). Thus, it was clear that ritual activities were also taking place outside these tombs, but clearly on a smaller scale. Part of the FTTP research in fact involves determining to what extent a tomb can be considered as part of a complex and a list of identified tomb complexes at Petra is in the process of being prepared.

FTTP Season 2: Preliminary Results

The eight tomb complexes that were planned and studied in detail during the second season of the FTTP were selected to represent the differ-



2. Tomb Br. 270 (far left) and Tomb Br. 276 (far right), Wādī Farasah West, Petra (L. Wadeson).



3. Tomb Br. 592, Wādī Mu‘aysara East, Petra (L. Wadeson).

ent structures that can be found accompanying the tombs and the various ways they could be arranged. These case studies are listed in **Table 1**, together with the façade type of the tomb, its location (**Fig. 1**) and the primary bibliography. The main elements of each complex are described here and plans are provided where available.

Tomb Br. 30

Tomb Br. 30 (Brünnow & Domaszewski 1904: 203; Mouton 2010: 281-282, 286; Nehmé 2012: 34; Wadeson 2012b: 105-106) is carved at the top of a small rocky outcrop in Wādī Mudhlim, just to the north of the Sīq entrance (**Fig. 1**). It is considered to belong to the Bāb as-Sīq necropolis, but in fact it is isolated from the other monumental tombs. It is prominently positioned in the landscape and was thus highly visible to all those entering Petra via the Sīq (**Fig. 4**). It is a monumental block tomb (i.e. all four sides are carved free from the rock) measuring 4.5 m



4. Tomb Br. 30, Bāb as-Sīq, Petra (L. Wadeson).

and 8 m high (Mouton 2010: 281) that sits on a stepped base (**Fig. 5**)⁵. Although only one row of crowsteps is visible on the sides of the monument, it is likely that another freestanding row was placed on its top, making it a Double Pylon type, as is observed for Tomb Br. 70 and Tomb Br. 307. The burial chamber is carved below the stepped base and accessed by a small doorway on the west side. Two deep shafts are carved in the floor, which may either be pit graves or else provide access to an underground chamber. Only clearance of the chamber will verify this.

Immediately to the north of the tomb is an open-fronted chamber, with an arched niche in the left side of the back wall (**Figs. 5, 6**). Although the floor is blocked with sand and debris, it is possible that this room might have been a triclinium. There are three reasons that support



5. Entrance to Tomb Br. 30, Bāb as-Sīq, Petra (L. Wadeson).

5. For a discussion of the block tombs at Petra, see Mouton 1997, 2006 and 2010 and Wadeson 2012b: 105-106,

117-121.

Table 1: List of tomb complexes documented during FTFPP Season 2.

Tomb Number	Façade Type	Location	Primary Bibliography
Br. 30	Block Double Pylon	Bāb as-Sāq / Wādī Mudhlim	Brünnnow & Domaszewski 1904: 203; Mouton 2010: 281-282, 286; Nehmé 2012: 34; Wadeson 2012b: 105-106.
Br. 192	Proto-Hegr	Wādī Farasah East	Brünnnow & Domaszewski 1904: 263; Nehmé 2012: 66; Wadeson 2011b: <i>passim</i> ; 2012b: 107, 110.
Br. 221	Hegr	Wādī Farasah East	Brünnnow & Domaszewski 1904: 267; Nehmé 2012: 71
Br. 269 & Br. 270	Simple Classical & Hegr	Wādī Farasah West	Brünnnow & Domaszewski 1904: 281; Schmid 2009b: 159-160; Wadeson 2011b: <i>passim</i> ; Nehmé 2012: 80-81.
Br. 276	Double Pylon	Wādī Farasah West	Brünnnow & Domaszewski 1904: 282; Nehmé 2012: 82; Mouton 2006: 86; Wadeson 2011b: <i>passim</i> ; 2012b: 118, 120.
Br. 559	Hegr	Wādī Mu‘ayṣara West	Brünnnow & Domaszewski 1904: 354; Schmid 2009b: 158-159; Wadeson 2011b: <i>passim</i> .
Br. 572	Unknown	Wādī Mu‘ayṣara East	Brünnnow & Domaszewski 1904: 355; Schmid 2009b: 158; Wadeson 2011b: <i>passim</i> .
Br. 693	Simple Classical	Mughur an-Naṣāra	Brünnnow & Domaszewski 1904: 377; Tholbecq 2011: 33-34; Wadeson 2011b: <i>passim</i> .

this hypothesis. Firstly, it is directly associated with the tomb, with a small forecourt linking the two structures. Secondly, there is a basin carved in the east wall, just before the entrance to the chamber, as is common with triclinia in Petra. Thirdly, the shape and design of the chamber resemble typical rock-cut and covered Nabataean triclinia.

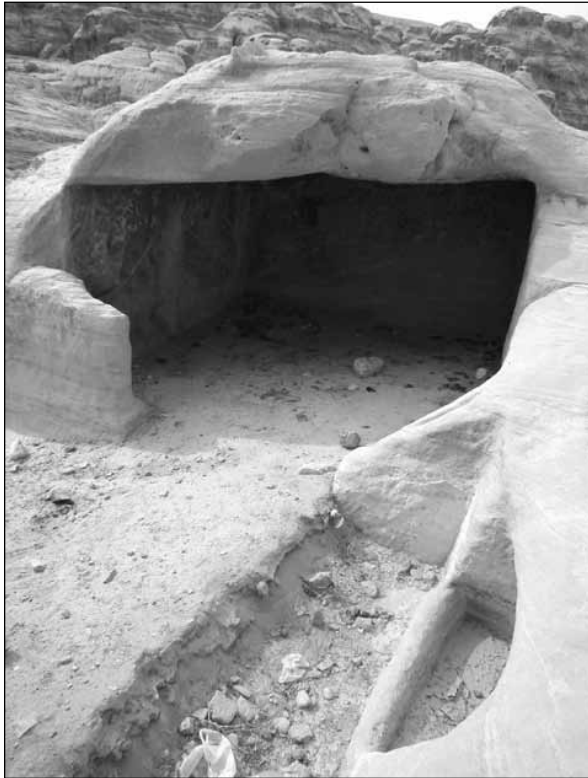
On the other side of the tomb, to the south, is a rectangular structure carved in the rock floor that has several water channels leading into it (Figs. 7, 8). This structure and the surrounding area are blocked with sand, but it is more than likely that we are dealing with a water reservoir here. Further to the south are a pit grave and the opening to a shaft tomb, which may or may not be related to Tomb Br. 30.

It is clear that the tomb and the two structures on either side, arranged on a linear axis, form a tomb complex since the main elements of a place for feasting and a source of water are present (Fig. 8). The fact that this tomb complex is on a relatively small scale compared to the larger well-known examples may be related to

its possibly early date. Mouton dates the tomb to the 1st century BC and maybe even earlier, based on ceramic finds and comparative studies with similar tombs at Mleiha in the Arabian peninsula, dated to the 3rd and 2nd centuries BC (1997: 81-98; 2006: 79-119; 2010: 275-287). Most of the large, well-known examples of tomb complexes, such as the Soldier Tomb, Tomb Br. 676 and the *Turkmāniyyah* Tomb date to the mid- to late-1st century AD (Schmid 2009b: 155; Wadeson 2010a: 54, Table 3). Thus, the complex of Tomb Br. 30 may be an important one for understanding the evolution of this architectural type in Petra. The documentation of this tomb provides useful comparative material for Block Tomb Br. 307, the complex of which is being studied by K. Petrovsky as part of her PhD thesis (2013: 194-197).

Tomb Br. 192

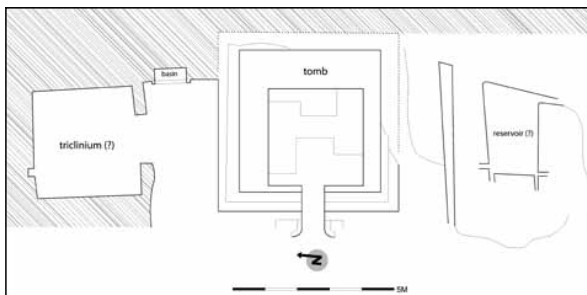
Tomb Br. 192 (Brünnnow & Domaszewski 1904: 263; Nehmé 2012: 66; Wadeson 2011b: *passim*; 2012: 107, 110) is located in Wādī Farasah East, on the lowest level of the tombs in



6. Possible triclinium associated with Tomb Br. 30 (note basin in front), Bāb as-Sīq, Petra (L. Wadeson).



7. Possible reservoir to the south of Tomb Br. 30, Bāb as-Sīq, Petra (L. Wadeson).



8. Plan of the complex of Tomb Br. 30 (Q. Twaissi).

this necropolis and facing west (**Fig. 1**). On the terrace directly above, one finds Tombs Br. 212 – 214. Tomb Br. 192 is somewhat isolated from the surrounding tombs, with its own private enclosed forecourt (**Fig. 9**).

Although the façade is heavily weathered, it is possible to see that it is of the Proto-Hegr type and once had inset capitals. The rectangular cutting to the left of the doorway appears to be a later modification. The base of the façade is not visible since it is blocked by at least 50 cm of sand. The burial chamber is spacious (w. 7.5 m; l. 7.16 m; h. 2.63 m) and neatly carved with straight walls and fine tool-work. There are four loculi in the left wall, five loculi in the rear wall and nothing carved in the right wall. The central loculus in the back wall is aligned with the chamber entrance and was likely reserved for the tomb owner or head of the family. The only loculus with a floor grave is that in the far right of the left wall. The chamber floor is partially cleared but no floor graves are visible. However, five circular receptacles are visible in the back left corner of the chamber, associated with the loculi (**Fig. 10**). Part of a rock-cut channel appears to connect to the receptacles, which were likely used for libations in honour of the dead. The area immediately in front of the entrance, inside the chamber, is slightly recessed, as is also observed in Tomb Br. 276 and the Unaishu Tomb.

The tomb has been carved deep into the rock leaving an enclosed court in front of the façade (**Fig. 9**). Although this central area is blocked with sand, a column drum is visible on the ground. Since it is aligned with the edge of the



9. Complex of Tomb Br. 192, Wādī Farasah East, Petra (L. Wadeson).



10. Burial chamber of Tomb Br. 192 (view towards back left corner), Wādī Farasah East, Petra (L. Wadeson).



12. Stone dressing on walls of possible triclinium of Tomb Br. 192, Wādī Farasah East, Petra (L. Wadeson).

façade, it is likely that a colonnade once lined the sides of the courtyard. On the left side of the courtyard are two rock-cut chambers (**Fig. 11**). The larger one (l. 5.82 m; w. 6.24 m; h. 2.60 m), on the far left and perpendicular to the tomb, is well-carved with the tooling technique observed by McKenzie in several of the larger tombs at Petra which she places in Group B for her chronological study (McKenzie 1990: 41-44, 121-122). This technique involved dressing the walls in fine, neat lines tilted at a forty-five degree angle from the horizontal. Along the top of the walls, directly beneath the ceiling, runs a band of horizontal lines, while in the top right-hand corner of the walls is a small square area with fine-line tooling hatched in the opposite direction (**Fig. 12**). The floor of the chamber is blocked, but the basin carved just inside the entrance, the fine tooling and the open front (possi-

bly once masonry-built) of the structure suggest it is a triclinium. Furthermore, there are several lamp niches carved in the walls.

The smaller chamber (l. 2.09 m; w. 2.11 m; h. 1.60 m), between the possible triclinium and the tomb, has a small, eroded doorway. The interior walls are roughly dressed with no features carved into them and the floor is blocked with sand. It is possible that this small room served as a storage or preparation area in relation to the triclinium, as observed in other tomb complexes, such as that of Tomb Br. 253 and Tomb Br. 779 (Wadeson 2011b: 9).

To the right of the tomb is a huge vat for water with high rock-cut walls that would have been closed in the front by a dam (Nehmé 2012:130) (**Fig. 13**). On the east side, rock-cut steps lead to the top of the walls where rock-cut channels directed the water into the vat. On the west side,



11. Chambers to the left of Tomb Br. 192, Wādī Farasah East, Petra (L. Wadeson).



13. Large vat for water to the right of Tomb Br. 192, Wādī Farasah East, Petra (L. Wadeson).

in front of the vat, is a rock-cut niche platform accessed by two separate eroded stairways – one from the bottom and another from the top right (**Fig. 14**). To the left of the niche is a basin, which is fed by the drains in the wall above. The niche is life-size and may have held a portable betyl. This installation highlights the relationship between water and cult in Petra, a topic which has been discussed in an earlier article (Wadeson 2011b: 7; see also Wenning 2001: 91).

All the elements associated with Tomb Br. 192 form a unified complex. They are arranged around a central courtyard, but are not as well-structured as the better-known examples of the Soldier Tomb and the Tomb of Unaishu. Notably, this is the only monumental complex belonging to a Proto-Hegr type tomb. These tombs typically have smaller façades and interiors than the Hegr tombs (Wadeson 2010a: 57-60). The isolation of this tomb makes it difficult to date relative to other tombs in this necropolis. However, the tooling in the triclinium tends to belong to tombs of the mid-1st century AD (McKenzie 1990: 41-44), which as we have mentioned is the period in which large tomb complexes seem to be popular. The niche-platform with water features offers an interesting variation in the study of tomb complexes, but as we will see below this is not the only example of such an installation.

Tomb Br. 221

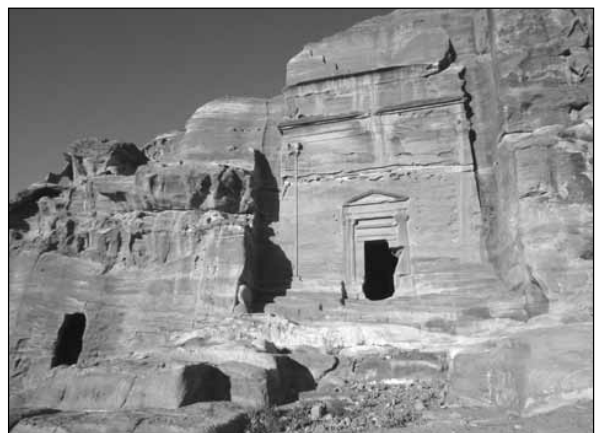
Tomb Br. 221 (Brünnow & Domaszewski 1904: 267; Nehmé 2012: 71) is also located in Wādī Farasah East, on the terrace above Tombs Br. 195–198 (**Fig. 1**). This high placement

makes it highly visible in the landscape. The tomb clearly has its own surrounding property that is accessed from the north side and from a now destroyed stairway in the south-west corner. This area in front of the tomb is bound on the south side by the rock and on the west side by a sheer drop to the level below (**Figs. 15, 16**). Thus, this tomb complex is separated from the surrounding tombs in the necropolis.

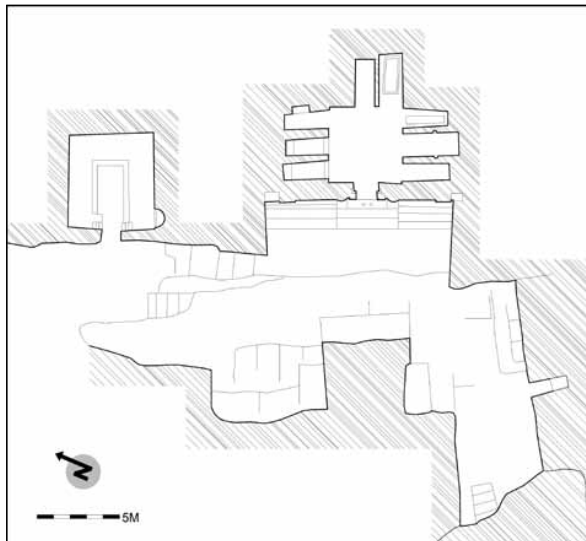
The tomb has a large Hegr façade that sits on a stepped base. The entrance to the burial chamber, which is accessed by a stairway that cuts through the stepped base, is framed by an elaborate doorway flanked by pilasters supporting a pediment. Two circular receptacles are carved on the top step before the chamber entrance, supposedly accommodating some sort of libation ritual upon entering the tomb. The burial chamber (w. 4.33 m; l. 4.51 m; h. 3.09 m) is surprisingly small considering the size of the façade (w. 10.68 m). There are three loculi in each of the side walls and two in the rear wall. These loculi are not consistent in terms of shape or size and only four of them have graves visible in their floors. The loculus in the far right of the left wall has a burial niche carved in its right wall, while the central loculus in the right wall has two niches in each of its side walls that are connected by a carved groove. Their function is uncertain, but if they are indeed contemporary with the main period of use of this tomb, they may have somehow supported a shelf inside the loculus. The floor of the chamber is only partially cleared, but no floor graves are visible. There are also four lamp niches in the right part of the front wall.



14. Niche-platform associated with Tomb Br. 192, Wādī Farasah East, Petra (L. Wadeson).



15. Complex of Tomb Br. 221, Wādī Farasah East, Petra (L. Wadeson).



16. Plan of the complex of Tomb Br. 221 (Q. Twaissi).

The area directly in front of the tomb seems to have once been a monumental ramp or stairway (**Fig. 17**). However, at a later stage it has been destroyed by quarrying, the traces of which are visible. In the rock wall to the south of the tomb is a tall niche (h. 2 m; w. 1 m) that is unfinished at the back. This may have been intended as a loculus. To the north of the tomb, traces of rock-steps on a north - south alignment are visible leading down to a small triclinium (Br. 220). The triclinium has a smooth, undecorated façade and is accessed by a tall doorway. As is typical for triclinia in Petra, there is a small rounded basin carved in the bottom right-hand corner of the chamber. The floor is blocked with sand, but the benches are well-preserved (**Fig. 18**). Owing to the amount of sand blocking the area in front of this tomb, it is not possible to



17. Area in front of Tomb Br. 221 (facing west), Wādī Farasah East, Petra (L. Wadeson).



18. Triclinium of Tomb Br. 221, Wādī Farasah East, Petra (L. Wadeson).

say whether there was an associated cistern or reservoir for water, but it is likely. The date of this tomb complex is also at this stage unknown.

Tomb Br. 269 / Tomb Br. 270

Tombs Br. 269 and Br. 270 are considered together here as they form part of the same complex (Brünnow & Domaszewski 1904: 281; Schmid 2009b: 159-160; Wadeson 2011b: *passim*; Nehmé 2012: 80-81). These tombs are located in a prominent position in Wādī Farasah West (**Fig. 1**) and are highly visible from the north (**Fig. 2**). They are perpendicular to one another and enclose a private area in front (**Fig. 19**).

Tomb Br. 269, which faces west, has a Simple Classical type façade with pilasters supporting a pediment. The burial chamber floor is not cleared, but a grave is partly visible in the bottom right corner. The chamber (l. 6.02 m; w. 6.97 m) is well-carved and has four loculi



19. Tomb Br. 269 (left) and Tomb Br. 270 (right), Wādī Farasah West, Petra (L. Wadeson).

carved in its back wall. The floors of the loculi are not cleared, but a grave is visible inside the third loculus from the left. Tomb Br. 270 is a semi-block tomb with a Hegr type façade that faces north-west towards az-Zantur. The monumentality of this tomb is achieved by carving all four sides of the top half free from the rock. The decorative elements of the tomb, including the crowsteps, are carved on all four sides, while the main façade sits on a stepped base. The burial chamber (l. 7.04 m; w. 5.70 m; h. 2.20 m) is heavily blocked with debris, making access difficult. However, three loculi are visible in the rear wall, the left of which is unfinished. The central loculus is aligned with the entrance. One loculus is also carved in the right part of the left wall. In the middle of each lateral wall is a rectangular niche (c. w. 0.43 m; h. 0.67 m; d. 0.23 m), the function of which is not clear.

The courtyard that these tombs share is approached from the north by a monumental stairway and corridor, and from the east by a smaller subsidiary stairway. The monumental stairway leads to a rock-cut gateway, to the west of which is a niche-platform (Nehmé 2012: 119) (**Fig. 20**). In the niche is the outline of a betyl. Water was directed over this betyl via a drain leading out of a basin in the rock platform above. This is similar to the situation discussed above for Tomb Br. 192. In the same rock platform above is the outline of a possible open-air triclinium (**Fig. 21**). Schmid reconstructs a porticus running north - south from this triclinium (2009b: 160, fig. 16). To the east of this is a recessed, rectangular area with signs of later quarrying.



20. Monumental gateway (with niche-platform on the right) to complex of Tombs Br. 269 and Br. 270, Wādī Farasah West, Petra (L. Wadeson).



21. View down over complex of Tombs Br. 269 and Br. 270 (from above Tomb Br. 270), Wādī Farasah West, Petra. Note possible triclinium in top left corner (L. Wadeson).

On the higher level behind Tomb Br. 270, to the south, is a possible water reservoir with a complex series of channels that once directed water around the tops of the tombs. Monumental rock-cut steps lead up to this reservoir from the south. In fact, the entire area to the south of the tomb is somewhat complex, with multiple platforms, stairways, wells and channels.

This tomb complex is notable for its inclusion of two tombs of different façade types. It is clear that Hegr Tomb Br. 270 was carved first since it is aligned with the monumental entrance and uses the space freely, whereas Simple Classical Tomb Br. 269 is carved into the available space, in the left rock wing of Tomb Br. 270 (Wadeson 2010a: 56, Table 4). The date of the carving of Tomb Br. 270 is not known, but it is argued elsewhere that the semi-block tombs may in fact predate the two-dimensional façade tombs (Wadeson 2012b: 117-121). A 1st century BC date is therefore not impossible.

Also noteworthy is the controlled access to this complex by means of a monumental gateway. The area inside the complex is somewhat private and separated from its surroundings, but at the same time the complex is well-connected to other nearby structures and tombs. The betyl at the entrance-way to the tomb complex demarcates the property and highlights its sacred aspect.

Tomb Br. 276

Tomb Br. 276 (Brünnnow & Domaszewski 1904: 282; Nehmé 2012: 82; Mouton 2006: 86; Wadeson 2011b: *passim*; 2012b: 118, 120) is also

located in Wādī Farasah West, just to the west of Tombs Br. 269 and Br. 270 (**Figs. 1, 2**). In fact the two complexes are connected by a small rock-cut stairway, which leads down from the south-west side of Br. 270 to the large triclinium (Br. 272) to the east of Br. 276. Carved into a separate rocky outcrop, Tomb Br. 276 dominates a large surrounding area and is one of the most monumental and visible tombs in Wādī Farasah (**Fig. 22**). It is a semi-block tomb since the north and west sides are carved free from the rock as well as the top of the tomb. Although only one row of crowsteps is visible, extending around all sides of the tomb, it is likely there was another row higher up where the stone is destroyed from weathering. The principal façade of the tomb faces north and sits on a stepped base.

The burial chamber (l. 10.62 m; w. 6.38 m) is spacious and neatly carved with a partially cleared floor. There are three loculi carved in the left wall. Only the loculus on the far right has a grave in its floor. A rectangular niche is carved in the wall between the first two loculi. In the back left corner of the chamber floor is a small pit grave, presumably for a child. In the wall above this grave is an associated Nabataean inscription and nefesh, which have been published by Nehmé (2012: 194, MP 185). The back wall of the chamber has been monumentalised with a low bench and two central steps that precede the three loculi carved above (**Fig. 23**). This arrangement echoes the stepped base of the façade. The central loculus was clearly intended for the most important burial of the tomb since it is framed by carved pilasters. This loculus, and that on its right, both have graves cutcarved



22. Tomb Br. 276, Wādī Farasah West, Petra (L. Wadeson).

into their floors. There is another Nabataean inscription carved in the wall between these loculi (Nehmé 2012: 194, MP 185.1).

The right wall of the chamber has no burial features carved into it, since this is in fact the west façade of the tomb. There is a raised doorway in the northern half of the wall, which indicates an earlier phase of the tomb (**Fig. 24**). This doorway corresponds to the level of the loculi in the left wall and provides an entrance from



23. Loculi in back wall of Tomb Br. 276, Wādī Farasah West, Petra (L. Wadeson).



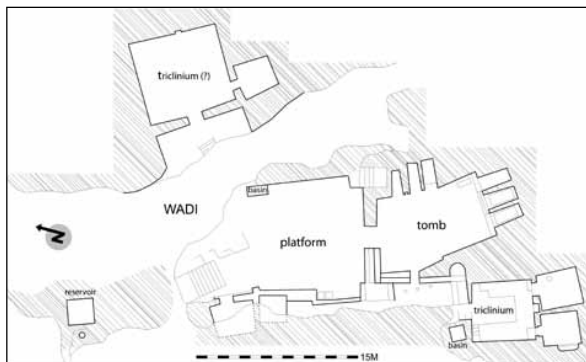
24. Right wall of Tomb Br. 276 burial chamber, with earlier doorway (note the bend in the wall) (L. Wadeson).

the west side of the tomb (**Fig. 25**). It has been proposed that this west façade was in fact the original orientation of the tomb, and that at a later stage the northern façade was carved and the chamber extended to the south (Wadeson 2012b: 118-120). This explains the obvious bend in the right wall, the lowered floor level and the visible change in orientation inside the chamber.

For whatever reason, the tomb appears to have been enlarged and monumentalised at some stage. The new northern façade is associated with the large platform in front of the tomb (**Figs. 22, 26**). This platform is enclosed by a low rock-cut wall and approached by a monumental stairway. At the bottom of the stairway is a water reservoir. On the west side of the platform are traces of what may have been rooms, while on the east side is a possible rectangular basin carved in the floor. The chamber (Br. 272) to the east of the platform seems also to be associated with this tomb (**Fig. 27**)⁶. It is preceded by a small plat-



25. West (earlier) façade of Tomb Br. 276, Wādī Farasah West, Petra (L. Wadeson).



26. Plan of the complex of Tomb Br. 276 (Q. Twaissi).

6. Nehmé (2012: 81) identifies Br. 272 as a funerary chamber due to a possible grave in the floor. However, its design and presence of the niche and subsidiary chamber make it more likely that its primary function was a feasting hall.



27. Br. 272 to the left of Tomb Br. 276, Wādī Farasah West, Petra (L. Wadeson).

form and stairway and although it is eroded and open at the front, the line of the original threshold is visible. This large room has neat, straight walls that are dressed with the tooling technique described above for the possible triclinium of Tomb Br. 192. There is a rectangular niche carved high in the rear wall of the chamber and a small subsidiary chamber in the bottom right corner. Although the floor is blocked by sand, it is likely that Br. 272 served as a triclinium or at least a feasting hall for Tomb Br. 276.

A definite triclinium is carved on the west side of the tomb⁷, but this is associated with the earliest stage of the tomb, i.e. the west façade (**Fig. 28**). This triclinium is small and has walls



28. Triclinium on the west side of Tomb Br. 276, Wādī Farasah West, Petra (L. Wadeson).

7. This is identified by Nehmé (2012: 133, F38) as a possible domestic chamber. However, it seems that the floor of this chamber was only recently cleared, revealing the benches.

dressed with stippled tooling, unlike in Br. 272. It is approached by stairs and preceded by a square basin that still bears traces of hydraulic mortar. A tall, rectangular niche is carved in the back wall of the triclinium and seems to be associated with an unpublished Nabataean inscription to its right. Either side of the niche are two small chambers accessed by stairs. A burial niche with a sunken grave is carved in the chamber on the right and it is assumed that the left chamber also had a burial function. Triclinia that also contain burials are not uncommon in Petra. Well-known examples include the triclinia associated with the Tomb of Unaishu and the Obelisk Tomb.

It is tempting to propose that the modification and enlargement of the complex of Tomb Br. 276 took place in the same period in which the other large tomb complexes at Petra became prevalent, around the mid-1st century AD. The date of the earliest phase of this tomb, with the small triclinium on the west side, is not known, but it is clear that during this time the tomb served a lower number of people. The later addition of the large platform and feasting hall appears to have provided for a greater number of people attending services in honour of the deceased. The monumental stairway to the complex on the north side of the platform was also an important reconfiguration, perhaps serving to highlight the act of approaching the tomb.

Tomb Br. 559

Tomb Br. 559 (Brünnow & Domaszewski 1904: 354; Schmid 2009b: 157-159, Fig. 14; Wadeson 2011b: *passim*) is situated in a commanding position almost at the top of the ridge that separates Wādī Mu‘ayṣara East and Wādī Mu‘ayṣara West in the north of Petra (Fig. 1). The façade faces out towards the city centre and dominates a large open area in front (Fig. 29). This tomb is somewhat isolated from the other tombs in the necropolis, which are mostly on the lower levels.

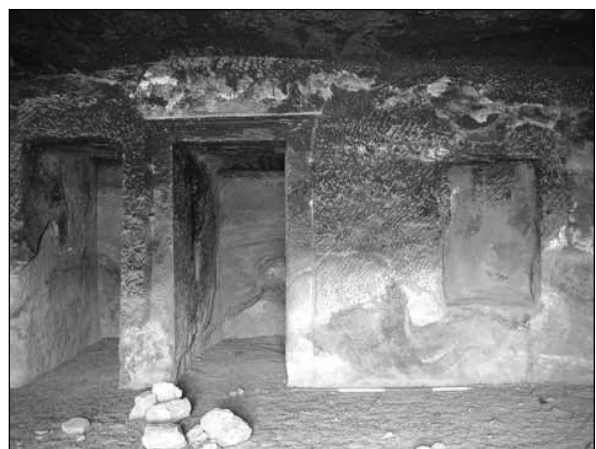
The façade of Br. 559 is a large Hegr type with an elaborate doorway framed by pilasters supporting a pediment. There are two slit windows carved in the rock wall either side of the façade and its base is blocked by sand. Remains of plaster are visible around the cornice directly above the door and rock-carvings of animals, including an ibex, are faintly visible in the lower



29. Tomb Br. 559 and area in front, Wādī Mu‘ayṣara, Petra (L. Wadeson).

entablature of the façade.

The burial chamber (l. 6.95 m; w. 8.10 m) is blocked by at least 0.40 m of sand. There are three loculi in each of the side walls, all of which have the same height apart from the one carved in the right part of the right wall. The floors of the loculi are mostly blocked by sand, but floor graves are visible in at least three of them. The loculus in the far right of the left wall has what appears to be a burial niche carved in its right wall. Three burial niches are also carved either side of the entrance, in the front wall of the chamber. In the middle of the back wall is a smaller burial chamber (l. 3.10 m; w. 2.70 m) with a loculus-like opening that is elaborated with a carved frame topped with a cornice (Fig. 30). The chamber extends to the right from the entrance and has an unfinished feature in its left wall. The floor is blocked, but likely contained



30. Loculus-chamber in the back wall of Tomb Br. 559, Wādī Mu‘ayṣara, Petra (L. Wadeson).

pit graves. To the left of this chamber is a loculus that is more neatly carved than the others. To the right of the chamber is an unfinished loculus, which if it had been finished would have given the tomb a symmetrical plan. The elaborated burial chamber in the back wall was clearly for the most important burial(s) of the tomb.

The large area (l. 22 m; w. 27 m) in front of the tomb is enclosed on its sides by a low rock-cut wall creating a courtyard space. A stepped pathway leads up this area from the south-west, connecting it to the tombs on the level below (**Fig. 31**). Another stairway, now eroded, in the north-west of the courtyard leads down to Tombs Br. 522 – 524 in Wādī Mu‘ayṣara West. To the east of the façade are a series of working platforms and an area that was being quarried. At the south-western corner of the courtyard is a rock-cut open-air installation that appears to be associated with this tomb. It consists of a central, slightly raised square platform surrounded by low rock-cut walls and partial benches (**Fig. 32**). A channel leads into the corner from the north-eastern side. Although not a typical triclinium with three raised benches, its size, the space around the platform and the basin in the north wall suggest it



31. Steps leading up to the area of Tomb Br. 559, Wādī Mu‘ayṣara, Petra (L. Wadeson).



32. Possible ‘feasting area’ associated with Tomb Br. 559, Wādī Mu‘ayṣara, Petra (L. Wadeson).

may have functioned as a feasting area.

To the south-east of the courtyard is a small enclosed area with a heavily eroded and blocked façade with a classical design facing west and a large water reservoir that was once covered with a vaulted roof (Muheisen 2009: 97, Pl. 78) (**Figs. 33, 34**). A channel connects the reservoir to a well to the east. The well is fed by a channel carved above the façade. A betyl in a niche is carved just to the right of the well, around the corner of the ledge, once again highlighting the relationship between water and cult. There may have once been a room carved on the north side of this area, as niches for arches are carved high up in the rock wall behind the stairway (Schmid 2009b: 158). To the left of the blocked façade, rock-cut steps lead up to a higher level where there is another reservoir, a circular cultic installation (see Tomb Br. 693 below), basins and



33. Tomb, reservoir, well and betyl niche associated with Tomb Br. 559, Wādī Mu‘ayṣara, Petra (L. Wadeson).



34. Reservoir associated with Tomb Br. 559 (note channel above tomb in foreground of photo), Wādī Mu'ayṣara, Petra (L. Wadeson).

a covered benched area (**Fig. 35**). The water was channelled from here to the cistern below (Schmid 2009b: 159). This may have been used as a feasting area, and seems much more private and limited to a smaller group of people than the areas on the lower level. It is also questionable whether this area was still considered as part of the complex of Tomb Br. 559. The steps continue up to the platforms above the tomb, which seems to have been an area for quarrying stone. As noted by Muheisen (2009: 95), the installations for water management are complex in this area.

The dominating position of Tomb Br. 559 and the complexity and size of its associated structures demonstrate that this was an important tomb complex in the Nabataean period. The date of this tomb remains to be established. Fur-



35. Rock-cut installations accessed by stairway, to the east of Tomb Br. 559. Wādī Mu'ayṣara, Petra (L. Wadeson).

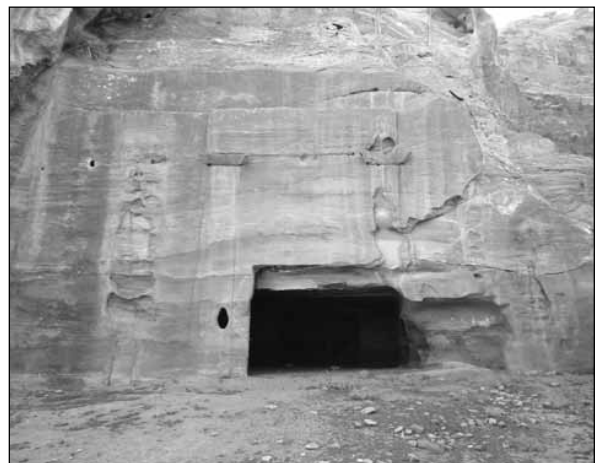
ther investigation is also required to elucidate the relationship between the various structures.

Tomb Br. 572

Tomb Br. 572 (Brünnow & Domaszewski 1904: 355; Schmid 2009b: 158; Wadeson 2011b: *passim*) is located in Wādī Mu'ayṣara East, just to the north-east of Tomb Br. 559 but on the east side of the ridge and on a lower level (**Fig. 1**). A view down on to this tomb complex is in fact possible from the area directly above Tomb Br. 559. It is in a less prominent position than the other tomb complexes discussed as it faces into the *wadi* and is not visible from the city centre. However, it is still prominent among the other tombs in this area owing to the size of its property and associated features.

The façade-type of the tomb cannot be determined since the top no longer survives. All that remains are two carved pilasters with inserted Nabataean capitals framing the façade (**Fig. 36**). An architrave is carved above the pilasters. The recessed ledge above the façade may indicate that it was topped with built crowsteps. A large portion of the lower part of the façade is missing, including the original entrance. A small window has been carved in the left pilaster of the façade, which is a rather unusual placement.

The walls of the burial chamber are extremely neat and well-carved. They display the tooling technique that has been discussed above for the complexes of Tombs Br. 192 and Br. 276. The ceiling is also dressed with fine, horizontal lines. However, the bottom parts of the side walls have been destroyed through erosion. The



36. Tomb Br. 572, Wādī Mu'ayṣara East, Petra (L. Wadeson).

plan of the chamber (l. 12.98 m; 7.27 m; h. 2.75 m) is unique in Petra, in that it is deep and has a recessed area at the back. This recessed area is framed by carved pilasters supporting a cornice (**Fig. 37**). It serves to emphasise the three square loculi in the back wall. All of these loculi have graves carved inside. The central loculus also has grooves carved in its side walls which may have served to support shelves. A further loculus with a grave is carved in the left part of the recessed area. In the main part of the chamber, there are five loculi in the left wall and four in the right wall, all of which are blocked by sand. The loculi closest to the recessed area on either side of the chamber have what appear to be eroded burial niches in their walls. The chamber is monumental in its design and arrangement, and is one of the few in Petra to still bear traces of decorative elements.

The area in front of the tomb is enclosed by a partly rock-cut, partly built wall to the north and a monumental rock-cut portal to the east, creating a relatively concealed space (**Fig. 38**). The north wall (Br. 573) is in fact blocking the small gorge to the north (Schmid 2009b: 158). The south side is open, but seems to have been once bound by a colonnade (Schmid 2009b: 158). This is suggested by the capital lying on the ground in the south-east corner of the forecourt which seems to have been inset in the space above, high in the rock wall (**Fig. 39**). Directly opposite this, to the left of the façade, it is possible to see a recess in which a column may have rested. Column drums are also observed in the area, and were reused in later



37. Back wall of burial chamber of Tomb Br. 572, Wādī Mu'ayṣara, Petra (L. Wadeson).



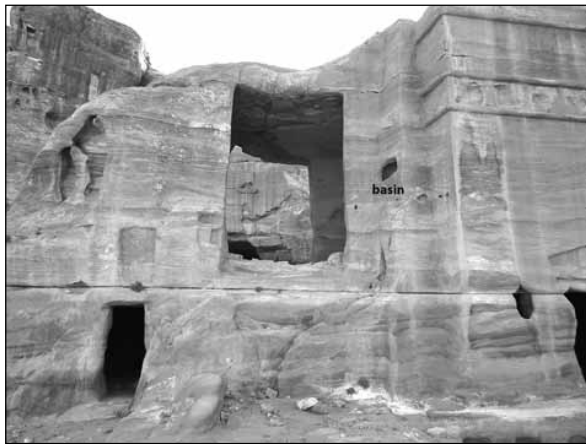
38. Complex of Tomb Br. 572 (tomb on left), Wādī Mu'ayṣara, Petra (L. Wadeson).



39. Courtyard of Tomb Br. 572 (facing east), Wādī Mu'ayṣara, Petra (L. Wadeson).

construction activity at the site (Schmid 2009b: 158).

The main entrance to the complex seems to have been via the monumental portal on the east (Br. 574) which frames Tomb Br. 572 (**Fig. 40**). This is a sort of covered vestibule that is open on the east and west sides. Remains of an eroded stairway are visible leading up to this room on the east side. The room may have also had a cultic function since there is a rock-cut bench in the north wall, a niche in the south wall and an arched basin on the north side of the eastern entrance. The ceiling of this structure is high and the walls are neatly carved. It is possible that the basin belonged to an earlier structure since it is in a high and inaccessible position in the wall. On the level below Br. 574, where possible steps lead up, a reservoir is carved in front of Tomb Br. 575 (**Fig. 41**). This was once



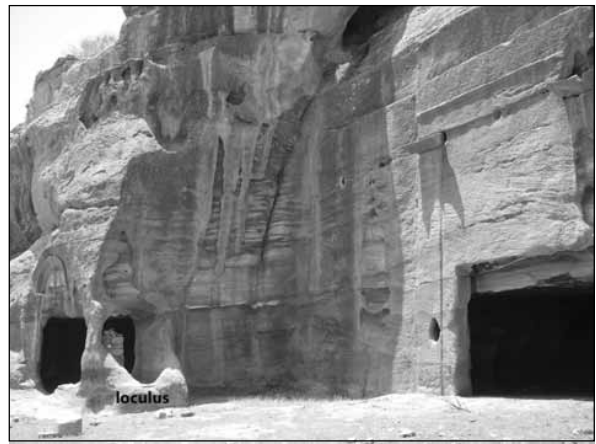
40. Entrance hall of Tomb Br. 572 (facing west) with basin high in the wall, Wādī Mu'ayṣara, Petra (L. Wadeson).



41. Reservoir associated with Tomb Br. 572 (Tomb Br. 575 behind), Wādī Mu'ayṣara, Petra (L. Wadeson).

covered, as the niches to support arches in the walls reveal.

Schmid has dated Tomb Br. 572 to the 1st century AD based on surface pottery collections and parallels with the Soldier Tomb Complex (2009b: 158). The tomb was carved later than the small Arch Tomb Br. 571 to the south since its courtyard space has been adapted to fit around the loculus in the north wall of Br. 571 (Fig. 42). It is also suggested that Double Pylon Tomb Br. 575 already existed when Br. 572 was carved, since the reservoir associated with Br. 572 has been placed in front of the entrance to Br. 575 and the monumental gateway has been adapted to the available space. This specific type of monumental gateway / vestibule is unique in Petra, but it is a common element of the tomb complexes that served to highlight the transition to the funerary space.



42. Arch Tomb Br. 571 to the left of Tomb Br. 572, Wādī Mu'ayṣara, Petra (L. Wadeson).

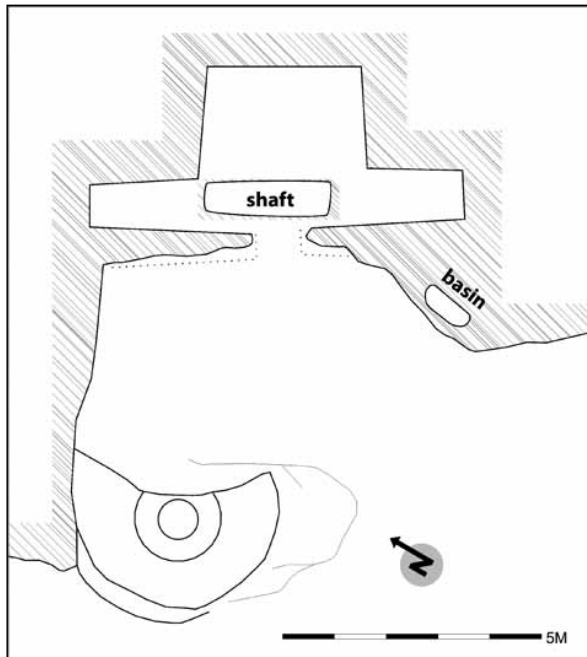
Tomb Br. 693

Tomb Br. 693 (Brünnow & Domaszewski 1904: 377; Tholbecq 2011: 33-34; Wadeson 2011b: 8) is situated in the north-eastern part of Mughur an-Naṣāra (Fig. 1). It is not in a particularly prominent position and is somewhat concealed by the surrounding rocky outcrops. The façade, which faces south-west, is heavily weathered and is thus missing most of its lower part (Fig. 43). The surviving carved pediment indicates that it belongs to the Simple Classical façade type.

The small burial chamber (l. 3.49 m; w. 3.06; h. 2.03 m) of this tomb has also suffered extensive erosion meaning that the original tool-work is no longer visible. There is one tall loculus in the front part of each of the side walls and the floor is blocked with sand (Fig. 44). A shaft entrance is carved in the ceiling, providing en-



43. Complex of Tomb Br. 693, Mughur an-Naṣāra, Petra (L. Wadeson).



44. Plan of the complex of Tomb Br. 693 (Q. Twaissi).

trance from the top of the tomb. Associated with the entrance to this shaft are two circular receptacles for offerings, which are commonly found with shaft tombs. It is likely that this tomb was originally accessed by the shaft and that the façade and loculi were added at a later stage, since there are several examples of this phenomenon at Petra (Wadeson 2012b: 113-117). The addition of the façade served to monumentalise the tomb, at which point the shaft entrance would have then gone out of use. The landscape of Mughur an-Našāra is characterised by small rocky outcrops, which were suitable for the carving of shaft tombs and also for later adding façades. This explains why there is a high number of such tombs in this area.

When the façade was added to this tomb, a small external complex was also created that was accessed from the south-east. This consists of a partially enclosed forecourt, an arched basin carved in the wall just to the right of the façade and an elaborate circular platform opposite the tomb (Figs. 43, 45). The latter feature has been interpreted by Tholbecq as a *'bóqroç'* used for making libations or other offerings (2011: 33-35). In the centre of the feature is a circular depression with a drainage hole, indicating that liquids were placed inside. Such installations, previously interpreted as *stibadia* are the focus



45. Circular platform with receptacle in front of Tomb Br. 693, Mughur an-Našāra, Petra (L. Wadeson).

of a detailed study undertaken by Tholbecq. Other well-known examples are found in front of the Obelisk Tomb and as part of the 'High Place' of Jabal al-Madhbah (Tholbecq 2011: 34, Fig. 4). Such an installation also seems to be present in the upper level of the complex of Tomb Br. 559, discussed above.

Unlike the other examples presented in this report, Tomb Br. 693 is a small complex with no visible structures for funerary feasting or a monumental entrance. However, the inclusion of the circular installation for offerings is significant, as so few tomb complexes have such a feature. This structure testifies to the occurrence of offerings outside the tombs. The date of Tomb Br. 693 has not yet been determined, but it is likely that is post-dates the shaft tomb from which it is formed.

Concluding Discussion

The tombs chosen for detailed study during the second season of the FTTP vary in terms of their location, façade type, size, and the type and arrangement of the installations associated with their surrounding property. Nevertheless, despite the evident variation, all these tombs have elements common to tomb complexes in Petra, including boundary structures that define the property, an open area or courtyard in front of the façade, a place reserved for dining, a source of water and features that are related to cult, such as niches, betyl carvings, circular receptacles or basins. This indicates that the same sorts of ritual activities were taking place at the tombs, such as funerary feasting, gathering and providing offerings to the dead and to the gods. Such

activities were performed in commemoration of the dead and share parallels with rituals in Nabataean religion. Most of the activity seems to have taken place in the courtyard area in front of these tombs, which could accommodate large numbers of individuals. The often prominent position of the tomb complexes meant that the rituals taking place in the service of the dead were highly visible and 'on show'. Thus, these commemorative activities clearly played an important social role for those living in Petra, providing an opportunity to confirm one's status within society, to strengthen family and / or tribal relations and to define a collective cultural identity (Wadeson 2011b: 10-11; 2013a: 24)⁸.

The variety evident in the form and layout of the complexes can be explained by the different topographical settings of the tombs within Petra (Wadeson 2012b: 104-112). The arrangement of the structures within the complexes was adapted to Petra's landscape and depended on the shape and size of the rock in which the tomb was carved. For example, some complexes are located within narrow wadis and thus a three-dimensional space could be easily created (Wadeson 2011b: 9; 2012b: 109). Areas with small, rocky outcrops, such as Mughur an-Našāra and Bāb as-Sīq, were also exploited for creating the separate elements that formed the complexes.

Regardless of the layout of the complexes, an important aspect seems to have been how their property was defined (Wadeson 2011b: 6)⁹. For example, rock walls demarcate the boundaries of many complexes, such as Tombs Br. 269 and Br. 270, and Tomb Br. 559. Other complexes are off-set from their surroundings by the landscape itself, such as Tomb Br. 30 and Tomb Br. 221, making their territory obvious. The concept of property and its legal implications is expressed in the inscription on the *Turkmāniyyah* Tomb, thus confirming the picture gained from the archaeological evidence.

The *Turkmāniyyah* Tomb inscription also relates how the property of the tomb complex was sacred and dedicated to the Nabataean god Dushara. This concept is also reflected in

the archaeological evidence, since not only is the space of the complexes defined as different from its surroundings, but also betyls and religious niches are commonly found at the boundaries, signalling the sanctity of the area (Wadeson 2011b: 7-8; see also Sachet 2012: 244-250). Several complexes are provided with gateways that may have acted as important transitional points. The presence of basins by the entrances to complexes and to tombs, suggests that some sort of ritual purification took place at these transitional points. Water in fact played an important role in the Nabataean funerary tradition, as demonstrated by the presence of large reservoirs and basins near the tombs (Wadeson 2011b: 8). Not only was it essential for the funerary feasting that took place at the tomb site, but it was also used for cultic purposes in relation to religious worship, as we saw in the cases of Tomb Br. 192, and Tombs Br. 269 and Br. 270.

Although the funerary space was considered as sacred, the tombs were very much part of daily life at Petra¹⁰, as demonstrated by their incorporation into, and prominence in, the urban landscape (Wadeson 2011b: 10; 2013a: 24). This idea is further reiterated by the presence of burials in triclinia where feasting took place, for example in the complexes of Tomb Br. 276, Tomb Br. 253, the Tomb of Unaishu and the Obelisk Tomb (Wadeson 2011b: 10)¹¹. Thus, there seem to have been fluid boundaries between the living and the dead, a concept which will be explored as part of a new research project by the author. Another issue which needs further study is the reason for the emergence and development of large-scale tomb complexes in the 1st century AD at Petra¹². This will be discussed in a forthcoming article (Wadeson in preparation).

Dr Lucy Wadeson
Oriental Institute
Pusey Lane
Oxford
OX1 2LE
UK
lucy.wadeson@orinst.ox.ac.uk

8. See Schmid (2013: 257-258) for a discussion of the social role of feasting. See also Nehmé (2013) for a discussion of 'The Installation of Social Groups in Petra'.
9. Schmid (2013: 252-254) discusses the defined spaces of tomb complexes as *heterotopias*, following the theory of Foucault.

10. Schmid has questioned to what extent the Soldier Tomb complex was used by the living (2009b: 162).
11. For another discussion of this phenomenon, see Sachet 2010: 253-257.
12. Sachet (2010: 259) has considered the development of banqueting rooms in Petra.

Bibliography

- Brünnnow, R.E. and von Domaszewski, A.
1904 *Die Provincia Arabia*. Vol. 1. Strassburg: Trübner.
- Healey, J.F.
1993 *The Nabataean Tomb Inscriptions of Madā'in Šālīh*. Oxford: Oxford University Press.
- 2009 *Aramaic Inscriptions and Documents of the Roman Period*. Oxford: Oxford University Press.
- Johnson, D.J.
2010 Petra, Wadi Mataha' in 'Archaeology in Jordan, 2008 and 2009 Seasons'. *AJA* 114.3: 538-40.
- McKenzie, J.S.
1990 *The Architecture of Petra*. Oxford: Oxford University Press.
- Mouton, M.
1997 Les tours funéraires d'Arabie, *nefesh* monumentales. *Syria* 74: 81-98.
- 2006 Les plus anciens monuments funéraires de Pétra: une tradition de l'Arabie préislamique. *Topoi* 14: 79-119.
- 2010 The Monolithic *Djin* Blocks at Petra: A Funerary Practice of Pre-Islamic Arabia. Pp. 275-287 in L. Weeks (ed.), *Death and Burial in Arabia and Beyond*. Oxford: Archaeopress.
- Al-Muheisen, Z.
2009 *The Water Engineering and Irrigation System of the Nabataeans*. Irbid: Yarmouk University.
- Nehmé, L.
2012 *Pétra: Atlas archéologique et épigraphique. 1. De Bāb as-Sīq au Wādī al-Farasah*. Paris: Académie des inscriptions et belles-lettres.
- 2013 The Installation of Social Groups in Petra. Pp. 113-127 in M. Mouton and S.G. Schmid (eds.), *Men on the Rocks: The Formation of Nabataean Petra*. Berlin: Logos.
- Netzer, E.
2003 *Nabatäische Architektur*. Mainz am Rhein: Philipp von Zabern.
- Petrovsky, K.
2013 The Infrastructure of the Tomb Precincts of Petra: Preliminary Results of the Tacheometrical Survey in Selected Areas. Pp. 189-204 in M. Mouton and S.G. Schmid (eds.), *Men on the Rocks: The Formation of Nabataean Petra*. Berlin: Logos.
- Sachet, I.
2010 Feasting with the dead: Funerary Marzeah in Petra. Pp. 249-262 in L. Weeks (ed.), *Death and Burial in Arabia and Beyond. Multidisciplinary Perspective*. Society for Arabian Studies Monographs 10 (BAR International Series 2107).
- 2012 Dieux et hommes des tombeaux d'Arabie Pétrée: iconographie et aniconisme des élites nabatéennes. Pp. 225-258 in I. Sachet and C.J. Robin (eds.), *Dieux et déesses d'Arabie: Images et représentations*. Paris: De Boccard.
- Schmid, S.G.
2009a The International Wadi Farasa Project (IWFP): Preliminary Report on the 2007 Season'. *ADAJ* 53: 95-105.
- 2009b Überlegungen zum Grundriss und zum Funktionieren nabatäischer Grabkomplexe in Petra. *ZDPV* 125.2: 139-170.
- 2013 Foucault and the Nabataeans or what space has to do with it. Pp. 251-269 in M. Mouton and S.G. Schmid (eds.), *Men on the Rocks: The Formation of Nabataean Petra*. Berlin: Logos.
- Tholbecq, L.
2011 Infrastructures et pratiques religieuses nabatéennes: quelques données provenant du sanctuaire tribal de la "Chapelle d'Obodas" à Pétra. Pp. 31-44 in F. Alpi et al. (eds.), *La pioche et la plume. Autour du Soudan, du Liban et de la Jordanie. Hommages archéologiques à Patrice Lenoble*. Paris: PUPS.
- Wadeson, L.
2010a The Chronology of the Façade Tombs at Petra: A Structural and Metrical Analysis. *Levant* 42.1: 48-69.
- 2010b *The Façade Tombs of Petra: from Exterior to Interior*. School of Archaeology, Oxford: D.Phil. thesis.
- 2011a Im Gedenken an die Toten: Die Bestattungssitten der Nabatäer. *Antike Welt* 42/6: 31-36.
- 2011b Nabataean Tomb Complexes at Petra: New Insights in the Light of Recent Fieldwork. Pp. 1-24 in A. Mackay (ed.), *ASCS 32 Proceedings*, (<http://ascs.org.au/news/ascs32/Wadeson.pdf>).
- 2012a Petra: Funerary topography and the al-Khubthah tombs. Pp. 737-739 in D. Keller, B. Porter & C. Tuttle (eds.), *Archaeology in Jordan, 2010 and 2011 Seasons*. *American Journal of Archaeology Newsletter* 116.4.
- 2012b The Funerary Landscape of Petra: Results from a New Study. Pp. 99-125 in L. Nehmé and L. Wadeson (eds.), *Nabataean Supplement to the Proceedings of the Seminar for Arabian Studies* 42. Oxford: Archaeopress.
- 2013a Petra: Behind the Monumental Facades. *Current World Archaeology* 57.1: 18-24.
- 2013b The Development of Funerary Architecture at Petra: the Case of the Façade Tombs. Pp. 167-188 in M. Mouton & S. Schmid (eds.), *Men on the Rocks: The Formation of Nabataean Petra*. Berlin: Logos Verlag.
- In press The Funerary Topography of Petra Project (FTPP): Preliminary Report on the 2010 Season. *ADAJ* 56.
- In prep. Depicting the Dead: Funerary Portraiture at Petra.
- Wenning, R.
2001 The Betyls of Petra. *BASOR* 324: 79-95.
- Zayadine, F.
1974 Excavations at Petra (1973-1974). *ADAJ* 19: 135-150.

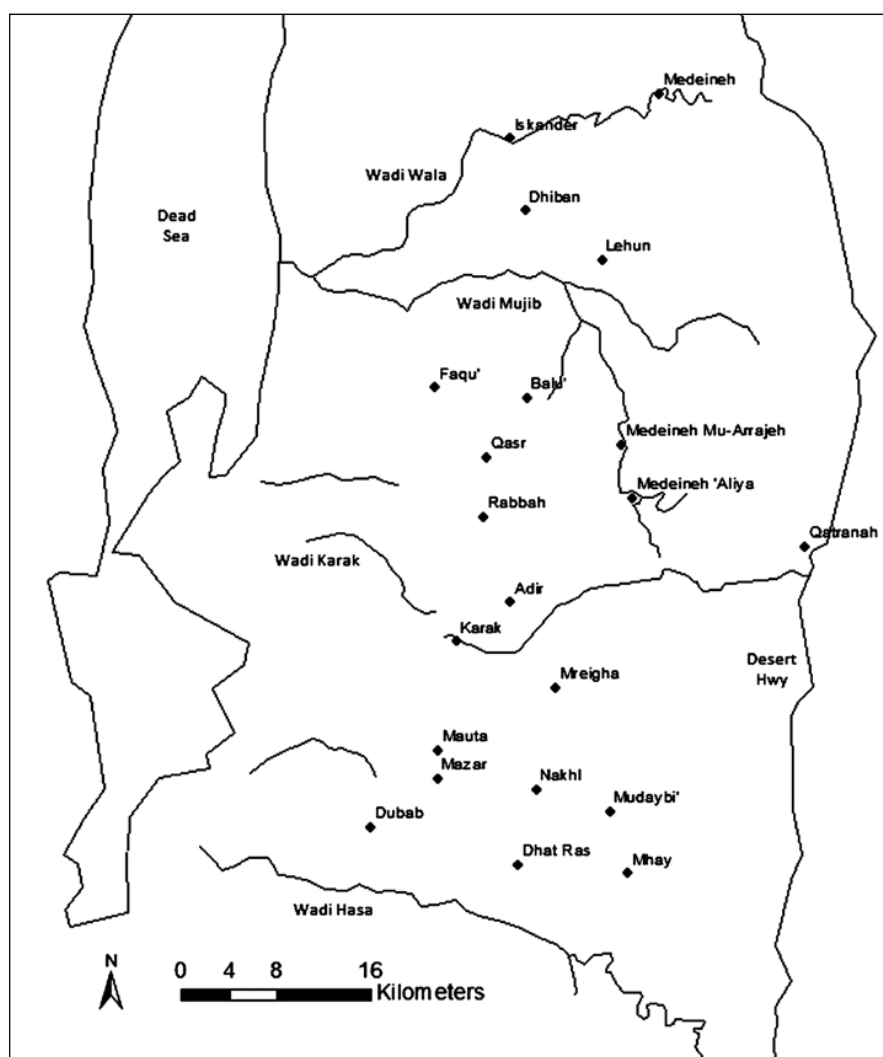
PATTERNS OF SETTLEMENT, ABANDONMENT AND RE-USE DURING THE BRONZE AND IRON AGES IN CENTRAL JORDAN: AN ANALYSIS OF THE OCCUPATIONAL HISTORIES OF INDIVIDUAL SITES USING ‘MEGA-JORDAN’

Mark D. Green

Introduction

This investigation focuses on the area comprising Wadi Wala and Wadi ath-Thamad to the north and Wadi Hasa to the south. The region extends eastward from the Dead Sea across the central Jordanian plateau to approximately 15

km east of the Desert Highway at the fringe of the Syrian - Arabian Desert (**Fig. 1**). Though the political boundaries were fluid during the Iron Age, with control of the region - north of the Wadi Mujib - frequently shifting between several competing groups, the study area rep-



1. Map of study area.

resents what is generally recognized as having been Moab during a part of this period (Dearman 1997; Lipiński 2006). Its strategic location in the southern Levant, combined with the surrounding fertile plateau highlands, attracted travelers from throughout the Middle East. The region was important during the Bronze and Iron Ages too, and this has been the subject of many investigations (e.g. Adams 2008; Finkelstein 1995; Kotter 2009; Levy, Daviau, Younker and Shaer 2007).

The landscape of this region gives evidence of the cultural changes that took place during the Bronze and Iron Ages throughout Palestine, for example, walled settlements, water management systems, agricultural ‘hinterlands’ supporting villages and towns, and trade (Graham 2008: 209). While several projects have completed surface surveys in the area (Mattingly 1997; Miller and Pinkerton 1991; Parker and Betlyon 2006) excavations have focused on a few large walled sites. As a consequence, our understanding of the organization and pattern of settlement, especially smaller settlements, remains incomplete (Graham 2008). We have learned that site location and density were influenced by both environmental and political factors (c.f. MacDonald 2002; Palumbo 2008). With regard to the physical environment, we know that during some periods (e.g. Roman and Umayyad) site locations in the study area were specially selected on the basis of, for example, access to rock outcrops and arable soils (Green 2002). We also know that during the Iron Age the Assyrians prohibited building settlements on high mounds (Fales 1990). It also appears that climate influenced site location, e.g. settlements expanded into what is today the eastern desert during periods of increased rainfall and were then abandoned during periods of aridity (Green 2004).

The Early Bronze Age (EBA) was a period of both significant settlement growth and decline (Chesson, Makarewicz, Kuijt and Whiting 2005). It was only during the Nabataean, Roman and Early Byzantine periods that the number of sites exceeded those of the EBA (Green 2004: table 1). At its peak, the number of EBA sites exceeded the number of Middle Bronze Age (MBA) and Late Bronze Age (LBA) sites by factors of three and five respectively (cf. Dever

2000). Many of the innovations that were first introduced in the Chalcolithic, such as irrigation (Rosen 1995), cultivation (Grigson 1995), olive and vine crops (Genz 2003), donkeys as a pack animals (Ovadia 1992) and an increase in the use of metal tools (Rosen 1997), continued and expanded into the Bronze Age. Though urbanization is generally recognized as having begun in EB I, in the study area many sites were not urbanized until EB II and EB III, a pattern that included the construction of walls around many sites (Sebag 2005). It is in EB II and EB III that the first signs of social stratification are documented (Esse 1989; Finkelstein 1995; Miroschedji 1999). However, “the Madaba region and the Karak Plateau appear to have remained outside this process” (Graham 2008: 210).

The collapse of society throughout the Aegean and the Levant at the end of the EBA has been widely discussed (Cordova 2007a; Homes-Fredericq 2009; Miroschedji 2009; Robbins 2001). The data from central Jordan are mixed. Miroschedji (2009) suggests that the collapse was not as extensive east of the Jordan valley as in other areas. Settlement disappeared between the EBA and Iron Age (IA) at Dhiban (Ji 2007; Porter *et al.* 2007), abandonment of al-Lahun occurred at the beginning of EB IV (Swinnen 2009) and during EB IV at Tall al-‘Umayri (Herr and Clark 2007). In contrast, Richard and Long (2007) report a flourishing EB IV settlement at Khirbat Iskander (see also Palumbo 2008) and pottery from both the MBA and LBA has been recovered at Tall Jalul (Younker 2007). MacDonald (2007) reports that the MBA and LBA are poorly represented south of the Wadi Hasa.

In terms of absolute numbers of sites in the study area, the whole of Jordan and much of the Levant (as represented by MEGA-Jordan and the Digital Archaeological Atlas of the Holy Land data) indicate that the number of sites actually increased from EB III to EB IV. That said, the reader is cautioned to avoid drawing conclusions based on counts alone. In many cases the survey data underlying the MEGA-Jordan (and JADIS) datasets lack the chronological precision required to make a definitive comparison (e.g. the majority of surveys combine EB II and EB III sites into a single EB II - III chronological period). Palumbo (2008) suggests that it was

a decrease in the size of sites from EB III to EB IV that has led some scholars to conclude that the EB IV was a period of abandonment.

Rather than a wholesale collapse, it seems more likely that the EB IV was a culmination of a decline in EB II - III urban societies and a return to a rural systems referred to as a "rural interlude" by Palumbo (2008: 227) and a "dark age" by Richard and Long (2007: 269).

Urban settlement was reestablished in the MBA (cf. Dever 2003), followed by a decline in sedentary occupation during the LBA (Yunker 2007) as localized polities were beginning to emerge (Falconer 2008).

The early IA (12th - 10th centuries BC) was a period of recovery throughout the Levant (Porter 2009). Some sites continued to enjoy prosperity during the LBA, e.g. Tall al-'Umayri (Herr 2000), while others entered into a new period of prosperity, e.g. Tall al-Lahun (Homes-Fredericq 2009) and importance, e.g. Karak (Finkelstein and Lipschits 2011). Early IA settlement was based on "geography rather than political boundaries or defensive needs" (Lev-Tov, Porter and Routledge 2011: 78). Although there is evidence of cooperation and communication between the region's settlers, no early IA administrative center or hierarchy, as observed in other Near Eastern polities, has been identified (Porter 2009). By late IA I, signs of a pre-Moab territorial entity, organized around tribal groups with no identifiable unified monarchy, appeared in the landscape south of the Mujib (Bienkowski 1992; Finkelstein and Lipschits 2011).

Iron Age II settlement was organized around tribal groups that gradually merged into "formal national states with their own monarchies and governmental bureaucracies" (Herr and Najjar 2008: 311). The secondary states of Ammon, Moab, Edom and Israel ascended (LaBianca and Yunker 1995), the Assyrians returned to power and the influence of the Egyptians waned. The discovery of four IA II volute capitals at Muddaybi' (Drinkard 1997), IA II steles at Balu' and Shiha (Lipiński 2006), an IA II basalt sculpture and volute capital at Karak (Dearman 1997; Finkelstein and Lipschits 2011) and the Mesha Inscription (Dearman 1989) point to a political structure that evolved into the kingdom / state / nation of Moab (Finkelstein 1995; Herr 2000; Lipiński 2006). Daviau and Chadwick (2007)

suggest that while Moab may have been a tribal state, it is impossible to identify distinct tribal cultural indicators given the limited number of excavations and published results. The region to the south of Mujib was apparently undisputed Moabite territory, while control of the area north of Mujib (as far north as Madaba) shifted between Moab, Ammon and Israel (Harrison *et al.* 2007; LaBianca and Yunker 1995). Jalul appears to have been located along the southernmost boundary of Ammonite territory (Yunker 2007). Although Assyrian troops entered the territory of Moab around 650 BC in pursuit of northern Arabs (Lipiński 2006), there is no record of confrontations between the Assyrians and the Moabites (Bienkowski 2000; Dornemann 1983).

Written sources are silent on Transjordan during the Persian Period. Attempts to reconstruct settlement histories from survey reports are tentative owing to uncertainty over the identification of Persian period material culture in Transjordan (Bienkowski 2008). In spite of this uncertainty, there is evidence from pottery for settlement continuity from the IA II through to the Persian period (Bienkowski 2001, 2002a, 2002b; Bienkowski *et al.* 2002; Herr 1997). Though there is no evidence for the continued status of Moab as a 'state' within the Persian Empire, it is likely that local tribal authorities continued to represent Persian interests (Bienkowski 2008).

The Physical Environment

The study area is located in the 'plateau and mountain zone' of west-central Jordan (Hadidi 1982). It is an uplifted, gently rolling eastwardly sloped peneplain, dissected by deep canyons that trend east to west (Green 2002). Beginning in the Cretaceous period (136 - 65 mya) and continuing through the Oligocene (38 - 26 mya), central Jordan was inundated by the ancient Tethys Sea. Several episodes of oceanic transgression and recession deposited most of the sedimentary bedrock in the region. During the Miocene (26 - 7 mya) and Pliocene (7 - 1.8 mya) as the Tethys Sea receded for the last time, compressive and tensional forces along the boundary between the Sinai microplate and Arabian plate formed the Great Rift Valley that extends nearly 6,000 km from Turkey to East Africa (Atallah 1991; Gar-

funkel *et al.* 1981; Husein *et al.* 1995; Mechie and el-Isa 1988; Salameh 1997; Sneh 1996; Wdowinski and Zilbermann 1996). The Rift Valley between the Sea of Galilee and the Dead Sea is known as the Ghor (Ar. *al-Ghawr*). Forces along the plate boundary resulted in a lateral displacement (strike-slip) of approximately 107 km in the Jordan valley (Atallah 1991; cf. Guiraud and Bosworth 1999). Local rifting and rotation along this boundary created the Dead Sea basin, the uptilted and uplifted plateau highlands, and erupted most of the highland basalt flows found on the plateau highlands and in the *wadi* canyons (Bayer *et al.* 1988; Brown, Schmidt and Huffman 1963; Burdon and Quennell 1959; Donahue 1985; Homes-Fredericq 1997; Mansoor 1999; Mechie and el-Isa 1988). Faults and fractures are found throughout the region. One of the region's more spectacular faults is the Fajj al-'Usaykir, which is part of the 300 km Karak - Wādī el-Fiha fault zone that extends from Karak to Saudi Arabia. The region continues to be tectonically active (el-Isa 1984; el-Isa and Shanti 1989; Jussim and Green 1999; Karcz *et al.* 1977; Macumber *et al.* 1997).

The region's drainage network formed early in the tectonically active phase along faults and fractures that functioned as conduits for surface and groundwater flow (Ginat *et al.* 1998; cf. Gupta and Jindal 2000; Horowitz 1987; Khalil 1992; Powell 1988; Salameh 1997; Tarawneh 1991). Repeated cycles of intense storms and high magnitude flash floods cut the deep canyons of the region's three largest *wadis* (Mujib, Hasa and Karak) that flow into the Dead Sea (Odeh and Salameh 1988; Salameh 1997). The combined basin drained by the *wadis* is 9,306 km² (MacDonad and Partners 1973; Salameh 1997). The level of the Dead Sea and its predecessors (Lake Samra in the Lower Pleistocene and Lake Lisan *ca* 50 - 12,000 BP) fluctuated many times during this period, resulting in significant erosion of the limestone and sandstone at the mouths of the major *wadis* where they emptied into the Dead Sea basin. These events have been recorded in more than 30 shore terraces that are preserved along the base of the Dead Sea escarpment and relict deltas where the major *wadis* drain into the Dead Sea basin.

Precipitation and temperature have varied throughout antiquity (cf. Bar-Matthews *et al.*

1998; Brayshaw *et al.* 2011; Courty and Vallverdu, 2001; Robinson *et al.* 2011; Wilkinson 2003), where an increase in one is correlated with a decrease in the other (al-Eisawi 1985). The current semi-arid environment often misleads one into assuming that the region has always been hot and dry. During the Chalcolithic and intermittently through the EBA the region was wetter than today. Analyses of remnant shore lines along the Dead Sea (Frumkin and Elitzur 2001) and the Sea of Galilee (Hazan *et al.* 2005), pollen (Neumann *et al.* 2007), organic matter in fossil land snails (Goodfriend 1990), and speleothems (Bar-Matthews and Ayalon 2004) indicate that the climate was considerably less stable than today with alternating high amplitude oscillations from wet to dry and vice versa (also cf. Schaub and Chesson 2007). Conditions became very arid during EB III (Bar-Matthews *et al.* 1998; Harlan 1985; Nissenbaum 1994; Rosen 1998). Aridity persisted throughout the remainder of the EBA, MBA, LBA and IA, before coming to an end in the Persian period (Donahue *et al.* 1997; Harlan 1988; Issar and Brown 1998; McGovern 1987; Netser 1998; Nissenbaum 1994; Raikes 1985; A. M. Rosen 1998; Shehadeh 1984; Wilkinson 2003).

Precipitation generally decreases as one goes from north to south and from east to west across the Levant, although there are micro-regions of high aridity and high rainfall punctuating this trend. Within the study area, the dramatic change in topography as one moves west to east up the Dead Sea escarpment, across the Transjordan plateau and into the Syrian - Arabian Desert, creates an environment where precipitation and temperatures change rapidly over a relatively short distance (Zohary 1973). Average annual precipitation is currently 325 - 350 mm on the plateau highlands, between 80 and 180 mm on the eastern plateau and less than 80 mm in the desert regions (Cordova 2007b; Foss 2003). Actual amounts vary considerably from year to year with periods of drought being common. Average annual temperatures are between 15 and 20 degrees Celsius and can approach 40 degrees when the hot summer *khamasin* winds blow from the east (Foss 2003; MacDonald 2002). These conditions create four geobotanical regions within the 4,500 km² study area: (1) the plateau highlands Mediterranean region, (2)

the semi-desert Irano-Turanian steppe region that encompasses a 15 km-wide zone extending west from the Desert Highway, (3) the Sudanian region in the Dead Sea Ghor and (4) a narrow Saharo - Arabian desert region that extends east of the Desert Highway (cf. al-Eisawi 1985; cf. Cordova 2007b; Zohary 1973).

The region's complex climate, vegetation, topography and geology have produced a wide variety of soils (cf. Jenny 1941). Wind borne loess is the predominant soil on the plateau with alluvial soils common in the *wadis* (Burdon and Quennell 1959; Foss 2003). The deep soils of the plateau highlands are dominated by red *terra rossa* Mediterranean soils with shallow grey - brown soils in the eastern semi-desert region (Zohary 1973). The highlands are very fertile and provide an excellent environment for the production of cereal crops, pasturing and growing fruit trees (Homes-Fredericq 2000; LaBianca and Younker 2003). The irrigated soils of the Ghor are some of the country's most agriculturally productive (Dunbar 2008). Soil erosion is a serious problem throughout the region where slopes exceed 3-5% (Foss 2003).

Access to water was and continues to be a critical consideration in the location of settlements within the study area. Through natural

and manmade structures, adequate water can be captured and stored to support year-round settlement across much of the region, even during the driest periods. Cisterns are common, particularly on the plateau highlands. Highland sites frequently exploited natural features or modified them to capture and store precipitation from winter storms in caves and man-made cisterns. Many old cisterns have been modified (e.g. with the addition of concrete capping blocks with metal doors) and are still in use today. Several types of water collection and storage structures are found in the study area: *biyar mujammi* (collecting wells) in the Karak region, *biyar hayy* (living wells) filled from underground sources, *mushash* (pits dug in clay soils), *qalib / zalib* (deep hand-dug wells), *mahfurs* dug by *bedouin* to collect water from enclosed depressions or at the junction of two *wadis*, and *thumaila* - also constructed by *bedouin* - which are shallow pits dug down to rock that collect water from underground seeps (Lancaster and Lancaster 1999). The author observed several *thumaila* filled with fresh water (one was home to several frogs) in the semi-arid Fajj al-'Usaykir in July 2011 (Fig. 2). Springs (Ar. *al-'Ayun*) are also common in some parts of the study area. They are found along the slopes of the major *wadis* and Dead



2. *Thumaila* in Fajj al-'Usaykir (July 2011).

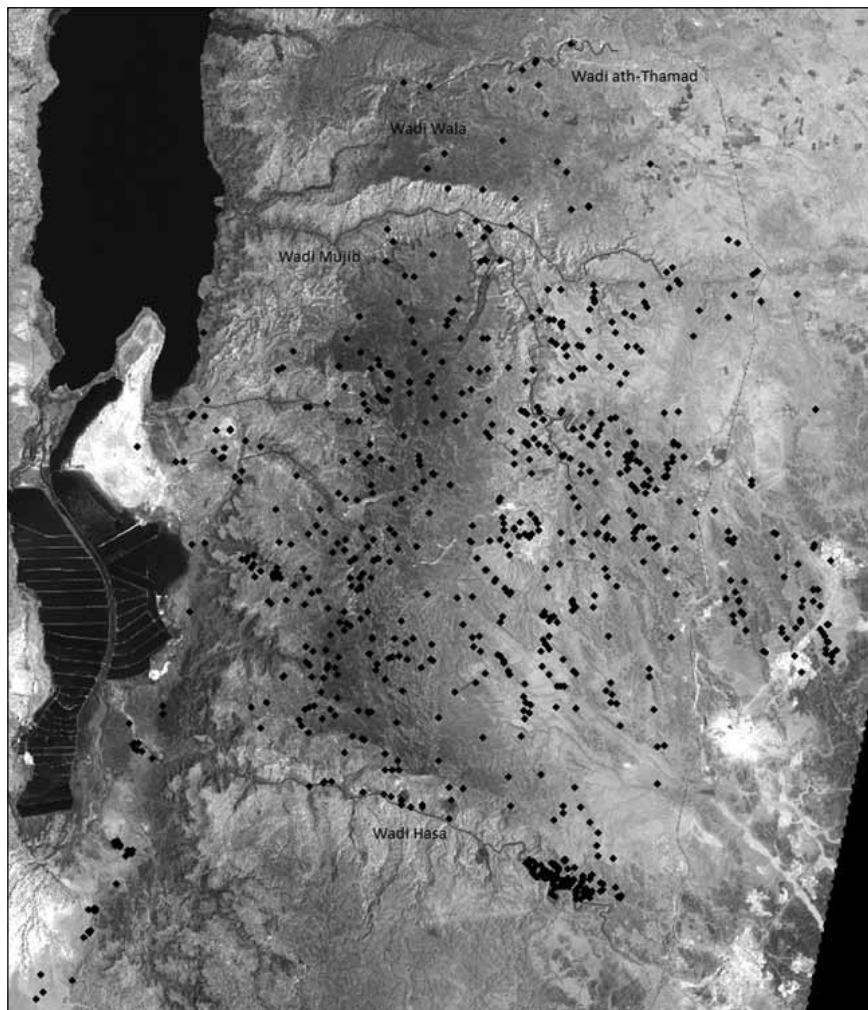
Sea escarpment, and are especially plentiful and large in Wadi Hasa. In 1960 it was estimated that all of the Wadi Hasa's springs together were producing 150,000 gallons per minute. (Ain 1960: 20).

Methodology

Several investigations have looked at regional settlement patterns during the Bronze and Iron Ages (cf. Boling 1988; Dearman 1992; Graham 2008; Green 2004; Sauer 1986). This investigation looks at Bronze and Iron Age settlement at the level of individual sites: (1) general physical setting, (2) when a site was first settled, (3) if and when it was abandoned and (4) if it was re-used after abandonment. Through documenting changes at the level of individual sites we gain a much better understanding of settlement shift at the regional scale.

The MEGA-Jordan database was the primary

source for site data in this analysis. The MEGA-Jordan project was launched as a collaboration between The World Monuments Fund, the Department of Antiquities of Jordan and the Getty Conservation Institute for the development and implementation of a GIS to inventory and manage Jordan's numerous archaeological sites. The MEGA-Jordan database includes site data imported from the Jordan Antiquities Data Information System (JADIS), originally created by Gaetano Palumbo (1994), and recent survey reports. At the time of writing, the database contained 10,955 sites with 45,570 site elements. Additional site data from the survey of the Karak Resources Project was added to the project dataset. More recent data from other sources was also included in the analysis (e.g. re-examination of site data [Brown 2010]). The full dataset for the study area includes 822 sites that were occupied at some point during the Bronze



3. Site locations (base image produced using Landsat 7 ETM+ satellite data acquired from the US Geological Survey, EROS Data Center, Sioux Falls, SD, USA; copyright 1995-2004 Environmental Systems Research Institute Inc. (ESRI) with permission).

and Iron Ages (**Fig. 3**). The dataset used in this analysis includes everything from sherd scatters to fortified structures with walls. The reader should be aware of the limitations of statistics arising from survey data, for example, uneven distribution of survey information (e.g. Chalcolithic sites derived from Jordan Valley surveys [Bourke 2008]) and the identification of survey material at a macro level owing to a lack of good local chronologies, or having detailed chronologies for only one period (e.g. the Early Bronze Age focus of Chesson *et al.* 2005). Another consideration is the inconsistent dating of pottery (Finkelstein and Lipschits 2011; cf. Savage *et al.* 2007; cf. Strange 2008).

Most surveys do not report chronological subdivisions for the Bronze Age (e.g. EB I, II, III and IV). Only 29% of the EBA sites, 18% of the MBA sites and 12% of the LBA sites are dated to a specific chronological subdivision (**Fig. 4**). As a consequence the Early, Middle and Late Bronze Ages were not analyzed here at the level of chronological subdivisions. Unfortunately, looking at the EBA, MBA and LBA as single periods fails to capture the cycles of expansion and abandonment within each period (cf. Gophna 2003). The chronological precision of the site data for the IA was much better (93% of the sites were dated to the precision of the subdivisions I, IIa, IIc or III). Because 95% of the IA II sites were settled during both the IA IIa/b and IA IIc, IA II period sites (a/b, c and unspecified) were analyzed as a single IA II period rather than by the IA II chronological subdivisions. Thirty-four sites in the IA II category were originally reported as 'Iron unspecified' in the published reports of the Karak Resources Project (KRP). At the suggestion of Dr Jerry Mattingly, director of the KRP, these sites were included as IA II for this investigation.

Six broad geomorphic zones can be documented in the study area (highlands, the Ghor, the escarpment, *wadis*, desert and semi-desert). For the purpose of this investigation, these were combined into four larger zones on the basis of

soil characteristics. These are: (1) the plateau region (including the plateau highlands and the Ghor), (2) the desert region (a zone extending east from the Desert Highway), (3) the semi-desert region (a zone extending 15 km west from the Desert Highway) and (4) *wadis* (including the major Wadis Mujib, Hasa and Karak, and the Dead Sea escarpment). Sites are located in each of the four zones, approximately 8% in the desert region, 24% in the semi-desert region, 26% in the *wadis* and 42% in the plateau zone. The plateau highlands were continuously settled throughout all periods and there was considerable variation in the settlement of the other zones.

Analysis

There were commonalities in the site data across all periods. The clustering of sites was statistically significant in all periods (statistically significant at a 99% confidence level calculated using ArcGIS Multi-Distance Spatial Cluster Analysis / Ripley's K-function and Average Nearest Neighbor). A minimum of 40% of sites in each period were established in new, previously unused locations (**Fig. 5**), and although the rate of site abandonment was extremely high during the EBA and IA II, site abandonment generally was common throughout the Bronze and Iron Ages. With the exception of the EBA and IA II, new site locations were abandoned at a higher rate than sites in reused locations.

Early Bronze Age

The number of sites in the desert and semi-desert zones was significantly higher during the EBA than any other period (55% of all EBA sites compared to 1% in the MBA, 2% in the LBA, 5% in the IA I and 4% in the IA II) (**Fig. 6**). In spite of a perceived preference for locating sites in the arid region, there was an avoidance of the desert and semi-desert region for locating new sites. Out of 196 EBA sites settled in new locations, only 3% were located in the eastern desert. A similar pattern was documented in the semi-desert region where 23% of newly located

	Early Bronze		Middle Bronze		Late Bronze		Iron I		Iron II	
	No.	%	No.	%	No.	%	No.	%	No.	%
Unspecified	328	71%	66	83%	123	88%	44	7%	52	15%
Subdivided	136	29%	14	18%	17	12%	605	93%	300	85%
Total	464		80		140		649		352	

4. Distribution of sites by chronological period.

Period	Total No. Sites	New Site Locations	Reused Locations	Abandoned in Period Immediately Following			Abandoned Through Persian Period		
				New Site Locations	Reused Site Locations	All Site Locations	New Site Locations	Reused Site Locations	All Site Locations
Chalcolithic	283	-	-	-	-	15 5%	-	-	-
Early Bronze	464	196 42%	268 58%	166 85%	253 94%	419 90%	79 40%	178 66%	257 55%
Middle Bronze	80	32 40%	48 60%	17 53%	10 21%	27 34%	8 25%	5 10%	13 16%
Late Bronze	140	56 40%	84 60%	36 64%	37 44%	73 52%	16 29%	19 23%	35 25%
Iron I	167	67 40%	100 60%	36 54%	21 21%	57 34%	32 48%	16 16%	48 29%
Iron II	352	192 55%	160 45%	135 70%	121 76%	256 73%	135 70%	121 76%	256 73%

5. Distribution of sites by location type: new and re-used.

	Geomorphic Setting								
	Desert		Semi-Desert		Wadi		Plateau		Total Sites
	#	%	#	%	#	%	#	%	
Early Bronze - New	6	3%	46	23%	58	30%	86	44%	196
Early Bronze - Reused	69	26%	135	50%	24	9%	40	15%	268
Early Bronze - All	75	16%	181	39%	82	18%	126	27%	464
Middle Bronze - New	-	-	-	-	17	53%	15	47%	32
Middle Bronze - Reused	-	-	1	2%	17	35%	30	63%	48
Middle Bronze - All	-	-	1	1%	34	43%	45	56%	80
Late Bronze - New	-	-	1	2%	9	16%	46	82%	56
Late Bronze - Reused	-	-	-	-	19	23%	64	77%	84
Late Bronze - All	-	-	2	1%	28	20%	110	79%	140
Iron I - New	-	-	6	9%	37	55%	24	36%	67
Iron I - Reused	2	2%	1	1%	30	30%	67	67%	100
Iron I - All	2	1%	7	4%	67	40%	91	55%	167
Iron II - New	-	-	2	1%	152	79%	38	20%	192
Iron II - Reused	2	1%	10	6%	50	31%	98	62%	160
Iron II - All	2	1%	12	3%	202	57%	136	39%	352

6. Distribution of sites by geomorphic setting.

sites were in that zone. 90% of EBA sites were abandoned by the MBA, with 55% of those sites remaining abandoned into the Persian period. All sites located in the eastern desert, semi-desert and Wadi Mujib were abandoned by the end of the EBA. With the exception of two sites in the Ghor, viz. one in Wadi Hasa and one in Wadi Wala, the only sites not abandoned during the EBA were those located on the plateau highlands.

Middle Bronze Age

Settlement in the eastern desert during the MBA was exceptionally low and only 1% of MBA sites were located in the semi-desert zone generally. In contrast, 56% of all MBA sites were located on the plateau highlands with the remaining 43% located in Wadis Mujib and Hasa, and along the Dead Sea escarpment. A

small (4.5 km²) cluster of seven sites was located in a region near the head of Wadi Hasa, but all were abandoned by the end of the MBA. The only MBA sites still occupied in the LBA were those on the plateau highlands and the Dead Sea escarpment.

Late Bronze Age

The percentage of sites in the plateau zone was much higher during the LBA than any other period (79% compared to 27% in EBA, 56% in MBA, 55% in IA I and 39% in IA II). The eastern desert remained sparsely populated, with only 1% of LBA sites located in the semi-desert region. The geographic center of LBA settlement shifted west in comparison to the MBA (measured using ArcGIS Mean Center and Central Feature). While sites in all locations were abandoned during the LBA, a disproportionate

share of the abandonments involved plateau highland sites located south of Karak (69%).

Iron Age I

There was a modest return of settlement to the semi-desert and eastern desert during IA I, in addition to settlement of the *wadis* (primarily Wadi Hasa). Within Wadi Hasa, 85% of IA I sites were located in a 15 km² area near to the head of the *wadi* (**Fig. 7**).

The southern boundary of this study followed that defined by MEGA-Jordan, namely at the bottom of the Wadi Hasa ravine. As a result, only sites on the northern face of the canyon were included in this analysis (a review of the site data for the opposite side found only three IA sites). Most sites in the 15 km² cluster were established in new locations. Settlement in the semi-desert and *wadi* zones was predominantly at new site locations (86% and 55% respectively), compared to only 26% of the plateau. At Wadi Hasa, 70% of sites were abandoned by IA I, while on the Dead Sea escarpment it was 54%; in the Ghor it was 67% and in the semi-desert transitional zone it was 71%. In stark contrast, of the fifteen sites settled north of Wadi Mujib, not one was abandoned.

Iron Age II

IA II was a period of significant expansion outside the plateau highlands with the total number of sites more than doubling from IA I. A majority (55%) of sites were in new locations. Of these, 79% were in the *wadis* and Dead Sea escarpment. North of Wadi Mujib, all of the IA I sites continued to be occupied, in addition to the establishment of two sites in new locations. Like the EBA, IA II was a period of significant abandonment. 73% of all Iron II sites were abandoned by the Persian period. Abandonment was most dramatic in the Ghor, along the Dead Sea escarpment, north of the Mujib and in Wadi Hasa, with 93% of all sites in these locations being abandoned. Of particular note is a cluster of ninety-five sites (27% of all IA II sites) within a 17 km² area near the head of Wadi Hasa (**Fig. 7**) that were abandoned at this time.

Discussion

The shifting pattern of settlement during the Bronze and Iron Ages has been the focus of many investigations. While abandonments were common in each period, the very large number of sites abandoned during the EBA has been the focus of particular interest. When we



7. Iron Age sites clustered near the head of Wadi Hasa: Iron I = white squares; Iron II = black triangles.

examine EBA abandonment at the level of individual sites (i.e. the total raw count of abandonments), the pattern suggests that the desert and semi-desert regions were preferred locations in the EBA. However, when we look at the distribution of new and existing sites, very few new site locations were established in the eastern region during the EBA. 92% of the EBA desert sites and 75% of the EBA semi-desert sites were in locations that had been occupied during the Chalcolithic. Proxy data indicate that precipitation was high at the end of the Chalcolithic, but began a stepwise trend toward aridity from the beginning of the EBA that culminated in the arid conditions we have today by the EB III. The distribution of new and re-used site locations suggests that during this trend toward aridity, conditions were adequate to support continued settlement in locations already established, while discouraging the establishment of new sites in the arid eastern desert (cf. Gophna 2003). This trend, along with the continued abandonment of the eastern desert throughout the remainder of the EBA and IA, and only minor resettlement in the semi-desert zone during the Iron I, offers additional evidence for climatic influence on settlement in the region. There was a return to the desert during the Persian period, although climate may not have been the driving force behind this resettlement.

An analysis of the sites clustered near the head of Wadi Hasa during the MBA, IA I and IA II also reveals an interesting trend. The degree to which this area was settled in new locations and the rate at which those sites were abandoned is striking. Though there were only six MBA sites in this location, all six sites were in new locations and all were abandoned by the end of the MBA. Of the 30 IA I sites located in this region, 71% were new settlements. Of the new settlements, 68% were abandoned, and 68% of all sites in the cluster were abandoned. During the IA II, of the 95 sites in the area, 76 (80%) were in new locations and all 95 were abandoned. The abundance of springs in the area undoubtedly contributed to the favorability of the location and may explain the frequent shifting of sites to new locations as settlers sought out productive springs. MacDonald (2002) suggests that springs may have been more numerous and stronger flowing during the IA around

Busayra, south of Wadi Hasa. In addition to the role that water may have played, it has also been suggested that Wadi Hasa was settled out of necessity owing to the more favorable highland locations already being “filled up” (Harlan 1988: 47). Though the region south of the Wadi Hasa channel is outside the area of this investigation, a review of site data in that region found that in contrast to the dense settlement on the north side of the Wadi Hasa canyon during the IA, very few sites were located on the south side of the canyon and the adjacent plateau.

Throughout the Bronze and Iron Ages, the different rates of abandonment for new locations versus re-used locations reveal an interesting pattern. During the two periods when site abandonment was the greatest (EBA and IA II), re-used locations were abandoned at a higher rate than new site locations. In contrast, during the MBA, LBA and IA I when the overall rate of abandonment was considerably less, sites in new locations were abandoned at a higher rate than those in existing locations. If the hypothesis proposed in the preceding paragraph is correct, the lower rate of new site abandonment during the EBA can be attributed to the careful selection of locations for those sites (on the plateau highlands) that were better suited to withstand periods of aridity. The lower rate of abandonment of sites in new locations during the IA II seems unrelated to climate and needs further analysis. The higher rate of abandonment of new site locations during the MBA, LBA and IA I may indicate that the more suitable locations for sites were those that had already been settled in earlier periods. Additional analysis of the physical environment associated with each of the abandoned locations is recommended to determine if the micro-climate (e.g. prevailing winds) and access to essential resources (e.g. water) were unfavorable and / or limited, and inadequate to sustain settlement in those locations.

A final observation is the increase in settlement north of Wadi Mujib during the IA, primarily through the establishment of sites in new locations. Though the area had been settled prior to the IA (five sites in the EBA, one site in the MBA and one site in the LBA), the increase in the number of sites (15 in the IA I and 17 in the IA II), with the majority of those sites in new lo-

cations (65%), suggests a rise in the importance of the area during the IA (cf. Routledge 2004). This corresponds well with events in the region as described in the text of the Mesha inscription (see Dearman 1989), the Kurkh monolith (see Sayce 1889) and 2 Kings 3 in the Hebrew Bible.

Conclusion

Settlement patterns observed through the occupational histories of individual sites have revealed details not visible at a regional scale. At the regional scale, it can appear as if all types of sites were part of major shifts in settlement (e.g. a move out of the desert, or converging into a small area near the head of Wadi Hasa). However, when individual sites are observed, it is clear that the uniformity observed at a macro level disappears at the micro level with changes in settlement location being different for sites established in new locations, compared to sites established in re-used locations. Where settlement shift on the plateau highlands typically involved sites from both new and re-used locations, shifts in settlement outside the highlands (e.g. occupation of the region north of Wadi Mujib and the abandonment of the eastern desert), almost always involved an overwhelming majority of sites from either those occupying new locations or those occupying re-used locations, not both.

This investigation considered the physical environment associated with site locations. The data suggested that decisions about where to settle during some periods were associated with changes in the physical environment (e.g. no new settlement in the eastern desert during the EBA), while in other periods decisions appeared unrelated to the physical environment (e.g. settlement of the region north of Wadi Mujib during the Iron Age). Additional work at the level of individual sites is needed to explore other factors (e.g. geopolitics and microenvironments) that may have influenced the decision to settle new locations as well as abandon existing locations.

Mark D. Green
Indiana State University
Department of Earth and Environmental Systems
Terre Haute, IN 47809
USA

Bibliography

- Adams, R.B. (ed.)
2008 *Jordan, An Archaeological Reader*. London, Equinox.
- 'Ain
1960 *Aramco World* 11 (6), 20-21.
- Atallah, M.
1991 Origin and Evolution of the Dead Sea *Geology of Jordan*: 15-19. Amman, Al Kutba.
- Bar-Matthews, M. and Ayalon, A.
2004 Speleothems as palaeoclimate indicators, a case study from Soreq Cave located in the Eastern Mediterranean Region, Israel. Pp. 363-391 in R. W. Battarbee, F. Gasse and C. E. Strickley (eds.), *Past Climate Variability through Europe and Africa*. Dordrecht, Springer.
- Bar-Matthews, M., Ayalon, A. and Kaufman, A.
1998 Middle to Late Holocene (6,500 Yr. Period) Palaeoclimate in the Eastern Mediterranean Region from Stable Isotopic Composition of Speleothems from Soreq Cave, Israel. Pp. 203-214 in A. S. Issar and N. Brown (eds.), *Water, Environment and Society in Times of Climatic Change*. Dordrecht, Netherlands, Kluwer Academic Publishers.
- Bayer, H.J., El-Isa, Z., Ringle, K. and Saffarini, G.
1988 Tensional and Strike-Slip Tectonics in the Karak Area (SE Dead Sea Region) - Results from Tectonic and Photogrammetric Investigations. *Neues Jahrbuch für Geologie und Paläontologie. Monatshefte* 4: 223-232.
- Bienkowski, P.
1992 The Beginning of the Iron Age in Southern Jordan, A Framework. Pp. 1-12 in P. Bienkowski (ed.), *Early Edom and Moab, The Beginning of the Iron Age in Southern Jordan* Vol.7. Sheffield, J.R. Collis Publications.
- 2000 Transjordan and Assyria. Pp. 44-58 in J. A. Sauer, L. E. Stager, J. A. Greene and M. D. Coogan (eds.), *The archaeology of Jordan and beyond, essays in honor of James A. Sauer*. Winona Lake, Ind., Eisenbrauns.
- 2001 The Iron Age and Persian Periods in Jordan. Pp. 265-274 in A. Hadidi (ed.), *SHAJ* Vol. VII. Amman, Department of Antiquities of Jordan.
- 2002a *Busayra, Excavations by Crystal-M. Bennett 1971-1980*. Oxford, Oxford University Press.
- 2002b Conclusions. Pp. 475-482 in P. Bienkowski (ed.), *Busayra, Excavations by Crystal-M. Bennett 1971-1980*. Oxford, Oxford University Press.
- 2008 The Persian Period. Pp. 335-352 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London, Equinox.
- Bienkowski, P., Oakeshott, M. F. and Berlin, A. M.
2002 The Pottery. Pp. 233-351 in P. Bienkowski (ed.),

- Busayra, *Excavations by Crystal-M. Bennett 1971-1980.* Oxford, Oxford University Press.
- Boling, R.
1988 *The Early Biblical Community in Transjordan.* Sheffield, Almond Press.
- Bourke, S.
2008 The Chalcolithic Period. Pp. 109-160 in R. B. Adams (ed.), *Jordan, An Archaeological Reader.* London, Equinox.
- Brayshaw, D., Black, E., Hoskins, B. and Slingo, J.
2011 Past climates of the Middle East. Pp. 25-50 in S. Mithen and E. Black (eds.), *Water, Life and Civilization, Climate, Environment and Society in the Jordan Valley.* New York, Cambridge University Press.
- Brown, G. F., Schmidt, D.L. and Huffman, A.C.
1963 *Geology of the Arabian Peninsula, Shield Area of Western Saudi Arabia.* Washington, D.C., U.S. Government Printing Office.
- Brown, S.H.
2010 *A Reevaluation of Iron Age Fortified Sites on the Eastern Kerak Plateau.* (M.A.), North Carolina State University, Raleigh.
- Burdon, D.J. and Quennell, A.M.
1959 *Handbook of the geology of Jordan to accompany and explain the three sheets of the 1,250,000 Geological map of Jordan east of the Rift by Albert M. Quennell.* Amman?, Govt. of the Hashemite Kingdom of Jordan.
- Chesson, M.S., Makarewicz, C., Kuijt, I. and Whiting, I.
2005 Results of the 2001 Kerak Plateau Early Bronze Age Survey *Annual of the American Schools of Oriental Research* Vol. 59: 1-62. Boston, American Schools of Oriental Research.
- Cordova, C.E.
2007a The Evolving Landscape of Jordan. The Contributions of Geoarchaeology and Paleoecology. Pp. 69-78 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan.* London, Oakville, CT, Equinox Pub. Ltd.
2007b *Millennial landscape change in Jordan, geoarchaeology and cultural ecology.* Tucson, Ariz., University of Arizona Press.
- Courty, M.A. and Vallverdú, J.
2001 The Microstratigraphic Record of Abrupt Climate Changes in Cave Sediments of the Western Mediterranean. *Geoarchaeology, An International Journal* 16(5): 467-500.
- Daviau, P.M.M. and Chadwick, R.
2007 Shepherds and Weavers in a 'Global Society', Moab in Late Iron Age II - Wadi ath-Thamad Project (Khirbat al-Mudayna). Pp. 309-314 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan.* London, Oakville, CT, Equinox Pub. Ltd.
- Dearman, J.A.
1989 *Studies in the Mesha inscription and Moab.* Atlanta, Ga., Scholars Press.
1992 Settlement Patterns and the Beginning of the Iron Age in Moab. Pp. 65-75 in P. Bienkowski (ed.), *Early Edom and Moab, The Beginning of the Iron Age in Southern Jordan.* Sheffield, J.R. Collis Publications.
1997 Roads and Settlement in Moab. *The Biblical Archaeologist* 60(4): 205-213.
- Dever, W.
2000 Nelson Glueck and the Other Half of the Holy Land. Pp. 114-121 in J. A. Sauer, L. E. Stager, J. A. Greene and M. D. Coogan (eds.), *The archaeology of Jordan and beyond, essays in honor of James A. Sauer.* Winona Lake, Ind., Eisenbrauns.
2003 Structure in the Early Bronze IV Period in Palestine. Pp. 282-296 in T. E. Levy (ed.), *The archaeology of society in the Holy Land* (3rd ed.). London, Continuum.
- Donahue, J.
1985 Hydrologic and Topographic Change During and After Early Bronze Occupation at Bab edh-Dhra and Numeria. Pp. 131-140 in A. Hadidi (ed.), *SHAJ II.* Amman, Department of Antiquities.
- Donahue, J., Peer, B. and Schaub, R.T.
1997 The Southern Dead Sea Plain, Changing Shorelines and Their Impact on Settlement Patterns Through Historical Periods. Pp. 127-136 in A. Hadidi (ed.), *SHAJ VI, Landscape Resources and Human Occupation in the Jordan Throughout the Ages.* Amman, Department of Antiquities.
- Dornemann, R.H.
1983 *The Archaeology of the Transjordan in the Bronze and Iron Ages.* Milwaukee, Milwaukee Public Museum.
- Drinkard, J.F.
1997 New Volute Capital Discovered. *Biblical Archaeologist* 60(4): 249-250.
- Dunbar, B.
2008 *The Dead Sea.* 2013.
- al-Eisawi, D.
1985 Vegetation in Jordan. Pp. 45-48 in A. Hadidi (ed.), *SHAJ II.* Amman, Department of Antiquities of Jordan.
- Esse, D.L.
1989 Secondary State Formation and Collapse in Early Bronze Age Palestine. Pp. 81-96 in P. d. Miroschedji (ed.), *L'urbanisation de la Pales-*

M. Green: An Analysis of the Occupational Histories in Central Jordan Using 'MEGA-Jordan'

- tine a l'age du Bronze Agcien*. Oxford, British Archaeological Reports.
- Falconer, S.
2008 The Middle Bronze Age. Pp. 263-280 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London, Equinox.
- Fales, M.
1990 The rural landscape of the Neo-Assyrian empire, A survey. *Bulletin of the State Archives of Assyria* 4(2): 81-142.
- Finkelstein, I.
1995 Two Notes on Early Bronze Age Urbanisation and Urbanism. *Tel Aviv* 22: 47-69.
- Finkelstein, I. and Lipschits, O.
2011 The Genesis of Moab, A Proposal. *Levant* 43(2): 139-152.
- Foss, J.
2003 Soils of the Karak Plateau. Retrieved January 29, 2013, from <http://vkrp.org/studies/environmental/plateau-soils/>
- Frumkin, A. and Elitzur, Y.
2001 The Rise and Fall of the Dead Sea. *Biblical Archaeology Review* 27(6): 42-50.
- Garfunkel, Z., Zak, I. and Freund, R.
1981 Active Faulting in the Dead Sea Rift. *Tectonophysics* 80: 1-26.
- Genz, H.
2003 Cash Crop Production and Storage in the Early Bronze Age Southern Levant. *Journal of Mediterranean Archaeology*, 16(1): 59-78.
- Ginat, H., Enzel, Y. and Avni, Y.
1998 Translocated Plio-Pleistocene drainage systems along the Arava fault of the Dead Sea transform. *Tectonophysics* 284: 151-160.
- Goodfriend, G.A.
1990 Rainfall in the Negev Desert during the Middle Holocene, based on 130 of organic matter in land snail shells. *Quaternary Research* 34: 186-197.
- Gophna, R.
2003 Early Bronze Age Canaan, Some Spatial and Demographic Observations. Pp. 269-280 in T. E. Levy (ed.), *The Archaeology of Society in the Holy Land* (3rd ed.). London, Continuum.
- Graham, P.
2008 The Early Bronze Age I-III. Pp. 161-226 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London, Equinox.
- Green, M.D.
2002 *A Geographical Analysis of Roman (64 BC) and Umayyad (640-750 AD) Period Site Locations on the Karak Plateau, Jordan*. Ph.D. Dissertation. Indiana State University.
2004 An Analysis of the Possible Influence of Climate of Settlement Shifts across the Karak Plateau and Surrounding Region, Jordan, Chalcolithic through Umayyad Periods. *The Arab World Geographer* 7(3): 193-205.
- Grigson, C.
1995 Plough and Pasture in the Early Economy of the Southern Levant. Pp. 245-268 in T. E. Levy (ed.), *Archaeology of Society in the Holy Land*. London, Leicester University Press.
- Guiraud, R. and Bosworth, W.
1999 Phanerozoic geodynamic evolution of north-eastern Africa and the northwestern Arabian platform. *Tectonophysics* 315: 73-108.
- Gupta, R.P. and Jindal, A.K.
2000 Influence of Buried Topography on Surface Drainage Pattern. *International Journal of Remote Sensing* 21(2): 209-211.
- Hadidi, A.
1982 The Archaeology of Jordan, Achievements and Objectives. *SHAJ I*: 15-21. Amman, Department of Antiquities.
- Harlan, J.
1985 The Early Bronze Age Environment of the Southern Ghor and the Moab Plateau. Pp. 125-129 in A. Hadidi (ed.), *SHAJ II*. Amman, Department of Antiquities.
1988 Natural Resources. Pp. 40-47 in B. MacDonald (ed.), *The Wadi el Hasa Archaeological Survey, 1979-1983, west-central Jordan*. Waterloo, Ont., Canada, W. Laurier University Press.
- Harrison, T., Foran, D. and Graham, A.
2007 Investigating 5,000 Years of Urban History, The Tall Madaba Archaeological Project. Pp. 143-152 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Hazan, N., Stein, M. and Agnon, A.
2005 The late quaternary limnological history of Lake Kinneret (Sea of Galilee), Israel. *Quaternary Research* 63: 60-77.
- Herr, L. and Clark, D.R.
2007 Tall al-'Umayri Through the Ages. Pp. 121-128 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Herr, L. and Najjar, M.
2008 The Iron Age. Pp. 311-334 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London,, Equinox.
- Herr, L.G.
1997 The Pottery. Pp. 228-249 in L. Herr, L. Gera-ty, O. Labianca and R. Younker (eds.), *Madaba Plains Project, The 1989 Season at Tell el*

- 'Umeiri and Vincinity and Subsequent Studies. Berrien Springs, MI, Andrews University Press.
- 2000 The Settlement and Fortification of Tell al-'Umayri In Jordan During the Late Bronze/Iron I Transition. Pp. 167-179 in J. A. Sauer, L. E. Stager, J. A. Greene and M. D. Coogan (eds.), *The archaeology of Jordan and beyond, essays in honor of James A. Sauer*. Winona Lake, Ind., Eisenbrauns.
- Homes-Fredericq, D.
- 2000 Excavating the First Pillar House at Lahun (Jordan). Pp. 180-195 in J. A. Sauer, L. E. Stager, J. A. Greene and M. D. Coogan (eds.), *The archaeology of Jordan and beyond, essays in honor of James A. Sauer*. Winona Lake, Ind., Eisenbrauns.
- 2009 The Iron Age II Fortress of al-Lahun (Moab). Pp. 165-182 in P. Bienkowski (ed.), *Studies on Iron Age Moab and neighbouring areas in honour of Michèle Daviau*. Leuven, Peeters.
- Homes-Fredericq, D., Dapper, M.D. and Vliegheer, B.M.D.
- 1997 Al-Lahun, A Geo-Archaeological Approach of the Belgian Excavations in Jordan *SHAJ VI*: 57-65. Amman, Department of Antiquities.
- Horowitz, A.
- 1987 Palynological Evidence for the Age and Rate of Sedimentation Along the Dead Sea Rift, and Structural Implications. *Tectonophysics* 141 (1-3): 107-115.
- Husein, A.I., al-Hamoud, A.S., al-Tarazi, E. and Nusier, O.K.
- 1995 Probabilistic Seismogenic Ground Motion Hazard Assessment of Karak City in Jordan. *Environmental and Engineering Geoscience*, 1(2): 207-218.
- el-Isa, Z.H.
- 1984 Earthquake Studies of Some Archaeological Sites in Jordan. *SHAJ II*: 229-235. Amman, Department of Antiquities.
- el-Isa, Z.H. and Shanti, A.A.
- 1989 Seismicity and Tectonics of the Red Sea and Western Arabia. *Geophysical Journal* 97: 449-457.
- Issar, A.S. and Brown, N.
- 1998 *Water, Environment and Society in Times of Climatic Change*. Dordrecht, Netherlands, Kluwer Academic Publishers.
- Jenny, H.
- 1941 *Factors of Soil Formation*. New York, McGraw-Hill Publishers.
- Ji, C.H.C.
- 2007 The 'Iraq Al-Amir and Dhiban Plateau Regional Surveys. Pp. 137-142 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Jussim, S.Z. and Green, C.M.
- 1999 Tectonic History and Hydrocarbon Potential of Northern Arabia. *American Association of Petroleum Geologists* 83(8): 1319-1320.
- Karcz, I., Karfi, U. and Meshel, Z.
- 1977 Archaeological Evidence for Subrecent Seismic Activity Along the Dead Sea - Jordan Rift. *Nature* 29: 234-235.
- Khalil, B.
- 1992 *The Geology of the Ar Rabba Area*. Amman, Natural Resources Authority.
- Kotter, W.
- 2009 Jordan, an archaeological reader. *Choice*, 46(11): 2163-2164.
- LaBianca, O.S. and Younker, R.W.
- 1995 The Kingdoms of Ammon, Moab, and Edom, The Archaeological of Society in the Late Bronze/Iron Age Transjordan (ca. 1400-500 BC). Pp. 402-410 in T. E. Levy (ed.), *The archaeology of society in the Holy Land*. New York, NY, Facts on File.
- 2003 The Kingdoms of Ammon, Moab and Edom, The Archaeology of Society in Late Bronze/Iron Age Transjordan (ca. 1400-500 BC). Pp. 319-415 in T. E. Levy (ed.), *The Archaeology of Society in the Holy Land* (3rd ed.). London, Leicester University Press.
- Lancaster, W. and Lancaster, F.
- 1999 *People, Land and Water in the Arab Middle East. Environments and Landscapes in the Bilad ash-Sham*. Amsterdam, Harwood Academic Publishers.
- Lev-Tov, J.S.E., Porter, B.W. and Routledge, B.E.
- 2011 Measuring Local Diversity in Early Iron Age Animal Economies, A View from Khirbat al-Mudayna al-'Aliya (Jordan). *BASOR* 361: 67-93.
- Levy, T.E., Daviau, P.M.M., Younker, R. and Shaer, M.
- 2007 *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Lipiński, E.
- 2006 *On the skirts of Canaan in the Iron Age, historical and topographical researches*. Leuven; Dudley, MA, Peeters.
- MacDonad, M. and Partners.
- 1973 *Mujib and Southern Ghors Irrigation Project* (Vol. 3). Amman, Natural Resources Authority.
- MacDonald, B.
- 2002 The Hinterland of Busayra. Pp. 47-52 in P. Bienkowski (ed.), *Busayra, Excavations by Crystal-M. Bennett 1971-1980*. Oxford, Oxford University Press.

M. Green: An Analysis of the Occupational Histories in Central Jordan Using 'MEGA-Jordan'

- 2007 Four Archaeological Surveys in Southern Jordan. Pp. 161-167 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Macumber, P.G., Edwards, P.C., Head, M.J. and Lakey, R.C.
 - 1997 Physical Environment and Occupation in the Tabaqat Fahl Region, Jordan Over the Last Half Million Years, *Landscape Resources and Human Occupation in Jordan Throughout the Ages. SHAJ VI*: 97-92. Amman, Department of Antiquities.
- Mansoor, N.
 - 1999 Strike-Slip to Dip-Slip Strain Transfer in an Actively Subsiding Pullapart Basin along the Dead Sea Transform, Aqaba, Jordan. *American Association of Petroleum Geologists* 83(11): 1891.
- Mattingly, G.L.
 - 1997 A new agenda for research on ancient Moab. *Biblical Archaeologist* 60(4): 214-221.
- McGovern, P.
 - 1987 Central Transjordan in the Late Bronze and Early Iron Ages, An Alternative Hypothesis of Socio-Economic Transformation and Collapse. Pp. 267-274 in A. Hadidi (ed.), *SHAJ III*. Amman, Department of Antiquities.
- Mechie, J. and el-Isa, Z.H.
 - 1988 Upper Lithospheric Deformations in the Jordan - Dead Sea Transform Regime. *Tectonophysics*, 153, 153-159.
- Miller, J.M. and Pinkerton, J.M.
 - 1991 *Archaeological survey of the Kerak Plateau, conducted during 1978-1982 under the direction of J. Maxwell Miller and Jack M. Pinkerton*. Atlanta, Ga., Scholars Press.
- Miroschedji, P.D.
 - 1999 Yarmuth, The dawn of city-states in southern Canaan. *Near Eastern Archaeology* 62(1): 2-19.
 - 2009 Rise and Collapse in the Southern Levant in the Early Bronze Age. *Scienze Dell'Antichita* 15: 101-129.
- Netser, M.
 - 1998 Population Growth and Decline in the Northern Part of Eretz-Israel during the Historical Period as Related to Climate Changes. Pp. 129-145 in A. S. Issar and N. Brown (eds.), *Water, Environment and Society in Times of Climatic Change*. Dordrecht, Netherlands, Kluwer Academic Publishers.
- Neumann, F.H., Kagan, E.J., Schwab, M.J. and Stein, M.
 - 2007 Palynology, sedimentology and palaeoecology of the late Holocene Dead Sea. *Quaternary Science Review* 26: 1476-1498.
- Nissenbaum, A.
 - 1994 Sodom, Gomorrah and the Other Lost Cities of the Plain – A Climatic Perspective. *Climatic Change* 26: 435-446.
- Odeh, S. and Salameh, H.
 - 1988 Geomorphological and Sedimentological Changes of Wadi Muchaires Delta on the Eastern Coast of the Dead Sea. *Dirasat (in Arabic)* 15, cited in Salameh, 1997.
- Ovadia, E.
 - 1992 The Domestication of the Ass and Pack Transport by Animals, A Case of Technological Change. Pp. 19-28 in O. B.-Y. a. A. M. Khazanov (ed.), *Pastoralism in the Levant, Archaeological Materials in Anthropological Perspectives*. Madison, Wisconsin Prehistory Press.
- Palumbo, G.
 - 2008 The Early Bronze Age IV. Pp. 227-262 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London, Equinox.
- Palumbo, G. (ed.)
 - 1994 *JADIS, the Jordan Antiquities Database and Information System, a summary of the data*. Amman, Jordan, Department of Antiquities of Jordan, American Center of Oriental Research.
- Parker, S.T. and Betlyon, J.W.
 - 2006 *The Roman frontier in central Jordan, final report on the Limes Arabicus Project, 1980-1989*. Washington, D.C., Dumbarton Oaks Research Library and Collection.
- Porter, B., Routledge, B., Steen, D. and al-Kawamlha, F.
 - 2007 The Power of Place, The Dhiban Community through the Ages. Pp. 315-322 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Porter, B.W.
 - 2009 Testing the Limits of Nonzero, Cooperation, Conflict, and Hierarchy in Ancient Near Eastern Marginal Environments. Pp. 149-171 in K. E. Browne and B. L. Milgram (eds.), *Cooperation in Economy and Society. Research in Economic Anthropology* (Vol. 26). Lanham, MD, AltaMira Press.
- Powell, J.H.
 - 1988 *The Geology of the Karak Plateau*. Amman, Natural Resources Authority.
- Raikes, R.
 - 1985 The Climate and Hydrological Background to the Post Glacial Introduction of Farming in the Middle East and its Subsequent Spread, With Examples from Jordan. Pp. 267-272 in A. Hadidi (ed.), *SHAJ II*. Amman, Department of Antiquities.

- Richard, S. and Long, J.C.
2007 Khirbat Iskander, A City in Collapse at the End of the Early Bronze Age. Pp. 269-276 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Robbins, M.
2001 *Collapse of the Bronze Age, The Story of Greece, Troy, Israel, Egypt, and the Peoples of the Sea*. Lincoln, NE, iUniverse.
- Robinson, S., Black, S., Sellwood, B. and Valdes, P.J.
2011 A review of palaeoclimates and palaeoenvironments in the Levant and Eastern Mediterranean from 25,000 to 5,000 BP, setting the environmental background for the evolution of human civilization. Pp. 71-93 in S. Mithen and E. Black (eds.), *Water, Life and Civilization, Climate, Environment and Society in the Jordan Valley*. New York, Cambridge University Press.
- Rosen, A.M.
1998 Early to Mid-Holocene Environmental Changes and Their Impact on Human Communities in Southeastern Anatolia. Pp. 215-240 in A. S. Issar and N. Brown (eds.), *Water, Environment and Society in Times of Climatic Change*. Dordrecht, Netherlands, Kluwer Academic Publishers.
- Rosen, S.A.
1995 The Social Response to Environmental Change in Early Bronze Age Canaan. *Journal of Anthropological Research* 14: 26-44.
1997 *Lithics after the Stone Age, A Handbook of Stone Tools from the Levant*. London, Altamira.
- Routledge, B.E.
2004 *Moab in the Iron Age, hegemony, polity, archaeology*. Philadelphia, University of Pennsylvania Press.
- Salameh, H.R.
1997 Geomorphology of the Eastern Coast of the Dead Sea, Jordan. *GeoJournal* 41(3): 255-266.
- Sauer, J.A.
1986 Transjordan in the Bronze and Iron Ages, A Critique of Glueck's Synthesis. *BASOR* 263: 1-26.
- Savage, S.H., Falconer, S. and Harrison, T.
2007 The Early Bronze City States of the Southern Levant, Neither Cities or States. Pp. 285-297 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Sayce, A.H.
1889 *Records of the past, being English translations of the ancient monuments of Egypt and western Asia*. London, S. Bagster and Sons.
- Schaub, T.R. and Chesson, M.S.
2007 Life in the Earliest Walled Towns on the Dead Sea Plain. Pp. 245-252 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Sebag, D.
2005 The Early Bronze Age Dwellings in the Southern Levant. *Le Bulletin du Centre de recherche français à Jérusalem* 16: 222-235.
- Shehadeh, N.
1984 The Climate of Jordan in the Past and Present. Pp. 26-35 in A. Hadidi (ed.), *SHAJ II*. Amman, Department of Antiquities.
- Sneh, A.
1996 The Dead Sea Rift, Lateral Displacement. *Tectonophysics* 263: 277-292.
- Strange, J.
2008 The Late Bronze Age. Pp. 281-310 in R. B. Adams (ed.), *Jordan, An Archaeological Reader*. London, Equinox.
- Swinnen, I.M.
2009 The Iron Age I Settlement and Its Residential Houses at al-Lahun in Moab, Jordan. *BASOR* 354: 29-53.
- Tarawneh, B.
1991 *The Geology of At-Tafela*. Amman, Natural Resources Authority.
- Wdowinski, S. and Zilbermann, E.
1996 Kinematic modelling of large-scale structural asymmetry across the Dead Sea Rift. *Tectonophysics* 266: 187-201.
- Wilkinson, T.J.
2003 *Archaeological landscapes of the Near East*. Tucson, University of Arizona Press.
- Younker, R.W.
2007 Highlights from the Heights of Jalul. Pp. 129-135 in T. E. Levy, P. M. M. Daviau, R. Younker and M. Shaer (eds.), *Crossing Jordan, North American contributions to the archaeology of Jordan*. London, Oakville, CT, Equinox Pub. Ltd.
- Zohary, M.
1973 *Geobotanical foundations of the Middle East*. Stuttgart, G. Fischer.

TALL ABŪ AL-KHARAZ - THE SWEDISH JORDAN EXPEDITION 2012: FIFTEENTH SEASON PRELIMINARY EXCAVATION REPORT

Peter M. Fischer and Teresa Bürge

Introduction

The fifteenth season of excavation at Tall Abu al-Kharaz was carried out with the kind support of the Department of Antiquities of Jordan between 23 September and 18 October 2012.

The 2012 season was devoted to the earliest Iron Age occupation of the site, which was discovered in 2009 in Area 9 and further exposed in 2010 and 2011 (Fischer and Feldbacher 2010, 2011; Fischer and Bürge 2012). A 46 m long two-storey compound with 22 rooms from the conventional Iron Age I period, *viz.* the local Phase IX, has partly been exposed. The study of the unique cell-plan architecture and new material for a refined stratigraphy¹, including the collection of first-class radiocarbon samples from primary floor contexts, were amongst the main objectives of the 2012 season of excavation. Numerous radiocarbon dates of short-lived samples from Phase IX point to a date around 1100 BC for the destruction of the compound.

The 2012 team consisted of 23 persons including P. M. Fischer (director), T. Bürge (assistant field director), H. Ta'ani (foreman, trench supervisor) and M. al-Bataineh (surveyor, draughtsperson). Trench supervisors were D. Blattner, J. van der Does, K. Heiss, S. al-Razzaz and K. Sauter. The representative of the Department of Antiquities was R. M. Odat. The expeditions were further backed up by the inspector of Pella, N. Khasawneh. Additional support was provided by S. Esbeihat (cook) and Y. Suleiman Musa (pottery washing). Ten local workers from Pella, Mashare' and Yabis were engaged in the excavations.

The Royal Court, represented by HRH Prince Raad Ibn Zaid and HRH Princess Majda Raad again showed interest in our work and provided support.

Results from the 2012 excavations in Area 9: Trenches LIXA – E (Fig. 1)

Background

The two-storey, cell-plan compound, which was exposed between 2009 and 2011, dates to the Iron Age I according to 15 radiocarbon dates from the floor of Phase IX which are all between roughly 1200 - 1000 BC. Fourteen rooms of this early Iron Age compound were exposed from 2009 to 2011, represented by Trenches LI – LV with a total length of 28 m. The rooms were covered by thick debris of burnt charcoal and mudbricks and were totally undisturbed after a severe conflagration that brought Phase IX to an end. Amongst the finds were around 180 intact or complete ceramic vessels, in addition to metal objects, textile production tools, faience vessels, stone tools, beads and scarabs and a *tannur*. Some of the vessels contained organic remains, for instance wheat, barley, millet, chickpeas, olives and the dried remains of olive oil, and even barley flour. The results from the previous season encouraged us to extend the 2012 excavations eastwards (Trenches LIXA - E). The Phase IX compound is now exposed for a length of 46 m (Fig. 2).

Iron Age II (early)

Phase XI

Only a few loci and some walls were exposed

1. This information is published in the third volume on Tall Abu al-Kharaz, *viz.* The Iron Age (Fischer in press). The first two volumes are on the Early Bronze

Age (Fischer 2008) and on the Middle and Late Bronze Ages (Fischer 2006).

-286-

before the excavations came to a halt. These are W683 and 684 in the northern part (TLIXC) of the exposed area where parts of a *tabun* north of W683 were also exposed. An interesting find from this area was a jar with red decoration on the rim and shoulder (L355-3). Instead of the usual and very regular ‘framed wavy-line’ decoration, the wavy line is irregular and almost resembles the imitation of a script (cf. the jar found in Phase X [see Fischer and Feldbacher 2011: 379, FIG. 2:1]). According to the pottery and radiocarbon determinations, this stratum belongs to the end of Iron Age I or possibly the beginning of Iron Age II.

Iron Age I Phase X (Fig. 3)

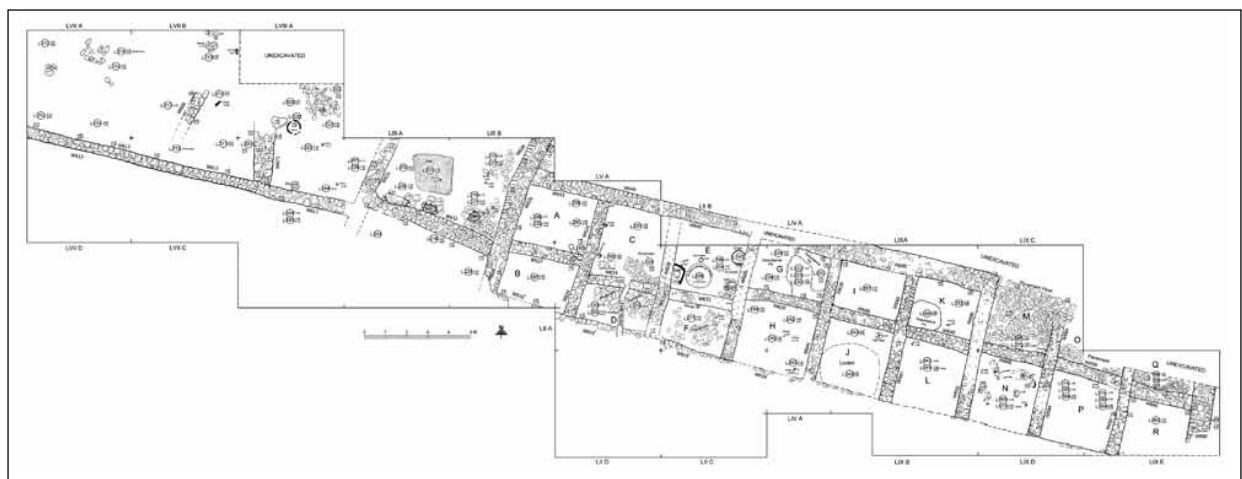
The architecture of this phase is located in the eastern part of the exposed area (TLIVA and TLIXA - E) and is characterised by the re-use of virtually all Phase IX walls. However, it is clear from various sections that the Phase X walls are slightly wider and built of stone and mudbrick.

East of the walled spaces (Rooms A - H) already excavated, ten more were exposed in 2012 (Rooms I - R). The four rooms in the west (Rooms I - L) are arranged in pairs and have beaten earth floors. The southern of the three pairs of the eastern rooms (Rooms N, P and R) have earth floors. The northern rooms (Rooms M, O and Q) are only partly excavated and show

stone pavements most likely representing courtyards. The easternmost wall of the compound is noticeably wider than the others and seems to represent the eastern limits of the compound.

Room J was affected by looting in 2009 and only a few *in situ* finds were recovered. In Room K, a pit 0.6 m deep did not yield any finds. An arrowhead of bronze (N1433) was found next to the pit and a spindle whorl / loom weight of stone was found in Room L (N1428)². Room N, which was covered by a layer of broken mudbrick debris from the roof construction, and charcoal and ash, contained two skeletons. These individuals obviously died in the collapsed building as their bones were blackened by fire. According to the preserved skeletal remains and teeth one skeleton is male, around 30 years old, the other is female, around 25 - 30 years old. Other finds from this room are a *tabun*, a pestle of basalt (N1440), a Philistine-style jug with white slip (L370-1), a cooking jug (L370-2) and several jars and storage jars (one of them is L370-4). Room P contained a spool-shaped, Aegean-type, loom weight of unfired clay (N1447). It should be highlighted that unfired pottery was found in several rooms, which demonstrates local production of pottery.

It can be concluded from the thick layer of destruction debris that, as previously suggested (Fischer and Feldbacher 2011: 380), the Phase X settlement was destroyed in a severe catastrophe.



3. Iron Age I Phase X compound (drawn by M. al-Bataineh).

2. This spindle whorl is of Early Bronze Age date but was reused in Phase X.

Phase IX (Fig. 2)

Seven more rooms were exposed in the eastern part of the compound (R15 - 21). During the excavations it became clear that Rooms 15 and 17 are built directly on or against the bedrock, which slopes upwards to the east and north. Therefore the easternmost three rooms to the south (R19 - 21) are single rooms with no counterparts to the north. They are also built directly on and against the bedrock.

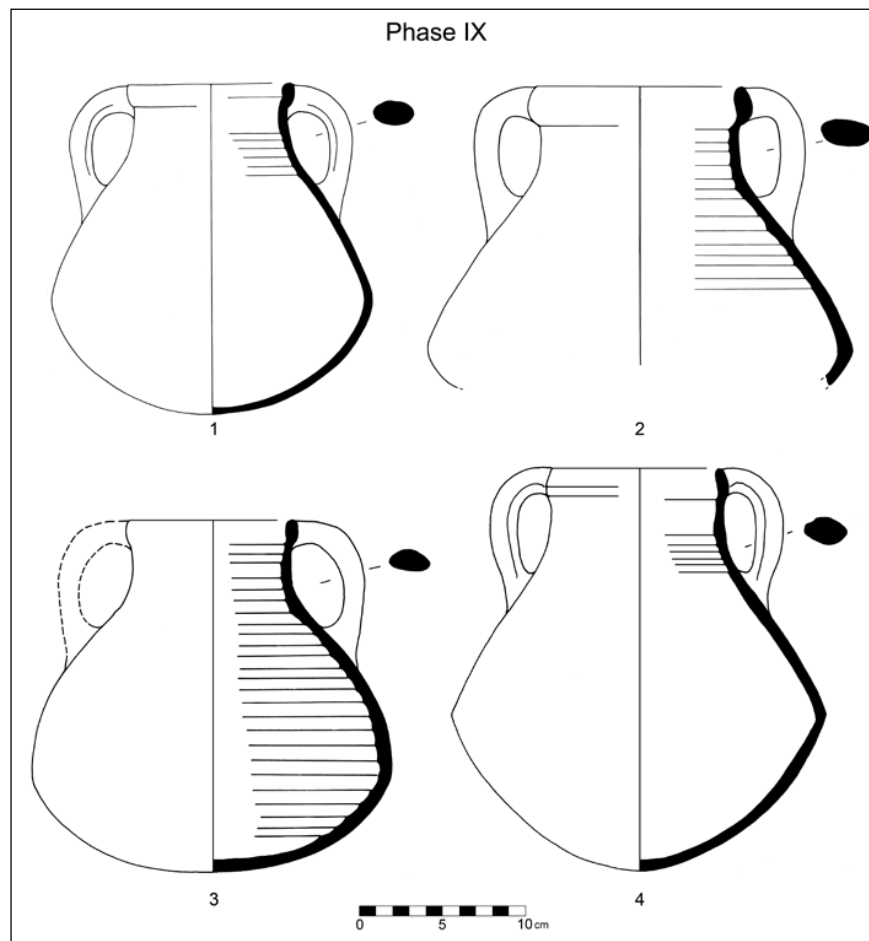
Room 15 contained a small weight of haematite (N1441), a pyxis of clay (N1442), a spindle whorl of calcite (N1443), an almost complete cooking jug (L369-1; see the cooking jugs from Phase IX in Fig. 4), several cooking pots and a pyxis of elongated shape (L369-6; see the pyxides from Phase IX in Fig. 5).

Room 16 was connected with Room 15 but the doorway was blocked with stones. Room 16 was partly looted and only its northernmost part was still intact. In this room a small hand-made

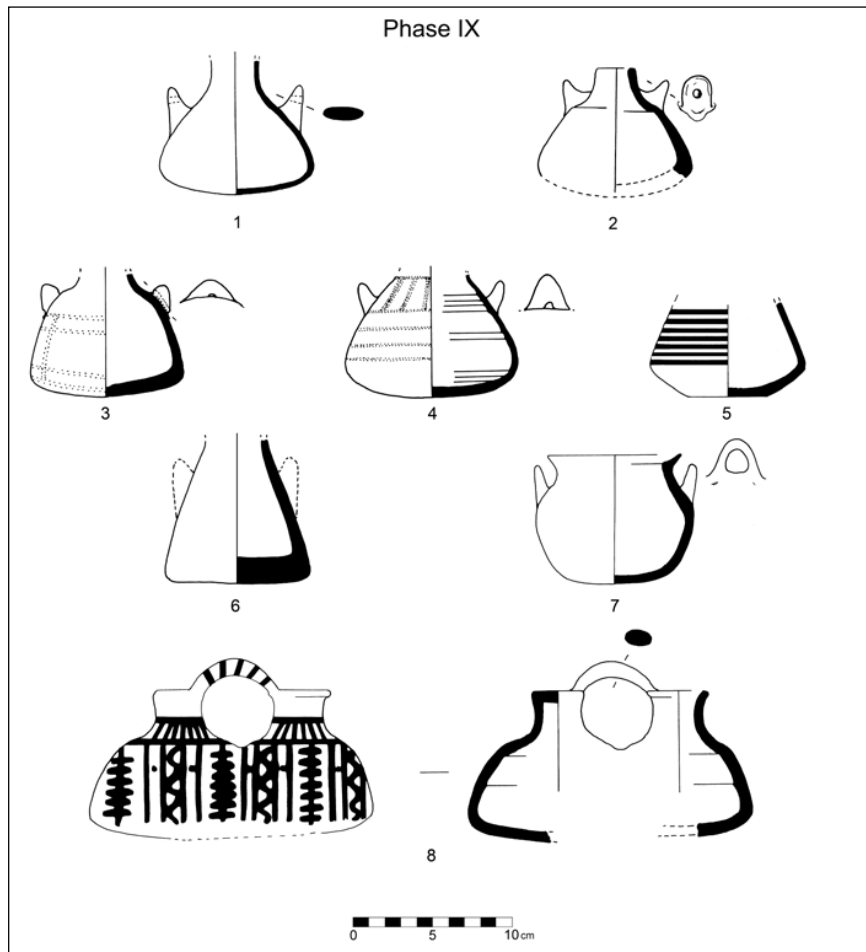
juglet of unfired or very soft-fired clay (N1432) and a tube of polished bone, maybe a spindle handle (N1439), were found. A collapsed *tabun* with a chimney was exposed on the floor of the basement of this room.

Room 17 contained pieces of unfired pottery, which again point to local pottery production. An open doorway connected this room with Room 18 (in W690).

In Room 18 three *tananir* were exposed. One of them was complete (L354-7) leaning against W692. It has a handle, which is the first ever found on a *tannur* at Tell Abu al-Kharaz (Fig. 6). Other finds in this room included a hand-made juglet of unfired clay (N1429), two small hand-made bowls of soft-fired clay (N1431, 1436), a lamp (L351-1), a spindle whorl of clay (N1434), a complete jug (N1430), a juglet (L351-3), a decorated pyxis of clay (L358-2), another pyxis (N1435) and a bowl (L358-1) (the last two examples were made of alabaster with incised



4. Iron I Phase IX: cooking jugs (drawn by M. al-Bataineh).



5. Iron Age I Phase IX: pyxides and a double-pyxis (drawn by M. al-Bataineh).



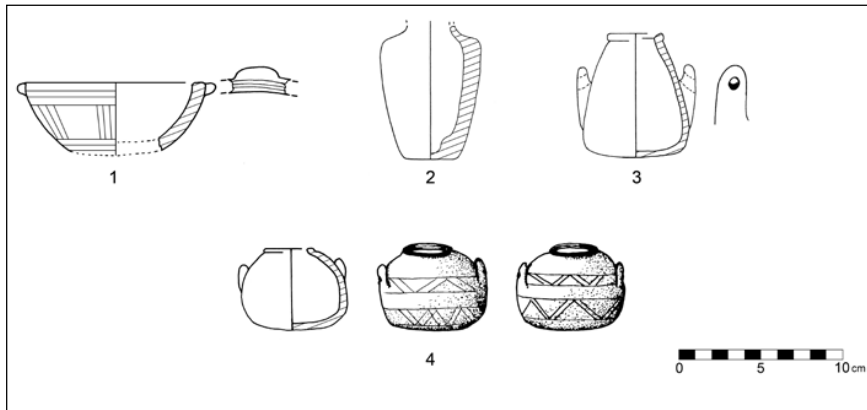
6. Iron Age I Phase IX: tannur with preserved handle (photograph by T. Bürge).

decoration [see the Phase IX alabaster vessels in **Fig. 7**], plus a lid of unfired clay (N1438).

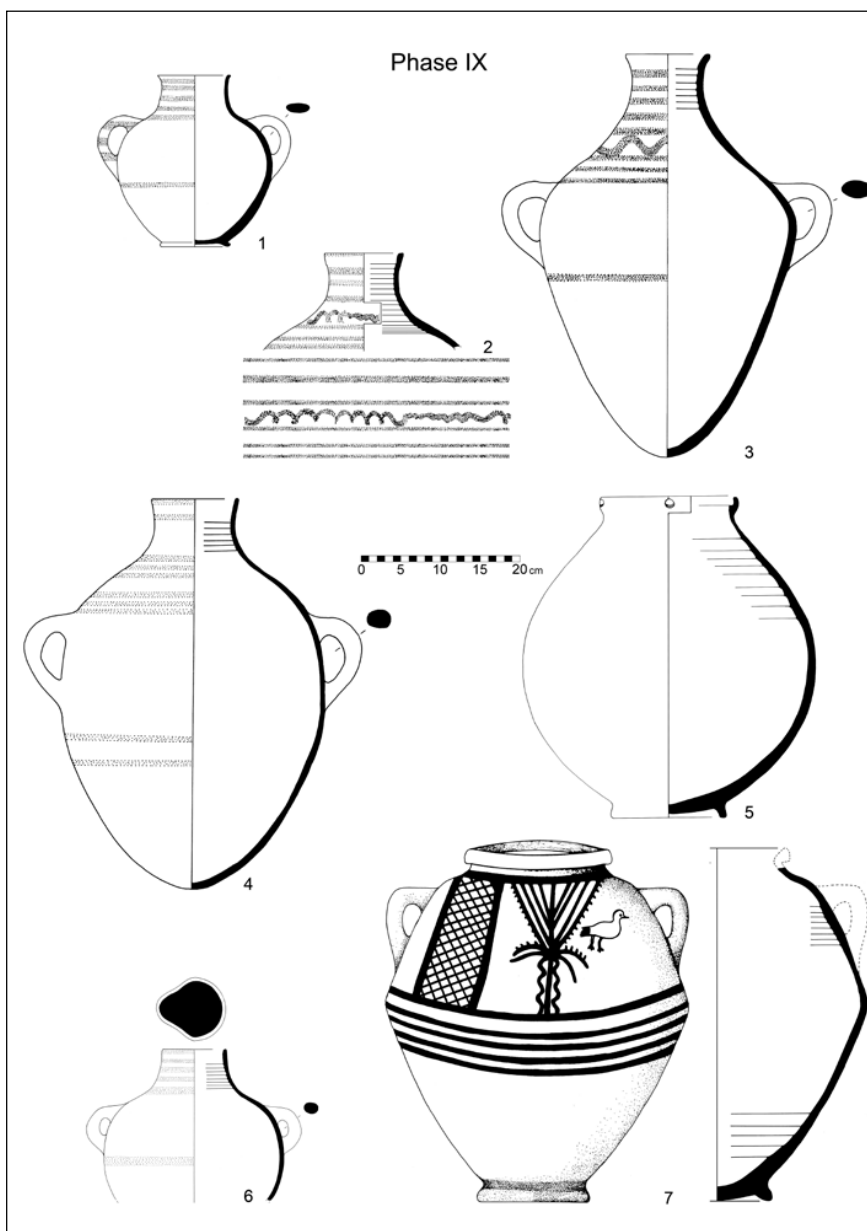
Like Room 18, the next room to the east, Room 19, had no adjacent room to the north. It also contained several installations for heating:

a part of a *tabun*, a *tannur* (L377-4) and an intact small heater (L377-5)³. Other finds included two hand-made bowls (N1446 and L377-7) and a hand-made jug (L377-8), an oval object of unfired clay, maybe a frying pan (L377-6), two spindle whorls of clay (N1445 and 1451), a spindle whorl of sandstone (N1444) and one of stone (N1452), a polished bone-tube with incised decoration (N1448), and a ring-shaped basalt tool with red pigment (N1449) which was possibly used during the pottery-manufacturing process. Other ceramic finds included a small, decorated pilgrim flask of high quality (N1453) and a jug with red decoration (L377-2). The shape of the latter recalls Late Bronze Age shapes (**Fig. 8: 1**). Around one kilogram of barley and wheat seeds was spread on the floor and numerous olive pits were collected in the western part of the room. The barley may have

3. It is unlikely that this object was a *tabun*.



7. Iron Age I Phase IX: alabaster vessels (drawn by M. al-Bataineh).



8. Iron Age I Phase IX: jug and jars (drawn by M. al-Bataineh).

been stored in an organic container. A wooden structure of indistinct shape was exposed close to the seeds. Another wooden construction was found around the *tannur*: it possibly served as support. The northern part of this room was built directly on the bedrock, which has a steep slope towards the south. The southern part of the floor of Room 19 was built on a loose fill, which was covered by large sherds and contained a mixture of different seeds, such as lentils, barley and olive pits. A juglet (N1454) was found next to the sherds within the foundation of the floor. Therefore, we conclude that there are two floors present in Room 19.

Room 20 was disturbed by a large animal hole in the southern part. Finds from this room included a spool-shaped, Aegean-type loom weight of unfired clay (N1458), a storage jar (L390-1), a lamp (L397-1) and two hand-made bowls of unfired clay (L391-1, L397-2). Bedrock and a section of the Middle / Late Bronze Age city wall appeared to the north.

The easternmost room of the compound, Room 21, is somewhat different from all the other rooms (**Fig. 9**). It is divided into a northern (R21A) and a southern (R21B) part by W701 with an entrance in the east. As the floor level of Room 21A is some 0.1 – 0.2 m higher than that of Room 21B, a threshold made of mudbrick was found in the doorway. There is a quite unique feature in Room 21A, namely two 0.8 m deep basins made of unfired clay. The walls around them are covered with a fine layer of clay plaster. Remains of barley / wheat seeds show that at least one of the basins was used for the storage of grain. Two metal finds were recovered in Room 21A, a toggle pin of bronze and a bead of pierced lead (N1450) resembling a sling bullet. Room 21B was obviously used as a storeroom. It contained two intact vessels, a cooking jug (N1457) and a jar (N1456). Other finds are seven plain storage jars, two small jars, a jug with red decoration on the shoulder resembling a script (L395-5; **Fig. 8: 2**), a jug with a trefoil mouth (L395-4), a small krater and two bowls (L395-1, 3). Of special interest is a large biconical krater depicting palm trees, a bird and geometric elements in the metope style (L395-2; **Fig. 8: 7**). This is one more Early Iron Age product that recalls Late Bronze Age prototypes. Another exceptional find is part of a



9. Iron Age I Phase IX: Rooms 21A with silos and 21B (photograph by P. M. Fischer).

small bronze wheel, which originally had eight spokes. Parallels from Philistine Tel Mique-Ekron are interpreted as parts of four-wheeled cult stands (Dothan 2002: 4–8). Other finds from this room include a basalt mortar, again with traces of red pigment (N1455), a ring-shaped weight (N1461) and a small pendant of stone (N1460). Numerous carbonized chickpeas were found in one vessel.

The eastern wall at the end of the compound, W702, is with its 1.0 m width noticeably wider than all the other walls belonging to the compound. Its width corresponds exactly to that of the Iron Age city wall, W621. On the very last day of excavation, a test trench was opened east of the compound and it became clear that the city wall does not continue east of W702. A preliminary theory is that this opening in the city wall was one of the early Iron Age city gates. The position of the suggested gate is on a more moderate slope of the *tall* facing the Wādī al-Yābis. It would make sense to assume that the main street leading from Wādī al-Yābis to the fortified city centre was here.

Future Objectives

Consolidation of the exposed structures of this unique compound was carried out by the Swedish team after the excavation in autumn 2012. In the future, however, it will be important to ensure an adequate level of preservation through supplementary work. Guarding of the site was undertaken by the Department of Antiquities in 2010 and 2011, but in 2012 no guard was employed by the Department. An application for future guarding has been forwarded to

the Department by the director of the Tall Abu al-Kharaz project and will hopefully be benevolently considered. Further investigations east of the compound where the city gate is suspected are planned to take place in 2013.

Bibliography

Dothan, T.

- 2002 Bronze and Iron Objects with Cultic Connotations from Philistine Temple Building 350 at Ekron. *IEJ* 52/1: 1–27.

Fischer, P.M.

- 2006 *Tell Abu al-Kharaz in the Jordan Valley. Volume II: The Middle and Late Bronze Ages*. Vienna: Austrian Academy of Sciences Press.
2008 *Tell Abu al-Kharaz in the Jordan Valley. Vol-*

ume I: The Early Bronze Age. Vienna: Austrian Academy of Sciences Press.

in press *Tell Abu al-Kharaz in the Jordan Valley. Volume III: The Iron Age*. Vienna: Austrian Academy of Sciences Press.

Fischer, P.M. and Bürge, T.

- 2012 Tall Abu al-Kharaz. The Swedish Jordan Expedition 2011: Fourteenth Season Preliminary Excavation Report. *ADAJ* 56: 467–482.

Fischer, P.M. and Feldbacher, R.

- 2010 Tall Abu al-Kharaz. The Swedish Jordan Expedition 2009: Twelfth Season Preliminary Excavation Report. *ADAJ* 54: 447–460.
2011 Tall Abu al-Kharaz. The Swedish Jordan Expedition 2010: Thirteenth Season Preliminary Excavation Report. *ADAJ* 55: 377–390.

TALL ABŪ AL-KHARAZ: THE SWEDISH JORDAN EXPEDITION 2013, SIXTEENTH SEASON PRELIMINARY EXCAVATION REPORT

Peter M. Fischer and Teresa Bürge
With Contributions by A. Lindqvist, B. Stolle and D. Kofel

Introduction

The Swedish excavations at Tall Abū al-Kharaz, a twelve-hectare tall in the central Jordan Valley, continued in 2013 in order to shed further light on the occupational sequence of one of the most dominant cities in the Jordan Valley. The city was first settled around 3150 BC, which corresponds to the conventional Early Bronze Age IB, and subsequently was occupied until Mamluk times (**Table 1**).¹

Table 1: Synopsis of phases of occupation at Tall Abū al-Kharaz from the Early Bronze Age to the Iron Age.

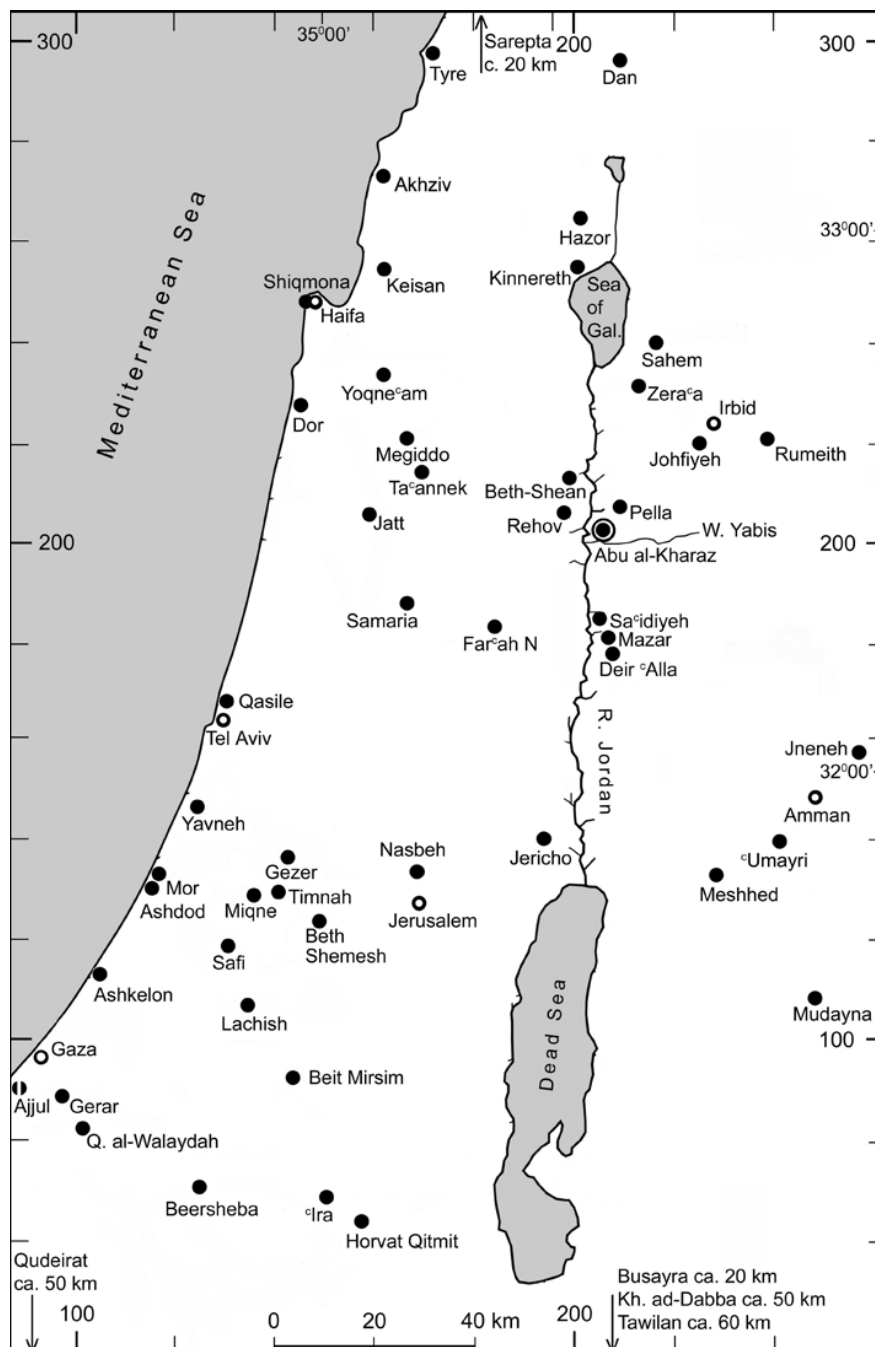
Phases	Dates BC	Periods ²
IA–B	3150–3050	EB IB
IIA–B	3050–3000	EB II
IIIA–B	3000–2900	EB II
Lacuna	2900–1600	EB III–MB II/III
IV/0	18th century	MB I
Lacuna?		MB II
IV/1	c. 1600	MB III
IV/2	1600–1525	MB/LB
V	1525–1450	LB IA
VI	1450–1400	LB IB
VII	1400–1350	LB IB/C–IC
VIII	1350–?	LB IC–II
Lacuna		LB II
IX	1100–1050	IA IB
X	1050? –930	IA IB/(IIA)
XI	930–850	IA IIA
XII	850–800	IA IIA/B
XIII	800–770	IA IIB
XIV	770–732	IA IIB
XV	732–600	IA IIC

The latest five years of excavations were mainly devoted to the investigation of the complete Iron Age sequence which lasted from the 12th century BC until 732 BC, when the city was conquered by the Neo-Assyrians. The main objective of the 16th season of Swedish excavation at Tall Abū al-Kharaz was to investigate the eastern and south-eastern limits of the city. This includes the area east of the 46 m long two-storey compound (Area 9) from Phase IX (Iron Age I from around 1100 BC) with its 20 m long western annex (see Tall Abū al-Kharaz and other important Iron Age sites in **Fig. 1**; plan of the excavated areas in **Fig. 2**). The excavations of this building began in 2009 and lasted until 2012. A total of 21 basement rooms, which correspond to the lower storey and which were arranged in a cell-plan layout, were exposed (preliminary report in Fischer and Feldbacher 2011; final report Fischer 2013: 264–341). The basement walls of the compound were still standing to a height of more than 2 m. Several hundred complete vessels and other objects point to the extensive contacts of a fairly rich society. Contacts with the Aegean and Cyprus through offshoots of the Sea Peoples/Philistines, and with Egypt and Phoenicia, were ascertained (Fischer and Bürge 2013). At the end of the 2012 season of excavation the eastern limit of the compound was reached. In 2011 a western annex was opened which added additional 20 m to the compound (Fischer and Feldbacher 2010 and 2011; Fischer 2012; Fischer and Bürge 2013).

According to the general objectives two new portions of the tall were investigated in 2013:

1. There are some occupational lacunae of which the longest lasted from the Early Bronze Age III until the Middle Bronze Age (see **Table 1**).

2. Pre-Iron Age periodization according to Fischer 2006: 362–374; Fischer 2008: 340–385; Fischer 2013: 516.



1. Iron Age sites in the Southern Levant.

one is to the east of the compound and include Trenches LIXF (Area 9), LXA and B, and LXIA and D (the latter four are in Area 10). The other is on the eastern edge of the upper plateau of the tall in Area 11: here, our intentions were to explore selected parts in order to trace additional Iron Age structures and a possible continuation

of the Phase IX compound from Area 9. The eastern limits of the city have not yet been investigated.³

Another important task was consolidation work on the Iron Age I compound, which started in 2010 and was concluded in 2013. The 21 rooms with walls which are still standing to a

3. Information on all investigated areas of the Early Bronze Age can be found in Tall Abū al-Kharaz, Volume 1 (Fischer 2008), the Middle and Late Bronze

Ages in Volume II (Fischer 2006) and the Iron Age including the recently uncovered Phase IX compound of Area 9 in Volume III (Fischer 2013).

height of more than 2 m were cleaned and consolidated with a fairly soft mixture of approximately one-third each of quartz sand, lime and cement.

al-Shalabi. Additional support was provided by S. Esbeihat (cook), Y. Suleiman Musa (pottery washing) and M. Mohammed Ahmad (transport). Workers from Pella, Mashārī⁶ and Yābis were engaged in the excavations. The Royal Court of Jordan, represented by T.R.H. Prince Raad Ibn Zaid and Princess Majda Raad,⁴ and the Swedish Embassy in Amman, headed by the recently appointed ambassador Helena Grön-dahl Rietz, visited the excavations.

Late Roman, Byzantine and Islamic/Abbasid
(c. 300–969 AD)

4. The expedition is very thankful for the continued support of Their Royal Highnesses.
5. Phase numbers have only been given to settlement periods from the Early Bronze Age (Phase I) until the

Iron Age (Phase XV for the latest Iron Age squatter occupation), i.e. in accordance with the final publications (see Fig. 1).

of this area in Late Roman, Byzantine and Islamic/Abbasid times. The architectural remains are difficult to interpret because of disturbances, rebuilding and the proximity to today's surface.

Iron Age Phase XI (930–850 BC)

The northern part of a walled space which is ascribed to Phase XI has been exposed in Trench LIXE (W697 with parts of the mudbrick superstructure still preserved, W711 and W696). There is a 0.8 m wide entrance in the eastern part of W711. The southern part of this space is not preserved due to erosion. Two hearths belong to this phase.

Phase X (1050–930 BC)

Room P from 2012 was further exposed to the north (W699/725, W722 and W721). It is partly stone-paved. Room Q from 2012 was partially exposed to the north (W697/721, W694/711 and W720). It became evident that the walls and floors of these rooms were built directly on top of the Early Bronze Age II city wall (**Fig. 3**).

Phase IX (1100–1050 BC)

The completely exposed two-storey-cell-plan compound from Phase IX can be seen in **Figs. 4 and 5**. Excavations north of Phase IX Rooms 19, 20 and 21 did not expose additional

structures from this phase. The settlers of the following Phase X obviously removed finds from earlier periods down to the top of the Early Bronze Age city wall.

The Iron Age defence system from Phases IX–XII (1100–800 BC)

These trenches are directly east of the Phase IX compound. Sherds from below colluvial soil date exclusively from the Early Bronze Age (sic!), viz. from Phases I and II. These two phases correspond to the conventional Early Bronze Age IB and II, i.e. roughly 3150–3000 BC.⁶ It could be shown by meticulous stratigraphic investigation that, around 1100 BC, the builders of the Phase IX (Iron Age I) compound cut through the entire Early Bronze Age defence system and deposited the foundation walls of their structures on the same level as the foundation of the Early Bronze Age defence systems.

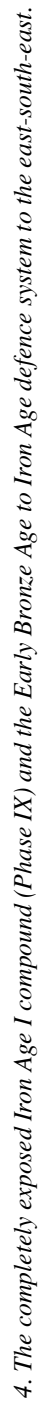
The easternmost wall of the Phase IX compound, W702, was erected approximately 1 m from the Early Bronze Age defence system to the east, which was left intact (**Fig. 5**). After the completion of the two-storey compound the gap towards the Early Bronze Age defence system was filled with stones and mud, which reinforced the Phase IX structures. The original Early Bronze Age structure from Phase II (Early



3. Area 9, Trench LIXE: architecture of Phases IX and X which was built upon the Early Bronze Age II city wall (between red arrows).

6. The Early Bronze Age occupation at Tall Abū al-Kharaz, viz. Phases IA–IIIB, dates from 3150 BC to 2950/2900 BC according to 16 radiocarbon dates; see

Fischer 2008: 381–382; Stadler and Fischer 2008; cf. Fischer and Bürge 2013: Table 1 which provides a short description of all phases.



Bronze Age II) was kept largely as it was designed two thousand years earlier and became an integrated part of the Iron Age defence system. The main east-west running walls of the defence system are still preserved to a height of approximately 3 m (to the north) and the section shows a width of 6 m. There are perpendicular, north-south running, walls and the spaces between them were filled with stones thus creating a defence glacis, which slopes steeply towards the south. At the south-easternmost corner of the upper plateau of the tall the glacis turns sharply towards the north (W714), where it is interrupted by a 2 m wide gap – one of the original Early Bronze Age city gates. The city gate is located at the spot of the settlement which is closest to the Wādī al-Yābis (= Wādī al-Rayyān), the most important water resource for the people of Tall Abū al-Kharaz during all periods. It is most likely that the road to the Wādī al-Yābis started here.

The Phase IB/Early Bronze Age IB city wall (3150–3050 BC)

Test trenches demonstrated that the stone-built defence system of Phase II rests on a substantial mudbrick foundation – the first city wall, which was originally built in Phase IB (**Fig. 6**).⁷ This confirms identical observations from previous seasons (Fischer 2008: 213–214).

An Early Bronze Age II tomb (3050–3000 BC)

A tomb was uncovered just inside the Phase II city wall (**Fig. 7**). An infant skeleton, facing north-west, with badly preserved bones, was unearthed. It was lying on an ellipsoid bed of carefully arranged pebbles in a flexed position with the arms probably crossed over the chest. The estimated age of the infant is 7±1 years according to the eruption sequence of the permanent and the remaining deciduous teeth. The permanent front teeth show 2–3 lines of enamel hypoplasia close to the enamel-cement border which suggest either periods of illness with high fever or nutrition deficiencies, or both (cf. Fischer 1986:12). There were no personal adornments, and the only tomb gift was a large jar of Grain Wash ware. It was obviously broken on purpose during the funeral but almost com-



6. Stone-built Early Bronze Age II city wall from Phase II resting on Early Bronze Age IB city wall made of mudbricks from Phase I, Area 10.

plete. This type of jar appears in both Phases IB and II at Tall Abū al-Kharaz (Fischer 2008: 276–278). However, the stratigraphical position of the tomb only allows a date in Phase II, viz. the Early Bronze Age II (3050–3000 BC).

Test Trenches in Area 11 (Trenches LXIIA and B, LXIIIA–D and LXIVB and C)

Islamic (Abbasid; 750–969 AD)

Abbasid pottery from a domestic context was found all over the area of the test trenches. The limited exposed area does not allow the attribution of certain structures explicitly to this period. Some structures were reused, others were built in this period. Finds include a tabun and hair pin of bronze.

Late Roman (c. 300 AD)

The interpretation of the Late Roman structures, which were discovered in Trenches LXIIIA–D and LXIVB and C, is incomplete because of limitations in exposure and disturbances, especially from the Islamic period. Nevertheless, there is a well-built structure, strictly oriented north–south / east–west, which was

7. The trenches were backfilled at the end of the season

and the original glacis was restored.

entered from the east via a 0.8 m wide entrance. This walled space is preliminarily interpreted as a Late Roman burial place which was reused for domestic purposes in Islamic (Abbasid) times.

Three skeletons were found in the southern part of the exposed area. None show any physical evidence for the cause of death. One is the well-preserved skeleton of a mature female lying in an outstretched west–east position facing south-south-west (**Fig. 8**). She was toothless and suffered from severe degenerative problems with her back and joints, viz. osteoarthritis. There is evidence of severe osteoporosis which is noticeable, for instance, on the scapulae (lower enlarged photo in **Fig. 8**). Some of her vertebrae show a particular degree of osteophytes formation on the articular surface (marginal lipping; upper enlarged photo in **Fig 8**). This pathological finding is certainly the result of the repeated

carrying of heavy loads and other arduous activities, for instance, farming. Her age at death is estimated at around 60 years. The estimation of her stature *in situ* gave 1.6 m. To the west of the mature female is another well-preserved skeleton of an infant lying in an outstretched position facing north. The infant's age at death is within the range of fairly precisely 4–5 years judging by the evolution of the teeth. The erupted dentition consists exclusively of deciduous teeth, 19 in number (tooth 81 is missing). To the south of the mature female is the skeleton of a very young infant, which is poorly preserved. It lay on its stomach in a west–east position. The age at death was 3–4 years to judge from the dentition.

Iron Age Phase XIV (770–732 BC)

A partly excavated walled space of a likely four-room house was exposed in Trenches



7. Early Bronze Age II tomb of an 7±1-year-old infant in Area 10.



8. Late Roman skeleton of an approximately 60-year-old female from Area 11; upper enlarged: vertebra with marginal lipping; lower enlarged: scapula with osteoporosis.

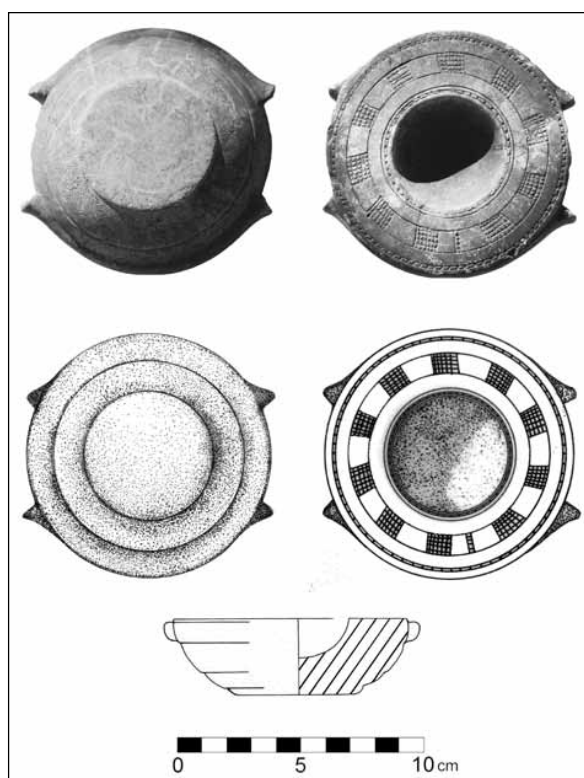
LXIIIA and D, and LXIVB and C. Several complete finds from this room were embedded in a substantial destruction layer with much ash: four juglets, a complete cooking pot (**Fig. 9**) and a hole-mouth jar, and objects which are related to textile production; i.e. spindle whorls, loom weights and shuttles. An extraordinary find is represented by an intact cosmetic palette of limestone (**Fig. 10**) which adds to the three which were discovered during previous season (two of limestone and one of alabaster). The palettes had a double function: they were – as the name implies – used for grinding and mixing cosmetics (or medicines) which would have been placed in the central depression but they also functioned as lids for a (perishable) container when turned upside down (see reconstruction in **Fig. 11**). Other finds to the north of the house are an iron dagger and an iron arrowhead, and another juglet.

Phase XIII (800–770 BC)

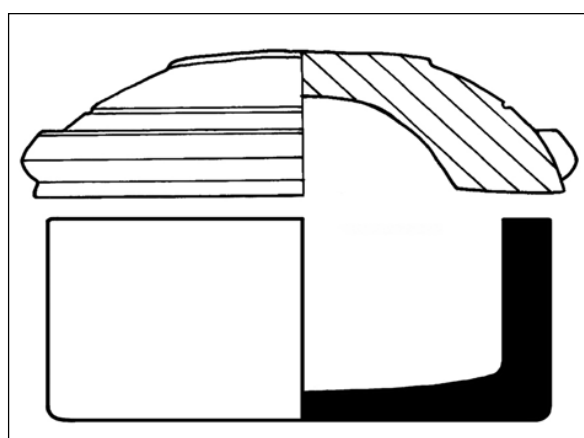
This phase of occupation is represented in Trenches LXIIIA–D and LXIVB and C. The function of several, only partly excavated, walls and stone pavements to the north cannot be interpreted. A small test trench was opened up inside the Phase XIV room (see above). Two interesting finds, which so far are unique at the site, were retrieved from below the floor level of Phase XIV: one is a bichrome-decorated jug (**Fig. 12**), the first of this type from the site, and the other a pierced stamp of limestone with an incised sign (**Figs. 13 and 14**).



9. Iron Age IIB cooking pot from possible four-room-house in Area 11, Phase XIV.



10. Cosmetic palette from Phase XIV, Area 11.



11. Reconstruction of a cosmetic palette used as a lid.

Phases IX or X (1100–1050 BC / 1050–930 BC)

This period is represented in Trenches LXI-IA and B in the shape of a walled, trapezoidal space. This space contained a mortar of limestone where dark lilac pigmenting on the interior suggests that black olives were crushed there. Another find is an almost complete, typical Iron Age I cooking pot with a triangular rim section (**Fig. 15**). To the south is another walled space from which a scarab of turquoise or serpentine derives (**Fig. 16**).



12. Bichrome-decorated jug from Phase XIII, Area 11.



13. Pierced stamp of limestone with incised sign from Phase XIII, Area 11.

Late Bronze Age Phase V (1525–1450 BC)

A test trench was dug below the Phase XIII remains. A well-preserved domestic context was exposed which contained several complete finds. According to the pottery this context is clearly Phase V, viz. the beginning of the Late Bronze Age: there is, for instance, a Chocolate-on-White Ware juglet with a thick white burnished slip and the typical abstract tree motif included in a metope decoration (**Fig. 17**). All the finds were embedded in a substantial destruction layer.

Conclusions

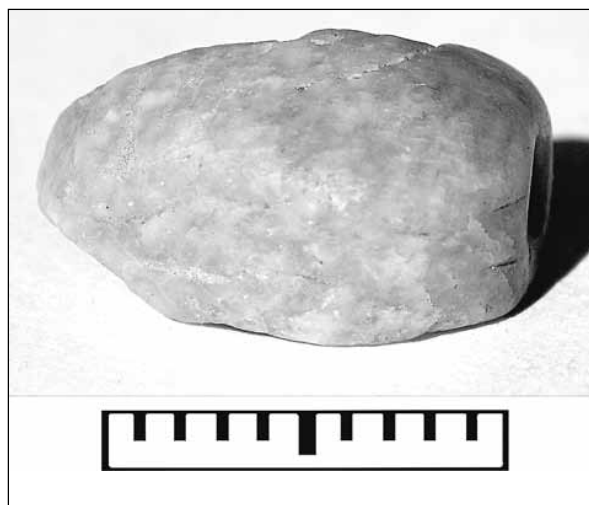
One of the most important discoveries from 2013 is the defence system from Early Bronze Age which was reused during the Iron Age (Areas 9 and 10). Around 1100 BC, the settlers of



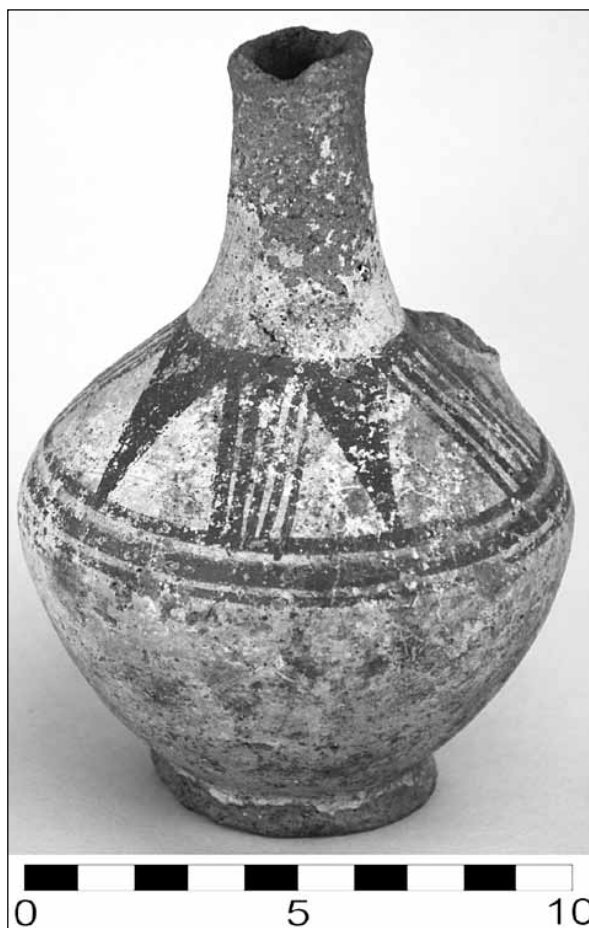
14. Stamp and impression of stamp.



15. Iron Age I cooking pot from Phase X or IX, Area 11.



16. Scarab of turquoise or serpentine from Phase X or IX, Area 11.



17. Chocolate-on-White Ware juglet from kitchen of Phase V, Area 11.

Phase IX cut through the entire Early Bronze Age II defence system from c. 3000 BC and deposited the foundation walls of their substantial two-storey compound on top of the Early Bronze Age II stone-built city wall. Although originally constructed 2000 years earlier the Early Bronze Age II glacis, which was reinforced with perpendicular walls – its section being 6 m long and 3 m high⁸ – was kept largely as it was designed around 3000 BC and became an integrated part of the Iron Age defence system.

At the south-easternmost corner of the upper plateau of the tall an opening in the Early Bronze Age II glacis represents a city gate. The gate is conveniently located at a spot which is closest to the Wādī al-Yābis, the most important water resource for the people of Tall Abū al-Kharaz during all periods, and it is to be expected that the road to the Wādī al-Yābis started here. Specific observations during previous seasons, namely that the stone defence system of the Early Bronze Age II was assembled on top of a substantial mudbrick foundation constructed in the preceding period, the Early Bronze Age IB, were once again confirmed.

Test trenches were opened in Area 11, the objectives of which were to explore the easternmost part of the city. These trenches were quite rewarding, considering the small exposed area. Remains from Islamic/Abbasid, Late Roman, Iron Age and Late Bronze Age were found. The Islamic structures from around 900 AD are domestic in nature. The Late Roman structure from c. 300 AD is preliminarily interpreted as a burial place, where three skeletons without tomb gifts were found. The Iron Age in these test trenches is represented by Phases XIV (770–732 BC) and XIII (800–770 BC). The former revealed a part of a probable four-room house with some extraordinary finds: one is an elaborate cosmetic palette of limestone with geometric incisions, and another an iron dagger. Phase XIII produced a vessel of high quality which so far is unique at the site: it is bichrome-decorated in red and black and has fairly large vertical handles and a pointed base. Another find from Phase XIII is a pierced stamp of limestone with an incised “sign” which it has not been possible to decipher so far.⁹

8. Three metres in height as preserved. The original height of the Early Bronze Age II defence system has been estimated at 6–8 m including the superstructure

of mudbrick and wood (Fischer 2008: 345).

9. It may also be a decorative symbol without any meaning.

A test trench between Phase XIII walls revealed remains from the beginning of the Late Bronze Age, viz. Phase V (1525–1450 BC). The context contained several complete finds, amongst them being a Chocolate-on-White Ware juglet with a thick white burnished slip and the typical abstract tree motif included in a metope decoration in chocolate-brown colour, a frying pan and a cooking pot and other objects. All finds were embedded in a substantial destruction layer, which confirms our earlier observation that Phase V was destroyed by a severe conflagration that obviously affected the entire city: the same situation was found, for instance, in the westernmost exposed part of the tell, namely in Area 2 which is approximately 150 m to the west of Area 11. It has been suggested in previous publication that Phase V at Tall Abū al-Kharaz was destroyed during a warfare campaign of Tuthmosis III or possibly Amenhotep II (Fischer 2006: 372–373).

One could assume after 16 seasons of excavations that, in principle, the entire occupational sequence of Tall Abū al-Kharaz and the typology of finds would be well established. Nevertheless, the latest four seasons of excavations brought to light new evidence on the historical periods following the Iron Age, and the beginning of the Iron Age, and numerous remarkable finds.

Appendix 1: Three Burials at Tall Abū al-Kharaz, 2013

By A. Lindqvist and B. Stolle

Introduction

During the Swedish Jordan Expedition of 2013 remains of three humans were exposed in close proximity to each other on the eastern side of Tall Abū al-Kharaz. All the skeletons lay at approximately the same level. They were found inside one of the rooms, which was enclosed by the walls W727 and W731. In the centre of this space there was a circular structure built of three courses of stones. The first skeleton (Skeleton 1) was discovered when removing the circular stone construction, which had been placed on top of and around the *cranium*. Further exposure revealed the presence of a complete adult skeleton. Another two skeletons of infants were uncovered nearby, to the southwest of Skeleton 1. The object of this appendix is to present and

investigate the skeletal remains in their context at Tall Abū al-Kharaz.

Skeleton 1 – The adult

The skeleton was positioned west to east, with the head towards the west and facing southwest. It was lying on its right side, in an almost straight position and bent very slightly backwards. The hands were placed together in front of the waist. The bones were generally in a very fragile state. The right (lower) side was better preserved than the left (upper) side, but very few bones were complete. The grave contained no gifts, but some potsherds were found in the fill. The majority of them date from the Late Roman/Islamic period. Most bones are accounted for. Missing bones are most likely explained by post-burial taphonomic processes. Closer examination of the skeleton's condition indicates that this individual must have been of an advanced age, probably over 50 years old.

The position of the *cranium*, upper *vertebrae* and *costae* suggests that the person suffered from *kyphosis* (or roundback, viz. over-curvature of the *thoracic vertebrae*). This would also explain the angle of the skeleton, bent to fit the person into the grave. Traces of *osteoarthritis* were detected on several *vertebrae*, mainly the lumbar *vertebrae* (especially the last), right *metacarpals* and right *radius*. The right *scapula* shows signs of *osteoporosis*. No teeth remain and considering the healed process of the *mandibula* and *maxilla*, they must have been lost a considerable time *ante mortem*. There is evidence of a healed wound (possibly a cut) on the right *tibia*. The left *humerus* shows an abnormal growth of the bone. An examination of the pelvic and facial outlines suggests that the skeleton is most likely female. Calculations based on the only complete longer bone, the right *fibula*, give a height for the individual of approximately 166 cm (White 2012: 420).

Skeleton 2 – Child 1

The skeleton was positioned west to east, with the head towards the west and facing north. It was lying on its back with a slight turn towards its left side. The torso is otherwise straight, while the legs are bent at the waist and knees. Given the raised position of the right *femur* and feet, it is plausible that the original position of

the legs had been shifted from a raised position to the side (*post mortem*). The arms are bent and placed on the left side with the hands in front of and underneath the *cranium*. The skeleton is in good condition with a few exceptions, such as the *femora*, lower *vertebrae* and the right side of the *pelvis*. Based on skeletal growth and dental status the age is estimated at six years, which does not permit determination of the sex. There is a small hole on the right side of the back of the *cranium*, which probably occurred *post mortem*. The *os temporale* on the right side is dislocated and pushed inwards. The deciduous tooth 51 is dislocated, with its root misplaced and visible. The *mandibula* also shows signs of damage where the deciduous tooth 81 is missing. There are no burial gifts, but here, too, some Late Roman/Islamic potsherds were found in the fill of the grave.

Skeleton 3 – Child 2

The skeleton was placed in a west to east position, with the head towards the west. The fragmented state of the skeleton made it impossible to determine in which direction it was facing. It could however be determined that it was placed on its stomach. The preserved parts of the legs and their position in the relation to the edge of the grave indicate that the lower parts of the legs were raised. Only certain parts of the skeleton could be recovered, such as five teeth, right *scapula*, both *humeri*, three *phalanges*, left *ulna*, three *costae*, five *vertebrae*, both *femora* and fragments of the *pelvis* and *cranium*. Possible abnormal growth of bone tissue was detected on the upper part of the right *femur*. From the teeth the age could be estimated at three to four years. As with child 1, sex determination was not possible due to the young age of the individual. There was no visible cause of death. Like the other two graves, this one contained no gifts, and similarly it contained potsherds of Late Roman/Islamic type.

Discussion and conclusion

The clear outlines of the cuts and the similar placement of the bodies within suggests that we are dealing with deliberate burials in a portion of a possible cemetery. Given the similar height, material content and orientation of the graves it is likely that these graves are con-

temporary. The lack of burial gifts makes dating more difficult. However the heights of the graves above the Late Iron Age structures found in the area, the pottery and the absence of gifts indicate one of the later occupational phases of Tall Abū al-Kharaz. At the same time the burials can be dated earlier than the Islamic phase, since they do not follow the traditional Islamic burial position. These factors imply that the burials have taken place during the Late Roman period, which is well represented at Tall Abū al-Kharaz.

The circular stone construction above the cranium of Skeleton 1 is interpreted as a possible grave marker, since the stones were closely placed around the underlying *cranium*. The other two burials contained no grave markers. The varying positions of the skeletons demonstrate that there was no standardized burial position. The uncommon placement of Skeleton 3, Child 2, suggests quite a careless burial. We would also like to present the hypothesis that the individuals might be related to each other. One should, however, note the considerable difference in age between the individuals. If related they should be two generations apart. The closeness of the graves and the similar dating could support this theory. The different burial positions and the careless burial of Skeleton 3 could suggest otherwise. So far no DNA analysis has been performed to determine any genetic relationship. Further excavation in a wider area is needed to investigate the nature of the burials and their surroundings.

Appendix 2: The Lithic Assemblage from Tall Abū al-Kharaz, 2013

By D. Kofel

Introduction

The analysis of flint artefacts is a useful tool that sheds light on ancient trade and exchange, craft specialization, and local production. There are a number of studies of the prehistoric lithic industries in the Levant, both in older (e.g. Siggers 1997; Bisson *BC* in press) and in younger periods (Raszick 2006, 2008). In this study, a short overview and the interpretation of the flint artefacts that were collected in 2013 are presented.

Material and Method

The material analysed is a total of 33 flint artefacts from 22 different loci (see **Fig. 18, Table 2** where also dates are presented). Most of the material was collected from the loci that are dated to Tall Abū al-Kharaz Phases XIII and XIV, viz. roughly 800–732 BC (Fischer 2013: 516). One flint knife was found in a Phase V, Late Bronze Age I, context dated to approx. 1525–1450 BC. Some lithics are certainly residual. No quantitative evaluations of the classified material were carried out, due to the insufficient number of objects.

Classification of the Lithic Tools

The material is dominated by sickle blades and knives. The ratio of blades to knives is approximately 1:1. The knives have been knapped using various techniques. Their cross-sections are either triangular or trapezoidal. They have one or two cutting edges, of which some of them are glossy due to use-wear.

Canaanian blades

Sickle blades (**Fig. 18**, nos: 3, 7, 10, 11 in **Table 2**) display the Canaanian blade technology. They have trapezoidal or triangular cross-sections (Rosen 1983b:16) and minor retouching on the working edges that are sometimes found with gloss. They are usually associated with the Early Bronze Age (Rosen 1982), although recently some authors have suggested earlier occurrence of Canaanian technology, i.e. during the first quarter of the 4th millennium BC at the transition from the Chalcolithic to the EB I (Bar and Winter 2010: 34). Canaanian blades are widely distributed in the southern Levant (Milevski 2013: 207) until they disappear in EB IV / MB I (Rosen 1997: 41). The contexts from which our blades derive are in any case much later.

Tabular scrapers

One tabular scraper (**Fig. 18**, no. 19 in **Table 2**) is present in the assemblage. Consistent with the standard definition it is a large, broad and thin flake struck from a large plaque of flint with the intact cortex on the surface (Milevski 2013: 209). Tabular scrapers appear in the central and southern regions of the Southern Levant during Pottery Neolithic B. They were in use until EB III (Rosen 1983a, 1997: 41).

Discussion and conclusion

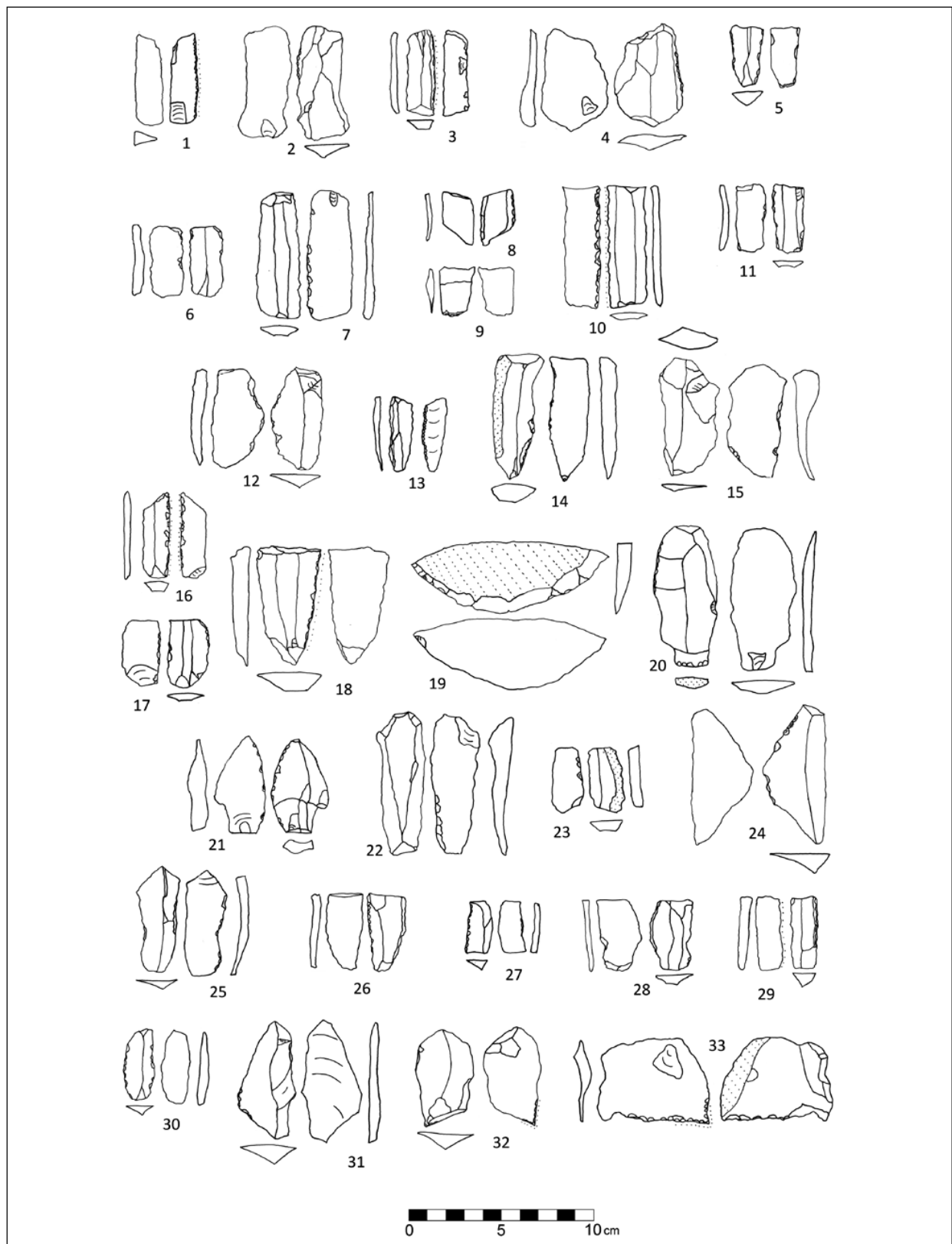
It seems that the lithics from Loci 415, 453, 468, 473 and 494 are residual and were most likely manufactured in the Early Bronze Age. They might have been found by later settlers and reused. Previous studies of lithic material from Tall Abū al-Kharaz (Raszick 2006, 2008) show that, although their number decreases, Canaanian blades and tabular scrapers are still present in Middle and Late Bronze Age contexts.

Although use-wear analysis has not been carried out it can be assumed that the knives were most probably used in daily activities such as cutting and preparing of meals. It may be that the knives were knapped on the site when they were needed. Some of our finds consisted of flint material, mainly blades and flakes, that might be production waste. This is in agreement with previous lithic studies from Tall Abū al-Kharaz (Raszick 2006). She describes a type of large geometric sickle segment that occurs in the Middle Bronze Age through the early Iron Age II (Raszick 2006: 294) and suggests that Area 2 at Tall Abū al-Kharaz might have been a place of lithic tool production. A similar model can be suggested for the aforementioned knives with a differing chronology: the production of the knives could have occurred during advanced phases of the Iron Age.

To conclude, the finds once again confirm that farming was the backbone of the economy of Tall Abū al-Kharaz. Some of the tools may have been used for slaughtering. Use-wear analysis should be carried out in order to support these statements.

Peter M. Fischer
Professor of Cypriote and Near Eastern
Archaeology
Department of Historical Studies
University of Gothenburg, Sweden
Contact: Dörjeskärgsgatan 37,
SE-421 60 Västra Frölunda
peter@fischerarchaeology.se

Teresa Bürge
Institute for Oriental and European Archaeology
Department for Egypt and the Levant
Austrian Academy of Sciences
A-1010 Vienna
teresa.buerge@gmx.de



18. Sickle blades: 1, 3, 5, 6, 7, 8, 9, 10, 11, 13, 16, 17, 23, 26, 27, 29, 30; Knives: 2, 4, 12, 14, 15, 18, 20, 21, 22, 24, 31, 32, 33; Blades: 17, 23; Retouched blades: 25, 28; Tabular scraper: 19

Table 2: The lithic assemblage of Tall Abū al-Kharaz

No	Artefact	Locus	Phase	Periods	Dates BC
1	Sickle blade	412	post IA		
2	Knife	414	post IA		
3	Sickle blade	415	post IA		
4	Knife	415	post IA		
5	Sickle? blade	450	XIV	IA IIB	770–732
6	Sickle blade	453	XIV	IA IIB	770–732
7	Sickle blade	453	XIV	IA IIB	770–732
8	Sickle blade	461	XIV	IA IIB	770–732
9	Sickle blade	462	XIV	IA IIB	770–732
10	Sickle blade	468	XII?	IA IIA/B	850–800
11	Sickle blade	473	post IA		
12	Knife	483	XII?	IA IIA/B	850–800
13	Sickle? blade	484	XIV	IA IIB	770–732
14	Knife	484	XIV	IA IIB	770–732
15	Knife	486	XIV	IA IIB	770–732
16	Sickle blade	488	XIII?	IA IIB/?	800–770
17	Blade	488	XIII?	IA IIB/?	800–770
18	Knife	490	XIII	IA IIB	800–770
19	Tabular scraper	494	XIII	IA IIB	800–770
20	Knife	495	XIV– post IA?		
21	Knife	496	X–XIII?	IA IIB/?	800–770
22	Knife	501	XIII	IA IIB	800–770
23	Blade	506	XIV	IA IIB	770–732
24	Knife	508	V	LB IA	1525–1450
25	Retouched blade	510	XIII	IA IIB	800–770
26	Sickle? blade	518	XIII	IA IIB	800–770
27	Sickle? blade	518	XIII	IA IIB	800–770
28	Retouched blade	518	XIII	IA IIB	800–770
29	Sickle blade	520	XIII	IA IIB	800–770
30	Sickle blade	520	XIII	IA IIB	800–770
31	Knife	520	XIII	IA IIB	800–770
32	Knife	520	XIII	IA IIB	800–770
33	Knife	520	XIII	IA IIB	800–770

Bibliography

Bar, S. and Winter, H.

- 2010 Canaanite Flint Blades in Chalcolithic Context and the Possible Onset of the Transition to the Early Bronze Age: A Case Study from Fazael 2. *Tel Aviv* 37: 33-47.

Bisson, M.S., Nowell, A., Cordova, C., Poupart, M. and Ames, C.

- In press Dissecting palimpsests in a Late Lower and Middle Palaeolithic flint acquisition site on the Madaba Plateau, Jordan. *Quaternary International*.

Fischer, P.M.

- 2006 Tell Abū al-Kharaz in the Jordan Valley. Volume II: The Middle and Late Bronze Ages. *Contributions to the Chronology of the Eastern Mediterranean 11*. Vienna: Austrian Academy of Sciences Press.
- 2008 Tell Abu al-Kharaz in the Jordan Valley. Volume I: The Early Bronze Age. *Contributions to the Chronology of the Eastern Mediterranean 16*. Vienna: Austrian Academy of Sciences Press.
- 2012 The Swedish Jordan Expedition 2009 and 2010 at Tall Abū al-Kharaz. Preliminary Results from the Early Iron Age Occupation in Area 9. *Opuscula. Annual of the Swedish Institutes at Athens and Rome* 5: 165-185.
- 2013 Tell Abu al-Kharaz in the Jordan Valley. Volume III: The Iron Age. *Contributions to the Chronology of the Eastern Mediterranean 34*. Vienna: Austrian Academy of Sciences Press.

Fischer, P.M. and Bürge T.

- 2013 The Swedish Jordan Expedition 2011 and 2012 at Tall Abū al-Kharaz. Preliminary Results from the Early Iron Age Occupation in Area 9. *Opuscula. Annual of the Swedish Institutes at Athens and Rome* 6: 307-338.

Fischer, P.M. and Feldbacher, R.

- 2010 Tall Abū al-Kharaz. The Swedish Jordan Expedition 2009: Twelfth Season Preliminary Excavation Report. *ADAJ* 54: 447-460.

- 2011 Tall Abū al-Kharaz. The Swedish Jordan Expedition 2010: Thirteenth Season Preliminary Excavation Report. *ADAJ* 55: 377-390.

Milevski, I.

- 2013 The Exchange of Flint Tools in the Southern Levant during the Early Bronze Age. *Lithic Technology* 38/3: 202-219.

Raszick, T.M.

- 2006 Lithics from the Middle and Late Bronze Age Periods. Pp 291-298 in P.M. Fischer (ed.), Tell Abu al-Kharaz in the Jordan Valley. Volume II: The Middle and Late Bronze Ages. *Contributions to the Chronology of the Eastern Mediterranean 11*. Vienna: Austrian Academy of Sciences Press.
- 2008 The Early Bronze Age Chipped Stone Assemblage from Tell Abu al-Kharaz. Pp. 297-301 in P.M. Fischer (ed.), Tell Abu al-Kharaz in the Jordan Valley. Volume I: The Early Bronze Age. *Contributions to the Chronology of the Eastern Mediterranean 16*. Vienna: Austrian Academy of Sciences Press.

Rosen, S.A.

- 1982 Flint Sickle-blades of the Late Protohistoric and Early Historic Periods in Israel. *Tel Aviv* 9/2:139-145.
- 1983a Tabular Scraper Trade: A Model of Material Cultural Dispersion. *Bulletin of the American Schools of Oriental Research* 249: 79-86.
- 1983b The Canaanite Blade and the Early Bronze Age. *Israel Exploration Journal* 33: 15-29.
- 1997 *Lithics After the Stone Age: A Handbook of Stone Tools from the Levant*. Walnut Creek: AltaMira Press.

Siggers, J.F.C.

- 1997 *The Lithic Assemblage from Tabaqat al-Būma: A Late Neolithic Site in Wadi Ziqlab, Northern Jordan*. PhD thesis. University of Toronto.

White T.D., Black, M.T. and Folkens, P.A.

- 2012 *Human Osteology*. 3rd edition, Amsterdam: Elsevier.

THE MIDDLE ISLAMIC PALACE AT KARAK CASTLE: A NEW INTERPRETATION OF THE GRAND QĀ'A (RECEPTION HALL)

Robin M. Brown

Introduction

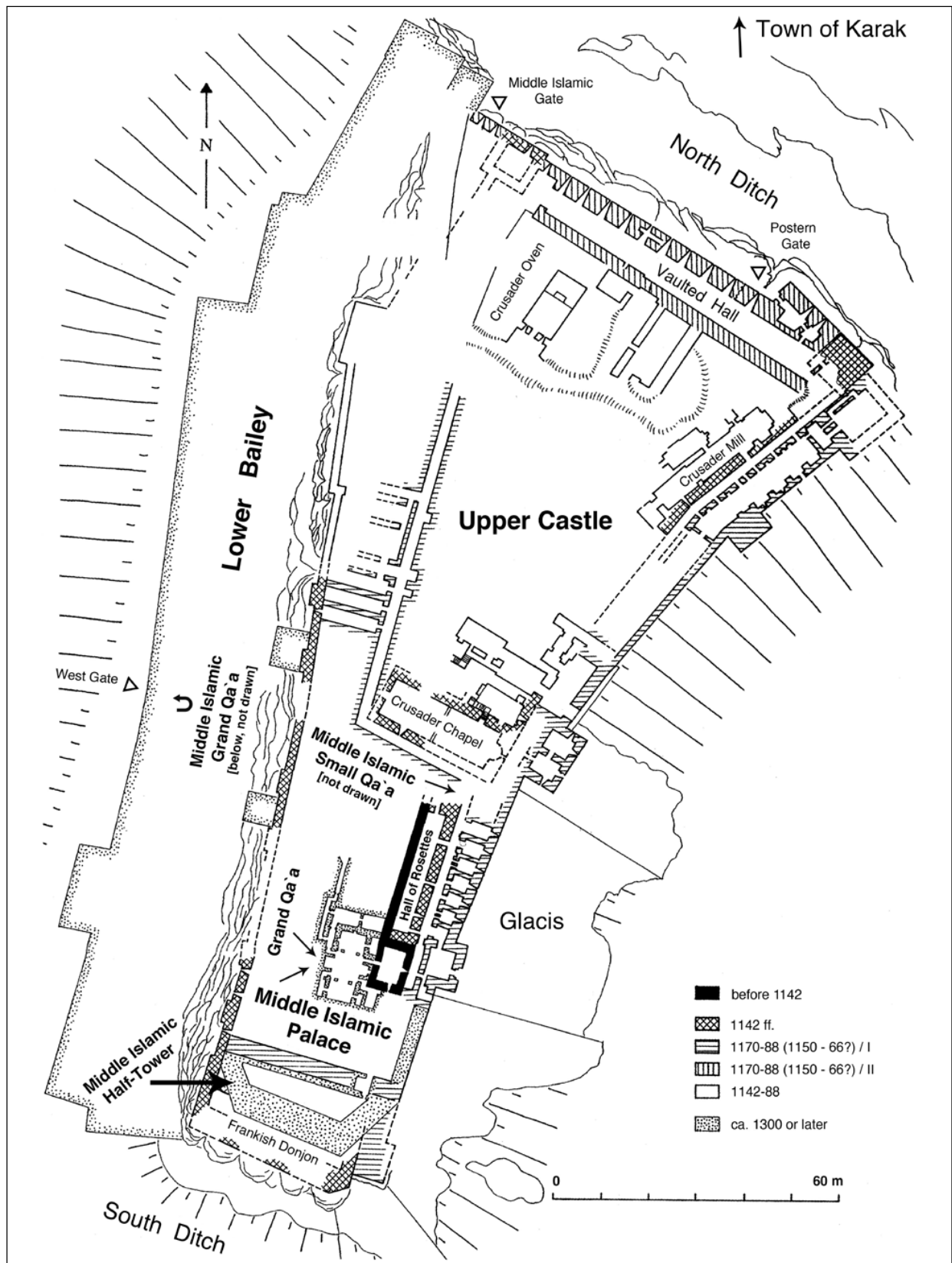
The archaeology of the Islamic periods in the lands of the eastern Mediterranean has received marked attention over the last few decades, resulting in fresh exploration and research, new knowledge, and a widening range of theoretical and methodological approaches. Within this practice, some topics long established in scholarly literature have received renewed attention. Among them, the wave of Muslim citadel and palace constructions that swept the Levantine landscape (*Bilād ash-shām*) from the 12th through the 14th centuries has re-emerged as an important focus of study. The recent and continuing documentation and study of the physical forms and socio-economic functions of palatial architecture in this era have been exceptionally fruitful. In this light, a re-consideration of the findings of the 1987 excavations in the Middle Islamic palace at Karak castle is appropriate and timely. The primary objective of this paper is to reassess the archaeological material associated with the construction of the grand *qā'a* (salon for reception and domestic life) of the palace, interpreted initially as a 14th century monument (Brown 1988a: 11; 1989a: 292; 1989b: 346), with attention to the apparent functions of the *qā'a*, as indicated by the nature and sequence of the occupational remains. From a historical perspective, this approach casts light on the palatial complex at Karak, first as a consequence of the expansive palace-building tradition that shaped the medieval urban topography of Bilad ash-Sham, and second as a suite that was later adapted to new social circumstances during the Ottoman era. Prefacing these discussions are an overview of the historical trends that describe the changing roles and functions of Karak castle through the duration of the Ayyubid, Mamluk,

and Ottoman periods, and an introduction to medieval references to palace constructions at this citadel.

Karak Castle and the Grand Qā'a of the Palace

The Frankish establishment of the mid-12th century hilltop castle was accompanied by the growth of an adjacent and dependent settlement, situated on the present site of the modern Jordanian town of Karak. The Frankish fortress site provided the structural base for the subsequent medieval Muslim castle of the late 12th through the 15th century. Over the course of the Ayyubid and early Mamluk periods, infrastructure continued to evolve as reconstructions were undertaken and major new features were added to the growing citadel, as well as within the prospering town. The structural remains of the multi-phase castle (**Fig. 1**) have been examined by several architectural historians (e.g. Deschamps 1939: 35-98; Biller, Burger, and Häffner 1999: 45-53; Korn 2004 [2]: 93-95; see also Kennedy 1994: 45-52; Raphael 2011: 163-72). Yet more study is warranted as adequate documentation has yet to emerge for a number of components, including corridors and chamber suites cleared in recent decades.

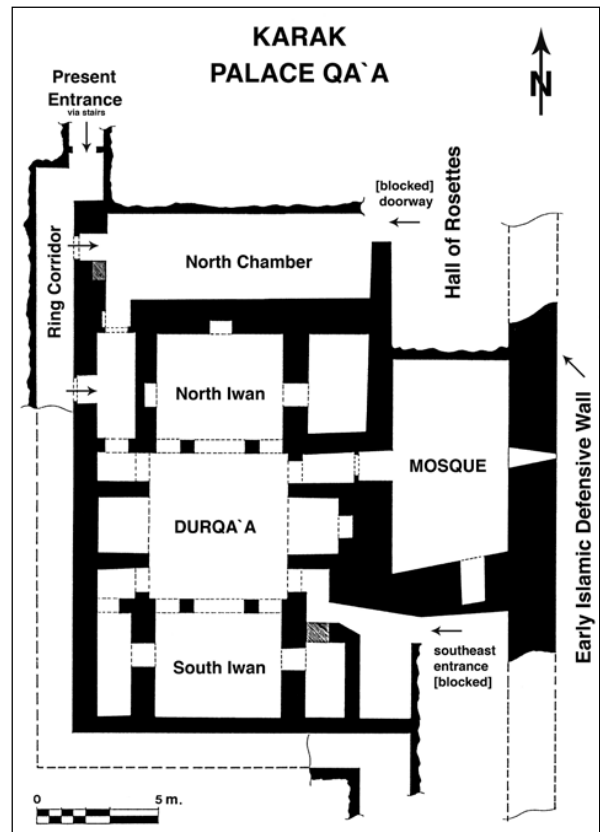
The fortress at Karak consists of an upper castle, which retains some Crusader constructions from between 1142 and 1188 (outer defenses, vaulted galleries, bakery, chapel and sacristy, etc.), and an extensive lower bailey attached beneath its western flank. The lower bailey is a post-Frankish construction, most likely of the Ayyubid period. Supported by a projecting defensive wall, this addition provided an open terrace suitable for military exercises, as well as substantial vaults on its upper level. Beneath the



1. Karak castle plan (adapted from Biller et al. 1999: 46, fig. 9).

terrace, the subterranean level includes the west castle entranceway (featuring a small portal set within a huge, yet superficial, external facade) leading to a substantial inner vestibule, designed as a grand qā'a, and thence to stairs ascending to the open courtyard. Flanking this grand qā'a are large vaulted galleries, providing vast subterranean storage space. Each of these features was recorded during a 1929 expedition led by Paul Deschamps (1939: plans 1-2). Lorenz Korn's architectural assessment indicates an Ayyubid date for the lower bailey, perhaps as early as the 1190s' building campaign of al-'Adil I Sayf ad-Din (2004 [2]: 94). In the upper castle, the massive southern half-tower functioned as the master tower (*tour maîtresse*), which Deschamps described as a *donjon* (1939: 80). This is generally accepted as a Mamluk construction from the building campaign initiated by Sultan az-Zahir Baybars I in 1263. While most of the monumental inscription on the exterior face of this tower is illegible, Baybars is clearly named, and carved representations of his emblematic panthers frame either end of the dedication.

The upper castle also hosts a Middle Islamic palace, boldly indicated by the surviving grand qā'a (Fig. 2), an arrangement that lay at the heart of every palatial residence constructed during the Ayyubid and Mamluk periods in Bilad ash-Sham and Egypt (Tabbaa 1997: 84-92; David 2007: 54-65; Revault 1982: 34-125; see also David and Rousset 2008). Qā'a configurations were traditionally composed of a square, or approximately square, central court or *durqā'a* that was flanked by *īwāns*. The iwans, which numbered between one and four, stood as chambers, or more modest alcoves (*suffahs*), with openings facing the *durqā'a*. Historical sources suggest that at least two medieval palaces with grand qā'as were built at Karak to accommodate the ruling elites, both of which would have been situated within the upper castle precinct. One of these is attributed to the mid-13th century rule of the Ayyubid prince an-Nasir Da'ud, while the other appears to have been patronized by Sultan an-Nasir Muhammad in the early 14th century of the Mamluk period (Ghawanimah 1979: 219). To date, only one grand qā'a has been ascertained within the ruins of the upper castle, and this was identified as a 13th or 14th century Islamic palace by architectural historians Terry



2. Plan of the grand qā'a of the palace at Karak castle.

Allen and Colin H. Brooker (see Brown 1989a: 287; *contra* Deschamps 1939: 88).

The grand qā'a of the palace stands upon a low bedrock shoulder near the southern half tower. The plan displays a symmetrical four-īwan pattern in which the square *durqā'a* is faced by two large vaulted chambers on the north-south axis and two vaulted alcoves on the east-west axis (Fig. 2 - 4); see also Deschamps 1939: pl. XVII A). The qā'a is surrounded by additional chambers and corridor passages, yet a full plan of the palace configuration is not available as some areas remain inaccessible. Circulation was facilitated by two points of entrance that linked the qā'a with other parts of the palace via throughways. These included a doorway at the northwest (fed by doorways from the ring corridor and north chamber) and a doorway at the southeast. Only one entrance would have been available to guests, however, and this may have been the northwest doorway that is used by visitors today (although the descending staircase linked to this doorway is a recent addition). The ring corridor skirting the qā'a on its western



3. *Grand qā'a of the palace, north iwan facade with triple entrance way. The central monumental doorway is flanked by two smaller doorways, both of which are now nearly entirely filled in with stone blocks, leaving only window-sized openings.*



4. *Grand qā'a of the palace, east facade of the durqā'a with the monumental iwan alcove (suffah) in the center of the tripartite facade. The alcove includes a central niche, the back wall of which is now broken through to the Early Islamic tower chamber modified for use as a mosque in the Middle Islamic period.*

and southern sides was connected to it through arrangements of bent accesses approachable from the northwest entrance. The ring corridor

was also connected to the southeast entrance of the qā'a, although aspects of this relationship remain obscured by debris blockage. The full scope of the original palace complex would have reflected the objectives and assets of its patron, in addition to the availability of space and the natural contours of the site. The eastern extent was defined by the mosque, and perhaps the hall of rosettes. The western limit may have been defined by the ring corridor, but more likely by vaulted chambers extending along the entire western face of the ring corridor. The palace probably spread farther to the north and south as well, beyond what is clearly understood today. A connection to the southern defenses may have existed as well.

The primary activities in qā'a settings included formal audiences, social interactions, and family life that often involved sleeping arrangements as well as meal service (see Tabbaa 1997: 84; David 2007: 62-63; Ibrahim 1984: 47-55). In addition, the Middle Islamic qā'a compounds of Bilad ash-Sham typically granted access to an adjacent bath suite, as demonstrated in Ayyubid palatial residences at the Aleppo Citadel – the main Ayyubid palace (Tabbaa 1997: 81; David 2007: 64, fig. 53, 65), Qal'at Sahyun (Grandin 2007: 163, figs 117, 135), and Harem (Gelichi 2006: 188, fig. 2, 194). Similarly, the bath at Qal'at Najm is located quite close to the palace complex (David 2007: 61, fig. 48, 64-65). Baths also appear in elite dwellings of the Mamluk period, as for example at Qal'at Sahyun (Grandin 2007: 163, fig. 135, 164) and Hisban (Walker and LaBianca 2003: 451-52, fig. 13). A bath has yet to be identified at Karak, but one may have existed. The palatial qā'as of Bilad ash-Sham typically also included, or provided access to, chambers designated as guard posts, as well as storage depots for various goods, such as weapons, commodities, and probably cash and valuables. Examples of these functions are indicated at the Aleppo Citadel – the main Ayyubid palace, where the arsenal was probably situated south of the larger qā'a (Tabbaa 1997: 78, 81). At Hisban, weapons, luxury ceramics, metal bowls, and highly valued commodities were kept in a storeroom next to the qā'a of the 14th century Mamluk governor's residence (Walker and LaBianca 2003: 449-51). At Karak, storage facilities are also indicated within or near

the qā'a, as described in more detail further in this text.

Religious practice is also evident at Karak. A private mosque, distinguished by a *mihrab* cut into the south wall and indicating the direction of prayer (*qibla*), stands adjacent to the qā'a (**Fig. 2**); originally this chamber constituted the interior of an Early Islamic tower, which may have been raised during the Jarrahid interlude of 981-982 (see Biller *et al.* 1999: 48-49; Bianquis 1986-1989 [1]: 141-42). Overall, the palace configuration at Karak closely replicates design conventions and functional purposes displayed in royal palaces and elite residences throughout the Muslim Levant and Egypt, in which the versatile qā'a theme was the key organizing principle.

The subterranean aspect of the qā'a at Karak deserves comment, for access to the palace complex is only possible today by a stairway descending from the upper ground level (see Deschamps 1939: pl. XV A-B; the square opening in the lower left shows the upper courses of the durqā'a). Here there are two points of clarification. First is that the elevation of bedrock within the confines of the upper castle varies considerably, with the qā'a resting upon a relatively low outcrop. Second is that the current upper ground level, which facilitates pedestrian traffic, stands above an artificial earthen fill. This massive leveling fill, which embedded parts of the palace complex and numerous other structures, created what was once a reasonably stable and open area (*ibid.* pls XV-XVI). The fill was probably inserted during the final Ottoman occupation of the castle that began in 1893, for travelers to Karak noted that Ottoman conscripts were engaged in massive earth moving works within the castle (Libbey and Hoskins 1905: 346; Brünnow 1895: 70; Bliss 1895: 219; Dowling 1896: 330, 332). Some of the filled-in areas of the upper castle have been recently cleared of debris, yet portions of fill remain in the areas to the north, west, and south of the palace qā'a.

Karak during the Middle and Late Islamic Periods

Karak held a prominent position within the Transjordan realm during both the Middle Islamic (1100-1516) and Late Islamic (1516-1918) periods, particularly in relationship to

regional socio-economic trends and broadly influential political transitions (e.g. Johns 1992, 1994; Lancaster and Lancaster 1995; Milwright 2008: 25-134; Rogan 2002: 29-32, 52-55, 238-39; see also Walker 2011: 45-83, 86-101). The principal themes and events briefly introduced here situate the castle, its palace tradition, and its archaeological profile within the prevailing social and cultural spheres of the time. While political history does not account for or explain the full scope of Karak's experience between the late 12th and the early 20th century, it offers a framework for describing the roles and uses of the castle that consists of four general stages. From the late 12th through the 14th century, under Ayyubid and early Mamluk rule, Karak was strategically valued on the imperial level and its status was enhanced through royal patronage. From the 15th to the 16th century, under late Mamluk and early Ottoman rule, Karak represented a provincial citadel-town with a role in regional administration. From the 17th through late 19th century, Karak was a small town center within the largely autonomous frontier region of the southern highlands – a territory ruled by tribal coalitions. From the late 19th century through the early 20th century, Karak was reintegrated within the imperial Ottoman domain as an important garrison town for regional administration. Pertinent aspects of these historical stages are described below.

Karak and its companion castle at Shawbak were important objectives of Ayyubid penetration into southern Transjordan and both were immediately absorbed as key strategic assets following the Crusader defeat at the battle of Hattin in 1188. This territory passed as *iqṭā'* to a succession of Ayyubid princes (1188-1263) who implemented repairs and patronized new constructions at Karak, while also demonstrating their confidence in its secure position by installing treasuries within the fortress (see Korn 2004 [2]: 93-95; Milwright 2006: 5, 11, 13). Yet most of the Ayyubids who held title to Karak kept primary residences elsewhere, typically in the more urban centers of Cairo, Damascus, or Jerusalem, while leaving provincial administrative duties to their appointed representatives. Exceptionally, an-Nasir Da'ud kept his principal residence at Karak, while ruling southern Transjordan as an independent principality (r. 1229-1249). The

Ayyubid claim to Karak grew increasingly insecure, however, as a result of the 1250 Mamluk political and military coup in Cairo and the Mongol advance into the southern Levant led by Hülegü Khan in 1260. Ultimately, Sultan Baybars I deposed the entitled Ayyubid prince, al-Mugith `Umar, thereby ushering Karak and its territories into the Mamluk domain in 1263.

Over the course of the Mamluk period (1263-1516), Karak's stature shifted from that of a prominent player within the wide arena of imperial priorities and events to that of a more narrowly defined and regionally focused administrative node. The early Mamluk era (through the end of the 14th century) brought prosperity to Karak as it garnered imperial favor and patronage, and its hinterlands attracted elites seeking investments in rural production (Milwright 2008: 78-93; Walker 2011: 86-105). In this period, Karak was recognized as an important imperial storage depot, continuing a role established under the previous era of Ayyubid rule. With the institution of Mamluk authority in 1263, Baybars I distributed as largesse the valuables that had been stored by al-Mugith `Umar. He then inspected and stocked Karak's granary, established a substantial treasury and armory, and supplied the castle with new stores of valuables, such as fabrics, while at the same time installing royal flocks in the countryside (al-Zahir, in Sadeque 1956: 181). Through these efforts, combined with a major building campaign, Baybars I gained a formidable stronghold that embraced a plentiful supply depot. Subsequently, Karak continued to flourish under the Qala'unid dynasty (1279-1382), benefiting from close cultural, political, and economic ties with Cairo. It was not unusual for sultans, heirs to the throne, and high ranking *amīrs* to frequent Karak and its region for the purpose of maintaining political and economic ties, while also engaging in social activities, such as sport hunting. In this era, the fortress also provided an imperial prison and place of exile for political contenders who had been banished from Cairo. In 1311, Sultan an-Nasir Muhammad glorified Karak by patronizing new facilities, among them a bath, a caravan hostel fountain, hospital, parade ground, mosque, religious school, and palace (al-Asqalani 1973: 317). Yet fortunes shifted as Karak's prestige and imperial favor diminished after the

1390-1399 reign of Sultan az-Zahir Barquq.

Under the late Mamluk rulers of the 15th century, the eclipse of Karak's political and economic significance within the imperial realm signaled a broader transition across the southern highlands and the rest of Transjordan, as profound socio-economic transformations were underway. These changes were linked to shifts in Mamluk administrative and military policies, including the dissolution of the *iqta`* system of land distribution and the growing privatization of former state lands (Walker 2011: 233-71). Increasingly marginalized from the state, the economic and cultural patterns of 15th century Transjordan were more localized. Despite greater isolation, Karak remained a provincial seat hosting regional governors who were appointed by the sultan and supported by the military (al-Bakhit 1992: 50-60).

The early 16th century Ottoman administration of Karak introduced a new imperial authority and accompanying soldiery. Initially, socioeconomic conditions in southern Transjordan appear to have remained much the same as in the prior century (Walker 2011: 273-74; 2009: 40-41). Yet Ottoman authority soon weakened in the Karak region and its virtual dissolution in the early 17th century led to localized decision-making among semi-independent or fully autonomous leaders and their tribal coalitions (see Peake 1958: 188-91; Milwright 2008: 50-51). With this transition, the castle shifted from a node of imperial Ottoman administration to a less formal resource whose functions lay at the discretion of the people of Karak and its vicinity. It was clearly no longer a seat of regional political authority, for prevailing tribal influence was not dependent on control over a local citadel or similar infrastructure. There are few specifics regarding the use of the castle in the mid- and late Ottoman centuries, but one mid-18th century chronicler referred to it as "... in a dilapidated condition and used by the bedouin for shelter" (al-Wakil, in Rafeq 1966: 228). Such informal activities within the castle appear to have continued through most of the 19th century, at which time the leading al-Majaly tribe exerted its greatest influence over the region. A comment by the passing traveler Theodore Dowling asserts that Karaki tribes kept stolen animals and goods within the castle prior to the 1893 re-

introduction of Ottoman rule (1896: 326). This hearsay remark, perhaps referring to property acquired during raiding campaigns, implies that the castle had provided secure housing for livestock and quantities of storable commodities or other items. It appears that family units also occupied the castle interior during these centuries, establishing village-like social environments, as was the practice at Ajlun and Shawbak castles (Burckhardt 1822: 267, 416-17; Brown 1988b: 227, 237, 240).

In 1893, Karak resumed its former role as a district center under Ottoman authority. While a new administrative bureau was constructed in the town, the castle housed cavalry horses and a garrison of some 1,200 to 2,000 Ottoman troops, most of whom were Palestinian and Circassian conscripts (Libbey and Hoskins 1905 [1]: 346). Among other duties, the soldiers were tasked with moving substantial amounts of earth and debris within the castle, as indicated above. It appears that at this time portions of the palace were infilled and the descending stairway was inserted to access the qā'a, which remained open. The Ottoman authorities used the qā'a, at least periodically, as a prison (*siġin*).¹ In its modified subterranean condition, the qā'a was well suited to enforcing confinement, particularly as only one passage for entrance and exit remained open. Elsewhere in the castle, a few new constructions were raised during this last occupation, but these were removed in 1925 (Key, in Lee 2003: 8).

Royal Palace and Grand Qā'a Constructions at Karak

The scattered historical references to royal residences at Karak are both informative and enigmatic. Fortunately, insights on this topic are offered by historians Yusuf Darwish Ghawanimah (1979: 219) and Bethany Walker (2011: 87-89). It is evident that Karak accommodated multiple structures built in the palatial style during the Ayyubid and Mamluk periods, yet the texts lack clarity with respect to the sequence and scope of these monuments, as well as the relationships among them. A *Qā'a an-Nāṣiri* or Nasirite Qā'a is attributed to the Ayyubid prince

an-Nasir Da'ud, who resided primarily at Karak during his autonomous tenure over Transjordan (1229-1249). This hall played significant practical and symbolic roles when the Mamluks seized Karak from al-Mughith `Umar, the last Ayyubid prince to hold title to the castles of southern Transjordan. Arriving in Karak in 1263, the conquering Sultan Baybars I occupied the citadel (*hiṣn*) and held court in the Qā'a an-Nasiri, while establishing his administration over the region (al-Zahir, in Sadeque 1956: 179). Additionally, an-Nasir Da'ud is credited with having raised a residence of authority (*dār as-sulṭāna*) at Karak, which was known as the *Dār as-Sa`āda* or House of Prosperity. The *Dār as-Sa`āda* and the Qā'a an-Nasiri probably comprised a single palace complex, and these facilities eventually accommodated a succession of governors appointed to the citadel by the Mamluk sultans (Ghawanimah 1979: 219). An-Nasir Da'ud also possessed an extramural suite (*jawsaq*) for housing guests, which was located in the valley below the castle; here Ibn Wasil and his party were given lodgings during a visit to Karak in 1231-1232 (Ibn Wasil 1972: 330).

During the Mamluk period, royal patronage of civil and religious monuments at Karak was closely associated with an-Nasir Muhammad. The suite of facilities commissioned by this enthusiastic sultan in 1311 embellished the castle and town, showcasing Karak's status within the imperial circles of that time. A palace (*qaṣr*) was included among his works (al-Asqalani 1973: 317). This configuration was apparently known as (or included within it) the *Qā'a an-Naḥās* or Hall of Copper, which would have accommodated the sultan during his visits and domiciled his resident sons who were sent to Karak for their education (Ghawanimah 1979: 219; Walker 2011: 87-89). By virtue of its name, the Qā'a an-Nahas presumably displayed highly accomplished metalwork – as decorative features or objects of copper or bronze – probably produced with raw material extracted from copper mines operating in the Faynan region south of the Dead Sea (see Jones, Levy, and Najjar 2012: 70, 72). Toward the close of the 14th century, Sultan az-Zahir Barquq resided within the Hall

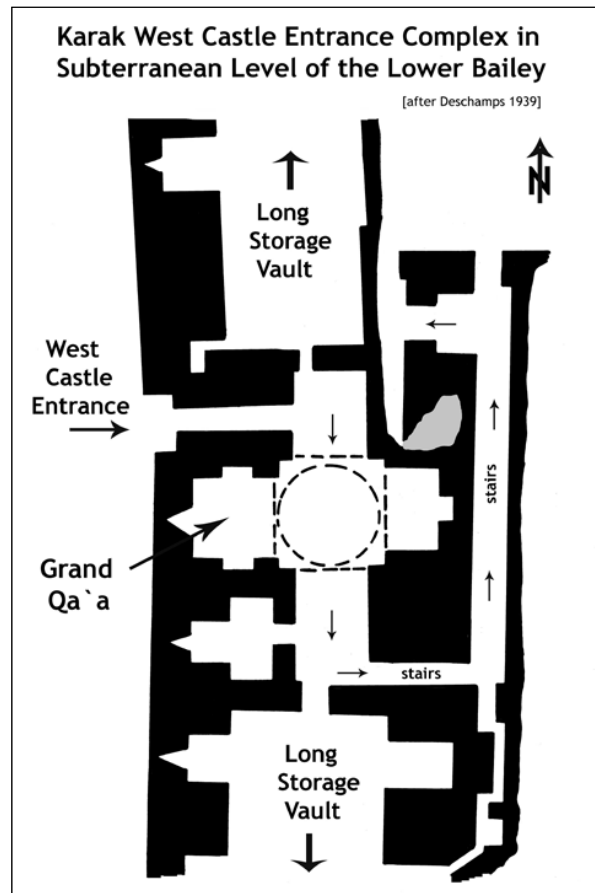
1. This function was related by elders at Karak in 1987, but other parts of the castle could have been used for

similar purposes (see comments by Ginsburg 1873: 216; Forder 2002: 112-13).

of Copper while exiled to Karak castle during his 1389 interregnum. This qā'a was noted for its windows opening toward Jerusalem and Hebron (Ibn al-Furat 1936: 138), attributes that imply a prominent west façade, which perhaps also contained a portal. Multi-storied dwellings with upper level windows offering landscape views were characteristic of Mamluk residences, and while the windows of the Hall of Copper might suggest a position at or near the western edge of the upper castle, this is not necessarily the case.

Despite many unanswered questions, it appears certain that multiple palatial residences functioned simultaneously at Karak during the Mamluk period, housing various elite castle dwellers and visitors, and these may have stood largely independent of one another. With respect to the surviving grand qā'a in the upper castle, the apparent lack of fenestration is noteworthy. While one might conjecture an erstwhile second story with a west facing gallery having once been structurally associated with the qā'a in some manner, there are no real indications of such. Presently, and taken at face value on this basis, the surviving qā'a appears to be a most suitable candidate for the Ayyubid Qā'a an-Nasiri of the second quarter of the 13th century.

The qā'a concept provided an essential and central feature of royal and elite residences throughout Middle Islamic Bilad ash-Sham and Egypt, yet it also appears frequently in other architectural forms, particularly religious schools (*madrasas*), but also baths (*ḥammāms*) and hospitals (*māristāns*). At Karak, there are two standing qā'as in addition to the grand qā'a of the medieval palace. One is the aforementioned grand qā'a within the subterranean level of the lower bailey (Fig. 5), an addition to the castle that probably dates to the Ayyubid period. This truly magnificent inner vestibule at the heart of the gate complex consists of two iwans (on an east-west axis) flanking the durqā'a through which entering visitors or residents passed in order to reach the vaulted staircase ascending to the open terrace on the upper level (Deschamps 1939: plan 1, pl. XXIV A; also in Brown 1988a: 289, fig. 2). Most impressive is the lofty pendentive dome above the durqā'a, featuring a drum base encircled with a broad band of muqarnas. The floor plan of this qā'a is approximately the same size as that of the grand qā'a in the upper



5. Grand qā'a within the west castle entrance complex, situated in the subterranean level of the lower bailey (adapted from Deschamps 1939: plan 1).

castle palace, yet very different spatial arrangements and styles of masonry were employed in the construction of these two suites. The second additional example is a small two-iwan qā'a situated directly north of the hall of rosettes (Fig. 1); unfortunately no drawing of this feature has been published. Apparently a reception area, this qā'a appears to have provided a modest inner vestibule linked to a palatial suite of some sort, or possibly a bath facility. Its striking elegance in design and execution implies no less than a reception chamber in the service of the royal family. The two vaulted iwan alcoves (on a north-south axis) flank a small durqā'a. The northern alcove hosts a plaque engraved with a geometric rosette pattern, and its floor block once accommodated a water fountain that presumably discharged water into a small pool nearby (Fig. 6). The southern alcove likely also held a matching or similar plaque that has since

been dislodged. The fine finished masonry of both alcoves is complemented by alignments of muqarnas cells set in vertical panels (**Fig. 6**). At some point, however, the floor of the south iwan was removed and replaced by a descending stairway leading into the hall of rosettes; originally a Frankish chamber that incorporated an Early Islamic defensive wall (Biller *et al.* 1999: 48-49). This staircase linked the reception area of the small qā'a to the grand qā'a of the palace via the hall of rosettes and its doorway (now blocked) leading into the north chamber (**Fig. 2**).

The date of the small reception area is undetermined, yet its remarkable elegance stands in sharp contrast to the grand qā'a's rough masonry, which was originally hidden behind finished surfaces of plaster. This stylistic divergence indicates that the small qā'a was not constructed as part of the same building program as the grand qā'a of the palace. Future research on



6. Small qā'a reception area in the upper castle, view of the north iwan.

the rosette panel, muqarnas, and fountain will certainly provide greater insights. Presently, it may be useful to point to the close affinity between the rosette panel at Karak and the carved panels situated directly above two lintels in the 1352-1353 *turba* of Turkan Khatun in Jerusalem (Burgoyne 1987: 323, pl. 28.1). Nevertheless, the question remains open as to whether the rosette panel is original to the construction of the north iwan. As the graceful integrity of the small qā'a was destroyed by the modification of the south iwan, that adaptation signaled an end to the original social functions and intentions of this reception area, as superseded by a new priority in establishing a direct connection to the palace and its grand qā'a. Presently, one might speculate that this transition in the way in which the reception area was valued took place toward the later Mamluk or early Ottoman eras.

The historical references and structural remains discussed above are important illustrations of Karak's status as a seat of royal presence and administration during the Middle Islamic period. As a royal citadel, Karak boasts repeated applications of the quintessential qā'a concept, a hallmark of the Middle Islamic architectural tradition throughout the Muslim eastern Mediterranean region. Moreover, the expressions of this theme at Karak display both predictable continuities and marked individuality. The following section considers the grand qā'a of the palace from another perspective, as described by the archaeological finds.

Summary of the Excavation in the Grand Qā'a of the Palace

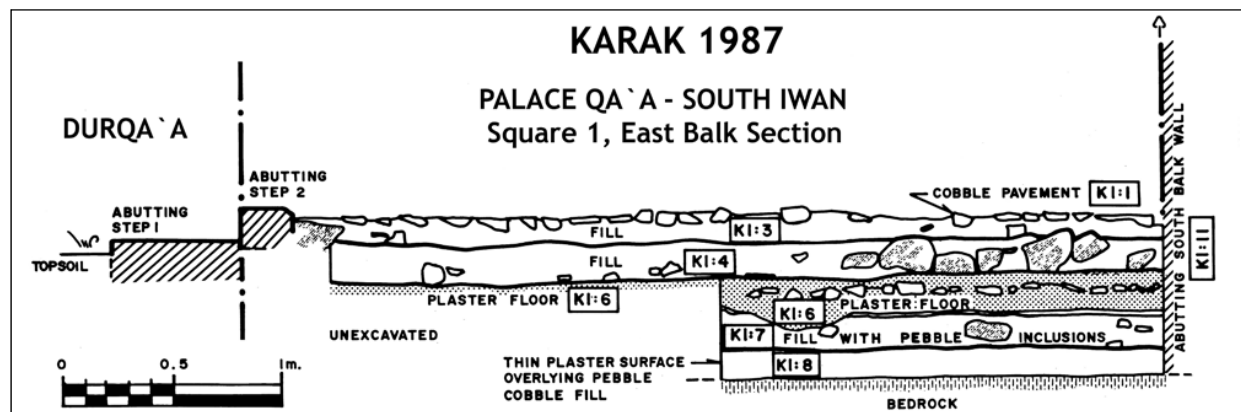
The 1987 excavation in the grand qā'a of the palace was a preliminary investigation with limited objectives to define the stratigraphic sequence and describe associated material remains. The project was conducted by the author in collaboration with architectural specialists Colin Brooker and Ruba Kana'an, faunal analyst Kevin Rielly, and Department of Antiquities representative Nabil Beqa'in. The principal findings including the occupational deposition and ceramic groups, are presented in detail in the field reports (Brown 1988a, 1989a). The faunal report offers further information on the functions of this core area of the palace (Brown and Rielly forthcoming), and a summary of these

animal bone findings is presented here.

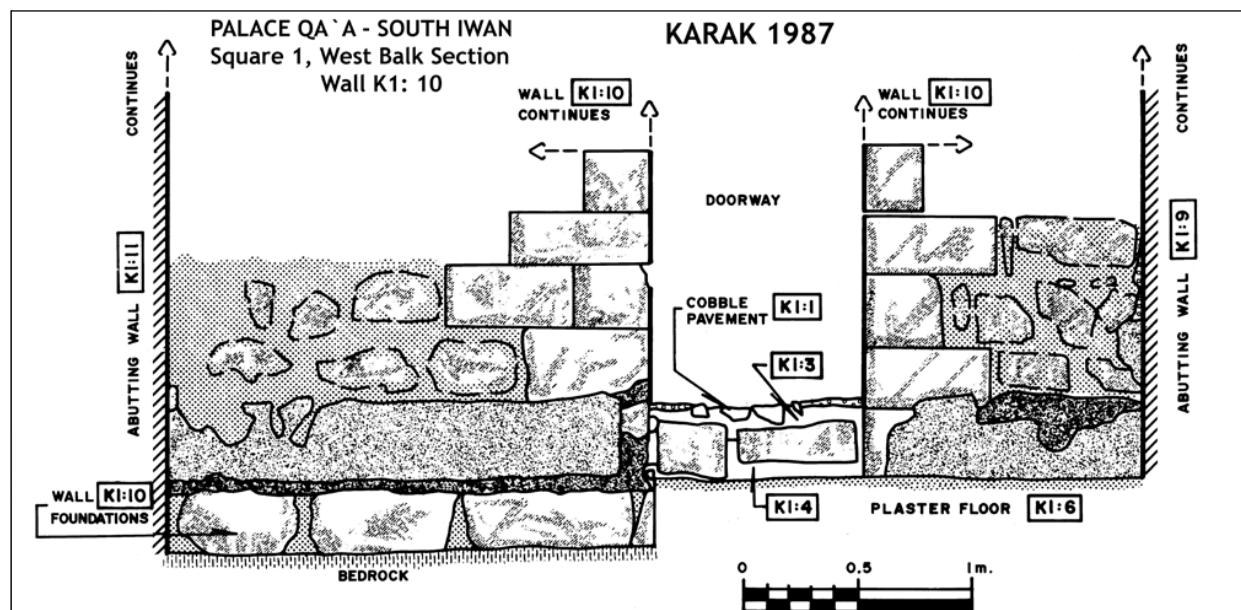
The sounding conducted in the south iwan of the qā'a (along the west wall, 4.2 m north-south x 2.0 m east-west) showed that the walls were set upon bedrock (Figs. 7 - 8). Above the bedrock, the founding soil layers supported the original plaster floor, a large portion of which remained intact. The soil and debris accumulations above the floor level represented two occupation phases, which were described in the field reports as Phase I dating to the Mamluk period and Phase 2 representing the Ottoman era (Brown 1989a: 292, 294-95; 1988a: 12-16). Significantly, this paper offers a refinement in phasing terminology, as well as a review of selected artifacts from the construction debris beneath the plaster floor. While the artifacts are

discussed more fully below, the salient points are introduced here. Most noteworthy, a poorly preserved coin that was initially interpreted as a 14th century Mamluk issue has been re-examined and found, conclusively, to be pre-Islamic. With respect to ceramic indicators, the latest datable sherds belong to a single 12th century stonepaste vessel that would have been traded into Karak during the Frankish or early Ayyubid occupation at the site. Thus, on the basis of the artifacts, it remains an open question as to whether the palace was constructed during the Ayyubid period (1188-1263) or the Mamluk era (1263-1516).

In light of this now clear possibility of an Ayyubid date for the palace, the construction and sub-floor level fills are redefined as Phase



7. South iwan excavation in the palace qā'a, east balk section.



8. South iwan excavation in the palace qā'a, west balk section.

1a, whereas the Mamluk era accumulation of earth and artifacts above the floor are redefined as Phase 1b. It should be emphasized, however, that this refinement in phasing terminology does not alter the original dating and analysis of the Mamluk and Ottoman deposits overlying the floor, which constitute the greater majority of the excavated material and of the initial reporting. As previously described, the ceramics from the Phase 1b deposit are typical of the 13th through 15th century, while those from the following Phase 2 include types that are characteristic of the Ottoman period, among them being examples that appear most indicative of the 18th and 19th centuries (Brown 1989a: 295-97).

As described in the field reports, the Middle and Late Islamic pottery corpus includes four type categories (for distributions of pre-Islamic wares see Brown 1989a: 295, Table 2). Among them are unglazed wheel-thrown cream wares with white, buff, and / or pink colored surfaces, and wheel-thrown glazed wares. These vessels were produced by specialist potters using specialized technologies for production, firing, and surface glazing, and show sophistication and standardization of manufacture through the Middle and Late Islamic periods. Handmade wares, some of which were painted with geometric or linear patterns, appear to have been

produced and marketed by skilled specialist potters as well, although these practitioners were less dependent on the use of specialized technologies (see Johns 1998: 70-71). While this appears to have been the case during the Middle Islamic period, the quality of production diminished among handmade wares of the Late Islamic period, suggesting that in this period much handmade pottery was fashioned by semi-skilled potters (likely including part-time and / or seasonal workers), using local materials and perhaps producing wares from household industries for local exchange. Fragments of large storage jars (*zīrs*) that typically display hand-coiled bodies and handmade or wheel-thrown necks represent a fourth group.

Sherds from all four ceramic categories occurred within each phase (no whole vessels were retrieved), as shown in **Tables 1 - 2**. The distributions of sherds within each ceramic type are recorded in **Table 1**. This chart shows that nearly half of the total assemblage belongs to wheel-thrown cream wares, and that storage jar fragments account for over a quarter of the total. Differences between the phases are also clear. Most of the sherds from storage jars, wheel-thrown cream wares, and wheel-thrown glazed wares (ranging between 82.8% and 69.0%) occurred in Mamluk Phase 1b contexts. In con-

Table 1: Middle and Late Islamic ceramic type distributions across all phases (with column totals and percentages).

Phase	Locus	Handmade (w/ some painted)		Wheel-made Cream (unglazed)		Wheel-made Glazed		Storage Jar (<i>zīr</i>)	
		No.	%	No.	%	No.	%	No.	%
1a	K1.7; K.8	11	14.5	17	7.3	3	7.1	17	12.7
1b	K1.4	8	10.5	171	73.1	29	69.0	111	82.8
2	K.1.1; K1.2; K1.3; K1.5	57	75.0	46	19.6	10	23.8	6	4.5
Sub-Totals & Percentages by Type		76	15.6%	234	48.1%	42	8.6%	134	27.6%
Grand Total = 486 sherds									
<i>Notes:</i> Adapted from Brown 1989a: 295, table 2; 296, table 3. All 3 sherds in the Phase 1a Wheel-made Glazed category belong to an imported, lustre-painted stonepaste bowl.									

Table 2: Middle and Late Islamic ceramic type distributions within each phase (with total sherds per phase and row percentages).

Phas	Locus	Handmade (w/ some painted)		Wheel-made Cream (unglazed)		Wheel-made Glazed		Storage Jar (zir)		Total Sherds per Phase
		No.	%	No.	%	No.	%	No.	%	No.
1a	K1.7; K.8	11	22.9	17	35.4	3	6.2	17	35.4	48
1b	K1.4	8	2.5	171	53.6	29	9.1	111	34.8	319
2	K.1.1; K1.2; K1. 3; K1.5	57	47.9	46	38.7	10	8.4	6	5.0	119
Grand Total = 486 sherds										
<i>Notes:</i> Adapted from Brown 1989a: 295, table 2; 296, table 3. All 3 sherds in the Phase 1a Wheel-made Glazed category belong to an imported, lustre-painted stonepaste bowl.										

trast, three quarters of all handmade sherds in the assemblage belonged to Ottoman Phase 2 contexts. TABLE 2 shows the relative distributions of these same ceramic types as they occur within each phase.

The sources of the pottery retrieved in excavation cannot be confirmed at present, yet much of it was probably produced in or near Karak. Historically, manufacturing of handmade vessels may have been undertaken by itinerant potters and / or by potters at any number of local workshops serving markets in nearby towns. By the later Ottoman centuries, less specialized household or village production appears to have been common in the southern Levant (Johns 1998: 83; Walker 2009: 55-56). Some manufacturing of plain and lead glazed wheel-thrown wares is likely to have taken place in or near Karak during the Middle Islamic period as well (Milwright 2008: 248), and this practice may have endured through the first century of Ottoman rule or beyond. However, use of both wheel-thrown wares and the largely handmade storage jars decreased over the course of the Ottoman period in southern Transjordan, suggesting a combination of lesser availability and lower demand for these products.

The stratigraphic outline below, which is excerpted from the field reports (Brown 1988a,

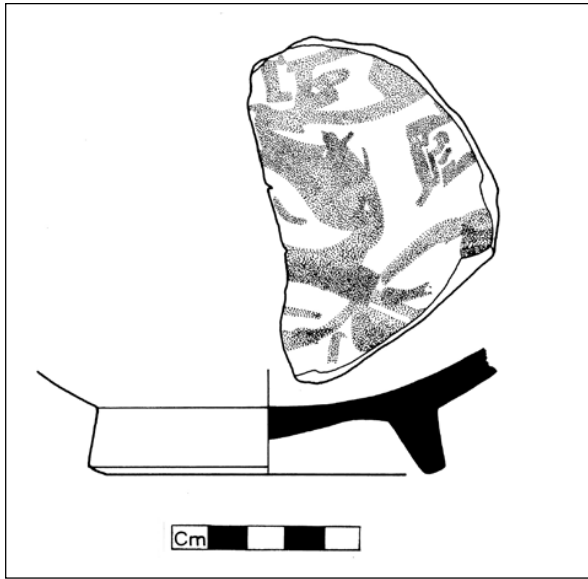
1989a), facilitates a discussion of the construction and subsequent uses of the palace qā'a.

Phase 1a: Construction of the Qā'a

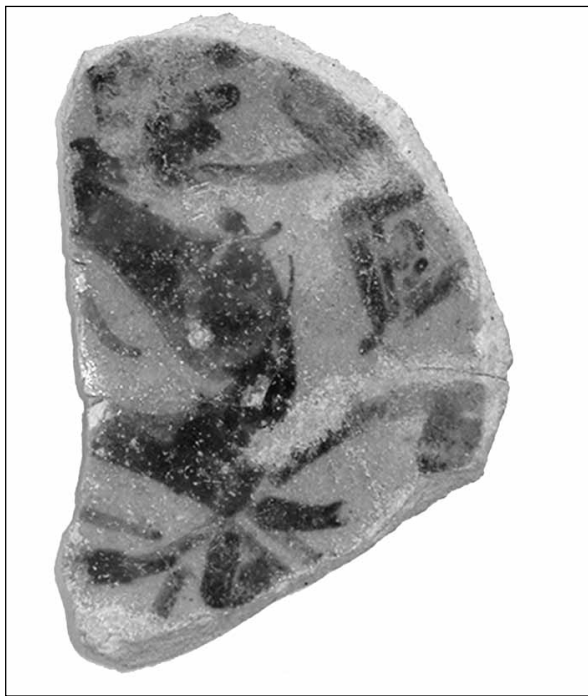
- Features included two sub-floor layers of leveling fill (K1.8, K1.7) beneath a thick plaster layer (K1.6) that was the original floor or bedding for a floor of paved stone.
- The few Islamic era artifacts from fill layers beneath the floor included undiagnostic cream ware body sherds and three adjoining sherds from the base of an imported, lustre painted, stonepaste bowl or plate of the 12th century (Figs. 9 - 10). Also present were Nabataean, Hellenistic, Roman, Byzantine, and earlier pottery fragments, as well as a Seleucid coin.
- Chronology: the artifacts retrieved shed little light on the date of the qā'a. The lustre-painted, vessel fragment of the 12th century refers to either the Frankish presence at the castle (1142-1188) or the early decades of the subsequent Ayyubid occupation.

Phase 1b: Mamluk Period Occupation in the Qā'a

- The principal feature was occupation ac-



9. 12th century lustre-painted bowl base, profile.



10. 12th century lustre-painted bowl base, photo.

cumulation (K1.4) overlying the original plaster floor of Phase 1a.

- The ceramic fragments are typical of 13th through 15th century deposits and consist of local and imported monochrome glazed and slipped wares, wheel-thrown cream wares, storage jar fragments, and handmade coarse wares - some of which display decorative paint (Brown 1989a:

295-97, 300-302, figs 5-7). Imported ceramics include sherds from Syrian blue and white glazed vessels that are well documented in 14th and 15th century contexts. This range of ceramic types is similar to that of Phase III at Shawbak (Brown 1988b: 232, 237).

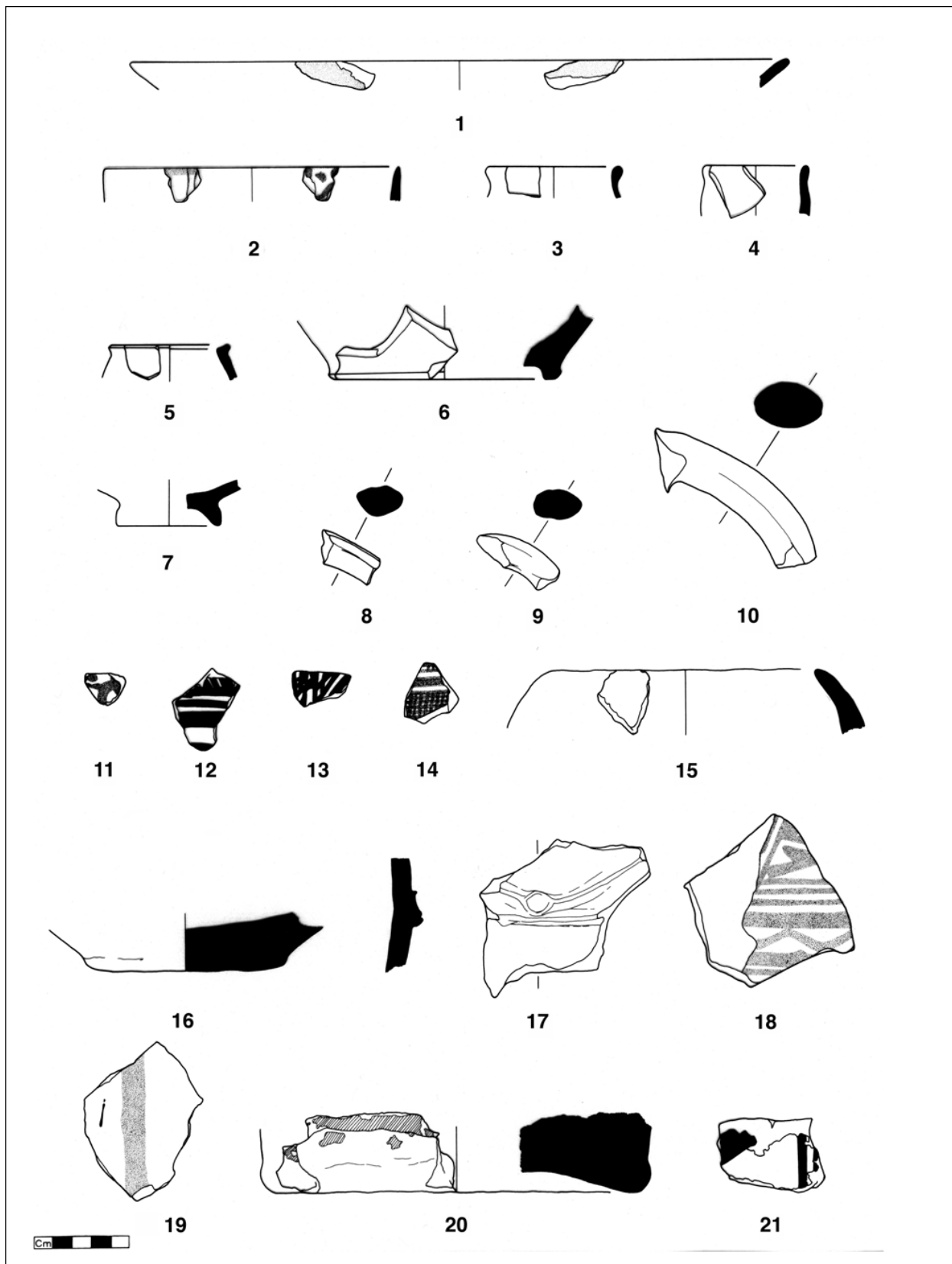
- Chronology: the post-construction occupation debris is characteristic of the 14th and 15th centuries, with some earlier material.

Phase 2: Ottoman Period Occupation in the Qā'a

- Features included a packed earth surface with an overlying fill (K1.3) cut by two later pits (K1.2, K1.5). Above these, and just below topsoil, lay a cobble pavement (K1.1). The pavement may be associated with refurbishing activities of the late 19th and early 20th century.
- The ceramic assemblage includes the same range of types as in Phase 1b, but demonstrates a sharp increase in the proportion of sherds from handmade vessels as well as a sharp decrease in storage jar fragments. The Phase 2 handmade pottery forms are typical of the Ottoman period, and some fragments indicate a relatively late range within the 18th and 19th centuries (**Fig. 11, Table 3**; Brown 1988a: 25-26, 38, fig. 7).
- Chronology: the ceramics confirm the reuse of the qā'a during the Ottoman era. The Phase 2 accumulation appears to have extended at least to the mid-19th century. It is possible that the most recent accumulation was swept away in tidying up efforts during the first half of the 20th century.

Phase 1a: Construction of the Qā'a

As indicated above, the construction date of the qā'a has yet to be ascertained with certainty. Of the Phase 1a artifacts from the fills beneath the original plaster floor, it should be emphasized that the damaged copper coin from a sealed deposit (K1:7) has been reassessed. The initial numismatic study concluded that the coin was a Mamluk issue of the 14th century (see Brown 1989a: 294). As this determi-



11. Ceramics from Phase 2, the Ottoman era occupation.

Table 3: Ceramics from Phase 2, ware descriptions.

Ill. No.	Square, Locus, Pottery Basket & Reg. No.	CERAMIC DESCRIPTIONS Form, Ware, Surface & Core
1	K1:3.3.122	Bowl rim (Wh): W = pinkish (5YR 7/4-7/6); I&EG = dark green; C = none; D = 33
2	K1:3.3.150-52	Bowl rim (Wh): W = whitish stonepaste (10YR 8/2); E&IP = dark cobalt blue; I&EG = colorless, over paint; C = none; D = 15
3	K1:3.3.14	Jug/Jar rim (Wh): W = pinkish cream (7.5YR 7/4); SS; C = none; D = 6
4	K1:3.3.39	Jug/Jar rim (Wh): W = cream (10YR 8/2); SS; C = none; D = 5
5	K1:3.3.112	Jug/Jar rim (Wh): W = cream (10YR 8/2); SS; C = none; D = 5
6	K1:3.3.80	Jug/Jar base (Wh): W = dark pink (2.5YR 6/6); SS; C = none
7	K1:3.3.34	Jug/Jar base (Wh): W = pink (E = 5YR 7/4; I = 7.5YR 6/2-7/2); SS; C = thick, grey
8	K1:3.3.76	Jug/Jar handle (Wh): W = cream (2.5YR 8/2); SS; C = thick, pink
9	K1:3.3.100	Jug/Jar handle (Wh): W = cream (10YR 8/2); SS; C = none
10	K1:3.3.101	Jug/Jar handle (Wh): W = cream (10YR 8/2); SS; C = none
11	K1:3.3.149	Bowl BS (Wh): W = whitish stonepaste (10YR 8/2); E&IP = dark cobalt blue; I&G = colorless, over paint; C = none
12	K1:3.3.127	Jug/Jar BS (HM): W = pinkish grey (7.5YR 6/2-7/2); ES = cream (10YR 8/3); EP = brown (5YR 5/2); C = grey; some chaff inclusions
13	K1:3.3.55	Jug/Jar BS (HM): W = light red (5YR 6/4); ES = dark cream (7.5YR 8/4); EP = brown (7.5YR 5/2); C = thick, black
14	K1:3.3.94	Jug/Jar BS (HM): W = pink (5YR 7/4); ES = cream (10YR 8/4); EP = brown (2.5YR 4/4); C = none
15	K1:2.2.16	Hole-Mouth Jar rim (HM): W = dark grey (10YR 3/2); ES = dark cream (10YR 7/3); EP = red-brown (2.5YR 5/4); C = thick, grey; chaff inclusions; D = 13
16	K1:2.2.18	Bowl or Jug/Jar base (HM): W = red-grey (10YR 4/2); SS; EP = traces of red (2.5YR 5/5); C = thick black
17	K1:2.2.21	Jug/Jar BS (HM): W = pink (5YR 7/4); ES = cream (10YR 8/2); C = thick, dark grey; some chaff inclusions; raised bands with impression
18	K1:2.2.22	Jug/Jar BS (HM): W = grey-brown (7.5YR 5/2); ES = dark cream (7.5YR 6/4-7/4); EP = grey-brown (5YR 4/3); C = very thick, black; very little chaff
19	K1:2.2.20	Jug/Jar BS (HM): W = pink (5YR 7/4); ES = dark cream (5YR 7/3); EP = dark red (10R 5/3) & an incidental drip of black; C = thick, black; some chaff inclusions
20	K1:1.1.39	Jug/Jar base (HM): W = pinkish cream (7.5YR 7/4); SS; C = very thick, black; some chaff inclusions
21	K1:1.1.42	Jug/Jar BS (HM): W = red (2.5YR 6/4); ES = pink-cream (5YR 7/4-8/4); EP = black (5YR 5/1); C = very thick, black; chaff inclusions

Key: BS = body sherd; C = core; D = diameter; E = exterior; G = glaze; HM = handmade; I = interior; P = paint; S = slip; SS = self-slipped; W = ware; Wh = wheel-thrown (or belonging to a wheel-thrown vessel)

nation seemed to eliminate the possibility of a 13th century construction date, it appeared that the palace qā'a was likely to have been constructed under the patronage of Sultan an-Nasir Muhammad in 1311 (ibid. 292). The author is especially grateful to numismatist Stefan Heidemann of the University of Hamburg for recently undertaking a second examination of the coin. While noting that the poorly preserved coin has features that might suggest a 14th century Mamluk origin, Heidemann determined that it represents a Seleucid issue from between the second and first century BC (personal communication, 2010).² The coin is therefore irrelevant to the founding date of the Middle Islamic palace qā'a. Rather, it is consistent with the sub-floor level Classical and Late Antique pottery fragments that reflect occupation at Karak during the pre-Islamic centuries.

Aspects of the Phase 1a ceramic profile refer to the medieval cultural environment of the castle. Whereas the Islamic era sherds from this sub-floor context are generally small and of little diagnostic value, one exceptional fragment is composed of three adjoining sherds from the base of a lustre-painted stonepaste bowl or plate of the 12th century (Figs. 9 - 10). Lustre-painted stonepaste wares are rare at Karak and no other examples were retrieved during the excavation, which yielded a total of forty-two sherds (from all phases) belonging to glazed vessels (Table 1). More notable, however, is the near absence of lustre-painted ceramics within the large unstratified assemblage of Middle Islamic glazed wares from the castle. Collected during a regional survey (see Miller 1991: 89, no. 204), this assemblage includes 2,747 sherds with lead or alkaline glaze, as determined by Marcus Milwright (2008: 274, table 1). Within this group are 876 alkaline glazed sherds from stonepaste vessels, most of which were interpreted as Damascene products from the mid-13th century onward (ibid. 207-208, 252, 372-83, catalogue pages 25-36). Only two of these stonepaste

sherds represent lustre-painted vessels, and Milwright dated these to 1175-1225 (ibid. 254, 338, 383, catalogue page 36: 4).

Research on Islamic lustre-painted wares from Levantine sites has grown markedly since the 1987 excavation at Karak. The author is particularly grateful to Stephen McPhillips of the University of Copenhagen and Robert Mason of the Royal Ontario Museum, each of whom examined the Phase 1a lustre-painted base and offered valuable insights; the discussion below draws on their expertise. The stonepaste base fragment belonged to a wedge-footed bowl or plate and displays a colorless alkaline glaze with a light greenish tinge (indicating the presence of iron oxide). An incidental drop of cobalt is also evident. The over glaze, lustre-painted decoration features a schematized floral design executed as a roundel encircling the bottom of the bowl's interior (Figs. 9 - 10). The dark brown tone of the paint indicates a copper-rich pigment that is typical of Syrian alkaline glazed and lustre-painted wares from the second quarter of the 12th century through the beginning of the 13th century. The relatively coarse granular paste of grey-white color is also familiar in this period.

Ceramic assemblages from the Syrian-French excavations at the citadel in Damascus demonstrate that this city was a major center of innovation in manufacturing technologies, and that it hosted a growing stonepaste ware industry from the late 11th century through the 12th century (McPhillips 2012: 448-49, 455-56, 459). The new typology of Damascene stonepaste wares is largely based on stratified collections from between the fourth quarter of the 11th century and the first decade of the 13th century, with additional material from contexts dating to the first half of the 13th century (McPhillips 2002: 140-41, 2012: 451-52). As a production center relatively close to the towns of southern Transjordan, Damascus probably supplied much of the stonepaste found in this region (Milwright 2008: 252). In the citadel assemblage, McPhillips dis-

2. The flan was prepared from a flattened cast copper bar, from which slightly rectangular pieces were cut, flattened, and struck. This flan preparation is typical of some 14th century Mamluk coins, yet several features indicate a Seleucid origin. The initial bar was produced in an open mold giving the coin's cross section a slightly trapezoid shape, whereas the cross section of a Mamluk coin is usually that of a flattened ellipse. The bulge on

the obverse is too high for a Mamluk issue, but it could indicate a portrait head. The plain field in front of it is typical of Seleucid portrait coins, whereas traces of an inscription or a marginal circle are expected on Mamluk coins. The reverse shows parallel lines from the right, probably representing a galley prow. Traces of a Greek inscription are above it, with the apparent final letters of (...)OY (Heidemann, personal communication 2010).

tinguished between stonepaste wares emerging in the late 11th century and continuing through the mid-12th century (Seljuk and Burid eras) and those of the second half of the 12th century (Zangid and early Ayyubid periods), noting that the latter show: more standardized production, relatively thick-walls (among bowls) and duller, friable fabrics (2012: 456). Although stonepaste sherds displaying the technologically sophisticated technique of metallic lustre paint are infrequent, they occur throughout the 12th century at the Damascus citadel, and examples of brown lustre-paint over green-tinted colorless glaze are attested (McPhillips 2002: 142, table 1.2, 2012: 456, 458; see also François 2008: 73-75).³

The lustre-painted stonepaste bowl from Phase 1a at Karak was probably a Damascus product from between the second quarter of the 12th century and the early 13th century. As such, it could have been traded into southern Transjordan during either the Frankish occupation (1142-1188) or the initial decades of the ensuing Ayyubid period. While this provides an interesting example of the robust trade in luxury ceramics that benefitted the residents of Karak, it offers only a *terminus post quem* with regard to the construction date of the palace complex.

Introduction to Phase 1b & Phase 2: The Mamluk and Ottoman Period Occupations in the Qā'a

For the Mamluk and Ottoman period occupations, the field reports remain the primary source of information on stratigraphy and artifacts from above the Phase 1a plaster floor (Brown 1988a, 1989a). Additional remarks are presented here in reference to both ceramic distributions and recent research on faunal remains from these phases. It should be noted that this discussion assumes a chronological gap between the construction of the qā'a and the deposition of the Phase 1b debris. As medieval palace qā'as typically accommodated both formal audiences and private domestic activities, it is likely that the qā'a at Karak required and received routine cleanings during much of the time in which it served these functions for the elites in residence. The onset of the Phase 1b debris accumulation

above the floor may indicate a gradual shift to less formal uses, accompanied by more casual or intermittent cleaning. Yet the duration of such a presumed gap between the qā'a construction and the Phase 1b debris accrual is a matter of conjecture.

Phase 1b: The Mamluk Period

The Mamluk period ceramic and faunal remains have important implications for envisioning some of the economic and social activities that took place in the qā'a during this era. Broadly speaking, the palace complex was an area where strict control and supervision could be exercised over the stores that accrued within it. Storage functions are indicated by fragments of storage jars, which account for over a third of the Phase 1b assemblage (**Table 2**). This representation is consistent with the role of medieval Islamic palaces and elite residences as important storage facilities for commodities and other highly valued goods, as aptly demonstrated by the excavations at the 14th century governor's residence at Hisban (Walker and LaBianca 2003: 451). Foodstuffs stored in ceramic jars within the qā'a at Karak may have included local and regional products, such as olive oil, honey, fruit syrups or preserves, molasses, and processed sugar, which were ultimately consumed or redistributed through trade or gift-giving protocols. In the context of this discussion, it should be noted that the vast facilities at Karak castle housed imperial bulk supplies of grain to support the military in the region and provide emergency reserves for the regional population, in the event of famine. In the Mamluk period, this function is attested from the reign of Baybars I through the end of the 14th century, and may have extended beyond that (see Walker 2011: 87, fn 207; Raphael 2011: 162). These stores would have been secured in the large vaults beneath the lower bailey, facilities that were most certainly initially stocked with grain during the Ayyubid period.

The artifact distributions also describe the qā'a as a setting for social interactions during the Mamluk period, particularly with respect to refreshment and dining. The majority of

3. See also Mason's Group 2, dated from 1125 to 1150 (1997: 181-83, 190, 2004: 97-98, 101) and Tonghini's

Fritware 2, dated from the second half of the 12th century through the early 13th century (1998: 46-51).

the Phase 1b sherds belonged to wheel-thrown vessels, as shown in **Table 2** (glazed and unglazed sherds combined account for 62.7%, Nn = 200). These were decorated serving bowls and undecorated jugs and jars facilitating food service and consumption of beverages. Most of the glazed sherds belonged to earthen ware vessels with yellow lead glaze, although examples of brown, green, or green and yellow bichrome glaze also occur. Among the seven examples from imported wares are sherds representing a green glazed, imitation celadon bowl (possibly as late as the 15th century) and several alkaline glazed stonepaste vessels. The latter include (1) rims from an incurved rim bowl and flange rim bowl, both decorated with blue and black paint beneath a colorless glaze – a familiar decorative technique in Bilad ash-Sham during the 13th and 14th centuries, and (2) a bowl base with blue paint beneath a colorless glaze, providing an excellent example of the ‘blue and white’ tradition of the 14th century, which also extended into the 15th century (Brown 1989a: 300, fig. 5: 4-6; see also Milwright 2008: 226-36). Most if not all of these were likely produced in Damascus, although alkaline glazed stonepaste vessels were also manufactured in Cairo (see summary in Tonghini 1998: 52-53). In general, Middle Islamic imported wares were relatively common at Karak. Milwright’s study of the unstratified material from the castle showed that of the total 2,747 glazed sherds collected, nearly a third (31.8%, N = 876) represented vessels with alkaline glaze (or less frequently lead alkaline glaze), most of which were stonepaste wares with fabrics characteristic of Damascene products (2008: 207-208, 211-12, 274, table 1). This assemblage further confirms that dining activities accompanied by luxury table wares were characteristic of the Mamluk era cultural milieu at Karak.

The animal remains also reflect dining practices within the qā’a during the Mamluk period, and this discussion refers to analyses in Brown and Rielly (forthcoming). The distributions of faunal material from food animals in Phase 1b and Phase 2 are shown in TABLE 4 with corresponding data from the Mamluk and Ottoman

occupations within the Ayyubid palace at Shawbak; data from Ottoman era contexts at Umm al-Jimal are included for comparison as well.⁴ The Mamluk faunal assemblage from Karak shows consumption of domesticated sheep, goat, cattle, and chicken. In this sample, local game is limited to gazelle, but imported fish provided an additional supplement to the meat diet. The latter were probably saltwater varieties originating in the Red Sea, although some fish from the Mediterranean Sea may have been traded into Karak as well. Such imported saltwater fish are well-documented in medieval assemblages from across the southern highlands, and at Hisban some local freshwater fish appears and these specimens were most likely procured from the Jordan River system (Brown and Rielly 2010b: 135-36, table 7). As is typical of medieval faunal assemblages from southern Transjordan, most sheep and goat at Karak appear to have been slaughtered within their second year, with some of the herd surviving into the third year and beyond. While this suggests a priority on meat production, secondary products of milk and wool probably played important roles in the local economy as well. The faunal data also indicate a selective preference for meat-rich bones, with a corresponding low incidence of bones that are typically removed as butchers’ waste. Thus the sheep / goat representations in Phase 1b suggest that slaughtering and kitchen preparation tasks were largely accomplished elsewhere. Cattle remains from this phase are exceptional, however, as they consist exclusively of head and foot parts. These imply dumping of butcher’s waste or a possible incidence of on-site butchering. A hind leg articulation of an equid was also present. As equids were generally not eaten and there is no evidence that this animal was consumed, these remains were likely abandoned in this location.

Phase 2: The Ottoman Period

The Ottoman era ceramic and faunal remains indicate domestic activity as in the preceding period, although the Phase 2 artifacts are relatively fewer (**Tables 2 and 4**) and may suggest

4. To date, the only published Ottoman era faunal assemblages from Jordan are collections from Karak, Shawbak, and Umm al-Jimal (Brown and Rielly forthcoming; Brown and Rielly 2010a; Toplyn 1998). The Stratum I

data from Hisban is potentially relevant, although only the domesticated mammal species are reported (Driesch and Boessneck 1995: 72, table 5.9).

different cultural trends. Profile drawings of sherds from Phase 2 loci, and their ware descriptions, are included here (**Fig. 11, Table 3**) to illustrate aspects of this discussion (as in Brown 1988a: 38, fig. 7; this figure was not included in the published version of the field report due to limitations of space). While the ceramic type categories remain the same in Phase 2, there are changes in the relative representations of these types, as indicated above, as well as in some aspects of production. Nearly half of the Phase 2 ceramics belong to handmade vessels, as shown in **Tables 2** (see also **Fig. 11: 12-21**). These include plain and decorated wares, the latter featuring painted geometric patterns or other motifs that were widespread in the southern Levant from the 12th century onward (**Fig. 11: 12-16, 18-19, 21**). With the relative increase in sherds from handmade vessels in Phase 2, the assemblage shows a correspondent decrease in the frequency of sherds in other type categories, most notably storage jar fragments (**Tables 1 and 2**). This implies a shift away from the use of these containers within the qā'a setting. The extent to which the wheel-thrown plain wares represented in Phase 2 may date to the Ottoman period is unclear, for these generally small fragments display the same characteristics as the Phase 1b plain wares (**Fig. 11: 3-10**). At least some of the wheel-thrown fragments are residuals, as indicated by two small fragments from stonepaste wares. Of these, one belongs to the blue and white bowl base from Phase 1b (**Fig. 11: 11**), while the other is a poorly preserved rim fragment from either a blue and white bowl or a blue and black under glaze painted bowl (**Fig. 11: 2**).

The Phase 2 sherds from handmade vessels generally represent the rather less sophisticated manufacturing techniques that tend to be typical of the Ottoman period, although a fragment from a more skillfully produced vessel, of the sort that appears commonly in the Mamluk period, is also present (**Fig. 11: 14**). Most of the sherds from handmade vessels display relatively poor clay fabrics and rudimentary manufacturing and firing techniques (**Fig. 11: 15-21**). Decorations among these wares include broad, more loosely painted, patterns and one instance of a raised band with thumb impressions (**Fig. 11: 18-19, 21, 17**). These features suggest an 18th to 19th century time frame (see Walker 2009: 44).

Green glazed ceramic products, largely bowls, continued to circulate in Transjordan throughout the Ottoman period (Walker 2009: 41-44). The Phase 2 assemblage includes three representative fragments, two of which are small body sherds that probably belonged to the same unslipped vessel. The third is a small portion of a rim from a plate or broad, shallow bowl with a dark green and glossy glaze that was also applied directly to the clay surface (**Fig. 11: 1**). Both the glaze technique and the vessel form are documented among the Ottoman era glazed wares of northern Transjordan (ibid. 41). The Phase 2 assemblage also includes sherds from lead glazed wares displaying various ranges of yellow - brown, but most of these are poorly preserved. The sources of manufacture of these glazed wares is unknown. While they may have been regional products traded into Karak, the possibility of local production should not be dismissed.

Some specialized ceramic products that were widely distributed as imports in the Ottoman period do not appear in the Phase 2 assemblage. Given the presence of rudimentary handmade wares that are typical of the 18th to 19th century, it would be reasonable to expect fragments of the ceramic tobacco pipes and porcelain coffee cups that were traded throughout the Ottoman lands from the 18th century onward (see Walker 2009: 47 ff.). The absence of these imports is notable, as is the lack of representation of wheel-thrown and reduction-fired gray wares, variants of which were produced in Gaza and other locations in Ottoman Palestine during this period. While Milwright found relatively few sherds from vessels imported during the Ottoman era overall, the unstratified collection nevertheless includes several examples from tobacco pipes, coffee cups, and reduction-fired gray wares (2008: 138, 254), suggesting that their absence in the Phase 2 assemblage may be a function of sample size.

Ascribing chronological parameters to Ottoman era pottery groups in Bilad ash-Sham is an enduring challenge, yet temporal and regional distributions began to emerge with studies by Marcus Milwright (2000) and Veronique François (2008). Currently, the most comprehensive framework for Ottoman ceramics in Transjordan is found in Bethany Walker's masterful assessment (2009). In summarizing the distributions of Ottoman pottery in this region, she notes "...

a relative scarcity of imports and glazed wares, a greater percentage of handmade wares, and a more limited range of wares and forms (and these are dominated by multi-purpose vessels used for food preparation, serving, and small-scale storage; large storage and transport vessels are rare), mostly of local production” (ibid. 39). In this discussion, Walker also points to the highly regional nature of Ottoman ceramic distributions in Bilad ash-Sham, particularly in the later centuries, with the result that assemblages vary considerably from site to site. This general characterization of Ottoman ceramic assemblages in Transjordan is certainly applicable to the Phase 2 ceramics from Karak.

The Ottoman period assemblage of bones from food animals is shown in **Table 4**, and while this sample is small, it offers some preliminary insights. Domesticated sheep and goat appear to have been the principal sources of meat, although chicken was also consumed. Supplements to the typical meat diet were provided by game species, such as gazelle and birds. The latter included chukar partridge and graylag goose, either of which could have been procured in the wild or raised in captivity. The lack of fish and cattle in Phase 2 stands in contrast to the Mamluk faunal assemblage. The general absence of fish bones in Ottoman contexts in the southern highlands implies a discontinuation of the widespread saltwater fish trade in this region, perhaps

resulting from a cultural shift in meat preferences (Brown and Rielly 2010a: 192). The absence of cattle in the assemblage from Ottoman Karak is not necessarily characteristic of this period and may reflect sample bias, for cattle appear in Ottoman contexts at Shawbak and Umm al-Jimal (**Table 4**).

The sheep and goat representations suggest a relative increase in reliance on these species in Phase 2. Specifically, the proportion of ovicaprid bone elements within the overall representation of meat animals shifts from 57.0% during the Mamluk period to 74.3% in the Ottoman era (**Table 4**). It is possible that a similar trend is indicated for the Shawbak data. As in the Mamluk period, most sheep and goat from the Ottoman phase at Karak appear to have been slaughtered within their second year. However, the Phase 2 assemblage shows a lesser concentration of meat-rich bones from sheep and goat (Brown and Rielly forthcoming). Overall, the distribution of skeletal parts suggests that ovicaprid butchering as well as culinary preparations took place either within or in close proximity to the qā’a.

Summary of the Mamluk and Ottoman Periods

Referring to the archaeological remains of the Mamluk and Ottoman eras, the ways in which the palace qā’a was used over time may, in some respects, reflect the historically indicated socio-

Table 4: The Mamluk and Ottoman era remains of food animals from the Middle Islamic palaces at Karak and Shawbak, and the Late Ottoman contexts at Umm al-Jimal.

Site, Phase/Stratum & Period	Karak Ph. 1b Mamluk		Shawbak Ph. 3 Mamluk		Karak Ph. 2 Ottoman		Shawbak Ph. 4 Ottoman		Umm al-Jimal Str. II Ottoman	
	No.	%	No.	%	No.	%	No.	%	No.	%
Meat Animals										
Sheep & Goat	146	57.0	99	81.8	104	74.3	80	88.9	279	94.6
Cattle	18	7.0	2	1.7			5	5.6	9	3.1
Camel			2	1.7			1	1.1	1	0.3
Pig							1	1.1		
Chicken	87	34.0	10	8.3	32	22.9	3	3.3	6	2.0
Fish	4	1.6	5	4.1						
Gazelle	1	0.4	3	2.5	2	1.4				
Game Birds					2	1.4				
Totals per Phase	256		121		140		90		295	

Notes: Data are presented as total fragment counts. The Umm al-Jimal data refer to Areas B and C. Faunal remains from Area A are omitted as this material appears partially or entirely deposited by French troops occupying the site in the early 20th century and therefore is less useful for comparison with Ottoman era faunal remains from Karak and Shawbak.

Citations: Brown and Rielly forthcoming; Brown and Rielly (2010a: 181, table 3); Toplyn (1998: 226, table 8; 227, table 11).

economic conditions of the region. The Mamluk artifact distributions show the importance of the qā'a for social activities, such as dining practices that were accompanied by displays of imported luxury table wares and substantial use of other vessels manufactured by potters specializing in wheel throwing and glazing techniques. These wares were used in serving meals that featured a diverse meat diet, with selected cuts of sheep and goat, and some fish, chicken, and beef. Storage of commodities is also indicated, although most of the goods and valuables that were likely to have been housed within or near the qā'a have, understandably, left no trace. These functions resonate closely with the intended purposes of a typical palace qā'a.

In general, the sophisticated life-style indicated for the Mamluk phase of occupation is echoed, to a greater or lesser extent, at other Mamluk sites in Transjordan. The widespread availability of highly specialized wheel-thrown ceramics, and the consistent appearance of at least a few examples of imported luxury wares (largely Damascene), as well as other products, is seen in similar repertoires from many sites, among them: Tabaqat Fahl, Area XXIII (McPhillips and Walmsley 2007: 132-36), Tall Abu Qa'dan, Phases J-T (Franken and Kalsbeek 1975: figs 35-38, 42-45; see also Sauer 1976), Hisban, Strata IIIA, IIIB, and II (Walker 2012: 562-87), Dhiban, Phase 2b (Porter *et al.* 2005: 207-209; Porter *et al.* 2010: 19-20; see also references to Tushingham's Middle Islamic ceramics from Dhiban in Sauer 1975: 108) and Khirbat Faris, Far. I and Far. II (Johns, McQuitty and Falkner 1989: 90-92, figs 25-27). Similarly, the long distance trade in saltwater fish, which is well documented in Middle Islamic contexts from the 12th century on, continued across southern Transjordan during the Mamluk period (Brown and Rielly 2010a: 191-92, 2010b: 135, table 7, 136). In these respects, the domestic debris from the Mamluk phase at Karak reflects widespread patterns of consumer preferences and the availability of specific goods traded throughout the region during this period.

The use of the qā'a during the Ottoman era shows a wide range of everyday domestic activities. Consumption of meals remained an important social practice, yet relatively few decorative table wares are evident. Furthermore, kitchen

tasks including food preparation and butchering appear to have taken place within the qā'a, in addition to meal service. Sheep and goat played a larger role in the meat diet and there is no evidence for consumption of fish. The distinctive nature of this Ottoman era material from Karak suggests greater dependence on locally produced goods and, with respect to livestock, greater priority on the rearing of sheep and goat. In the context of local history, it is likely that the qā'a was occupied by tribal households.

The ceramics indicate an increased reliance on technologically less specialized vessels of local manufacture. As ceramic storage jars appear to have been used sparingly, other types of containers fulfilled storage needs at this time. Both of these trends are apparent throughout Transjordan (Walker 2009: 39). Additionally, evidence for the fish trade is lacking, as are luxury imported ceramics from highly specialized workshops, although the latter, including table wares, tobacco pipes, and coffee cups, are represented in the substantially larger unstratified collection, as noted above. The extent to which wheel-thrown glazed and unglazed table wares were imported into Karak in this period is unclear, for the point at which local manufacture ceased has yet to be determined. Nevertheless, the hallmark green glazed wares of the Ottoman era appear to have been among the ceramic types traded into the Karak region at this time. Overall, the ceramic assemblage from the Ottoman phase implies a shift that favored local manufacture of handmade wares. Inter-regional trade in various goods was practiced throughout the southern highlands during this period by travellers of all sorts, among them merchants, caravaneers, and *hajj* pilgrims. However, many of high-demand trade items would have left little direct archaeological evidence. For example, a partial list of trade goods bartered in the Ma'an market in 1845 cites coffee, sugar, spices, firearms, gun powder, and lead (Wallin 1854: 123). These and other items were certainly offered in 19th century Karak as well.

The original concept of the palace qā'a as a monumental hall for hosting a relatively wealthy family of the ruling elite, whose priorities included formal reception of guests and supervising access to personal wealth, including currency and high value goods, carried little explicit

consciousness into the later Ottoman centuries. Nevertheless, some universal household functions were shared throughout the ages, despite differences in household means or priorities. Overall, these observations, grounded in historical archaeology, offer an intriguing although still preliminary picture of the functions of the qā'a within the variable social and economic environments associated with the castle.

Themes in Ayyubid Palace Architecture in Syria and Transjordan

Relatively recent studies addressing Middle Islamic palaces and dwellings in the palatial style have lent considerable depth to the literature on historical architecture in the Muslim Levant (e.g. Yovitchitch 2011: 269-77; David 2007; Korn 2004 [1]: 75-79; Tabbaa 1997: 71-96; see also David and Rousset 2008; Fourdrin 2005: 167-73), providing an opportunity to review the architectural attributes of the qā'a at Karak with increasing clarity. In particular, fresh insights regarding the characteristics of the Ayyubid qā'as of Syria describe strong continuities that are relevant to the history of medieval palace architecture in Transjordan.

By the late 12th century, citadel-palace constructions were proliferating rapidly throughout Bilad ash-Sham and the neighboring territories of Egypt, the Jazira, and southeast Anatolia. This concept gained particular currency and momentum in and around Ayyubid Syria, where a great number of citadels embracing royal and elite residential complexes were erected (Rabbat 2006). While some of these palaces are known only in historical literature, a number of qā'as have survived. Among the prominent examples of these are the qā'as at: Raqqa (ca 1168), Qal'at Sahyun (late 12th or early 13th century), Qal'at Najm (ca 1215), Bosra – Tower of al-'Adil (1215-1218), Diyarbakir (early 13th century), Aleppo Citadel – main Ayyubid palace (first half of the 13th century), Aleppo Citadel – Tawashi Palace (1230-1231?) and Harim (late 12th to early 13th century). The elite private res-

idence known as Matbakh al-Ajami in Aleppo (late 12th to early 13th century) provides an additional example of the Syrian palatial style of the Ayyubid period. The palace at Mu'azzara is most likely a mid-13th century construction of either the late Ayyubid or early Mamluk decades. Comparative documentation on Ayyubid palace qā'as in Egypt is quite limited, but a late 18th century plan of the qā'a of as-Salih Najm ad-Din Ayyub (d. 1249), built within his citadel on Rawda Island at Fustat, has survived (Creswell 1978 [2]: 86, fig. 38). Aspects of this design appear transitional, including traits that are well known expressions among qā'as of the Mamluk era (Revault 1982: 38; Ibrahim 1984: 53). In Syria, these transitional traits are also expressed in the design of the qā'a at Mu'azzara (Fourdrin 2005: 174-77).

Bridging the Muslim territories of Syria and Egypt, Transjordan was also a stage for the citadel-palace building culture of the Middle Islamic period, as evident at Karak and several other sites. Shawbak hosts a grand qā'a of the late 12th or early 13th century (Brown 1989b: 229, fig. 3), and remnants of a palatial residence stand within the 1214-1215 tower of Aybak at Ajlun castle (Yovitchitch 2006: 236). An elite dwelling within the citadel at Hisban from the first half of the 14th century probably housed the Mamluk governor (Walker and LaBianca 2003: 447-53). Among these four surviving examples of palatial constructions in Transjordan, the qā'a at Shawbak provides a particularly useful basis for comparison with that of Karak. There has been general consensus that the Shawbak palace was built during the early Ayyubid period (Rugiadi 2009: 120-21; Nucciotti 2007: 44-45; Brown 1988b: 240, 242). The durqā'a, flanking alcoves, and large iwan (to the southeast of the durqā'a) all bear dimensions that are nearly identical to those at Karak. The second large iwan (to the northwest of the durqā'a) remains blocked by overburden. As a result, the qā'a plan remains incomplete, as indicated in the original architectural drawing (Brown 1989b: 229, fig. 3).⁵ Nevertheless, a

5. Unfortunately, an altered and inaccurate, yet widely replicated version of the original plan of the qā'a at Shawbak includes the false implication of the existence of a wall sealing the northwest side of the durqā'a (e.g. Bertocci 2009: 112, fig. 25, 111, fig. 26, 115, fig. 30; Bini 2009: 29, fig. 39, 2004: 64-65, fig. 63, 69, fig. 66,

70, fig. 67, 71, figs 68-69; Faucherre 2004: 53, fig. 8, 54, fig. 9; Luschi 2004: 198, fig. 205; Yovitchitch 2011: 270, fig. 332.; 338, plate VII; Vannini 2012: 45, fig. 11). Such a wall does not exist, and its implication disrupts the actual integrity and symmetry of this monument.

tentative reconstruction of the dimensions of the blocked large iwan to the northwest, prepared by Thomas Biller, Daniel Burger, and Hans-Heinrich Häffner following their on-site examination of the structural evidence, suggests quite plausibly that the qā'a followed a rigorously symmetrical arrangement, as was the case at Karak (Biller *et al.* 1999: 34, fig. 1). Most notably, the Shawbak qā'a is elongated by an additional unit attached to the end of the large iwan (to the southeast), a feature that may have been duplicated beyond the second large iwan, as hypothesized in the reconstruction proposed by Biller *et al.* (*ibid.*). In addition to this distinguishing feature, the Shawbak qā'a also displays marked accomplishment in execution, suggesting a costly undertaking with particular attention to the creation of a luxurious environment. While the patron is unconfirmed, it is likely a work of al-'Adil, dating to the 1190s, or of his son al-Mu'azzam 'Isa Sharaf ad-Din (d. 1227), who formally received the southern Transjordan castles in 1207-1208 (al-Maqrizi 1980: 150-51), but probably acted as governor of this region from 1198. While the investment at Karak was more modest, its design may have drawn some measure of inspiration from the qā'a at Shawbak.

Palaces constructed in Bilad ash-Sham between the late 12th century and the 1260 inception of Mongol penetration display well documented continuities in spatial design and other attributes. Principal stylistic themes include muqarnas portals and sculptural ornament, and qā'a arrangements that express variations on the four-iwan design principle and include tripartite facades and water pools or fountains for embellishment (Tabbaa 1997: 81-95). Triple entrances through closed iwan chambers (*travée rythmique*) facing the durqā'a are also quite common.⁶ While such themes constituted a widely repeated vocabulary among the Ayyubid palace qā'as of Bilad ash-Sham, these suites also tend to exhibit distinct and conscious individualism in design and decorative traits, undoubtedly reflecting the specific tastes and preferences of their patrons.

At Karak, the qā'a displays a four-iwan plan that is precisely symmetrical on both the

axis of the two large iwans (aligned north and south) and the axis of the two smaller iwan alcoves (aligned east and west). While not typically found in Syria, such exact symmetry may well exist at Shawbak also, as noted above, but this is yet to be confirmed. Tripartite facades, consisting of an iwan with doorways opening to either side of it, are represented at Karak on the east and west faces of the durqā'a. In contrast, the large iwans to the north and south are closed by partition walls featuring triple entrance doorways that include a large central portal (most likely originally fitted with wooden double doors) flanked by smaller doors to either side (Fig. 2; Deschamps 1939: pl. XV A). An identical arrangement of tripartite facades and triple entranceways appears at Shawbak. These features are common among in Ayyubid Syria, yet most qā'as in that region include only one closed iwan with triple entrances. At Karak, the symmetry of the qā'a arrangement raises the question as to the functions of these spaces relative to one another, particularly with respect to the location of the grand iwan (seat of authority) from which the prince or governor received guests, and the same question pertains to the qā'a at Shawbak.

The design of tripartite facades and closed iwans with triple entrances arranged around the durqā'a underscores the remote, mysterious, and inaccessible nature of the grand qā'a, as perceived by palace visitors. From the durqā'as at Karak and Shawbak, guests would have faced a total of ten doorways (!), referring to nine portals in addition to the one through which entrance to the qā'a had been gained. Not only would the activities and contents within the two large iwans have been fairly obscured from the visitor's view by facades that likely included wooden doors that could be shut, it would not have been readily apparent to guests if the other doorways facing the durqā'a led to passages, rooms, or blind cubicles. Such arrangements were characteristic of the Ayyubid period and intended to baffle visitors, who typically would have entered the palace complex through a series of bent access corridors or vestibules that also contributed to a sense of intricacy, if

6. In Egyptian housing documents, closed units with triple entrances that faced a durqā'a were termed *majlis*, distinguishing them from the structural form of the *iwān*,

which was completely open to the durqā'a (Sayed 1987: 37-39).

not disorientation. In these respects, illusions of spatial complexity were well planned and well conveyed. These labyrinthine patterns are found in nearly every Syrian palatial dwelling cited above. In contrast, Mamluk qā'as in elite residences tended to emphasize spaciousness, often favoring broad open iwans that extended the principal axis.

Conclusion: A New Interpretation of the Grand Palace Qā'a at Karak

Architecturally, the surviving qā'a at Karak reflects close similarities of design and style with the qā'as of Ayyubid Syria. Therefore, it may be most beneficially discussed in the context of the Ayyubid palace repertoire of Bilad ash-Sham, as above, rather than being treated as a Mamluk construction. Given the various threads of circumstantial evidence presented here, one may reasonably infer, at this junction, that this grand qā'a at Karak is the Qā'a an-Nasiri of an-Nasir Da'ud (r. 1229-1249), and that it is situated within his palace, the Dar al Sa'adah. This assertion inevitably raises the question as to the location of the Mamluk era Qā'a an-Nahas or Hall of Copper. In this respect, there may be a faint hint in the small qā'a or reception area. Yet this remains unresolved and such inquiries are beyond the scope of this discussion. Most significantly the role of Karak in the development of Middle Islamic palatial architecture in Bilad ash-Sham remains a rich field for further exploration.

Robin M. Brown
36 Washburn St
Watertown
MA 02472
USA
robin_brown@terc.edu

Bibliography

- al-'Asqalāni, A.
1973 *Ad-Durar ul-Kāmina fī A'yān il-Mi'atith-Thāmina*, Vol. 2. Hyderabad: Osmania Oriental Publications Bureau.
- al-Bakhit, M. A.
1992 *Das Königreich von al-Karak in der mamlūkischen Zeit. Aus dem arabischen Geschichtswerk von Muḥammad 'Adnān al-Bahīt übersetzt und ausführlich erläutert*; Alexander Scheidt. Frankfurt am Main: Peter Lang.

- Bertocci, S.
2009 I rilievi dei castelli crociati dell'area di Petra. Pp. 87-133 in S. Bertocci and M. Bini (eds.), *Castelli medievali a Petra e nel vicino oriente tra rilievo e archeologia*. Firenze: Società Editrice Fiorentina.
- Bianquis, T.
1986-89 *Damas et la Syrie sous la domination fatimide (359-468/969-1076). Essai d'interpretation de chroniques arabes medievales*. 2 vols. Damascus: Institute Français de Damas.
- Biller, T.; Burger, D.; and Häffner, H.-H.
1999 Neues zu den Burgen des Königreichs Jerusalem in Transjordanien, Montréal (Shobaq) - Li Vaux Moïse (Wu'eira) - Kerak. Pp. 33-58 in M. Kozok (ed.), *Architektur, Struktur, Symbol: Streifzüge durch die Architekturgeschichte von der Antike bis zur Gegenwart: Festschrift für Cord Meckseper zum 65. Geburtstag*. Petersberg: Imhof.
- Bini, M.
2004 Il castello di Shoubak. Pp. 55-95 in M. Bini and S. Bertocci (eds.), *Castelli di pietre: Aspetti formali e materiali dei castelli crociati nell'area di Petra in Transgiordania*. Firenze: Edizioni Polistampa.
2009 The Eastern Border. The Wu'ayra Fortifications – Habis Castle – Shoubak Castle – Kerak Castle. Pp. 15-40 in M. Bini and C. Luschi (eds.), *Castelli e cattedrali. Sulle tracce del regno crociato di Gerusalemme. Resoconti di viaggio in Israele*. Firenze: Alinea.
- Bliss, F. J.
1895 Narrative of an Expedition to Moab and Gilead in March, 1895. *Palestine Exploration Fund Quarterly Statement*: 203-234.
- Brown, R. M.
1988a Report of the 1987 Excavation at Kerak Castle: The Mamluk Palace Reception Hall. Document on file at the American Center of Oriental Research and the Department of Antiquities, Amman.
1988b Summary Report of the 1986 Excavations: Late Islamic Shobak. *Annual of the Department of Antiquities of Jordan* 32: 225-245.
1989a Excavations in the 14th Century A.D. Mamluk Palace at Kerak. *Annual of the Department of Antiquities of Jordan* 33: 287-304.
1989b Kerak Castle. Pp. 341-347 in *Archaeology of Jordan II.1. Field Reports: Surveys & Sites L-Z. Akkadica Supplementum VII*, ed. D. Homes-Fredericq and J. B. Hennessy. Leuven: Peeters.
- Brown, R. M., and Rielly, K.
2010a Faunal Remains from Excavations in the Ayyubid Palace at Shawbak Castle in Southern Transjordan. *Berytus* 51-52 (2008-2009): 169-198.

- 2010b A Twelfth Century Faunal Assemblage from al-Wu'ayra in the Southern Highlands of Jordan. *Annual of the Department of Antiquities of Jordan* 54: 121-141.
- Brown, R. M., and Rielly, K.
 forthcoming Faunal Remains from Mamluk and Ottoman Occupations in the Middle Islamic Period Palace at Karak Castle (Qal' at al-Karak). *Annual of the American Schools of Oriental Research* 69 (2014).
- Brünnow, R.
 1895 Reisebericht, I. Von Jerusalem bis Madaba. *Mittheilungen und Nachrichten des Deutschen Palaestina-Vereins*: 65-79.
- Burckhardt, J. L.
 1822 *Travels in Syria and the Holy Land*. London: Murray.
- Burgoyne, M. H.
 1987 *Mamluk Jerusalem, an Architectural Study*. London: British School of Archaeology in Jerusalem, World of Islam Festival Trust.
- Creswell, K. A. C.
 1978 *The Muslim Architecture of Egypt*. 2 vols. New York: Hacker Art Books.
- David, J.-C.
 2007 Ayyubid Palace Architecture in Syria. Pp. 51-70 S. Bianca (ed.), in *Syria: Medieval Citadels Between East and West*. Turin: Umberto Allemandi for The Aga Khan Trust for Culture.
- David, J.-C., and Rousset, M.-O.
 2008 La qā'a de la maison Wakil à Alep: origine d'un nouveau modèle d'espace domestique. Pp. 55-69 in J. Gonnella and J. Kröger (eds.), *Angels, Peonies, and Fabulous Creatures: The Aleppo Room in Berlin*, eds.. Rhema-Münster: Museum für Islamische Kunst, Staatliche Museen zu Berlin.
- Deschamps, P.
 1939 *Les châteaux des croisés en Terre-Sainte*, II. *La défense du royaume de Jérusalem: Étude historique, géographique et monumentale*. Bibliothèque archéologique et historique 34. Paris: Geuthner.
- Dowling, T. E.
 1896 Kerak in 1896. *Palestine Exploration Fund Quarterly Statement*: 327-332.
- Driesch, A. von den, and Boessneck, J.
 1995 Final Report on the Zooarchaeological Investigation of Animal Bone Finds from Tell Hesban, Jordan. Pp. 65-108 in Ø. S. LaBianca and A. von den Driesch (eds.), *Faunal Remains: Taphonomical and Zooarchaeological Studies of the Animal Remains from Tell Hesban and Vicinity*. Berrien Springs, MI: Andrews University.
- Faucherre, N.
 2004 La forteresse de Shawbak (Crac de Montréal), une des premières forteresses Franques sous son corset mamelouk. Pp. 43-66 in N. Faucherre, J. Mesqui, and N. Prouteau (eds.), *La fortification au temps des Croisades*. Rennes: Universitaires de Rennes.
- Forder, A.
 2002 *Ventures Among the Arabs in Desert, Tent, and Town. Thirteen Years of Pioneer Missionary Life with the Ishmaelites of Moab, Edom and Arabia*. New York: Gospel. Reprinted from 1909 edition. Piscataway, NJ: Gorgias.
- Fourdrin, J.-P.
 2005 Le palais fortifié médiéval de Muazzara (Syrie). *Annales Islamologiques* 39: 149-204.
- François, V.
 2008 *Céramiques de la citadelle de Damas. Époques mamelouke et ottomane*. Aix-en-Provence: Centre National de la Recherche Scientifique, Laboratoire d'Archéologie Médiévale et Moderne en Méditerranée (CD-ROM).
- Franken, H. J., and Kalsbeek, J.
 1975 *Potters of a Medieval Village in the Jordan Valley. Excavations at Tell Deir 'Allā: A Medieval Tell, Tell Abu Gourdan, Jordan*. North-Holland Ceramic Studies in Archaeology 3. Amsterdam: North-Holland.
- Ghawānimah, Y. D.
 1979 *Tārīkh Sharqī al-Urdun fī 'asr Dawlat al-Mamālīk al- Ūlā: al-Qism al-Hadarī*. Amman: Wizārat al-Thaqāfa wash-Shabāb.
- Ginsburg, C. D.
 1873 Report on the Exploration of Southern Moab. Pp. 210-223 in *Report of the Forty-Second Annual Meeting of the British Association for the Advancement of Science*. London: Murray.
- Grandin, T.
 2007 Introduction to the Citadel of Salah al-Din. Pp. 139-180 in S. A. Bianca (ed.), *Syria: Medieval Citadels Between East and West*. Turin: Umberto Allemandi for The Aga Khan Trust for Culture.
- Ibn al-Furat, M.
 1936 *The History of Ibn al-Furat*, ed. C. K. Zurayk. Beirut: Printed at the American Press.
- Ibn Wāṣil, M.
 1972 *Mufarrij al-Kurūb fī Akhbār Banī Ayyūb*, Volume 4. Cairo: National Library.
- Ibrahim, L. A.
 1984 Residential Architecture in Mamluk Cairo. *Muqarnas* 2: 47-59.
- Johns, J.
 1992 Islamic Settlement in Ard al-Karak. *Studies in the History and Archaeology of Jordan* 4: 363-368.

- 1994 The *Longue Durée*: State and Settlement Strategies in Southern Transjordan Across the Islamic Centuries. Pp. 1-31 in E. L. Rogan and T. Tell (eds.), *Village, Steppe and State: The Social Origins of Modern Jordan*. London: British Academic.
 - 1998 The Rise of Middle Islamic Hand-Made Geometrically-Painted Ware in Bilād al-Shām (11th-13th Centuries A. D.). Pp. 65-93 in R.-P. Gayraud (ed.), *Colloque international d'archéologie islamique*, ed. R.P. Gayraud. Cairo: Institut Français d'Archéologie Orientale.
- Johns, J.; McQuitty A.; and Falkner, R.
- 1989 The Fāris Project: Preliminary Report upon the 1986 and 1988 Seasons. *Levant* 21: 63-95.
- Jones, I. W.; Levy T. E.; and Najjar, M.
- 2012 Khirbat Nuqayb al-Asaymir and Middle Islamic Metallurgy in Faynan: Surveys of Wadi al-Ghuwayb and Wadi al-Jariya in Faynan, Southern Jordan. *Bulletin of the American Schools of Oriental Research* 368: 67-102.
- Kennedy, H.
- 1994 *Crusader Castles*. Cambridge: Cambridge University Press.
- Korn, L.
- 2004 *Ayyubidische Architektur in Ägypten und Syrien: Bautätigkeit im Kontext von Politik und Gesellschaft 564-658/1169-1260*. 2 vols. Heidelberg: Heidelberger Orientverlag.
- Lancaster, W., and Lancaster, F.
- 1995 Land Use and Population in the Area North of Karak. *Levant* 27: 103-124.
- Lee, J. R.
- 2003 Kerak Castle - The 1997 Church Excavations. Paper presented at the Archaeology of Crusader States & Medieval Culture symposium, St. Louis Community College – Florissant Valley, St. Louis.
- Libbey, W., and Hoskins, F. E.
- 1905 *The Jordan Valley and Petra*. 2 vols. New York: Putnam's Sons.
- Luschi, C. M. R.
- 2004 Il Palazzo Ayyubide. Pp. 197-201 in M. Bini and S. Bertocchi (eds.), *Castelli di pietre: Aspetti formali e materiali dei castelli crociati nell'area di Petra in Transgiordania*. Firenze: Edizioni Polistampa.
- McPhillips, S.
- 2002 Twelfth Century Pottery from the Citadel of Damascus. *Bulletin d'études orientales* 53-54. *Supplément: Études et travaux à la citadelle de Damas 2000-2001: Un premier bilan*, 139-155.
 - 2012 Continuity and Innovation in Syrian Artisanal Traditions of the 9th to 13th Centuries. Ceramic Evidence from the Syrian-French Citadel of Damascus Excavations. *Bulletin d'études orientales* 61: 447-473.
- McPhillips, S., and Walmsley, A.
- 2007 Fahl during the Early Mamluk Period: Archaeological Perspectives. *Mamluk Studies Review* 11.1: 119-156.
- al-Maqrīzī, T.
- 1980 A History of the Ayyūbid Sultans of Egypt. Trans. and notes R. J. C. Broadhurst. Boston: Twayne.
- Mason, R.
- 1997 Medieval Syrian Lustre-painted and Associated Wares: Typology in a Multidisciplinary Study. *Levant* 29: 169-200.
 - 2004 *Shine Like the Sun: Lustre-painted and Associated Pottery from the Medieval Middle East*. Costa Mesa, CA: Mazda.
- Miller, J. M., ed.
- 1991 *Archaeological Survey of the Kerak Plateau*. Atlanta: Scholars.
- Milwright, M.
- 2000 Pottery of Bilad al-Sham in the Ottoman Period: A Review of the Published Archaeological Evidence. *Levant* 32: 189-208.
 - 2006 Central and Southern Jordan in the Ayyubid Period: Historical and Archaeological Perspectives. *Journal of the Royal Asiatic Society*, ser. 3, 16.1: 1-27.
 - 2008 *The Fortress of the Raven: Karak in the Middle Islamic Period (1100 - 1650)*. Leiden: Brill.
- Nucciotti, M.
- 2007 Analisi strategiche degli elevati: primi risultati. Pp. 27-55 in G. Vannini (ed.), *Archeologia dell'insediamento crociato-ayyubide in Transgiordania: il progetto Shawbak*. Florence: Borgo San Lorenzo.
- Peake, F. G.
- 1958 *A History of Jordan and Its Tribes*. Coral Gables: University of Miami.
- Porter, B.; Routledge, B.; Fatkin, D. S.; Zimmerle, W.; Hakes, J.; Salvant, J.; and Schultz, W.
- 2010 The Dhībān Excavation and Development Project's 2005 Season. *Annual of the Department of Antiquities of Jordan* 54: 9-34.
- Porter, B.; Routledge, B.; Steen, D.; Parslow, C.; de Jong, L.; and Zimmerle, W.
- 2005 Tall Dhībān 2004 Pilot Season: Prospection, Preservation, and Planning. *Annual of the Department of Antiquities of Jordan* 49: 201-216.
- Rabbat, N.
- 2006 The Militarization of Taste in Medieval Bilād al-Shām. Pp. 84-105 in *Muslim Military Architecture in Greater Syria: From the Coming of Islam to the Ottoman Period*, ed. H. Kennedy. Leiden: Brill.

- Rafeq, A-K.
1966 *The Province of Damascus, 1723-1783*. Beirut: Khayats.
- Raphael, K.
2011 *Muslim Fortresses in the Levant: Between Crusaders and Mongols*. London: Routledge.
- Revault, J.
1982 L'architecture domestique au Caire à l'époque mamelouke (XIII^e-XVI^e siècles). Pp. 19-142 in J.-C. Garcin, B. Maury, J. Revault, and M. Zakariya (eds.), *Palais et maisons du Caire I. Époque mamelouke (XIII^e-XVI^e siècles)*. Paris: Centre National de la Recherche Scientifique.
- Rogan, E. L.
2002 *Frontiers of the State in the Late Ottoman Empire*. Cambridge, England: Cambridge University.
- Rugiadi, M.
2009 Il palazzo ayyubide a Shawbak. Pp. 120-121 in *Da Petra a Shawbak: Archeologia di una frontiera*, ed. G. Vannini and M. Nuccioti. Florence: Giunti.
- Sadeque, S. F.
1956 *Baybars I of Egypt*. Dacca: Oxford University.
- Sauer, J. A.
1975 Review of *The Excavations at Dibon (Dhiban) in Moab: The Third Campaign 1952-1953*, by A. D. Tushingham. *Annual of the Department of Antiquities of Jordan* 20: 103-109.
1976 Pottery Techniques at Tell Deir `Allā. *Bulletin of the American Schools of Oriental Research* 224: 91-94.
- Sayed, H. I.
1987 The Development of the Cairene Qā'a: Some Considerations. *Annales Islamologiques* 23: 31-53.
- Tabbaa, Y.
1997 *Constructions of Power and Piety in Medieval Aleppo*. University Park, PA: Pennsylvania State University.
- Tonghini, C.
1998 *Qal'at Ja'bar Pottery: A Study of a Syrian Fortified Site of the Late 11th-14th Centuries*. British Academy Monographs in Archaeology 11. Oxford: published for the Council for British Research in the Levant by Oxford University Press.
- Toplyn, M. R.
1998 Animal and Human Skeletal Remains (1977). Pp. 221-228 in B. de Vries, et al., *Umm el-Jimal: A Frontier Town and Its Landscape in Northern Jordan*, Vol. 1: *Fieldwork 1972-1981*. Journal of Roman Archaeology Supplement 26. Portsmouth, RI: Journal of Roman Archaeology.
- Vannini, G.
2012 Archeologia di una frontiera Mediterranea. Pp. 35-48 in G. Vannini and M. Nuccioti (eds.), *La Transgiordania nei secoli XII-XIII e le 'frontiere' del Mediterraneo medievale*. BAR International Series 2386. Oxford: Archaeopress.
- Walker, B. J.
2009 Identifying the Late Islamic Period Ceramically: Preliminary Observations on Ottoman Wares from Central and Northern Jordan. Pp. 37-65, 127-153 in B. J. Walker (ed.), *Reflections of Empire: Archaeological and Ethnographic Studies on the Pottery of the Ottoman Levant*. *Annual of the American Schools of Oriental Research* 64. Boston: American Schools of Oriental Research.
2011 *Jordan in the Late Middle Ages: Transformation of the Mamluk Frontier*. Chicago: Middle East Documentation Center.
2012 The Islamic Period. Pp. 507-593 in J. A. Sauer and L. G. Herr (eds.), *Ceramic Finds: Typological and Technological Studies of the Pottery Remains from Tell Hesban and Vicinity*. Hesban 11. Berrien Springs, MI: Institute of Archaeology and Andrews University.
- Walker, B. J., and LaBianca, Ø. S.
2003 The Islamic Qusūr of Tall Ḥisbān: Preliminary Report on the 1998 and 2001 Seasons. *Annual of the Department of Antiquities of Jordan* 47: 443-471.
- Wallin, G. A.
1854 Narrative of a Journey from Cairo to Medina and Mecca, by Suez, Arabā, Tawilā, al-Jawf, Jubbé, Hāil, and Nejd, in 1845. *Journal of the Royal Geographical Society of London* 24: 115-207.
- Yovitchitch, C.
2006 The Tower of Aybak in 'Ajlun Castle: An Example of the Spread of an Architectural Concept in Early 13th-Century Ayyubid Fortification. Pp. 225-242 in H. Kennedy (ed.), *Muslim Military Architecture in Greater Syria: From the Coming of Islam to the Ottoman Period*, ed. H. Kennedy. Leiden: Brill.
2011 *Forteresses du Proches-Orient: l'architecture militaire des Ayyoubides*. Paris: Paris-Sorbonne.

‘AWJA SITES: SUPPLEMENTARY INVESTIGATIONS OF NEOLITHIC OPEN SANCTUARIES IN SOUTHERNMOST JORDAN

Sumio Fujii, Takuro Adachi, Hitoshi Endo and Masatoshi Yamafuji

Introduction

The ‘Awja sites are located in southernmost Jordan, near the Saudi border. They were first discovered during the 2010 summer field season and were subsequently briefly examined in the 2011 summer field season (Fujii *et al.* n.d.). The then rescue investigation suggested that they represented Neolithic or Chalcolithic open sanctuaries, but the field operation was interrupted halfway through owing to a heavy sandstorm that erupted during the latter half of the season. For this reason, we devoted the last ten days of this season to supplementary investigations at these unique sites and tried to gather further research data. This has contributed to the establishment of a chronology for Neolithic open sanctuaries in southern Jordan and surrounding areas. Another result was the discovery of representations of feline animals at ‘Awja 1, which has shed new light on cultural contact between southern Jordan and the Negev / Sinai during the Late Neolithic. The following is a brief summary of the investigation results.

The Sites and Site Settings

The ‘Awja sites lie in the middle of a sand desert that extends below the escarpment fringing the southern edge of the Jafr basin (**Fig. 1**). The area belongs to the Cretaceous formation in terms of geology, presenting a landscape quite different to the Jafr basin, which is covered with extensive quaternary sediments (Bender 1974: 20-22). In this sense, it may be more correct to define the area as a northern extension of al-Tubaiq, the hilly, sandstone terrain occupying the north-western corner of Saudi Arabia. The local climate is therefore hyper-arid, with no perennial water sources in the area. These harsh

environmental conditions are the most distinctive feature of the ‘Awja sites, and hold a key to understanding their cultural background.

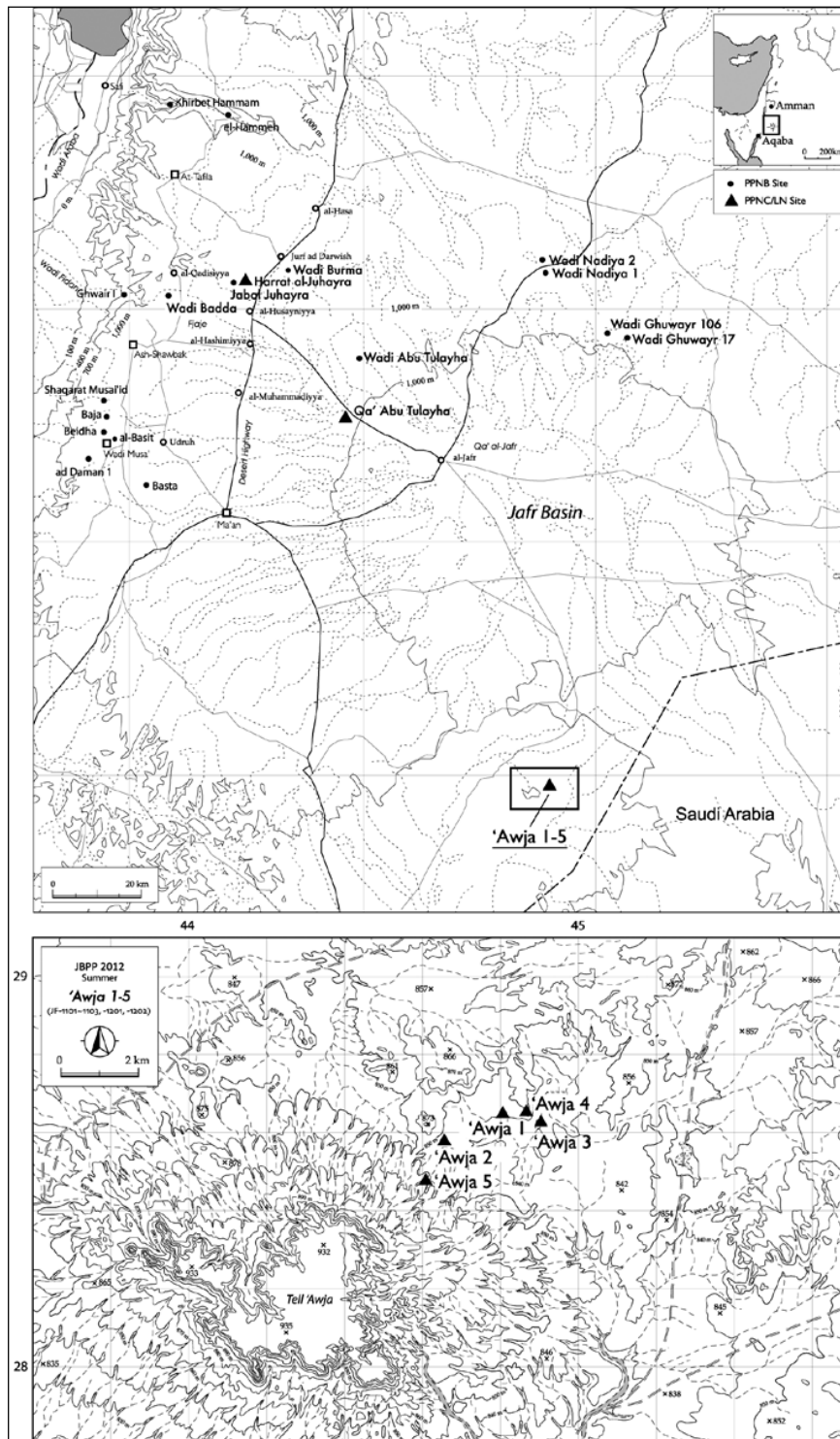
The sites are situated on flat terrain *ca* 2.5 km north-east of Tell ‘Awja, the main landmark in the area, and form a contemporary site cluster encompassed within small sandstone hills and rises. The last field season located three sites, ‘Awja 1, 2 and 3, which were tentatively identified as Neolithic to Chalcolithic open sanctuaries (Fujii *et al.* op. cit.). The most recent season located two new sites (‘Awja 4 and 5). The description that follows will focus on the three sites of ‘Awja 1, 4 and 5, that were either re-investigated or newly investigated in this field season.

Supplementary Excavation at ‘Awja 1

The site of ‘Awja 1 is located on a fluvial plain, *ca* 5 km north-east of Tell ‘Awja, and consists of the following two structural complexes (**Figs. 2 - 4**). Complex I was partially excavated last season. This season significantly enlarged the excavation area and explored its overall character. Complex II, on the other hand, was only surface-cleaned last season. During this season it was entirely excavated and its details pursued. Since neither artifacts nor faunal / floral remains were recovered from either complex, the following description focuses only on structural remains.

Complex I

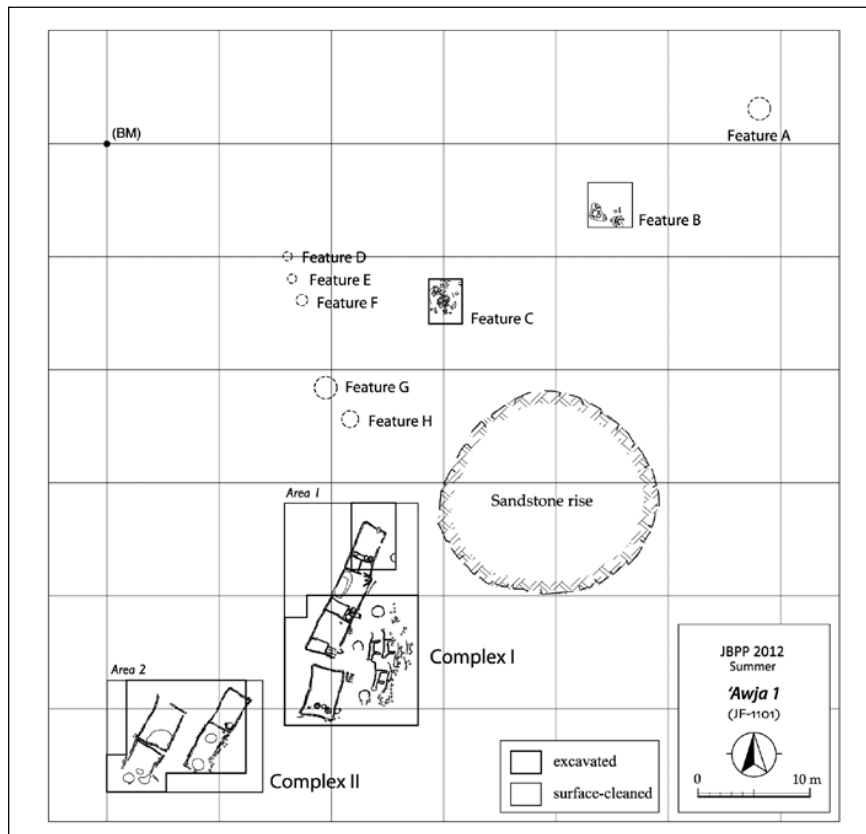
The supplementary investigation has clarified the overall character of Complex I (**Figs. 5 - 7**). In terms of technology, we confirmed anew that the complex was constructed by means of the two-row upright slab wall technique, a con-



1. The location of the 'Awja sites and their surrounding topography.

struction method unique to the Neolithic *badia* (Betts 1998, 2012; Fujii n.d.; Garrard *et al.* 1987, 1994). Of interest was the existence of corner stones, which were used to mark the mid-points of the two long sides of each unit as well as its four corners. This fact demonstrates that

the complex was constructed on a systematic architectural basis. As for construction material, locally occurring coarse sandstone slabs were used without any significant modification. Most were 10 - 30 cm long and were laid directly on the then ground surface in stretcher bonds. The



2. 'Awja 1: site plan.



3. 'Awja 1: general view of the site (looking NE).

exceptions to this are small features constructed of smaller slabs, often arranged in an upright position. No clear evidence for clay mortar or foundation 'banks' was recognized, but it might possibly have weathered away over a long peri-

od of time. The absence of fallen stones around the walls indicates that the complex consisted only of the foundation course. No small finds, including faunal / floral remains, were recovered in or around the complex, suggesting that



4. 'Awja 1: general view of the site (looking SW).

the site was used for some ephemeral or non-domestic purpose. The absence of traces of actual life, such as hearths or ashy deposits, to say nothing of artifacts, also supports this functional identification.

The complex falls into the following two groups of units. One consists of the laterally connected continuum of Units A - C, which is aligned ENE - WSW and measures *ca* 12 m in total length and *ca* 2 - 2.5 m in width. The other is the freestanding Unit D, which is separated from the neighboring Unit C by *ca* 1 m and, at the same time, differs slightly in general orientation from the continuum of which Unit C is part. Both observations suggest that there was a small temporal gap between the two. Also of significance is the fact that all of the four units are associated with a round feature in front of their front walls. Both components are probably paired to form the composite unit or 'pseudo-house burial cairn' characteristic of Late Neolithic open sanctuaries or symbolic communal cemeteries in the Jafr basin (Fujii n.d.). As noted above, no artifacts were recovered in or around the complex. Even hearths and ashy deposits were absent. A brief description of each unit follows.

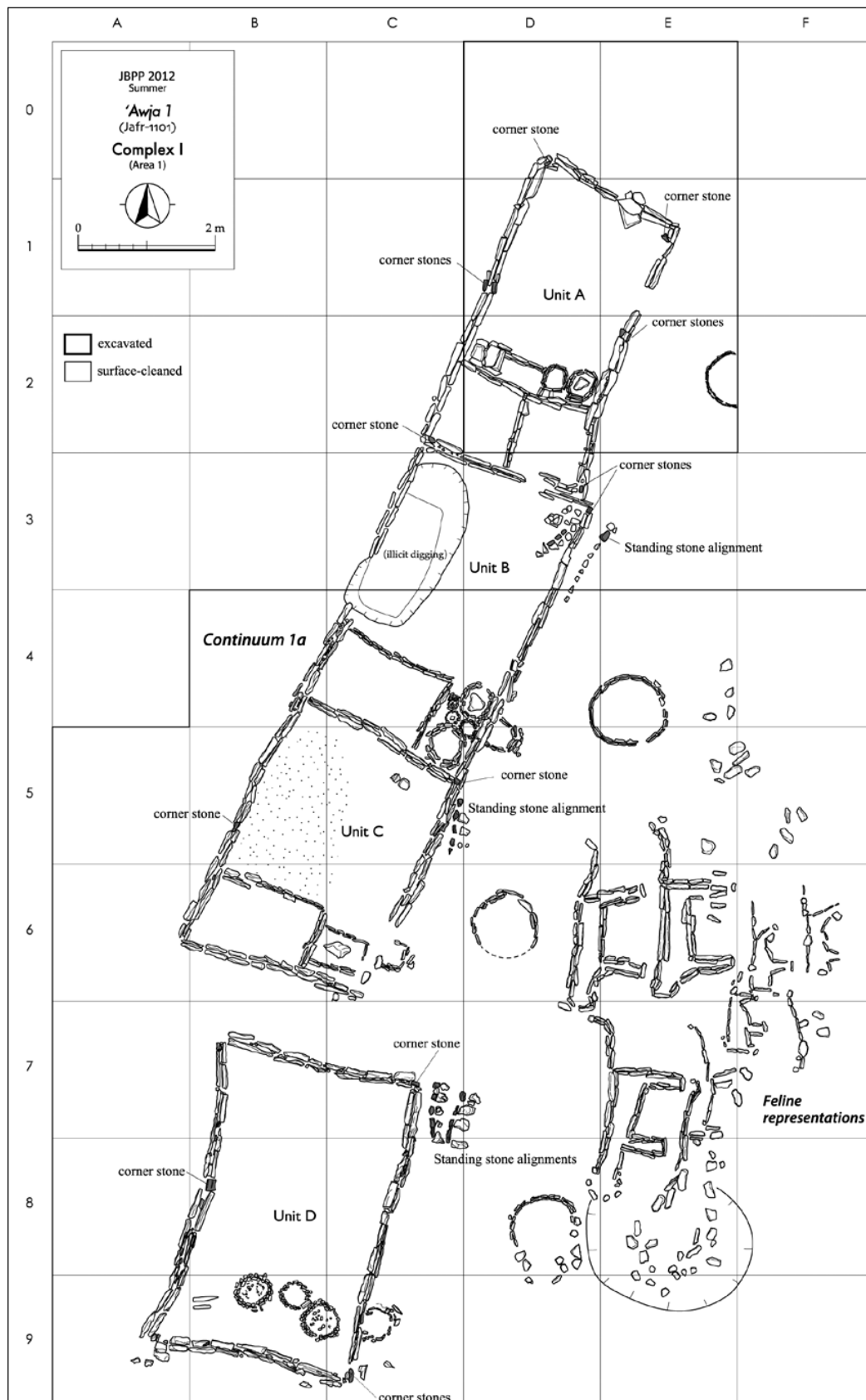
Unit A

Unit A, the northernmost component of the continuum, is a rectangular structure *ca* 4 m long by *ca* 2 m wide (**Fig. 8**). As noted above, corner stones were used to mark a total of six

major points on the peripheral walls. The unit was equipped with a small gap in the middle of the front wall, which might represent an entrance to the main room of the unit. In addition, two square compartments and four small rectangular or round features were incorporated along the south-western wall. Interestingly, two of the four small features were covered with a capstone, but nothing was found underneath (**Fig. 9**). Turning to the outside of the unit, a large circle *ca* 0.8 m in diameter and *ca* 0.1 - 0.2 m high was added to the frontal space of the unit. As suggested above, it probably combined with its neighbor to form a composite unit.

Unit B

Unit B was partially excavated last season. This season expanded the excavation area to the north and confirmed anew that: (1) the unit is rectangular structure *ca* 4.5 m long by *ca* 2.5 m wide; (2) it is equipped with a vertically elongated compartment and four small circles at its back left corner and front left corner respectively; (3) a capstone is placed in the center of two of the four round features; (4) a small semi-circular feature is attached to the southern part of the front wall (**Figs. 10 and 11**). New discoveries included a small concentration of stones at the north-eastern corner of the main room and a short alignment of upright stones outside the corner (**Fig. 12**). The latter feature is common to the other two units, suggesting that it was part of the standard furniture of Complex I. Here, again,



5. 'Awja 1: plan of Complex I.



6. 'Awja 1: general view of Complex I (looking N).



7. 'Awja 1: general view of Complex I (looking SW).



8. 'Awja 1: general view of Unit A (looking NW).



9. 'Awja 1: close-up view of the southeastern corner of Unit A (looking NE).



10. 'Awja 1: general view of Unit B (looking NW).

a larger circle *ca.* 1 m in diameter was associated with the front wall at a distance of *ca.* 1 m.

Unit C

Unit C was fully excavated last season and no repetition is needed here. We would like to only note that: (1) it is equipped with a vertically elongated compartment at its back left corner and a small rectangular feature at its front left corner; (2) it is associated with a short wall alignment *ca.* 1 m long and a semi-circular feature *ca.* 0.4 m in diameter close to the ends of the frontal wall; (3) a large round feature *ca.* 1 m in diameter is attached to the front space (**Fig. 13**).

What is important here is that the unit displays evidence for typological simplification, which takes an even clearer form in the neighboring Unit D.

Unit D

Unit D was only part-exposed in the last field season (Fujii *et al.* n.d.). This season revealed its entirety. In the end it turned out that the unit has a rectangular plan and measures *ca.* 4.5 m by *ca.* 2.5 m in floor area (**Figs. 14 and 15**). Unlike the other three units, this freestanding example was simple in terms of divisions of indoor space, with no rectangular compartments



11. 'Awja 1: close-up view of the southeastern corner of Unit B (looking SW).



12. 'Awja 1: close-up view of the northeastern corner of Unit B (looking E).



13. 'Awja 1: general view of Unit C (looking N).



14. 'Awja 1: general view of Unit D (looking W).



15. 'Awja 1: general view of Unit D (looking NE).

being incorporated within it. Instead, three small round circles *ca* 0.4 - 0.5 m in diameter were irregularly arranged along the southern wall (Fig. 16). In contrast, the outdoor features

still maintained the 'standard' triple set, consisting of short wall alignments at the right end of the front wall (as observed from the front) (Fig. 17), a semi-circular feature near the left



16. 'Awja 1: close-up view of the southeastern part of Unit D (looking SW).



17. 'Awja 1: close-up view of the northeastern corner of Unit D (looking SW).

end of the front wall and a large circle in the front space.

As suggested in the previous report, the wall-sharing relationships between any two adjacent units, especially Units A and B, seem to indicate that the elongated complex developed gradually from ENE to WSW. The sequential simplification in the division of indoor space is also consistent with this assumption. It would follow, then, that the complex began with Unit A (and its neighboring large circle), was interrupted once at Unit C, and then restarted with Unit D but ended soon thereafter. The small gap between the last two units might possibly represent some sort of temporal gap. The series of unique traits – *viz.* the isolated location in hyper-arid terrain, the use of the two-row upright slab wall technique, the consistent combination of a rectangular structure and a round feature in front of it, and the formation of a laterally connected body of such homogeneous composite units – is

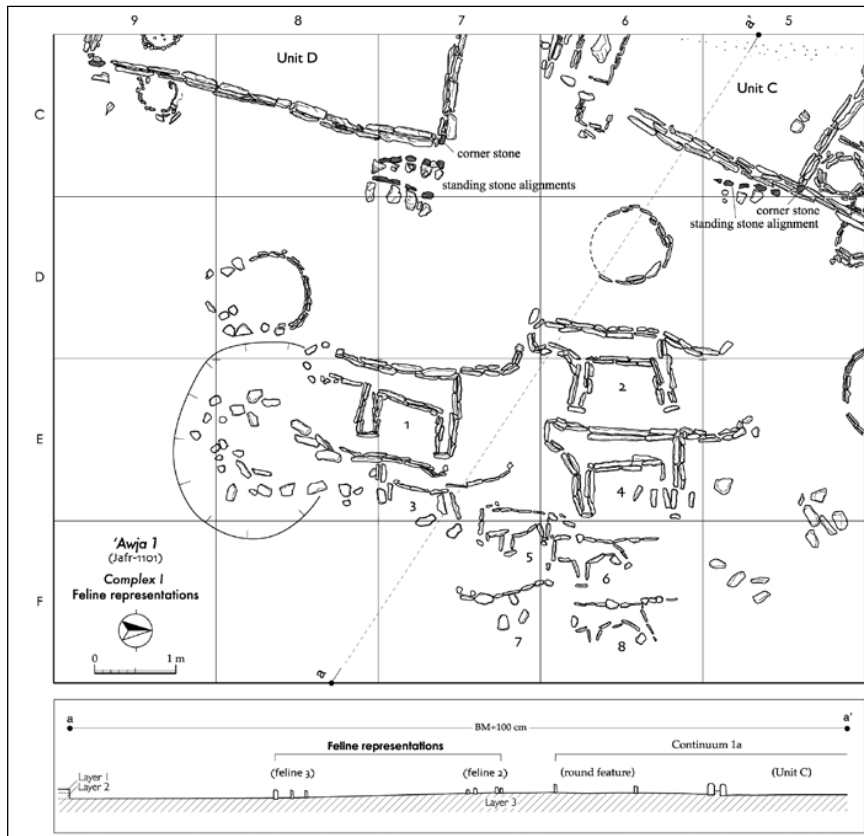
common to the Neolithic open sanctuaries in the neighboring Jafr basin as well (Fujii *n.d.*). There is no doubt that Complex I shares a similar character and date to them.

Feline Representations

Last season's work had confirmed two short wall alignments in front of Unit C (Fujii *et al.* *n.d.*: Fig. 6). This season enlarged the excavation area and traced their extension to the east. As a result, quite unexpectedly, they turned out to a part of animal representations made using the two-row upright slab wall technique (Figs. 18 and 19). In terms of iconography, they were identified as feline animals on the basis of their overall body proportions, the absence of horns and their long tails curling only at the tip. Technologically, as with the neighboring complex, elongated construction materials were put directly on the then ground surface in stretcher bonds, and no clear evidence for clay mortar and foundation banks was recognized. The inner space of every feature was packed with silty sands including abraded flint pebbles.

The overall iconography was composed of two rows and four tiers: a total of eight feline animals were represented. The upper two tiers contained four larger felines (probably representing adult individuals), which measured *ca* 1.5 - 2 m in trunk-length, *ca* 1 m in trunk height and *ca* 1 m in tail length. The lower two tiers, on the other hand, consisted of four smaller felines (probably representing juvenile individuals) measuring *ca* 1 m in trunk length, *ca* 0.5 - 0.6 m in trunk height and *ca* 0.5 m in tail length. All of the eight felines were represented in a lateral view with their heads facing south and their long tails stretching north. Every feature was depicted in a fairly realistic manner, and the details including a long tail curling only at its roundish tip were accurately portrayed (Fig. 20). However, a large pit *ca* 2 - 2.5 m in diameter and *ca* 0.3 m in depth was dug at the southern edge of the feline representations and partly disturbed the original stone alignments of the two adjacent features and the outdoor circle belonging to Unit D.

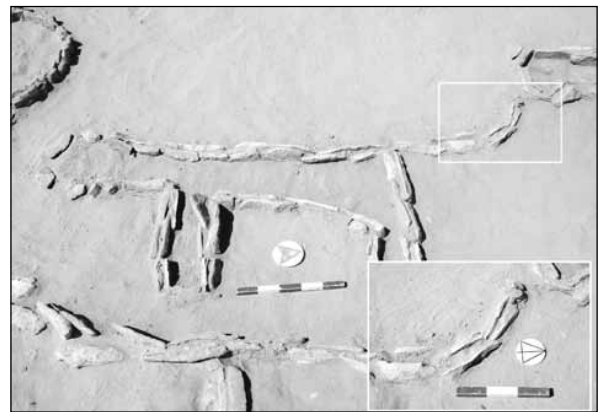
There is little doubt that the feline representations were coeval with the neighboring complex, because both share the same technology and site stratigraphy. The rough correspondence of general orientation between the two may also argue



18. 'Awja 1: plan of the feline representations.



19. 'Awja 1: general view of the feline representations (looking W).

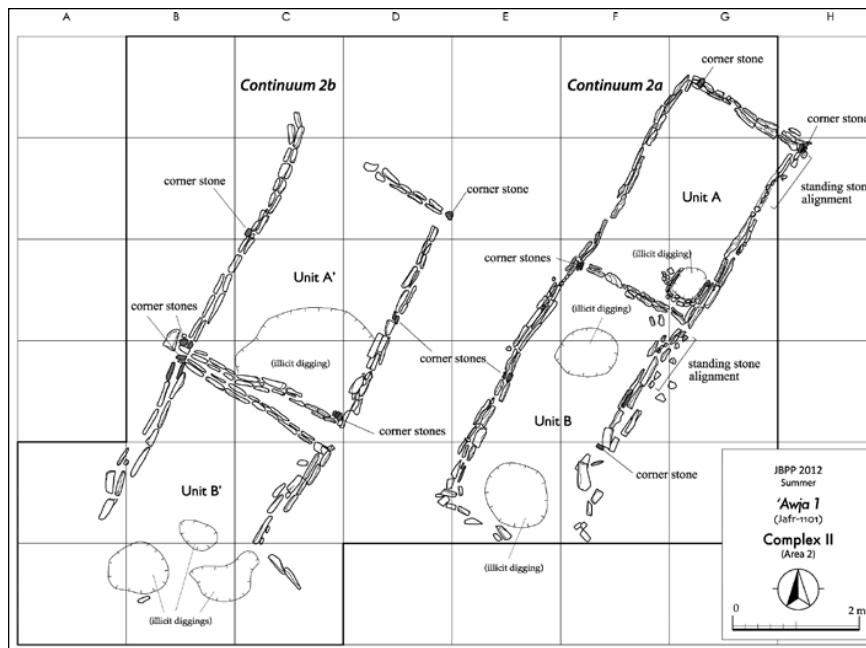


20. 'Awja 1: close-up view of the feline representations (looking W).

in favour of this assumption. Thus, the question is which of the neighboring two units (i.e. Unit C or Unit D) it belonged to, but no direct clue is available. A hint, if any, consists of the fact that large sandstone slabs over 50 cm long were sporadically used for the larger feline representations, especially Feline 4. Similar slabs are used at Unit D, albeit only sporadically, but are not used at all at Unit C. This seems to suggest that the feline representations may have been associ-

ated with Unit D, the most recent component of the neighboring complex.

Another important question concerns the specific function of the feline representations, but nothing can be said about this at our current stage of knowledge. All we can say is that they were probably related to some sort of communal ritual that took place at the site. Regardless, the concomitance of such unusual features highlights the unique nature of the 'Awja sites.



21. 'Awja 1: plan of Complex II.

Complex II

Complex II is located *ca* 5 m south-west of Complex I. The surface cleaning last season revealed its rough shape. The excavation this season has confirmed that: (1) it consists of a pair of parallel continua that are both orientated ENE - WSW; (2) each continuum consists of two laterally connected rectangular units *ca* 4 - 5 m long by *ca* 2 - 3 m wide; (3) each unit is constructed using the two-row upright slab wall technique and incorporates several corner stones at the prescribed points (**Figs. 21 - 23**). Incidentally, last season's work identified several pebble concentrations in and around the four units, but these turned out to represent the spoil of illicit diggings.

The four units are simple in terms of division of indoor space, with internal features being limited to a small circle at the front left corner of Unit A of Continuum 2a (**Fig. 24**). However, in view of the fact that illicit diggings have focused on the south-western corner of each unit, the possibility that the other three units also incorporated similar features cannot be fully ruled out. Anyhow, the decrease or disappearance of small internal features suggests that the typological simplification observed in the last two units of the neighboring complex continued at Complex II and took on an even clearer form.

Further support for this assumption comes from the collapse of the triple set of outdoor



22. 'Awja 1: general view of Complex II (looking N).

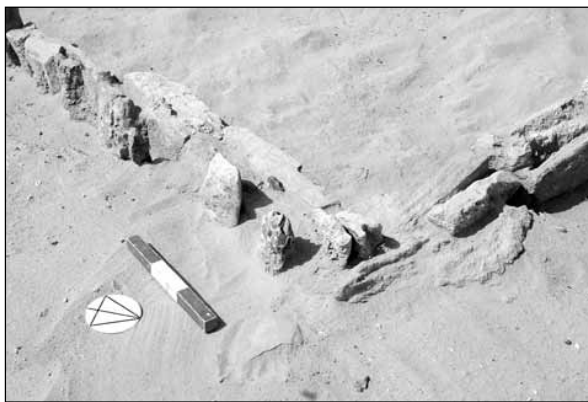


23. 'Awja 1: general view of Complex II (looking SW).

features. Although an upright stone alignment barely survives at the two units of Continuum 2a (**Fig. 25**), the other two components - a



24. 'Awja 1: close-up view of the middle part of Continuum 2b (looking W).



25. 'Awja 1: close-up view of the northeastern corner of Unit A, Continuum 2b (looking SW).

small semi-circular feature at the left end of a front wall and a freestanding round feature in the frontal space - no longer accompany them. In the case of Continuum 2b, all three components disappear. These observations corroborate anew that the four units of Complex II represent simplified and probably subsequent forms of Complex I, especially Unit D. As discussed below, this perspective provides insights into the chronological sequence of the 'Awja sites.

New Investigations at 'Awja 4

Unlike the other four sites which are all located on a fluvial plain, 'Awja 4 occupies the flat ridgeline of an elongated sandstone hill *ca* 0.5 km east of 'Awja 1. The site was discovered this field season and was briefly examined by means of surface cleaning. As a result, it can be said that the site includes at least three complexes aligned north-west – south-east at *ca* 10 - 20 m intervals (Fig. 26). As with the other 'Awja sites, the two-row upright slab wall technique was used for the

construction, and small upright corner stones marked cardinal points of the walls. Here again, no specific traces of actual life such as artifacts and hearths were confirmed.

Area 1

Area 1 (29°42.090 N, 036°24.203 E; *ca* 853 m above sea level) is located at the north-western edge of the site. It contained at least four rectangular units *ca* 3 - 4 m long and *ca* 1.8 - 2.2 m wide (Fig. 27). Three of them were connected laterally to form a continuum at least 8 m long. The continuum extends in a north - south direction, but this is probably due to the topographical constraints of the slope on which it is located (the same is true of the other continua described below). The remaining Unit D was freestanding and differed slightly in general orientation from the continuum. In this sense, we may argue that the complex bears some resemblance to Complex I at 'Awja 1. However, all four units are simple in terms of division of internal space and, in this respect, resemble Complex II (rather than Complex I) at 'Awja 1. The total disappearance of small features might suggest that it is slightly later in date even than Complex II.

Area 2

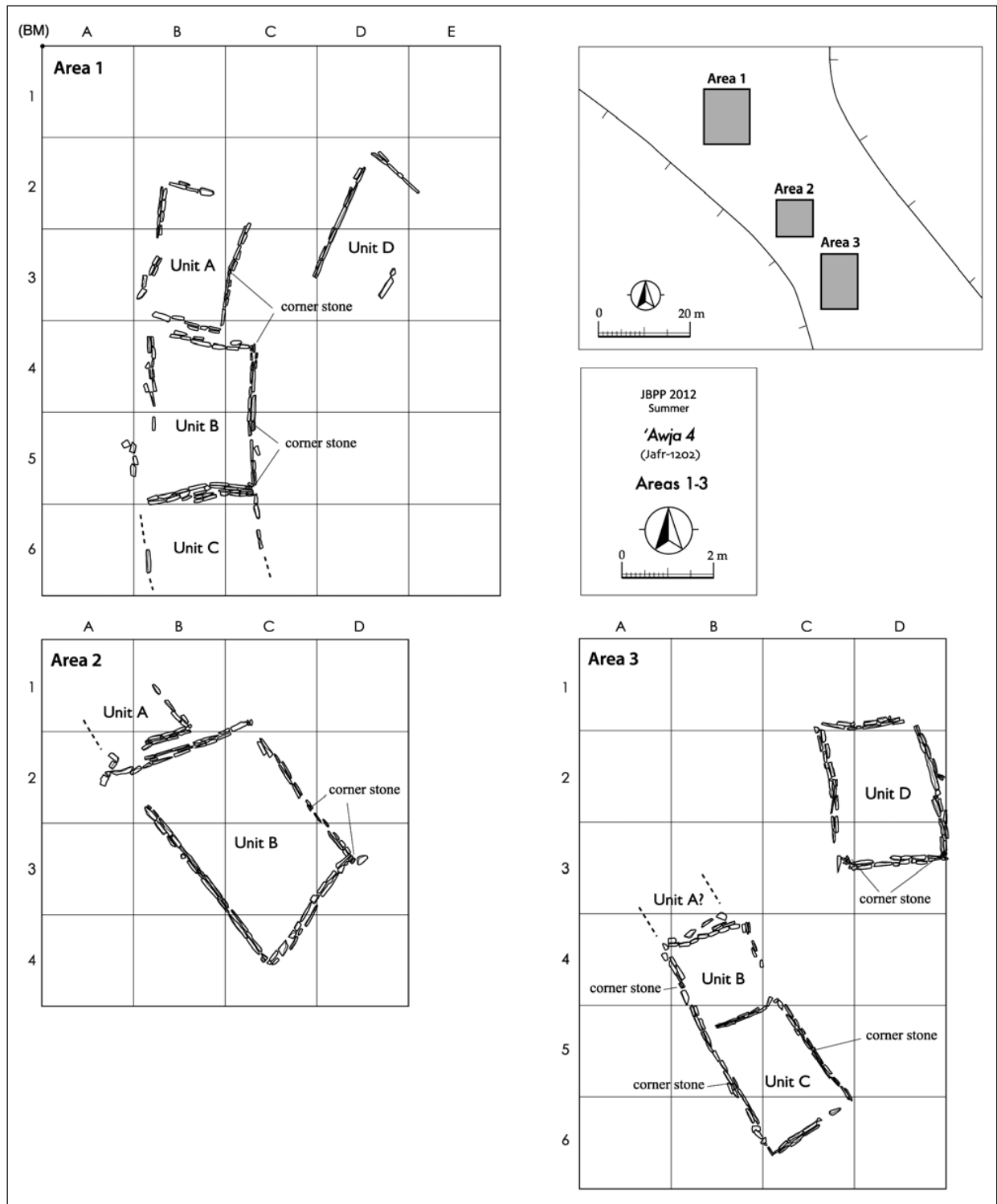
Area 2 occupies a gentle slope *ca* 20 m south-west of Area 1. This area contained at least two rectangular to trapezoidal units *ca* 4 - 5 m long and *ca* 3 m wide, although Unit A was poorly preserved and its overall character difficult to interpret (Fig. 28). Both units were connected to form a short continuum extending in a north-west – south-east direction. As with the four units at Area 1, neither of these two units incorporated any small feature.

Area 3

Area 3 is situated *ca* 5 m south-east of Area 2 and includes at least four rectangular units of various sizes (Fig. 29). Three of them were laterally connected to form a continuum at least 5 m long. Unit D was freestanding and separated from the neighboring continuum by a gap of *ca* 3 m. Again, none of them was associated with any small feature.

New Investigations at 'Awja 5

The site of 'Awja 5 (29°41.150 N, 036°26.587



26. 'Awja 4: plans of structural remains at Areas 1-3.

E; ca 817 m above sea level) is located at the southern foot of a small sandstone hill ca 3 km south-west of 'Awja 1. It was discovered for

the first time, along with with 'Awja 4, during this field season and was briefly examined by means of surface cleaning. It turned out that the



27. 'Awja 4: general view of Area 1 (looking N).



28. 'Awja 4: general view of Area 2 (looking NW).



29. 'Awja 4: general view of Area 3 (looking N).

site contained a large-scale continuum with a total length of *ca* 17 m and a width of *ca* 4 - 6 m (Figs. 30 - 32). Again, the two-row upright slab wall technique was used for the construction, but with the addition of limestone cobbles as well as sandstone slabs. It is probably for this reason that many of the construction materials were found as collapse. Corner stones were used at the prescribed locations. Neither artifacts nor hearths were found.

The complex consisted of four rectangular to square units connected laterally on an approximate south - north alignment. Two of the four were each associated with a large circle to their fronts, although there is a possibility that the other two units were also originally equipped with a similar feature. In view of the wall-sharing relationships between adjacent units, it seems that the continuum began with Unit A and then gradually developed southwards.

Unit A

Unit A was *ca* 4 m long by *ca* 3 m wide. It was poorly preserved; no details could be determined except that a small stone concentration was attached to the middle of the rear wall.

Unit B

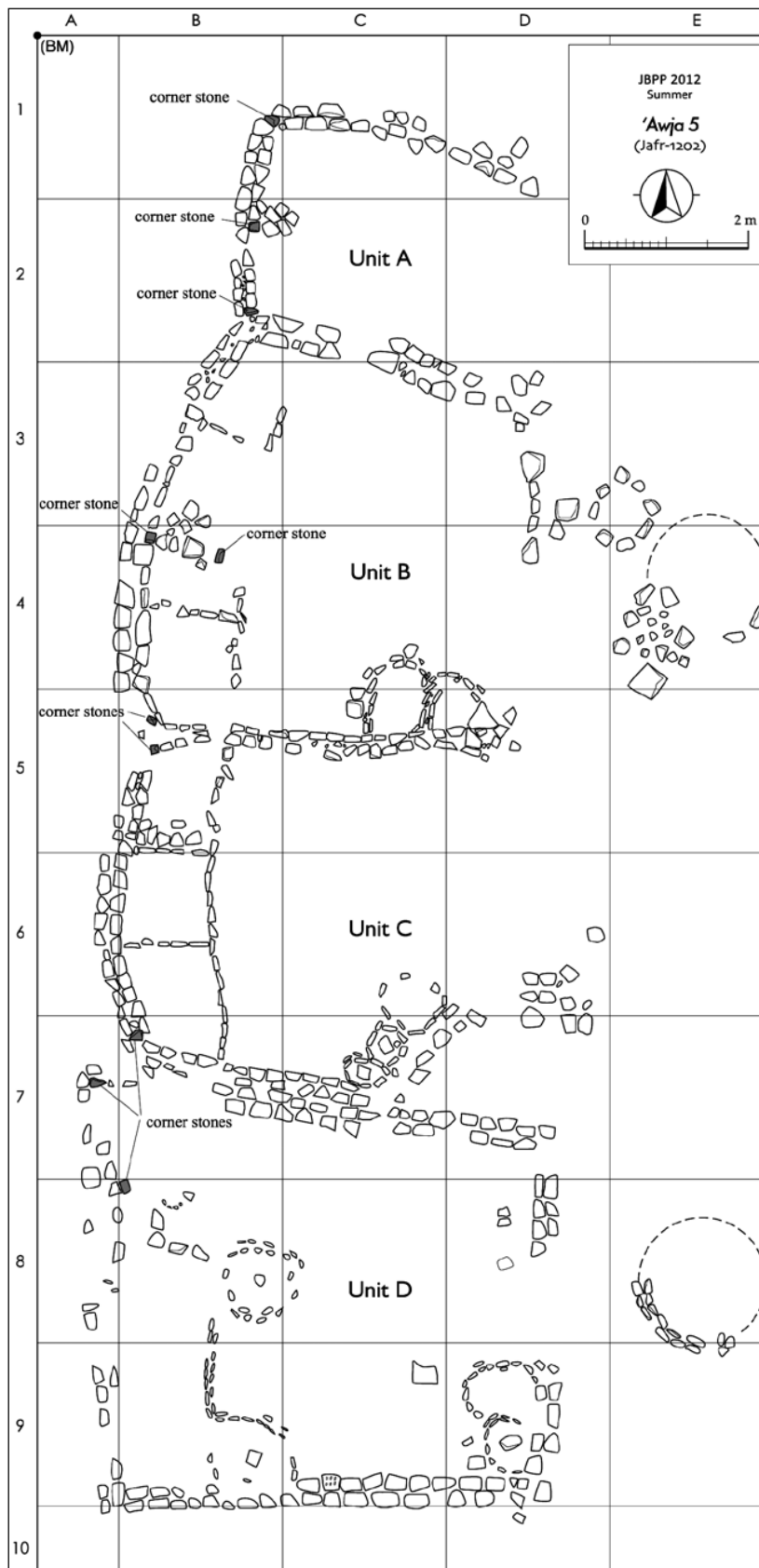
Unit B was relatively well-preserved and had an approximately square plan measuring *ca* 4.5 - 5 m by *ca* 5 m. The interior features consisted of three long compartments along the rear wall and two small circles at the front left corner. In addition, a small stone concentration existed in the central compartment. Outdoor features consisted of two circles, both of which occupied the front space of the unit and measured *ca* 0.6 - 1.5 m in diameter.

Unit C

Unit C measured *ca* 4 - 5 m by *ca* 5 m and was well-preserved except for its front half. The rear compartment was again tripartite and associated with a stone concentration along a longitudinal partition wall. Features at the front left corner included three small circles and a poorly preserved amorphous compartment. No exterior features were found, but this might be due to the serious disturbance of the front space of the unit.

Unit D

Unit D was the largest and the most elaborate of the four units, having a trapezoidal plan *ca* 4.5 - 5.5 m wide and *ca* 5.5 m deep. In contrast to the abutting Unit C, it was poorly preserved in the rear part and well-preserved to the front. The rear compartments had been shifted slightly to the observer's left, and a small compartment was newly added to the back left corner. These phenomena may possibly have contributed to the appearance of the first unit of Complex I at



30. 'Awja 5: plan of the site.



31. 'Awja 5: general view of the site (looking NW).



32. 'Awja 5: general view of the site (looking SE).

'Awja 1. In addition, a small circle was attached to the middle of the compartment. As with Unit B, a large circle *ca* 1.5 m in diameter occupied the front space.

This series of traits, *viz.* the roughly square plan, the existence of a tripartite compartment along the rear wall and a few small circles at the front left corner, and the attachment of a small stone concentration in the middle of the rear compartments, is reminiscent of a freestanding unit examined at 'Awja 2 last season (Fujii *et al.* n.d.: Fig. 12). The 'Awja 5 complex probably represents the laterally connected main space of such a freestanding unit in association with a tripartite rear compartment.

Discussion

The supplementary investigations described here have provided further insights into the unique character of the 'Awja sites. In conclusion, we would like to briefly discuss their function, chronology and archaeological significance in a broader context.

Site function

It is most unlikely that the 'Awja sites represent settlements, workshops, storage areas or any other structural complexes for practical use. The combined evidence, *i.e.* the isolated site location in hyper-arid terrain poor in water supply, the absence of traces of actual life (*e.g.* hearths, artifacts and faunal / floral remains), the recurring combination of an empty rectangular unit and a round feature in front of it, and the concomitance of the unique feline representations, all suggests that these structures were used as open sanctuaries or the symbolic communal cemeteries of early pastoral nomads.

Further support for this functional identification comes from the two Neolithic sites in the Jafr basin: Harat al-Juhayra (Fujii 2005) and Qa' Abu Tulayha West (Fujii 2000, 2002). Both of them share similar traits with the 'Awja sites, indicating that these unique features are widely distributed within the arid margins of southern Jordan. Their unique site formation process suggests that every unit was constructed as a ritual location for a symbolic burial that was not associated with any human skeletal remains or grave goods (Fujii n.d.). It is for this reason that we have termed these structures 'pseudo-house burial cairns', *i.e.* a symbolic burial cairn associated with a pseudo-house. The same probably applies to the 'Awja sites, because they are also marked by the combination of an empty unit (*i.e.* pseudo-house) and an empty circle (*i.e.* symbolic burial cairn).

Another question revolves around who was involved in the construction and management of these unique open sanctuaries. Although no direct evidence is available, the site location in hyper-arid terrain strongly suggests that pastoral nomads were involved. As a matter of fact, no contemporary settlements have so far been found at 'Awja or in its environs (Abu-Azizeh n.d.; Fujii and Abe 2008; Mahasneh and Gebel 2009; Tarawneh and Abudanah 2011; Quintero and Wilke 1998; Wasse and Rollefson 2005, 2006). This suggests that the 'Awja sites were used by early pastoral nomads who migrated on a seasonal basis into the arid peripheries of southern Jordan.

Chronology

The issue of chronology is problematic, be-

cause there is no direct evidence such as C₁₄ data or diagnostic artifacts at the 'Awja sites. However, there are two clues. One concerns the chronologies of the neighboring Jafr and Negev / Sinai regions, which may serve as a general framework around which to seriate the 'Awja sites. The other is the typological sequence of the 'Awja sites themselves. Available evidence suggested that each continuum developed gradually from the observers' right to left. This perspective would enable us to trace the general trend of typological change within a continuum, which might in turn provide some insight into the chronological sequence amongst continua. By combining both methods, we propose to incorporate the 'Awja sites into the *badia* chronology as follows (Figs. 33 and 34):

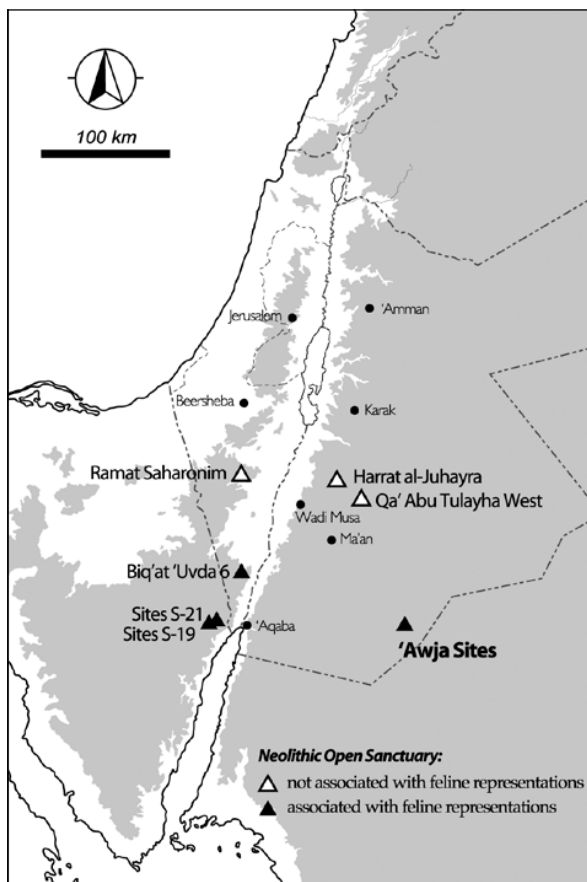
(1) The freestanding unit at 'Awja 2 is thought to be the earliest of the five sites. It resembles the freestanding unit (i.e. proto-Juhayra type units) at Harrat al-Juhayra in terms of the arrangement of an elongated compartment (or compart-

ments) along the rear wall and, for this reason, can probably be dated to the PPNC or the beginning of the Late Neolithic in a broad sense. Of interest is the fact that, unlike the Jafr example, the 'Awja unit incorporates small circles into its front left corner. A similar phenomenon has also been identified at 'Awja 5 and 'Awja 1, suggesting that it was a local tradition of the 'Awja area.

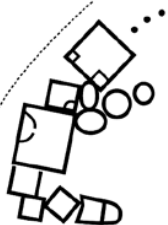


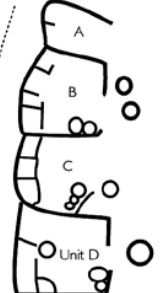
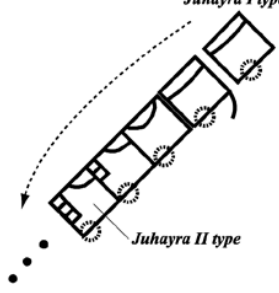
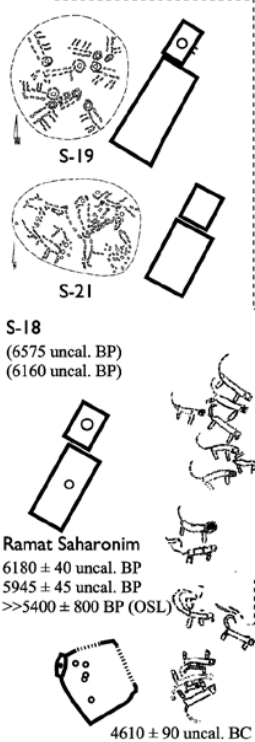
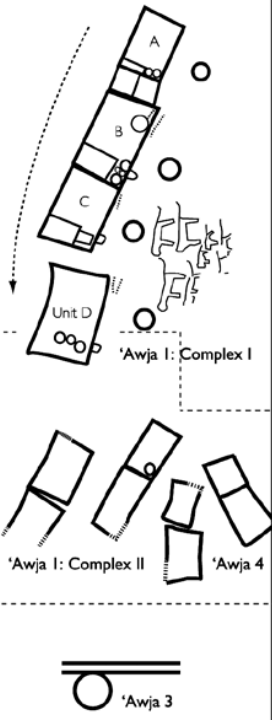

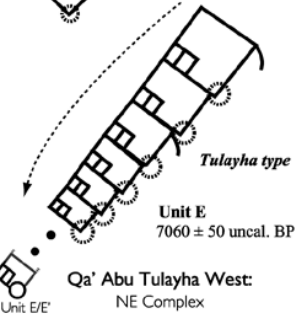


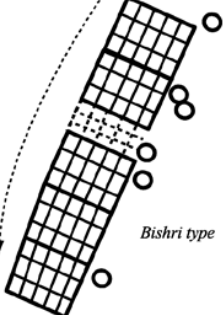
(2) There is little doubt that 'Awja 2 was followed by 'Awja 5, because the latter can be regarded as the laterally connected body of the freestanding open sanctuary at the former site. Exactly the same trend is recognized at Harrat al-Juhayra. This allows us to date the 'Awja 5 complex to the latter half of the PPNC. However, local traditions survived in both areas: while the 'Awja 5 units still incorporated small circles into the front left corner of each unit, the Jafr units remained simpler in terms of division of internal space and were devoid of such small features. Of significance are signs of typological simplification initiated at the final unit(s) at both sites. The appearance of the next-generation units can be seen as an extension of the general trend.

(3) Subsequently, the Jafr basin witnessed the replacement of the horizontally elongated compartment along the rear wall by a few rectangular compartments at the rear left corner. A single C₁₄ date from Qa' Abu Tulayha West suggests that this episode took place within the span of the Late Neolithic. The transition from 'Awja 5 to Complex I of 'Awja 1 can also be understood within the same context. (Again, its signs were recognized in the final unit of the former complex.) As with the contemporary Jafr units, the 'Awja 1 units incorporate a square to rectangular cell (or cells) within their back left corner. Thus, they probably date to the same horizon as Qa' Abu Tulayha West, that is to say the Late Neolithic. The attachment of a few small circles to the front left corner of each unit highlights the continuation of the 'Awja tradition. The feline representations can be regarded as a new cultural component associated with the final stage of Complex I. This accords well with the chronology of the Negev / Sinai, where similar features have been dated to the latter half of the Late Neolithic on the basis of a series of C₁₄ dates.

(4) The next stage is characterised by a typological simplification. The evidence suggests



33. Distribution map of the Neolithic open sanctuaries in the southern Levant.

Sinai/Negev	'Awja	Jafr	Bishri
		PPNB  Wadi Abu Tulayha	
	 'Awja 2	PPNC  <i>proto-Juhayra type</i> Harrat al-Juhayra	
	 'Awja 5	 <i>Juhayra I type</i> <i>Juhayra II type</i> Harrat al-Juhayra	
 S-19 S-21 S-18 (6575 uncal. BP) (6160 uncal. BP) Ramat Saharonim 6180 ± 40 uncal. BP 5945 ± 45 uncal. BP >>5400 ± 800 BP (OSL) 4610 ± 90 uncal. BC Biqat 'Uvda 6 4450 ± 200 uncal. BC 4450 ± 60 uncal. BC	 'Awja I: Complex I 'Awja I: Complex II 'Awja 4 'Awja 3	Late Neolithic  <i>(Juhayra II type)</i>  <i>Tulayha type</i> Unit E 7060 ± 50 uncal. BP Qa' Abu Tulayha West: NE Complex Unit E/E' Chalcolithic  BC-100s Qa' Abu Tulayha West: SW Complex BC-405 5640 ± 40 uncal. BP 5560 ± 40 uncal. BP BC-600s Early Bronze Age Wadi Burma South 	 <i>Bishri type</i> Fakat Bidewy I ? ? Fakat Bidewy 2 ? (* not to scale)

34. Tentative chronology of the Neolithic open sanctuary in the southern Levant.

that the evolution of the Jafr open sanctuary headed towards a partial simplification of the original shape of a preceding unit. This turning point was marked in the two final units (i.e. Units E and E') of the Northern Complex at Qa' Abu Tulayha West, which can be regarded as a prototype for the subsequent freestanding units associated only with a few pseudo-walls (Fujii n.d.). The evolution of the 'Awja open sanctuary, on the other hand, appears to have moved towards a simplification of internal space division whilst retaining its original shape. The turning point was Unit D of Complex I at 'Awja 1, which bridges the typological gap between the two complexes at the site. The three complexes at 'Awja 4 can also be dated to the same horizon, although they might be a little later in view of the complete disappearance of incorporated small features. Several C₁₄ dates from the Negev and Sinai suggest that the simplified units reached their peak in the latter half of the Late Neolithic. Meanwhile, the evidence from 'Awja 3 suggests that the 'Awja area subsequently returned to the Jafr tradition.

Archaeological implications

The discovery of the 'Awja sites has two main archaeological implications. First, it has considerably expanded the known distribution of this unique type of open sanctuary to the south, thereby bridging the cultural gap between the Jafr Pastoral Neolithic and the Negev / Sinai Pastoral Neolithic. Second, as a result it has now become possible to deal with the process of pastoral nomadization in both areas within a unified chronological framework. Our recent investigation in central Syria demonstrated that the open sanctuary culture reached the northern half of the Levantine *badia* (Fujii n.d.; Fujii *et al.* 2013). Similar sites are also anticipated in north-western Saudi Arabia. In this sense, the open sanctuary has the potential to shed new light on the process of pastoral nomadization across the entire area of the Levantine *badia*.

The feline representations discovered at 'Awja 1 are another notable feature of the 'Awja sites. All of the four known examples of this type of site – viz. 'Awja 1, Site S-19 and Site S-21 in the north-eastern corner of the Sinai Peninsula (Eddy and Wendorf 1999), and Biqat Uvda 6 in the south-eastern Negev (Yogev 1983; Avner

1984; Goring-Morris 1993) – are not only concentrated within a limited geographical area on both sides of the rift valley, but also consist of simplified types of open sanctuary. In contrast to this is Ramat Saharonim in the central Negev, which has similar structures but these are not associated with representations of felines (Rosen *et al.* 2007). Contemporary Jafr sites also differ from the four known sites in that they are devoid of both similar structures and feline representations. Considered in this light, we can argue that the feline representations belong to a short-term subculture of the southern margins of the Levantine *badia* dating to the latter half of the Late Neolithic. Available evidence suggests that these unique features began at Unit D of Complex I at 'Awja 1, and then spread westward along with a short complex consisting of a simple twin unit. The specific use of the feline representations remains uncertain. All we can suggest is that they were probably associated with some sort of communal ritual linked to early pastoral nomads. Further study is needed to shed more light on this intriguing phenomenon.

Concluding Remarks

The series of supplementary investigations at the 'Awja sites described here has contributed to the establishment of a tentative chronology for the Neolithic open sanctuary, being a key to tracing the process of pastoral nomadization in the Levantine *badia*. Another unexpected result has been the discovery of the unique feline representations, which has bridged a cultural gap between Late Neolithic southern Jordan and the contemporary Negev / Sinai. In so doing, it has shed new light on the post-PPNB socio-cultural dynamics in the arid margins of the southern Levant. However, much still remains obscure, including the specific use of these unusual representations. We are keen to continue our efforts to realise the archaeological potential of the Jafr basin and surrounding areas.

Acknowledgements

Phase 3 of our research project in southern Jordan has been financially supported by the Japan Society for the Promotion of Science (Grant-in-Aid for Scientific Research [A], No. 20251006). We would like to express our sincere gratitude to the Department of Antiqui-

ties of Jordan for their kind cooperation with our project. Our thanks also go to Mr Khalid Tarawneh, representative of the DoA, who supported us in many ways.

Sumio FUJII
School of Humanities
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
fujiiikun@staff.kanazawa-u.ac.jp

Takuro ADACHI
School of Humanities
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
mppnb@staff.kanazawa-u.ac.jp

Hitoshi ENDO
Research Institute for Humanity and Nature
457-4 Motoyama, Kamigamo, Kita-ku, Kyoto
603-8047, Japan
endo_h@chikyu.ac.jp

Masatoshi YAMAFUJI
Japan Society for the Promotion of Science
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
m-yamafuji@staff.kanazawa-u.ac.jp

Bibliography

- Abu-Azizeh, W.
n.d. Al-Thulaythuwa archaeological survey and excavation project: Material culture, settlement patterns and structural analysis of Chalcolithic/ Early Bronze Age pastoral nomadic campsites. *Syria* 90, Thematic file on the proceedings of the workshop *Current Research on Protohistoric Occupation in Peripheral Desert Areas of Jordan*, organized by Abu-Azizeh, W. and Tarawneh, M. (Wadi Mussa, July 2011).
- Avner, U.
1984 Ancient cult sites in the Negev and Sinai deserts. *Tel Aviv* 11: 115-161.
- Bender, F.
1974 *Geology of Jordan*. Berlin: Bornträger.
- Betts, A. (ed.)
1998 *The Harra and the Hamad: Excavations and Explorations in Eastern Jordan, vol. I*. Sheffield: Sheffield Academic Press.
- 2012 *Later Prehistory of the Badia: Excavation and Surveys in Eastern Jordan, vol. 2*. Sheffield: Sheffield Academic Press.
- Eddy, F.W. and Wendorf, F.
1999 *An Archaeological Investigation of the Central Sinai, Egypt*. Boulder: University Press of Colorado.
- Fujii, S.
2000 Qa' Abu Tulayha West: An interim report of the 1999 season", *ADAJ* 44: 149-171.
2002 Pseudo-settlement hypothesis: Evidence from Qa' Abu Tulayha West, southern Jordan. *Archaeozoology of the Near East* 5: 181-194.
2005 Harrat al-Juhayra pseudo-settlement: A preliminary report of the al-Jafr Basin Prehistoric Project, 2004. *ADAJ* 49: 57-70.
n.d. Chronology of the Jafr Pastoral Prehistory and Protohistory: A key to the process of pastoral nomadization in the southern Levant. *Syria* 90, Thematic file on the proceedings of the workshop *Current Research on Protohistoric Occupation in Peripheral Desert Areas of Jordan*, organized by Abu-Azizeh, W. and Tarawneh, M. (Wadi Mussa, July 2011).
- Fujii, S. and Abe, M.
2008 PPNB frontier in southern Jordan: A preliminary report on the archaeological surveys and soundings in the Jafr Basin, 1995-2005. *al-Rafidan* 29, p. 63-94.
- Fujii, S., Adachi, T. and Yamafuji, M.
2013 Fakat Bidewy 1 and 2: Archaeological investigations around Bir Rahum, 2011 (Spring). *Al-Rafidan* 34: 3-12.
- Fujii, S., Yamafuji, M. and Nagaya, K.
n.d. 'Awja 1-3: Neolithic and Chalcolithic open sanctuaries in southernmost Jordan. *ADAJ* 56 (forthcoming).
- Garrard, A. N., Betts, A., Byrd, B. and Hunt, C.
1987 Prehistoric environment and settlement in the Azraq Basin: an interim report on the 1985 excavation season. *Levant* 19: 5-25.
- Garrard, A., Baird, D., Colledge, S., Martin, L., and Wright, K.
1994 Prehistoric environment and settlement in the Azraq Basin: An interim report on the 1987 and 1988 excavation seasons. *Levant* 26: 73-109.
- Goring-Morris, A.N.
1993 From foraging to herding in the Negev and Sinai: The early to late Neolithic transition. *Paléorient* 19/1: 65-89.
- Mahasneh, H. M. and Gebel, H. G. K.
2009 The Eastern Jafr Joint Archaeological Project: The 2001 and 2006 surveys in Wadi as-Shahab al-Abyad, southeastern Jordan. *ADAJ* 53: 465-478.

- Quintero, L. and Wilek, P.
1998 Archaeological reconnaissance in the al-Jafr Basin, 1997. *ADAJ* 42: 113-122.
- Rosen, S. A., Bocquentin, F., Avni, Y. and Porat, N.
2007 Investigations at Ramat Saharonim: A desert Neolithic sacred precinct in the central Negev. *Bulletin of American Schools of Oriental Research* 346: 1-27.
- Tarawneh, M. B. and Abudanah, F. Q.
2011 The eastern Bayir archaeological project: Preliminary report on the 2004, 2005, and 2009 survey seasons. *ADAJ* 55: 57-71.
- Wasse, A. and Rollefson, G.
2005 The Wadi Sirhan Project: Report on the 2002 archaeological reconnaissance of Wadi Hudruj and Jebel adh-Dharwa, Jordan. *Levant* 37: 1-20.
2006 The Wadi Sirhan Project: Note on the 2002 archaeological reconnaissance of Wadi Hudruj and Jebel adh-Dharwa, Jordan. *ADAJ* 50: 69-82.
- Yogev, O.
1983 A fifth millennium B.C.E. sanctuary in the 'Uvda Valley. *Qadomiot* 16/4: 118-132.
-

PRELIMINARY REPORT OF THE SHAWBAK NORTH ARCHAEOLOGICAL PROJECT (SNAP): 2012 - 2013

Sumio Fujii, Masatoshi Yamafuji, Takahiro Odaka and Yui Arimatsu

1. Introduction

Despite its rich archaeological potential, the Shawbak area has for some reason been poorly investigated. Apart from Shawbak castle (e.g. Brown 1988; Vannini 2011), well-known archaeological sites in the area are restricted to a large-scale Palaeolithic flint scatter along the Fjayj escarpment (Rollefson 1981a, 1981b, 1985), the PPNB settlement of Wadi Badda (Fujii 2007, 2010), the dolmen field of Umm Tuwyrat (Dubis *et al.* 2004; Scheltema 2008) and a few Iron Age sites around Khirbat ad-Dabba (Whiting *et al.* 2008, 2009). In comparison with surrounding areas such as the Faynan drainage basin (e.g. Levy *et al.* 1999, 2001, 2002; Barker *et al.* 1999, 2007; Finlayson and Mithen 2007), the Wadi al-Hasa catchment area (e.g. Miller 1991; MacDonald 1988; MacDonald *et al.* 2004) and the Petra intermontane plateau (e.g. Gebel 1988; Lindner *et al.* 1990, 2001; Knodell and Alcock 2011), the deficiency of basic archaeological information about the Shawbak area skews the regional picture and demands urgent attention.

The Shawbak North Archaeological Project (SNAP) aims to shed new light on the general occupational history of the large depression below the Fjayj escarpment and the surrounding hilly terrain. The survey area corresponds to the western extension of the Jafr basin, the main focus of our long-term research project (JBPP [the Jafr Basin Prehistoric Project]) and, in this sense, has the potential to bridge an information gap between the 'desert' and the 'sown'. It is also anticipated that the survey will go some way towards connecting the Kerak / Tafila area to the north with the Petra area to the south. Taking the results of a pilot study in 2010, the first

season of the new project took place in 2011 and located a total of 16 archaeological sites, ranging in date from the Palaeolithic to the Islamic periods (Tarawneh *et al.* 2011; Fujii *et al.* 2012). This report briefly summarizes the results of the second to fourth seasons, conducted from 2012 to 2013.

2. Survey results

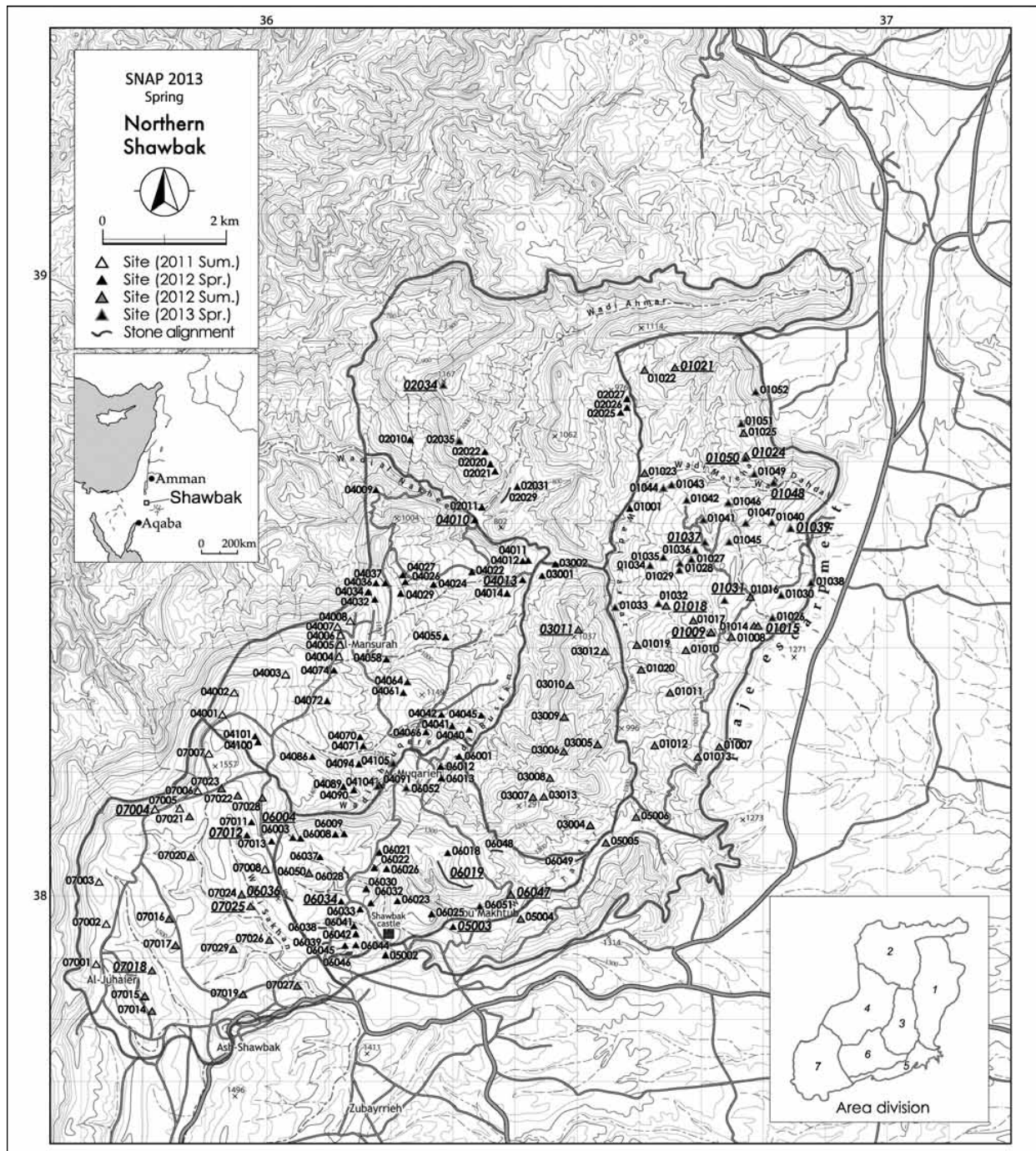
A series of surveys identified a total of 166 new archaeological sites (**Fig. 1**), described below in chronological order.

Palaeolithic

A total of eight Palaeolithic flint scatters were located, most of which clustered on the eastern edge of an isolated hill in Area 3 (**Fig. 2**). The surface finds included finely retouched handaxes that probably date to the final Acheulean (**Fig. 3**), as well as robust blades and flakes that possibly belong to the Middle to Upper Palaeolithic period. The location of these sites and their artifacts suggest some sort of relationship with the neighboring site of Fjayj (Rollefson *op.cit.*)

Pre-Pottery Neolithic B (PPNB)

A total of five sites (including two small settlements) were identified. Site 01048 (Wadi Badda) occupies a terrace overlooking Wadi Dahdal, which flows west in the northern part of Area 1 (**Fig. 4: 1**). This small settlement (*ca* 1 - 2 ha) was found for the first time in 2007 (Fujii 2007) and has been revisited several times thereafter (Fujii 2010: 375-380). As previously reported, several masonry wall alignments are exposed on the present ground surface (**Fig. 4: 2-3**). Surface artifacts include naviform core and blade components, Amuq and Byblos

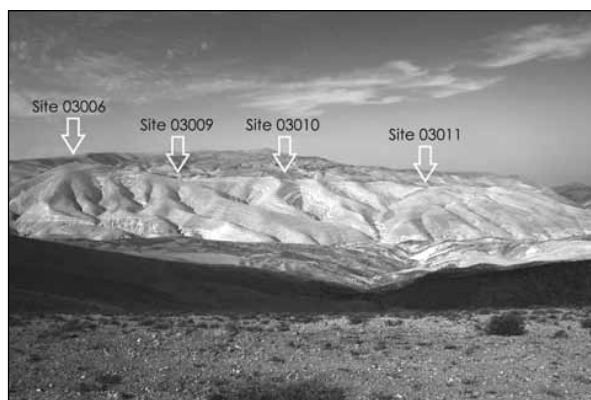


1. Registered sites, 2011 to 2013. Underlined numbers present the sites referred to in the text.

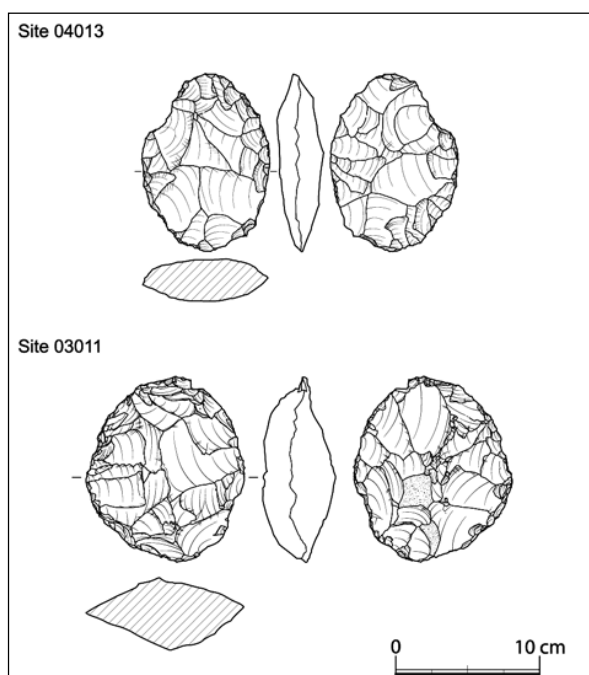
points, a heavy-duty digging tool and other miscellaneous retouched tools (**Fig. 4: 4**). This is the most promising PPNB site in the research area.

Site 04010 ('Ain Nattaf), another settlement site, lies on the south bank of Wadi Nakheel bordering Areas 2 and 4 (**Fig. 4: 5**). The site

was found for the first time in the summer of 2010 when we conducted a few days' trial survey with young colleagues from al-Hussein Bin Talal University. The fourth season reconfirmed the presence of several masonry structures (**Fig. 4: 6-7**) and a PPNB flint assemblage, including a naviform core (**Fig. 4: 8**).



2. Distant view of Palaeolithic sites in Area 3 (looking W).



3. Surface finds from the Palaeolithic sites.

Early Bronze Age

A total of 34 EBA-related sites (including a few small settlements) were identified. Overall, the sites were concentrated in the western part of the research area, being scarce in the eastern part.

Site 07012 occupies the flat top of a small hill and extends over *ca* 1 ha (**Fig. 5: 1**). EBA sherds, especially those of EB II and IV, are the predominant surface finds (**Fig. 6: 1-13**). A few small square or round masonry structures are exposed on the ground surface.

Sites 01015 and 01024 are located on a gentle slope overlooking Wadi Tartar to the west (**Fig. 5: 2-3**). Both sites consisted of several round

features *ca* 5 - 10 m in diameter and yielded a number of EBA coarse-ware sherds (**Fig. 6: 14-15**). These included a few EB I examples (**Fig. 6: 16-17**).

Site 07004 was discovered in the first season (Fujii *et al.* 2012) and was subsequently revisited to collect further information. Though seriously looted, the site includes at least five to six elongated tumuli arranged in parallel (**Fig. 5: 4**). The largest example measures *ca* 20 m in length, *ca* 5 m in width and *ca* 1.5 - 2 m in height. Simple ware sherds that probably date to EB II and EB IV were found around them. The surface collection included lamp bowls and jars (of red-washed, mica-tempered ware), both of which feature in the pottery repertoire of Tel Arad in the northern Negev (Amiran *et al.* 1978). Similar examples have been reported from two small settlements near es-Sadeh and at Umm Saysaban (Lindner *et al.* 1990: 199-204, 2001: 302-304, 309), suggesting that in the EBA southern Jordan was closely tied with the contemporary Negev highlands.

Iron Age II

A total of 73 sites (including a settlement and a few tumulus fields) yielded Iron Age II pottery. Unlike the EBA sites, they were concentrated in the south-western and eastern parts of the research area.

Site 05003 is a small settlement, *ca* 1 ha in area, that is located on a small hill on the south bank of Wadi Tartar (**Fig. 7: 1**). The site includes several structures and is surrounded by a perimeter wall built of roughly dressed limestone boulders *ca* 20 - 80 cm in length (**Fig. 7: 2**). The surface collection includes a large number of sherds dated to Iron Age II (**Fig. 8: 1-15**). The occurrence of two fragments of slag (probably iron) suggests that this hamlet-sized settlement was engaged in metallurgy.

Site 01009 is located on a small hill overlooking Wadi Tartar far to the west (**Fig. 7: 3**). It consists of several structures of various types, which form a small complex measuring *ca* 50 m north - south by *ca* 20 m east - west. The surface finds suggest an Iron Age II date for the site (**Fig. 8: 16-21**).

Site 06004 occupies a flat top of a small hill in the north-western part of Area 6. The site includes several tumuli *ca* 5 - 6 m in length and *ca*



1. Site 01048 (Wadi Badda): general view (looking NE).



2. Site 01048: exposed structures (looking E).



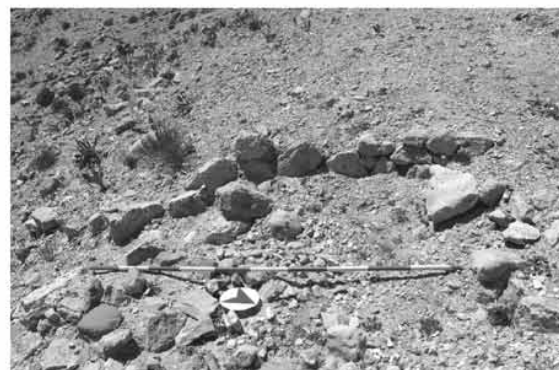
3. Site 01048: exposed wall (looking N).



4. Site 01048: surface finds.



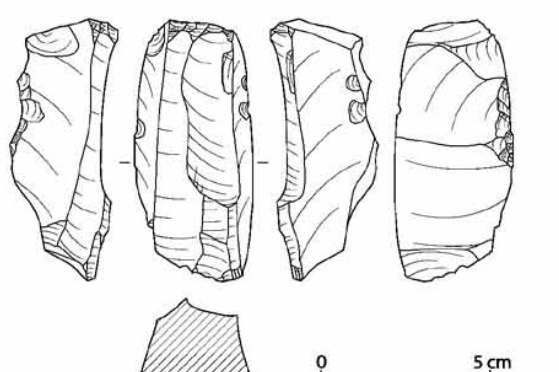
5. Site 04010 (Ain Nattaf): general view (looking NW).



6. Site 04010: exposed structure (looking SW).

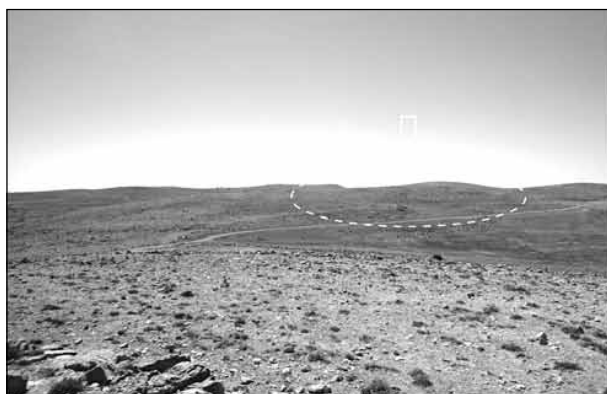


7. Site 04010: exposed wall (looking W).



8. Site 04010: Naviform core.

4. PPNB sites.



1. Site 07012: general view (looking W).



2. Site 01015: general view (looking W).

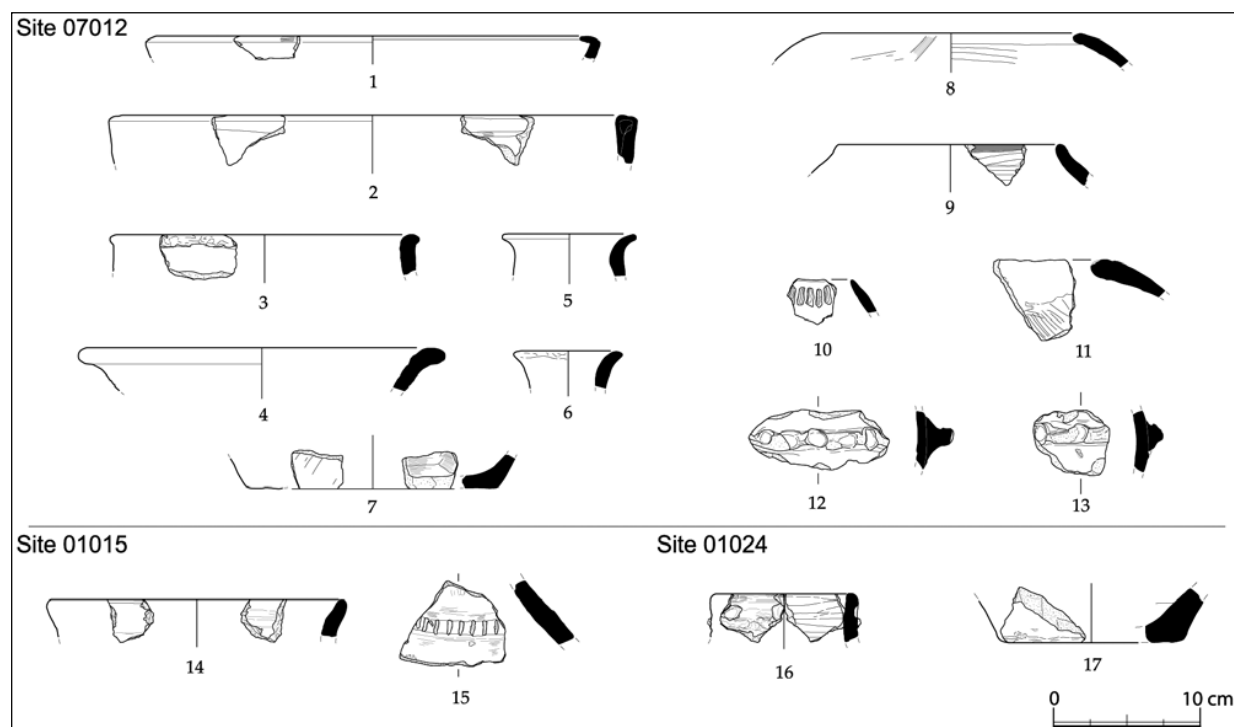


3. Site 01024: general view (looking S).

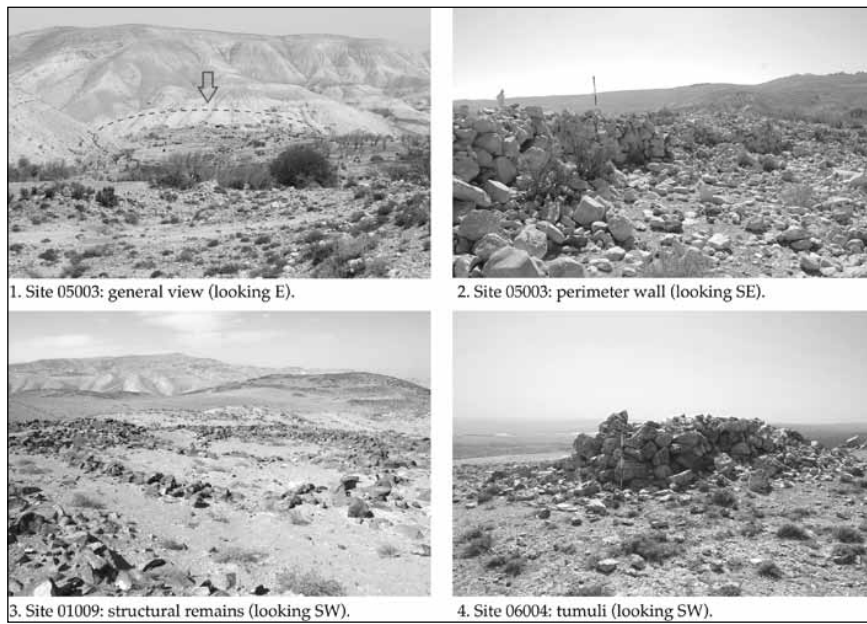


4. Site 07004: general view (looking NE).

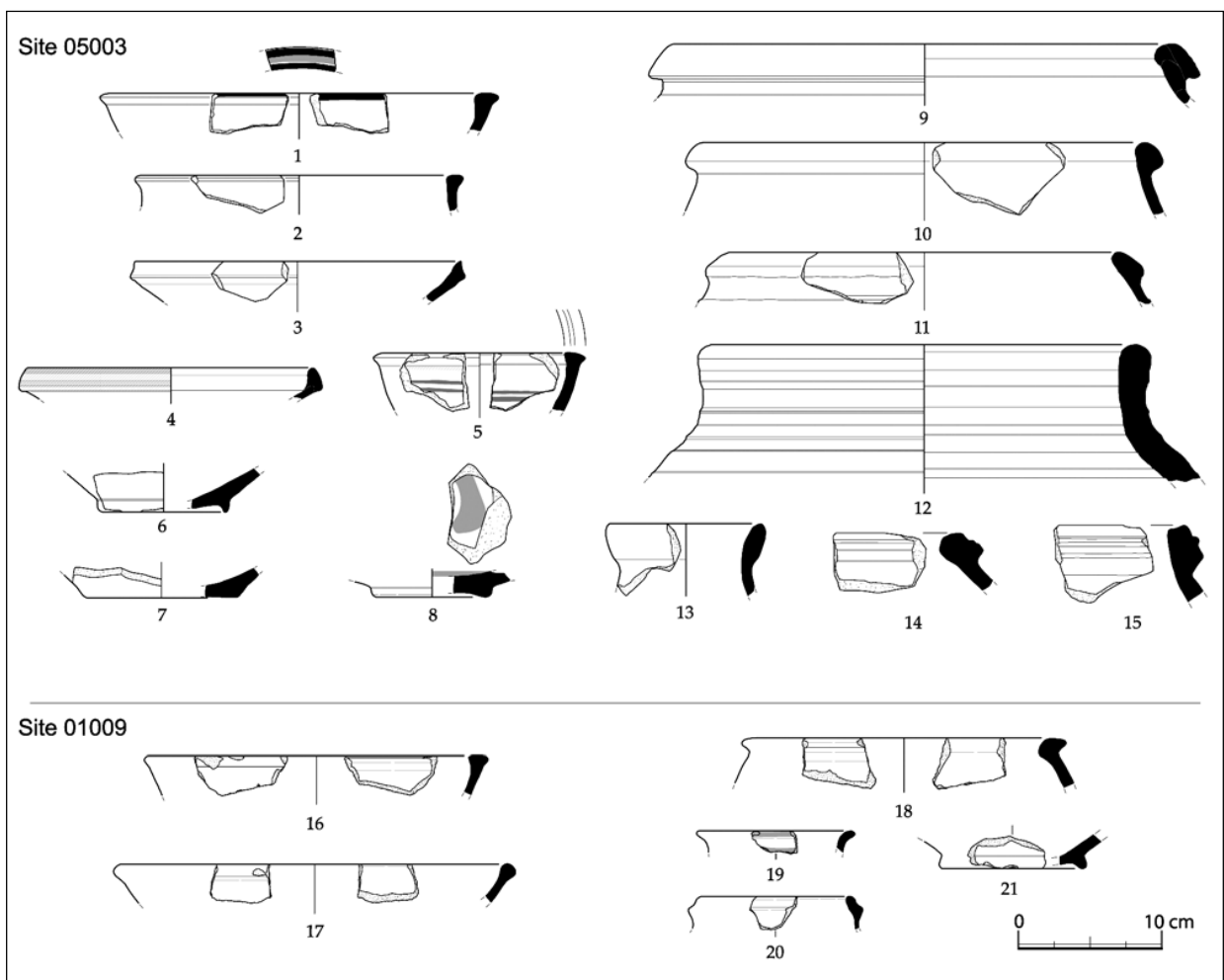
5. *Early Bronze Age sites.*



6. *Surface finds from the EBA sites.*



7. Iron Age II sites.



8. Surface finds from the Iron Age II sites.

1 - 1.5 m in preserved height, and an elongated feature *ca* 23 m in length, *ca* 3 m in width and *ca* 2 m in preserved height (**Fig. 7: 4**). A small number of Iron Age II pottery sherds were collected. The surface finds include Nabataean and Roman sherds as well.

Hellenistic and Nabataean

A total of 67 sites yielded archaeological materials related to the Hellenistic and Nabataean periods.

Site 01037 is located in the northern part of Area 1, on a terrace along Wadi Tartar (**Fig. 9: 1**). The site is commonly known as Khirbet Badda (Lower) and forms a small settlement *ca* 1 ha in area. Many rectangular structures built with basalt cobbles and boulders cover the whole area of the site. As at Site 02034, described below, a large number of Nabatean sherds (including fine painted ware) were found in and around them.

Site 01018 is located at the southern edge of a gently sloping terrace along Wadi Tartar (**Fig. 9: 2**). It measures *ca* 20 m north - south by *ca* 40

m east - west and consists of a cluster of several round features built with a single row of roughly dressed basalt cobbles. Some Nabataean painted and fine ware sherds were collected (**Fig. 10: 1; Fig. 11: 1-5**).

Site 02034 is situated on the highest hill in Area 2. It consists of a tumulus *ca* 5 m in diameter (**Fig. 9: 3**) and an oval structure *ca* 12 m by *ca* 6 m in floor area (**Fig. 9: 4**). A number of Nabataean fine and painted ware sherds were found around them (**Fig. 10: 2**).

Roman and Byzantine

A total of 122 sites were recorded. These ranged from settlements to isolated rectangular structures, tumulus fields and freestanding walls.

Site 07018 is a small settlement *ca* 2 ha (*ca* 100 m north - south by *ca* 200 m east - west) in area, located on the west bank of a small *wadi* in Area 7 (**Fig. 12: 1**). The site contains many rectangular and round structures, *ca* 5 m in width or diameter, which are enclosed within perimeter



1. Site 01037 (Khirbet Badda Lower): general view (looking W).



2. Site 01018: structural remains (looking W).

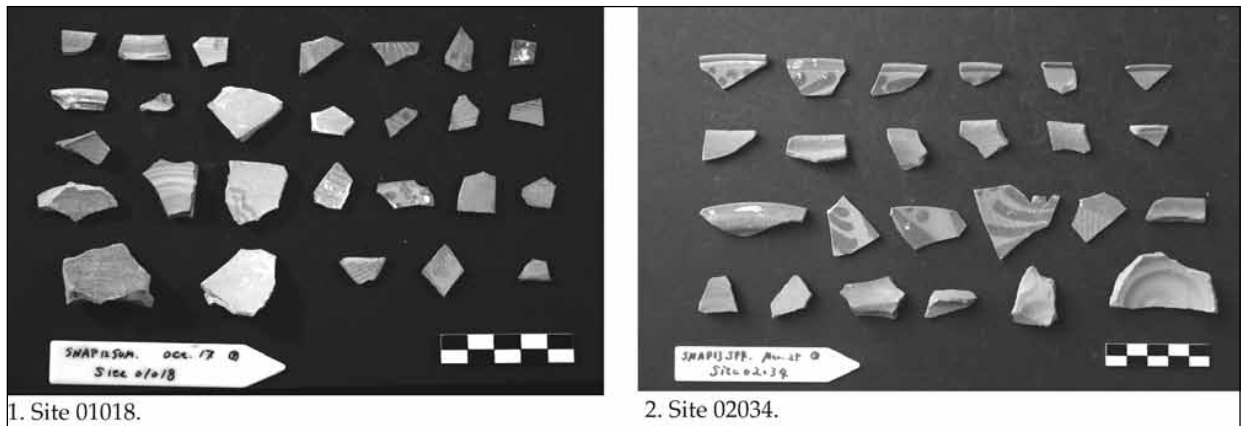


3. Site 02034: tumulus (looking E).



4. Site 02034: structural remain (looking SE).

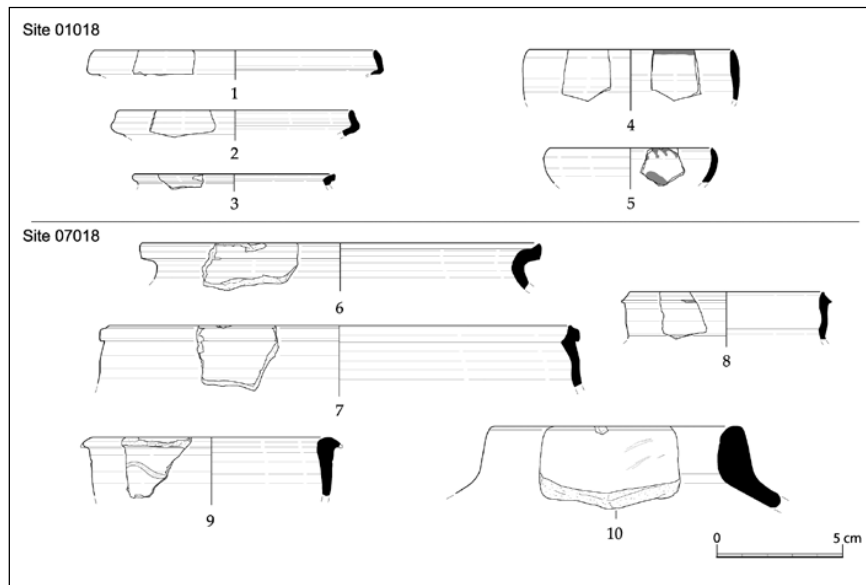
9. Hellenistic and Nabataean sites.



1. Site 01018.

2. Site 02034.

10. Surface finds from the Hellenistic and the Nabataean sites.



11. Surface finds from the Nabataean and the Roman-Byzantine sites.

walls preserved to a height of several courses. A few diagnostic sherds were collected on the ground surface (**Fig. 11: 6-10**).

Site 07025 occupies the west bank of Wadi Sakhan and consists of a large square structure with a floor area of *ca* 20 m north - south by *ca* 20 m east - west and perimeter walls *ca* 2 m in preserved height (**Fig. 12: 2**). The surface collection includes a small quantity of sherds dating to the Roman - Byzantine periods.

Site 06047 is located on a slope immediately above the modern village of Abu Makhtuv (**Fig. 12: 3-4**). The surface finds include a number of Roman - Byzantine pottery sherds. The site was sounded by a DoA team several years ago but has not yet been published.

Middle to Late Islamic

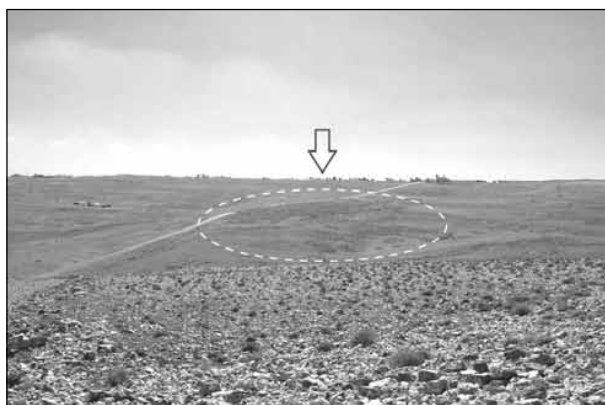
A total of 62 sites yielded material dating to

the Middle to Late Islamic periods. The most typical example is Site 01039, commonly known as Khirbet Badda (Upper), which is located on a gentle slope immediately below the Fjayj escarpment (**Fig. 13: 1**). Rectangular structures extend over the whole area of the settlement (*ca* 2 - 3 ha) (**Fig. 13: 2**). Coarse ware sherds predominate, some of which are decorated with black paint (**Fig. 14**).

Miscellaneous

Stone alignments

A total of 20 freestanding stone alignments were recorded. A few of them are very long, being up to *ca* 800 m in total length (**Fig. 15: 1-2**). The date of these unique features is still unknown owing to an absence of diagnostic finds. The same is true of their function, but in



1. Site 07018 (Khirbet el-Mogaier): general view (looking W).



2. Site 07025: structural remain (looking W).



3. Site 06047: structural remains (looking NE).



4. Site 06047: structural remains (looking E).

12. Roman-Byzantine sites.



1. Site 01039 (Khirbet Badda Upper): general view (looking W).



2. Site 01039: large structure (looking NW).

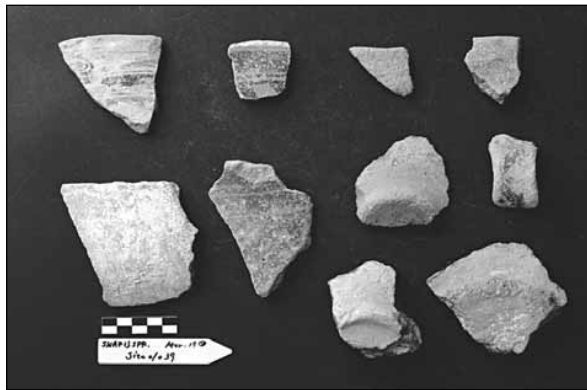
13. Middle to Late Islamic site.

view of the concentration of these features on gentle slopes in Area 6, many of them might be regarded as fences to delimit cultivated land.

Petroglyphs

The survey located a total of 14 petroglyph clusters, most of which cluster on the basalt

plain in the center of Area 1. Both pecking and line-drawing techniques are used to depict what are largely hunting scenes. Individual iconographies include gazelle, dogs, felines, camels, ostriches and other miscellaneous wildlife (**Fig. 16: 1, 2**). In addition, human figures fitting arrows to their bows are also depicted. Dating the



14. Surface finds from the Middle to Late Islamic site.

petroglyphs is one of the main issues that we have to tackle in the future.

Cupmarks

Two sites include cupmarks on exposed limestone bedrock. The examples at Site 01021 are typically circular in plan, measuring *ca* 20 - 30 cm in diameter (**Fig. 17: 1**). Those found at Site 06034 may have been used for grape and / or olive pressing (**Fig. 17: 2**). A limited number of Iron Age II and Late Islamic sherds were found at the latter site, but nothing conclusive can be said about the date of the site itself. The dating



1. Site 06019: general view (looking NW).



2. Site 06036: general view (looking N).

15. Stone alignments.



1. Site 01031.



2. Site 01050.

16. Petroglyphs.



1. Site 01021 (looking S).



2. Site 06034 (looking SE).

17. Cupmarks.

of these extramural facilities requires in-depth research that takes local settlement patterns into account.

3. Concluding Remarks

This series of general surveys has provided some insight into the occupational history of the research area. What interests us is the lack of clear evidence for several periods, including the Late Neolithic, Chalcolithic, Middle to Late Bronze Ages, Iron Age I and Early Islamic period. A similar trend has been noted in surrounding areas as well (e.g. MacDonald *et al.* 2010, 2011, 2012). The only possible exception is a base fragment found at Site 01039, which bears the impression of a coarse spiral matt and hints at temporary utilisation of the area in the Chalcolithic period (MacDonald 1992: Pl. 9: 7; Fujii 2004: Figs. 7: 8, 10: 5).

Another notable characteristic is an absence of large settlements throughout all periods. This is inexplicable, when we consider that neighboring areas (e.g. the Kerak region and northern Negev) include town-sized settlements such as Bab edh-Dhra' (EB II-III), Tel Arad (EB II-III) and Buseirah or *Bozrah* (Iron Age II). Differences in general topography, especially the extent of available arable land, may lie behind this phenomenon.

Also of interest is the scarcity of EBA cairn fields. Bearing in mind that the adjacent EBA Jafr basin is well-known for burial cairns (Fujii 2004), as well as for the large-scale exploitation of flint (Fujii 2011), this phenomenon is unexpected and might possibly be understood

as an aspect of habitat segregation between the 'desert' and the 'sown'. As a matter of fact, our survey results suggest that the Shawbak area was linked with the west during EB II rather than with the east (Lindner *et al.* 1990, 2001). Petrographic analysis of pottery sherds has also corroborated a close link between the central Negev highlands and central and southern Jordan (Goren 1996). These perspectives require us to review the survey results in a broader context.

With these issues in mind, we would like to proceed to the next stage of our research, namely limited soundings at a number of promising sites located during the course of the surveys.

Sumio FUJII
School of Humanities
Kanazawa University
Kakuma-machi, Kanazawa, 920-1192, Japan
fujiijun@staff.kanazawa-u.ac.jp

Masatoshi YAMAFUJI
Japan Society for the Promotion of Science
Kanazawa University
Kakuma-machi, Kanazawa, 920-1192, Japan
m-yamafuji@staff.kanazawa-u.ac.jp

Takahiro ODAKA
Waseda Institute for Advanced Study
Waseda University
1-6-1 Nishi-Waseda, Shinjuku-ku, Tokyo 169-8050 Japan
odaka@aoni.waseda.jp

Yui ARIMATSU

Japan Society for the Promotion of Science
Hiroshima University
1-2-3 Kagamiyama, Higashi-Hiroshima, Hiroshima, 739-8522, Japan
yui_a_0513@yahoo.co.jp

Bibliography

Amiran, R., Paran, U., Shiloh, Y., Brown, R., Tsafrir, Y., and Ben-Tor, A.

- 1978 *Early Arad I: The Chalcolithic Settlement and Early Bronze City, First-Fifth Seasons of Excavations, 1962-1966*. Jerusalem: The Israel Exploration Society.

Brown, R.M.

- 1988 Summary report of the 1986 excavations late Islamic Shobak. *ADAJ* 32: 225-245.

Barker, G.W., Adams, R.B., Creighton, O.H., Crook, D., Gilbertson, D.D., Grattan, J.P., Hunt, C.O., Mattingly, D.J., McLaren, S.J., Mohammed, H.A., Newson, P., Palmer, C., Pyatt, F.B., Reynolds, T.E.G., and Tomber, R.

- 1999 Environment and land use in the Wadi Faynan, southern Jordan: the third season of geoarchaeology and landscape archeology (1998). *Levant* 31: 255-292.

Barker, G., Bilbertson, D., and Mattingly, D. (eds.)

- 2007 *Archaeology and Desertification: The Wadi Faynan Landscape Survey, Southern Jordan*. Oxford: Oxbow Books.

Dubis, E., Marahlah, M.A.A., and Nawafiah, S.

- 2004 Two new dolmen fields in the ash-Showbak area. *ADAJ* 48: 15-24.

Finlayson, B. and Mithen, S. (eds.)

- 2007 *The Early Prehistory of Wadi Faynan, Southern Jordan*. Oxford: Oxbow Books.

Fujii, S.

- 2004 Harrat al-Burma cairn line, Wadi Burma south cairn field, and Harrat as-Sayeyya K-Line: a preliminary report of the 2003 summer season of the Jafr Basin Prehistoric Project, phase 2. *ADAJ* 48: 25-50.

- 2007 Wadi Badda: a PPNB settlement below the Fjayj escarpment in southern Jordan. *Neo-Lithics* 2/07: 19-23.

- 2010 A comprehensive review of Neolithic water catchment facilities in the Jafr Basin, southern Jordan: a preliminary report of the Jafr Basin Prehistoric Project, phase 3, 2009. *ADAJ* 54: 371-386.

- 2011 'Lost property' at Wadi Qusayr 173: evidence for the transportation of tabular scrapers in the Jafr basin, southern Jordan. *Levant* 43/1: 1-14.

Fujii, S., Yamafuji, M., and Arimatsu, Y.

- 2012 A preliminary report of the Shawbak North Archaeological Project (SNAP), summer 2011.

ADAJ 56: 157-169.

Goren, Y.

- 1996 The southern Levant in the Early Bronze Age IV: the petrographic perspective. *Bulletin of the American Schools of Oriental Research* 303: 33-72.

Gebel, H.G.

- 1988 Late Epipalaeolithic – Aceramic Neolithic sites in the Petra area. Pp. 67-100 in Garrard, A.N. and Gebel, H.G. (eds.), *The Prehistory of Jordan: the State of Research in 1986*. British Archaeological Report Series 396 (i). Oxford: B.A.R.

Knodel, A.R. and Alcock, S.E.

- 2011 Brown University Petra archaeological project: the 2010 Petra area and Wadi Sulaysil survey. *ADAJ* 55: 489-508.

Levy, T.E., Adams, R.B., and Shafiq, R.

- 1999 The Jabal Hamrat Fidan Project: excavations at the Wadi Fidan 40 cemetery, Jordan (1997). *Levant* 31: 293-308.

Levy, T.E., Adams, R.B., Witten, A.J., Anderson, J., Arbel, Y., Kuah, S., Moreno, J., Lo, A., and Wagonner, M.

- 2001 Early metallurgy, interaction, and social change: the Jabal Hamrat Fidan (Jordan) research design and 1998 archaeological survey: preliminary report. *ADAJ* 45: 159-187.

Levy, T.E., Adams, R.B., Hauptmann, A., Prange, M., Schmitt-Strecker, S., and Najjar, M.

- 2002 Early Bronze Age metallurgy: a newly discovered copper manufactory in southern Jordan. *Antiquity* 76: 425-437.

Lindner, M., Knauf, E.A., and Zeitler, J.P.

- 1990 Es-Sadeh- a lithic – Early Bronze – Iron II (Edomite) – Nabataean site in southern Jordan: report on the second exploratory campaign, 1988. *ADAJ* 34: 193-237.

Lindner, M., Hübner, U., and Genz, H.

- 2001 The Early Bronze Age settlement on Umm Sayaban, north of Petra (Jordan) and its topographical context, report on the 1998/1999 survey. *ADAJ* 45: 287-310.

MacDonald, B.

- 1988 *The Wadi el Hasa Archaeological Survey 1979-1983, West-Central Jordan*. Ontario: Wilfrid Laurier University Press.

- 1992 *The Southern Ghors and Northeast 'Arabah Archaeological Survey*. Sheffield: J.R. Collis Publications, Department of Archaeology and Prehistory, University of Sheffield.

MacDonald, B., Herr, L.G., Neeley, M.P., Gagos, T., Moumani, K., and Rockman, M.

- 2004 *The Tafila-Busayra Archaeological Survey 1999-2001, West-Central Jordan*. Boston: American Schools of Oriental Research.

MacDonald, B, Herr, L.G., Scott Quaintance, D., and Lock, H.M.

- 2010 The Shammakh to Ayl archaeological survey, southern Jordan: preliminary report (first season 2010). *ADAJ* 54: 329-344.

MacDonald, B, Herr, L.G., Scott Quaintance, D., al-Hajaj, W. and Jouvenel, A.

- 2011 The Shammakh to Ayl archaeological survey, southern Jordan: second season 2011. *ADAJ* 55: 363-376.

MacDonald, B, Herr, L.G., Scott Quaintance, D., Clark, G.A., and Macdonald, M.C.A.

- 2012 *The Ayl to Ras an-Naqab Archaeological Survey, Southern Jordan (2005-2007)*. Boston: American Schools of Oriental Research.

Miller, J.M. (ed.)

- 1991 *Archaeological Survey of the Karak Plateau*. Atlanta: American Schools of Oriental Research.

Rollefson G.

- 1981a A lower Paleolithic surface site near Shobak, Wadi el-Bustan, southern Jordan. *ADAJ* 25: 153-170.

- 1981b The late Acheulean site at Fjaje, Wadi el- Bustan, southern Jordan. *Paléorient* 7/1: 5-21.

- 1985 Late Pleistocene environments and seasonal

hunting strategies: a case study from Fjayj, near Shobak, southern Jordan. *Studies in the History and Archaeology of Jordan* 2: 103-107.

Scheltema, G.

- 2008 *Megalithic Jordan: An Introduction and Field Guide*. Amman: American Center of Oriental Research.

Tarawneh, M., Abudanah, F., and Fujii, S.

- 2011 North Shawbak Archaeological Project (NSAP): a preliminary report on the first field season, 2010. Unpublished report.

Vannini, G.

- 2011 A medieval archaeology experience in Jordan: the 'Medieval' Petra mission of University of Florence. *ADAJ* 55: 295-312.

Whiting, C.M., Fraser, J., Jakob, T., Miller, H., and Kehrborg, I.

- 2008 The first preliminary report of the south Jordan Iron Age II survey and excavation project (SJI-AP): the 2004, 2005 and 2006 seasons of excavation at Khirbat ad-Dabba. *ADAJ* 52: 255-278.

- 2009 The second preliminary report of the south Jordan Iron Age II survey and excavation project (SJIAP): the 2004, 2005 and 2006 seasons of surface survey. *ADAJ* 53: 275-296.

EXCAVATIONS AT WADI NADIYA 2 AND SUPPLEMENTARY INVESTIGATIONS OF THE JAFR NEOLITHIC BARRAGE SYSTEM

Sumio Fujii, Takuro Adachi, Hitoshi Endo,
Masatoshi Yamafuji, Yui Arimatsu and Kazuyoshi Nagaya

Introduction

The third phase of the Jafr Basin Prehistoric Project (JBPP), directed by the primary author, has addressed the issue of correlating the history of water-use in the arid margins with the process of pastoral nomadization. The first field season, carried out over roughly two weeks from 13 to 24 September 2009, was devoted to a reconnaissance survey of archaeological sites associated with this issue (Fujii 2010a, 2010b). The second season, which took place over about three weeks from 14 September to 2 October 2010, carried out rescue excavations at the Neolithic barrage site of Wadi Ghuwayr 106 (Fujii 2010c, 2012; Fujii, Adachi *et al.* 2011) and its neighboring outpost of Wadi Ghuwayr 17 (Fujii 2012b, Fujii, Quintero *et al.* 2011). These investigations confirmed once again that the combination of a barrage and an outpost was the norm for the Jafr Pastoral PPNB and that this type of complex extended far across the basin, beyond the type-site of Wadi Abu Tulayha (excavated during the second phase of our research project [Fujii 2006a, 2006b, 2007a, 2007b, 2007c, 2008, 2009a]). The third and fourth seasons were carried out for a total of six weeks from 4 to 29 September 2011 and from 18 March to 5 April 2012, focusing on the comprehensive investigation of another barrage site: Wadi Nadiya 1. The investigations provided valuable insights into the location, chronology, function and formation processes of the Jafr PPNB barrage system as a piece of essential infrastructure supporting early pastoral transhumance (Fujii, Adachi *et al.* 2012). The fifth field season, our main effort, took place over about five weeks from 26 August to 2 October 2012. For this, we shifted to the adjacent barrage site of Wadi Nadiya 2 and

investigated the techno-typological sequence of the Jafr Neolithic barrage system. This report briefly summarizes the results.

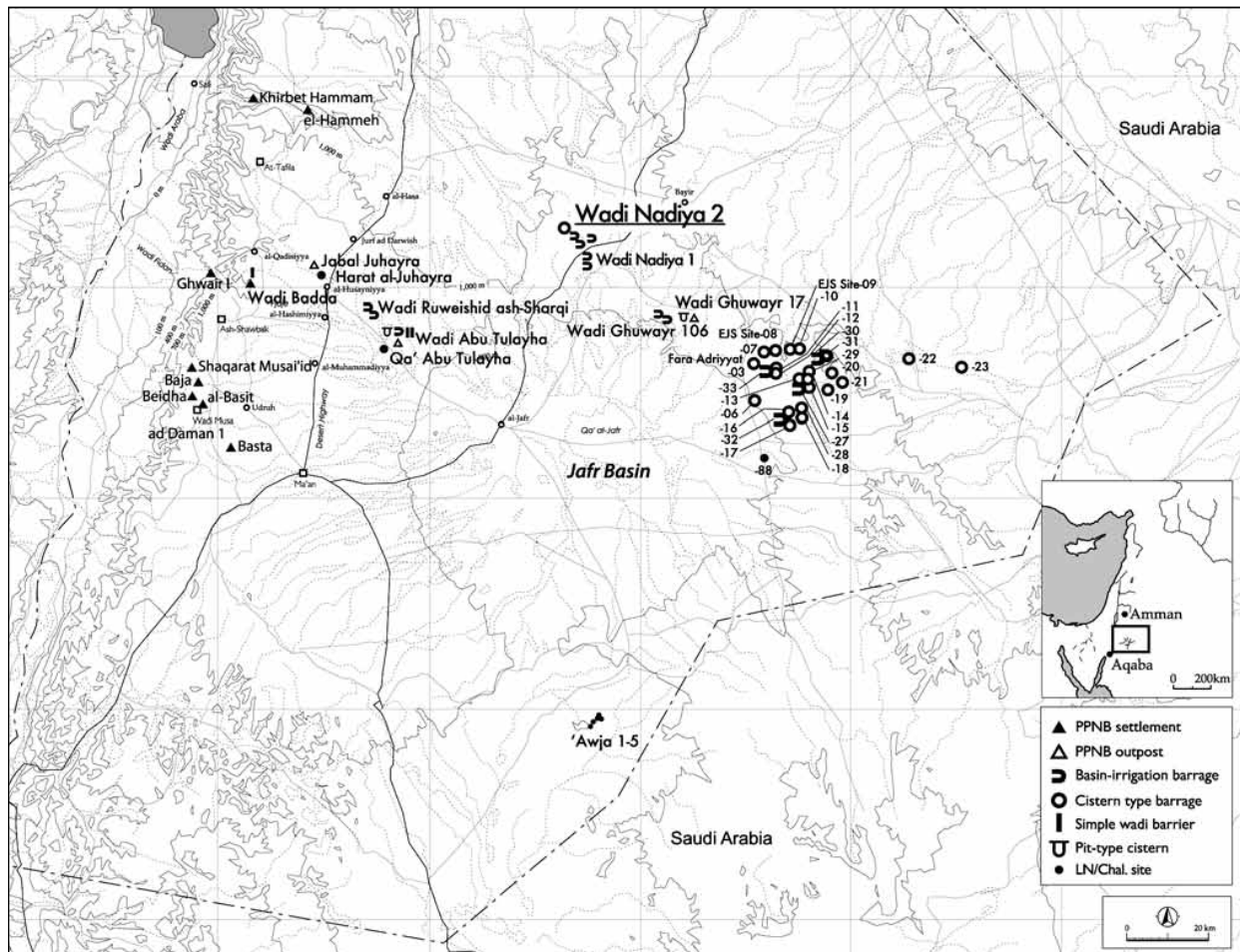
The Site and Site-Setting

The site of Wadi Nadiya 2 is located in a flint pavement desert (*hamada* in Arabic) that extends behind the escarpment fringing the northern edge of the Jafr basin (Figs. 1 and 2). It was discovered last season, during the course of excavations at the adjacent barrage system of Wadi Nadiya 1. The surrounding environment is the same as at the adjacent site, so no repetition is needed here. We would like to only note that the site setting is (and probably was) very harsh and that local land use has long been limited to sporadic seasonal pasturing.

Wadi Nadiya 2 is an extramural barrage site, consisting of four stone-built barrages of various sizes (Fig. 3). It is isolated in the middle of the flint-strewn desert at an elevation of *ca* 1,030 - 1,050 m asl and appears not to have been associated with a neighboring settlement as its 'operating body' (Fig. 4). Three of the four barrages are aligned at roughly equal intervals along a small *wadi* that drains from the playa system where Wadi Nadiya 1 is located. The other barrage is located *ca* 550 m east of the complex, being constructed across another small *wadi* flowing out of the same playa system. These four barrages combine with the two upstream barrages (i.e. Barrages 1 and 2 of Wadi Nadiya 1) to form a large-scale water-use system consisting of a total of six barrages.

The Investigation

We designated the three westerly features as Barrages 1 - 3 in descending order of elevation,



1. Wadi Nadiya 2 and other Neolithic sites in the Jafr Basin.

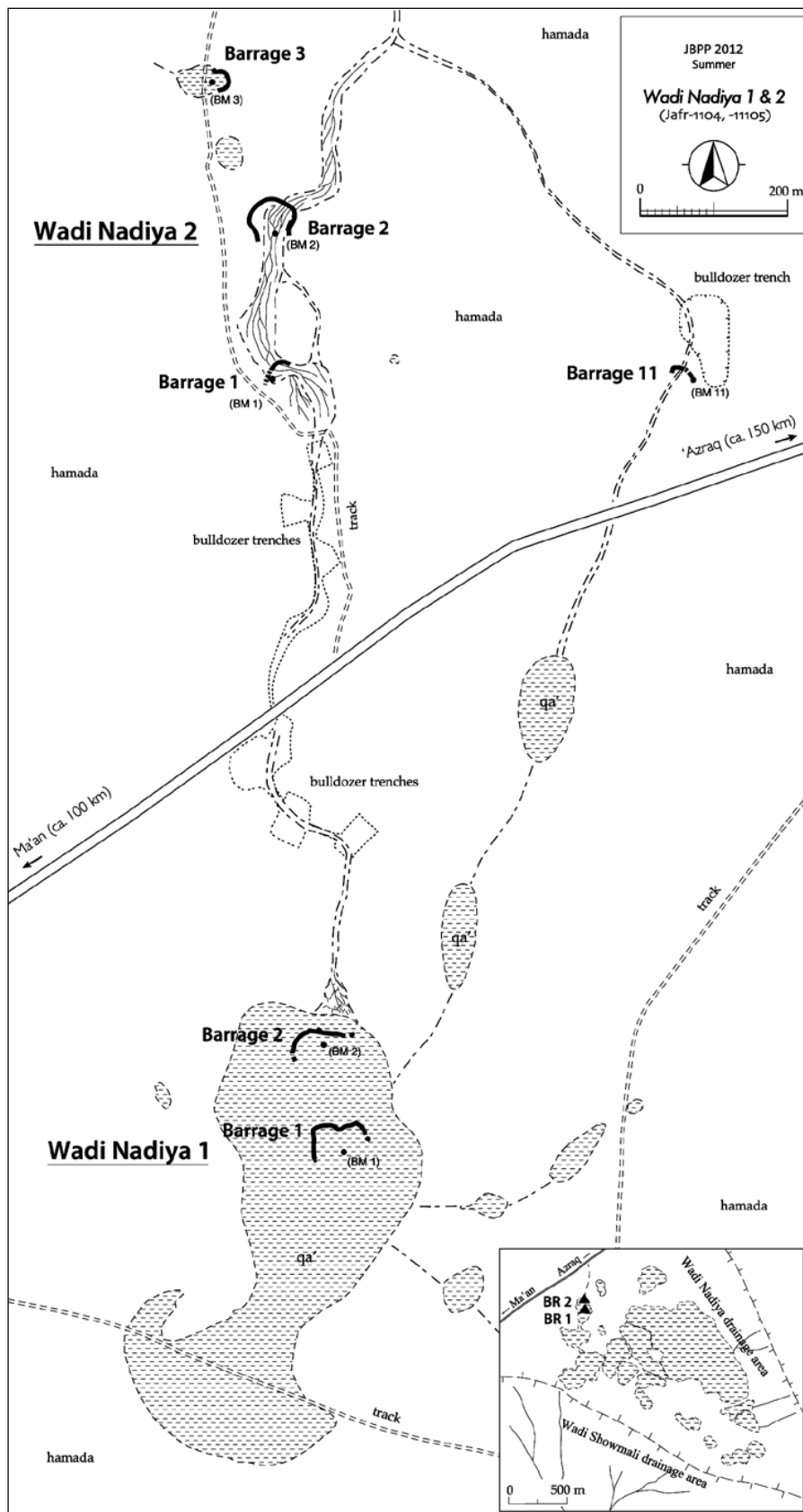
i.e. from south to north. The other example was designated Barrage 11. For the convenience of operating in separate locations, we set up four arbitrary fixed points: BM-1 for Barrage 1 (*ca* 1,026 m asl; N 30°42.253, E 036°24.267), BM-2 for Barrage 2 (*ca* 1,025 m asl; N 30°42.358, E 036°24.278), BM-3 for Barrage 3 (*ca* 1,025 m asl; N 30°42.472, E 036°24.233) and BM-11 for Barrage 11 (*ca* 1,030 m asl; N 30°42.252, E 036°24.568).

Barrage 1 was poorly preserved and was, therefore, only briefly examined by means of a small-scale excavation near the middle of the barrage wall. In addition, we cleaned a nearby bulldozer trench and examined the natural stratigraphy around the site. (For details of the natural stratigraphy at the site, see also the last report concerning the excavations at Wadi Nadiya 1.) Barrage 2 was more intensively examined by means of four excavation areas, three

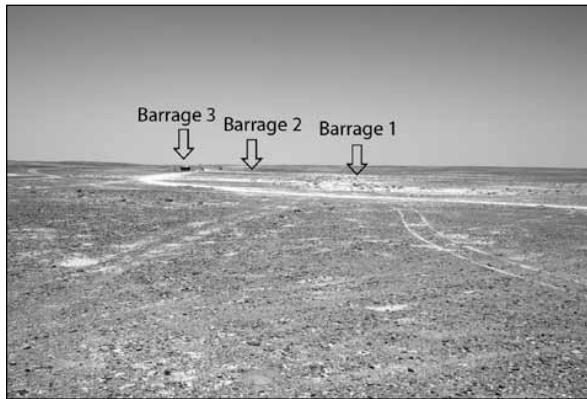
of which aimed to define the range of an open-cut limestone quarry dug in front of the barrage wall. Though much smaller in scale, the same operation was carried out at Barrage 3 as well. Barrage 11, on the other hand, was only briefly examined by means of surface cleaning. Excavated soil from the first three barrages was not sieved owing to the extreme scarcity of small finds.

Excavation of Barrage 1

Barrage 1 is located *ca* 1 km downstream or north of Barrage 2 of Wadi Nadiya 1, with the Azraq - Ma'an highway (i.e. Route 5) running between them. It is constructed across a bend in the small *wadi* that drains from the upper barrage system (Fig. 3). This was probably done to protect the barrage from seasonal floods. As a matter of fact, a well-developed braided channel covers the surrounding *wadi* beds, indicating



3. Wadi Nadiya 1 and 2: site plan.



4. Wadi Nadiya 2: distant view of the site (looking NE).

the hydrodynamic principle that the current in a river / *wadi* is strongest on the outside of a bend. The barrage wall is *ca* 55 m in minimum length (including the intermittent gaps) and up to *ca* 0.4 - 0.5 m in height from the prehistoric ground surface.

Area 1

Area 1 was opened to examine the structure of a well-preserved wall segment (WS-5/6) near the middle of the barrage wall. The excavation showed that the wall segment was constructed of a single row and single course of undressed or partly dressed limestone cobbles and boulders placed in an upright position, and that it was based on a foundational bank *ca* 3 m in width and *ca* 0.1 - 0.2 m in preserved height (Figs. 5 and 6). As with the two upper barrages, a large pit *ca* 0.5 - 0.6 m in depth was identified in front of the wall. This pit reaches the upper surface of Layer 5 and probably represents part of an open-cut quarry excavated for the procurement of construction material. However, unlike Barrage 1 (but like Barrage 2) of Wadi Nadiya 1, the northern edge of the open-cut limestone quarry was not equipped with a subterranean masonry retaining wall that would have protected the main body of the barrage wall from erosion. The far end of the pit extended beyond the excavation area, but it seems likely that the quarry was several meters wide and extended in a gentle arc along the barrage wall. No *in situ* finds were recovered, but a tabular scraper core (Fig. 17: 1), a robust tabular scraper (Fig. 17: 2) and a spherical hammerstone made of a cortical flint pebble (Fig. 17: 3) were found close together in the upper fill layers. The occurrence of these

Chalcolithic - EB flint artifacts allows us to define a *terminus ante quem* for the construction of the barrage.

Bulldozer cut

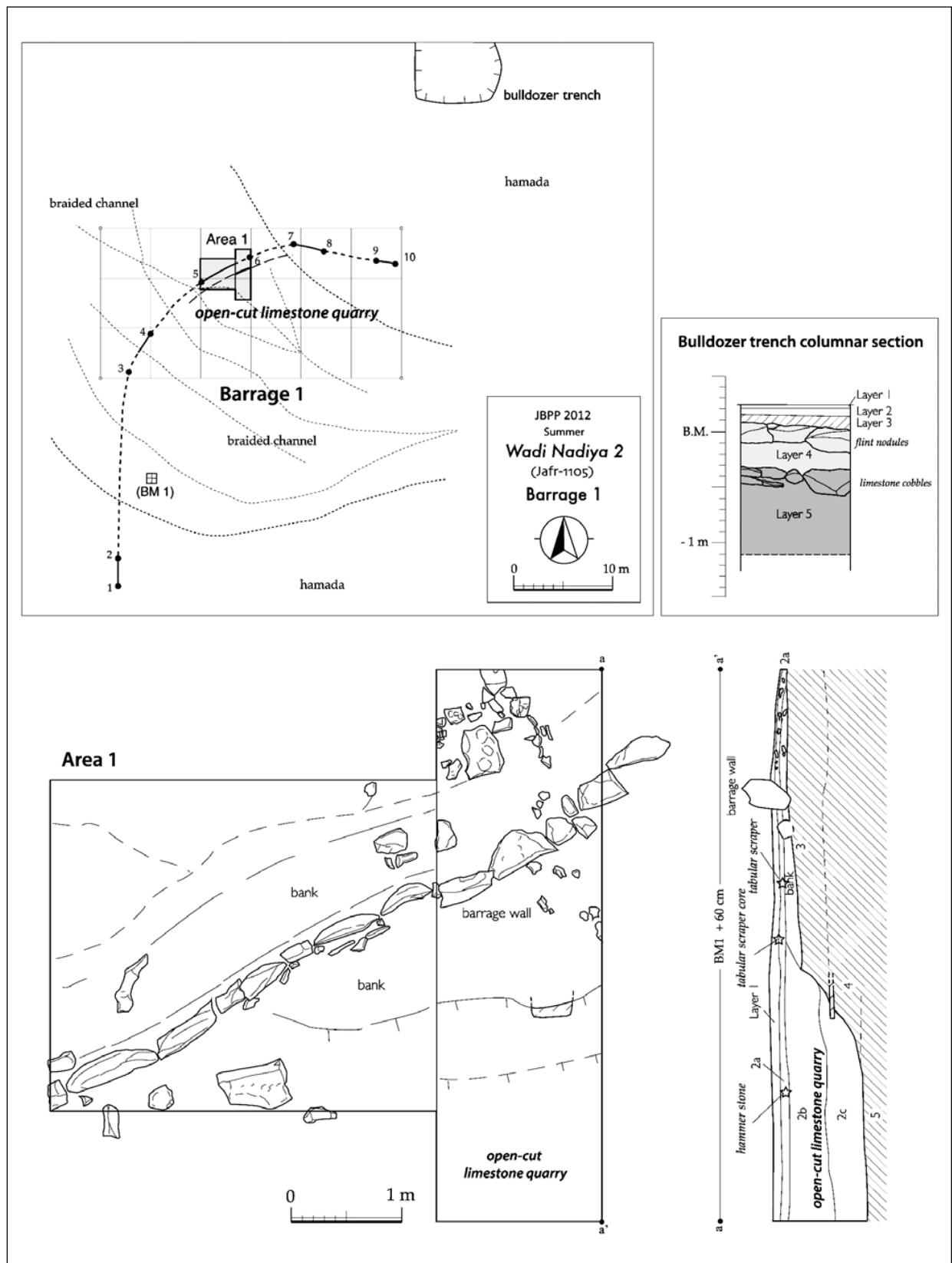
The cross-section of a nearby bulldozer cut confirmed that the natural stratigraphy of the site was almost identical to that of the upper barrage system (Fujii, Adachi *et al.* 2012: Fig. 24). Of significance is the fact that limestone cobbles and boulders adhere to the upper surface of the chalky limestone layer (i.e. Layer 5). It follows that the large pit in front of the neighboring barrage wall was dug to obtain these high-quality construction materials. The existence of a similar pit at Barrage 2 (described below) can be understood in the same context. (It should however be noted that, as evidenced by the site stratigraphy of Wadi Nadiya 1, a flint sub-layer occasionally takes the place of the limestone sub-layer. In this case, the barrage wall would have been constructed of flint nodules. This is the case with Barrage 3 [described below].)

Excavation of Barrage 2

Barrage 2 is located at the top of another bend *ca* 200 m downstream from Barrage 1 (Fig. 3). It was constructed so as to enclose the small *wadi*, tracing a large semi-circle *ca* 60 m across. The barrage wall, which was *ca* 135 m in total length and up to *ca* 0.6 - 0.7 m in preserved height, was equipped with a bottleneck-like inlet *ca* 40 m wide (Figs. 7 and 8). This was the largest of the three barrages and its semi-enclosed flood zone was estimated at *ca* 0.2 ha. Here again, a well-developed braided channel extended over the surrounding *wadi* beds, confirming that the stream velocity of the *wadi* is (and probably was) reduced to a significant extent by the presence of the bend on the one hand and the barrage on the other.

Area 1

This elongated, trench-like excavation area was set up across the central part of the barrage wall. The excavation revealed a poorly constructed masonry wall up to *ca* 0.4 - 0.5 m high, which was supported by a *ca* 4 m-wide rear bank covered with limestone and flint rubble (Fig. 9). The rubble layer probably aimed to protect the bank from erosion. Here again, an open-cut



5. Barrage 1: plan and cross-section.



6. Barrage 1: general view of Area 1 (looking N).

limestone quarry *ca* 0.5 - 0.6 m in depth was identified in front of the barrage wall. It reached the upper surface of Layer 5, corroborating that the large pit was dug to procure construction materials. As with Barrage 1, it was not associated with a subterranean masonry retaining wall that would have protected the main body of the barrage from seasonal floods. No datable *in situ* finds were recovered.

Areas 2, 2/3 and 3

These three excavation areas were set up intermittently along the major axis of the barrage with a view to locating the far end of the open-cut limestone quarry identified in Area 1. It turned out that the quarry gradually terminated near the northern edge of Area 2/3 (**Fig. 7**). It follows that the quarry had a width of *ca* 20 m, although it probably represents a cluster of smaller quarrying pits. In view of the fact that its eastern extent was confirmed in Area 4, it is conceivable the open-cut quarry traced a semi-circle in front of the barrage wall.

A limestone cobble was found *in situ* near the middle of Area 2, in a state of being removed from the upper surface of Layer 5 (**Fig. 10**). Also of interest is the existence of a large pit (within the pit) beside the cobble, which demonstrates that, when necessary, the barrage constructors dug below Layer 5 in search of more substantial construction material. Area 2 yielded a diagonally truncated stone bar (**Fig. 17: 8**) and a flint bowlet (**Fig. 17: 9**), both of which are described in more detail below.

Area 4

This excavation area was opened along the

north-eastern part of the barrage wall, roughly in the center of the washout, to explore the structure of the wall segment subject to the strongest sideways water pressure. The excavation revealed that the wall segment directly overlays thermal-flaked flint nodules forming the upper surface of Layer 4 (**Figs. 11 and 12**). This means that the Layer 3 silty sand deposits (upon which the Jafr PPNB barrages were normally constructed) had already been washed away when the barrage was built, leaving the jagged flint sub-layer exposed in the *wadi* bed. Unlike the other wall segments, large limestone cobbles and boulders were used for the construction of this key part of the barrage wall. In addition, they were arranged in two rows with rubble core in between. Of interest is the fact that, while the rear wall used smaller but more standardized stones and arranged them in stretcher bonds, the front wall used larger but less standardized stones and placed them in header bonds. This contrast allows us to view the former as the main body of the barrage and the latter as a sort of protection wall. A large pillar base, a chronological marker of the Jafr PPNB, was found in incorporated into the rear wall (**Fig. 13**).

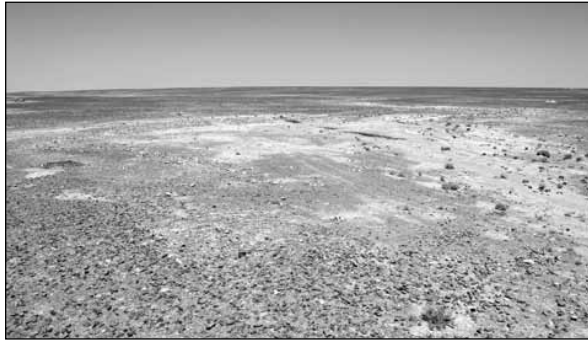
The open-cut limestone quarry in this excavation area was much deeper (*ca* 0.7 - 0.8 m) than in the other excavation areas and reached the middle part of Layer 5, where large limestone boulders were often concentrated. This is probably because the construction of this key wall segment required construction materials large enough to withstand the full force of seasonal flooding. It is also conceivable that the deep depression in front of the barrage wall helped to slow surging floodwaters. Regardless, the remarkable differences in both structure and construction materials between Areas 1 and 4 confirms that careful thought went into the design and construction of the barrage.

In addition to the pillar base, the area yielded a dozen early Islamic grayish ware sherds from the lower fill layer (**Fig. 17: 10**). These are described below in some detail.

Excavation of Barrage 3

Barrage 3 is located *ca* 200 m NNW of Barrage 2. However, it is *ca* 150 m distant from the small *wadi* and instead occupies flat terrain at the lower edge of a small-scale closed drainage





8. Barrage 2: general view (looking NE).



9. Barrage 2: general view of Area 1 (looking NW).



10. Barrage 2: general view of Area 2 (looking N).

system. For this reason, a small playa (instead of a braided channel) has formed in its flood zone. The barrage has a semi-circular plan opening westward and is equipped with a short, slightly out-curved guiding wall at both ends (**Fig. 14**). This barrage is relatively well-preserved and is characterized by its small size, semi-enclosed plan and a well-developed rear bank covered with flint rubble. The total length of the barrage wall is *ca* 55 m and its preserved height *ca* 0.2 - 0.3 m. Instead of limestone cobbles, angular flint nodules *ca* 20 - 40 cm long are used as the main construction material. As noted above, this is

probably due to minor differences in the nature of the underlying strata as a source of construction material. No *in situ* finds were recovered.

Area 1

Bearing the results from the upper two barrages in mind, we set up an elongated excavation area along the main axis of the barrage and examined the structure of the open-cut quarry and central wall segment behind it. It turned out that the quarry was *ca* 5 m wide and *ca* 0.8 m deep, extending along the barrage wall. Although we could not identify both ends of the quarry owing to time constraints, it probably traces an arc along the barrage wall. A pile of angular flint nodules (similar to those used in the construction of the barrage wall) was found at the eastern edge of the quarry, immediately below the barrage wall. These were probably prised out of the bottom of the quarry (i.e. the upper surface of Layer 5), but were left unused for some reason. This discovery once again attests to the function of the large pit in front of the barrage wall as an open-cut quarry.

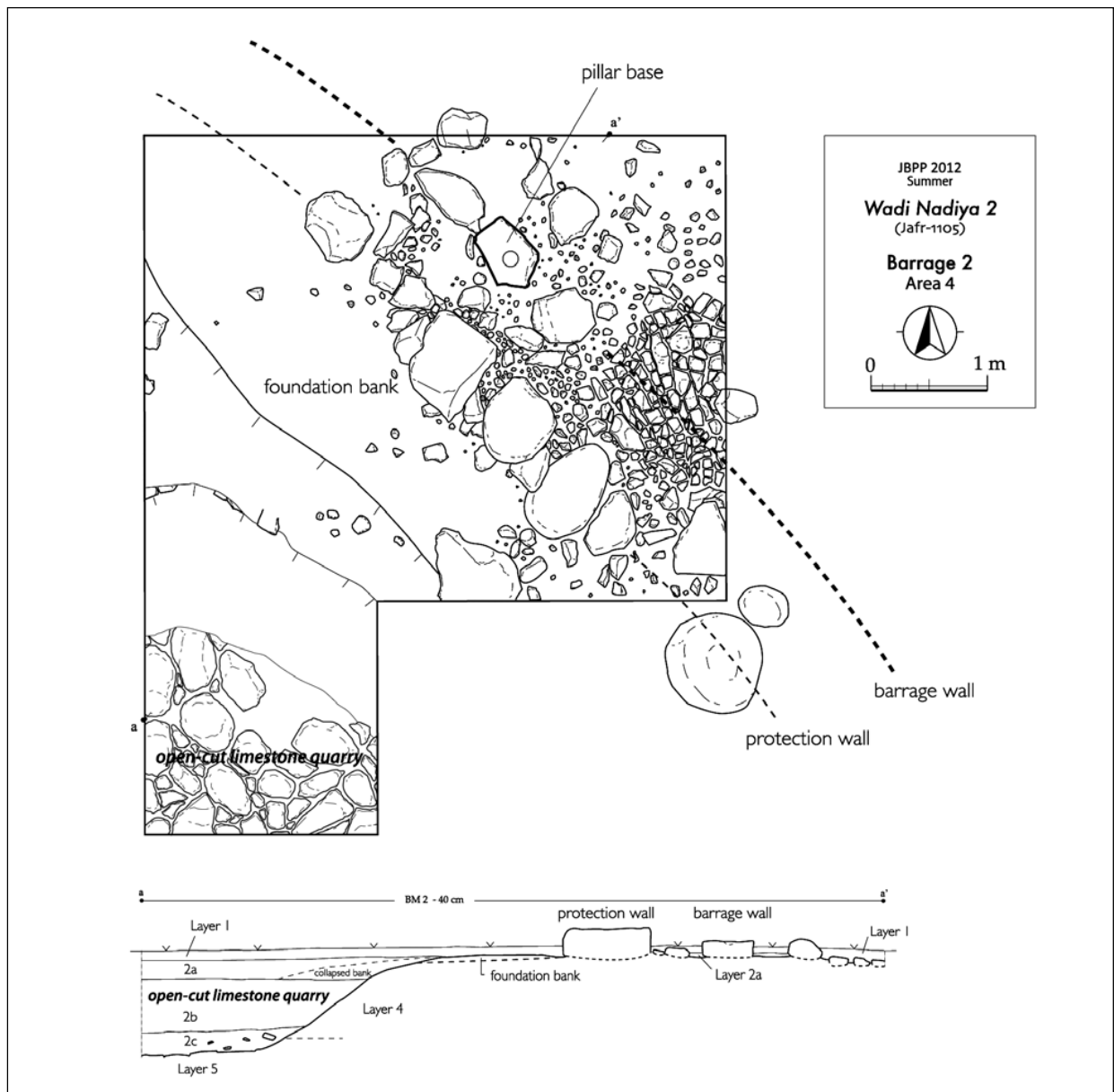
The barrage wall was simple in structure, being constructed of a single row and single course of angular flint nodules arranged in stretcher bonds. What interested us more was the rear bank, which was *ca* 5 m wide, *ca* 0.3 - 0.4 m high and was covered with flint and limestone rubble. There is no doubt that both of these construction materials were sourced from the adjacent open-cut quarry. It follows that the quarry supplied construction material for both the rear bank and the barrage wall. The open-cut quarry probably also served as an *ad hoc* cistern for storing seasonal run-off surface water - a rational device well-suited to highly mobile groups such as early pastoral nomads.

Area 2

This small excavation area was established 1 m west of Area 1 with a view to checking the extent of the open-cut quarry. The excavation confirmed that the quarry ended in the western part of Area 1 and did not reach the central part of the flooded area.

Investigation of Barrage 11

Though not excavated, a brief examination confirmed that this isolated barrage measured *ca* 35 m in total length and was constructed of



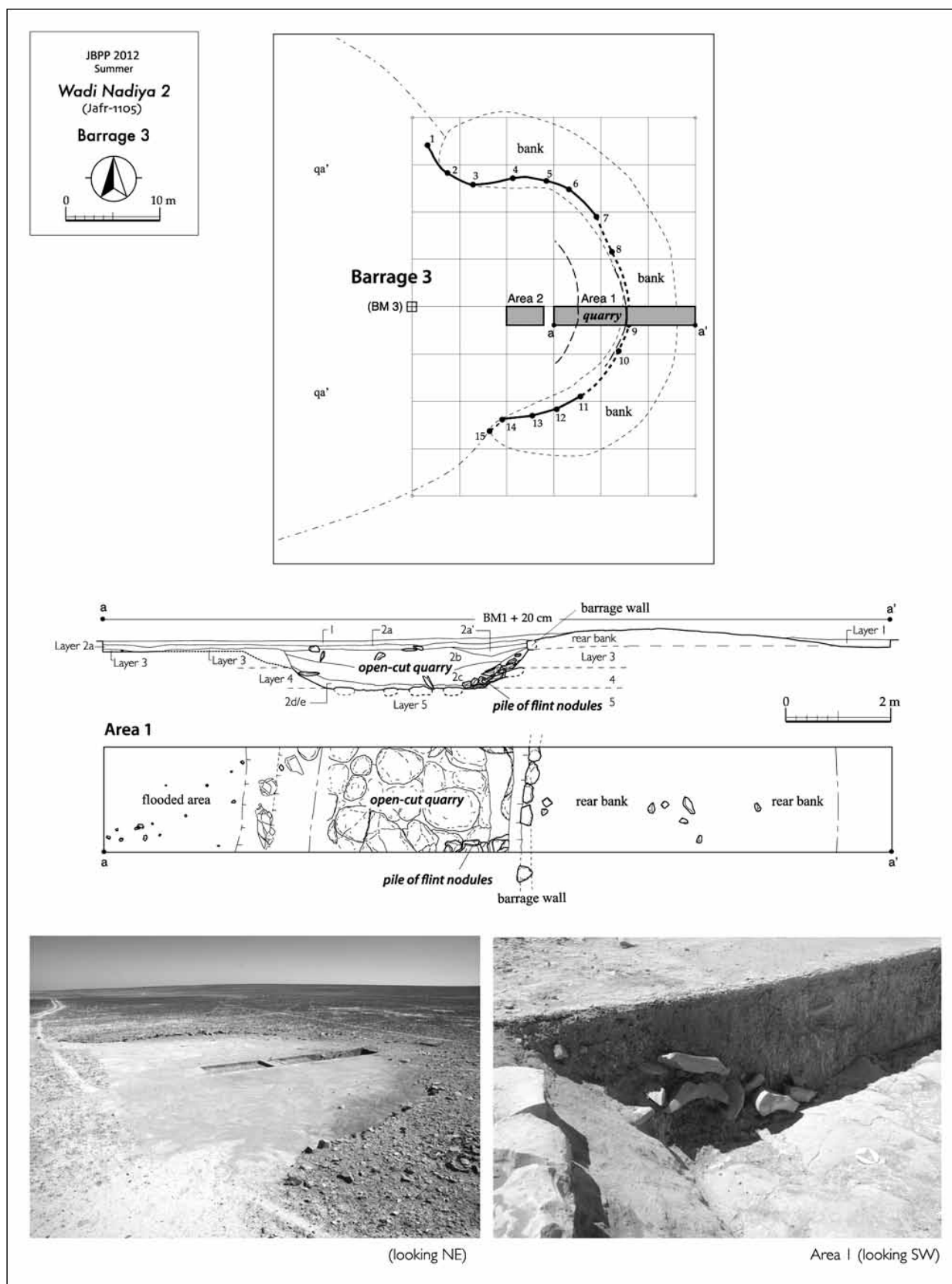
11. Barrage 2: plan and cross-section of Area 4.



12. Barrage 2: general view of Area 4 (looking NE).



13. Barrage 2: close-up view of the barrage wall at Area 4 (looking N).

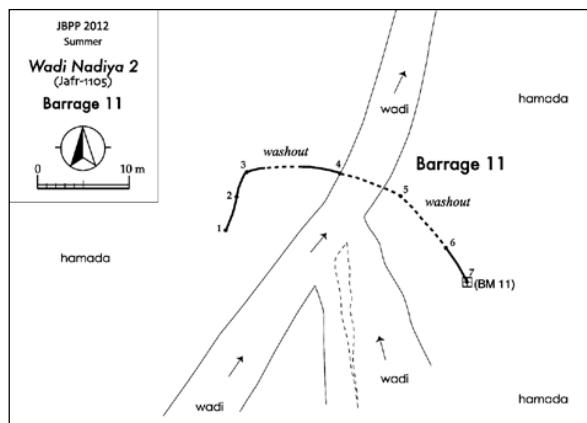


14. Barrage 3: plans and cross-section.

a single row and single course of undressed or partly dressed limestone cobbles that were usually placed in an upright position (Figs. 15 and 16). It had much in common with Barrage 1, including its location near a bend in a small *wadi*, an arc-shaped general plan, its overall dimensions and the frequent use of upright stones. There is a possibility that, as with Barrage 1, this barrage likewise represents the uppermost feature of a barrage system, but no clear evidence for lower features was confirmed (Fig. 3). No artifacts were found.

Small Finds from Wadi Nadiya 2

As is usual with extramural barrage sites, Wadi Nadiya 2 was very poor in small finds. Those recovered in and around the excavation areas were limited to a pillar base, a diagonally truncated stone bar, a small number of chipped flint artifacts and a dozen early Islamic pottery sherds. Although none except the pillar base were found *in situ*, they do provide some insight into the date of the barrage system.



15. Barrage 11: schematic plan.



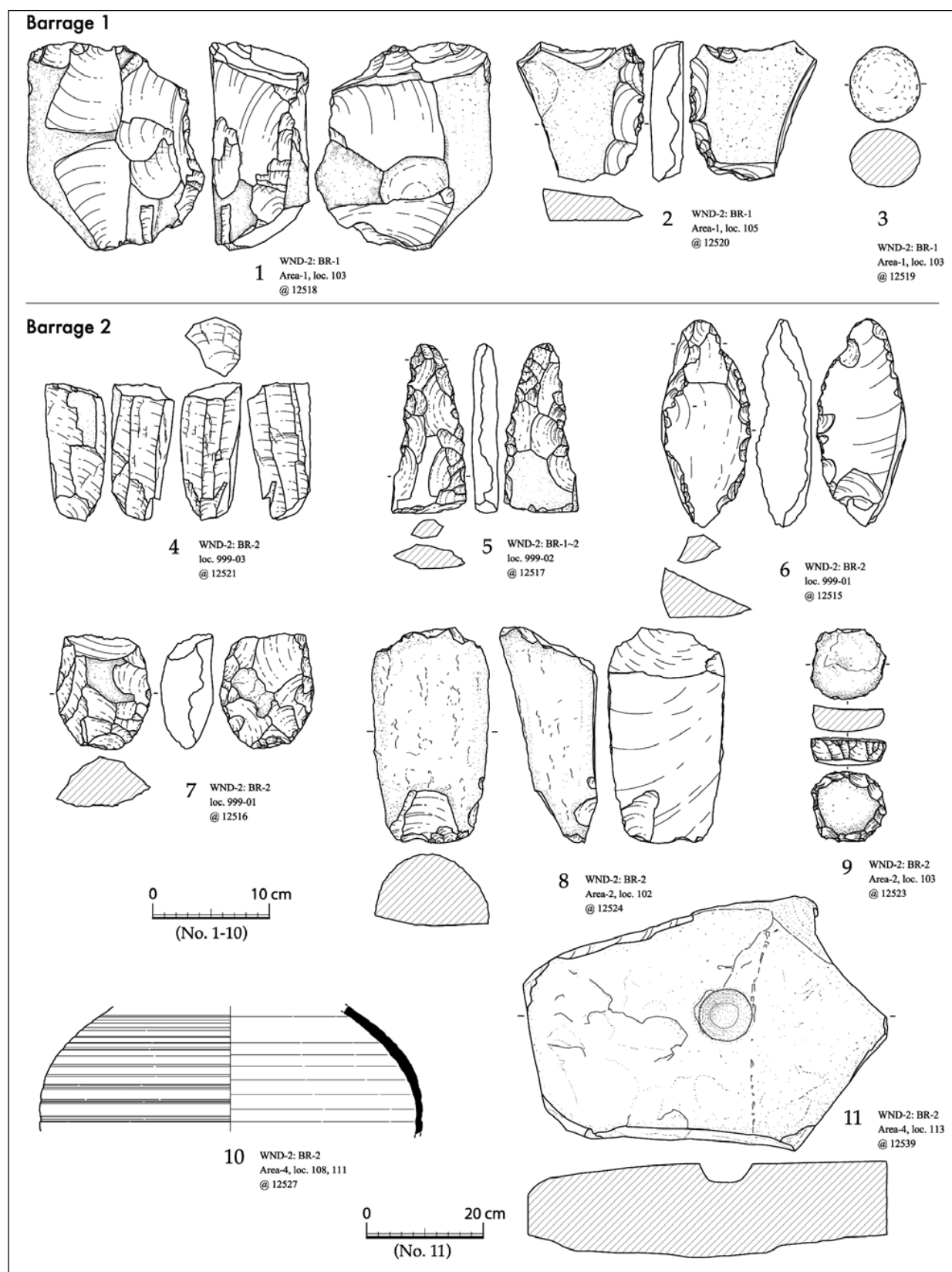
16. Barrage 11: general view (looking NW).

Pillar base

As noted above, Barrage 2 incorporated a large pillar base within the central wall segment that faced the seasonal floods of the small *wadi* (Fig. 13). This limestone object was 63 cm long, 14 cm thick and weighed *ca* 59 kg, being equipped with a small concavity (9 cm in diameter and 3 cm deep) roughly in the center of its flat upper surface (Fig. 17: 11). No notable macroscopic use-wear was recognized in the concavity. Similar artifacts have been found at two PPNB outposts and several contemporary barrages in the Jafr Basin (e.g. Fujii 2007b: Fig. 16, 2007c: Fig. 9; Fujii, Adachi *et al.* 2011: Figs. 32, 33; Fujii n.d.: Fig. 13). It appears that they were incorporated in a key wall segment as good luck talismans intended to secure the safety and longevity of the barrage (Fujii, Adachi *et al.* 2011: 206). There is little doubt that the pillar base from Barrage 2 shares a similar date and function with previously identified examples. This *in situ* find from the barrage wall provides a reliable clue to the date of the Wadi Nadiya 2 barrage system.

Diagonally truncated stone bar

A diagonally truncated stone bar, another chronological marker of the Jafr Pastoral PPNB, was found as a stray find within an upper fill layer in the open-cut limestone quarry of Barrage 2 (Fig. 17: 8). This heavy-duty tool, 25 cm long and *ca* 3.4 kg in weight, is made of a cortical flint nodule. As with the flint bowlet described below, it was crafted to take full advantage of the original shape of the raw material, with secondary retouch being limited to diagonal truncations at either end. In view of its weight and the remarkable edge damage it had sustained, this *ad hoc* tool was probably used for digging the open-cut limestone quarry. A large number of similar examples, admittedly made mostly of limestone, have been reported from the PPNB agro-pastoral outposts of Wadi Abu Tulayha (e.g. Fujii 2008: Fig. 31, 2009a: Fig. 19) and Wadi Ghuwayr 17 (Fujii, Quintero *et al.* 2011: Fig. 27). The neighboring barrage system of Wadi Nadiya 1 also yielded a similar object (Fujii, Adachi *et al.* 2012: Fig. 34, no. 1). Though from a fill layer, the occurrence of this diagnostic artifact provides further support for dating the barrage system to the PPNB.



17. Barrages 1 and 2: small finds.

Flint bowlet

The ‘flint bowlet’ is a palm-sized, pallet-like stone vessel peculiar to M - LPPNB settlements in southern Jordan. It is characterized by its unique production technique that takes full advantage of a thermally pitted, shallow concavity on the upper surface of a tabular flint nodule (Gebel 1999). While MPPNB bowlets is typically larger in size and roughly trimmed, LPPNB examples are usually much smaller with fine retouch along their periphery (Fujii 2009b, 2012a). A typical example of a LPPNB bowlet was found near the diagonally truncated stone bar, that is to say in the surface layer of Area 2 of Barrage 2 (**Fig. 17: 9**). This bowlet (125 gm in weight, 6.5 cm in diameter, 2.1 cm high and *ca* 2 - 3 cc in maximum capacity) is notable for its small size, elaborate lateral retouch and sophisticated profile. The occurrence of such a precious object, which seems somewhat out of place at an extramural water-use facility, hints at the presence of a nearby LPPNB outpost that would have functioned as the ‘operating body’ for the barrage system. Taking this into consideration, we feel able to narrow down the likely date of the barrage system to the LPPNB.

Chipped flint artifacts

A small number of chipped flint artifacts were collected in and around the excavation areas of the three barrages. As described above, the finds from the upper fill layer of Barrage 1 included a tabular scraper core (**Fig. 17: 1**), a heavy-duty tabular scraper (**Fig. 17: 2**) and a spherical hammer stone (**Fig. 17: 3**). It is important to note that they were found close together as a rough ‘set’. As suggested above, their occurrence provides a *terminus ante quem* for the construction of the barrage. The upper fill layer of Barrage 2, on the other hand, yielded two blade cores (**Fig. 17: 4**), three digging tools (**Fig. 17: 5-7**) and several blades and flakes. The frequency of heavy-duty digging tools is characteristic of the Jafr Pastoral PPNB, and parallel examples have been found at Wadi Abu Tulayha (e.g. Fujii 2007a: Fig. 28, 2009a: Fig. 15) and Wadi Ghawayr 17 (Fujii, Quintero *et al.* 2011: Fig. 25), as well as at the neighboring barrage complex of Wadi Nadiya 1 (Fujii, Adachi *et al.* 2012: Fig. 34, no. 5-8). As with the diagonally truncated stone bar, they were probably used for digging

the open-cut limestone quarry (in the case of a barrage site) or foundation pit for semi-subterranean structures (in the case of an outpost). There is little doubt that these finds from Wadi Nadiya 2 were used for the former purpose. In addition, the barrage system yielded a few dozen miscellaneous flint artifacts (including Mousterian points, tabular scrapers and Jafr blades) as stray finds.

Pottery

A dozen early Islamic grayish ware sherds were found in Area 4 of Barrage 2, in a lower fill layer within the open-cut limestone quarry (**Fig. 17: 10**). They were wheel-made, well-fired, tempered with dark gray sand particles (*ca* 1 - 5 mm across) and decorated with fine horizontal ribs. Refitting showed that they formed a single pot with an external diameter of *ca* 33 cm. It appears that they were probably swept away from some feature, probably a tomb, in the upper course of the *wadi*. Incidentally, similar sherds were found at Barrage 1 of Wadi Nadiya 1 (Fujii, Adachi *et al.* 2012: Fig. 34, no. 10-11), along with a gravestone inscribed with early Islamic letters (*ibid.*: Fig. 34, no. 9). The same is true of Barrage 1 at Wadi Abu Tulayha (Fujii 2007a: 409-411). These finds highlight the fact that there was unexpectedly frequent traffic in the Jafr basin during the early Islamic period. Also of significance is the fact that, as evidenced by traces of washout, most of the residual spoil of the open-cut quarries was carried away by repeated floods and replaced by later deposits. This makes it difficult to date the barrage systems and reconstruct the ancient environments around them on the basis of the barrage deposits.

Surrounding Features

In addition to Loc. 2001, found last season, three surrounding features were newly discovered during the course of the excavations at Wadi Nadiya 2 (**Fig. 2**). Loc. 2002 is situated *ca* 0.4 km south-west of Barrage 1. It is a small concentration of petroglyphs, which depict herbivorous animals and other miscellaneous figures on cortical limestone cobbles. Both pecking and line-drawing technique were used separately but, in view of the marked difference in the degree of weathering, the former technique appears to be much earlier in date than the latter. In addition,

wasam-like signs as well as Thamudic and Islamic letters were inscribed either separately from or overlapping the petroglyphs.

Loc. 2003, situated *ca* 0.5 km west of Barrage 1, is a small flint workshop. Tabular scraper cores and their related debitage class samples were found sporadically, but tool blanks - to say nothing of finished products - were very scarce. Most of the cores used locally available small cortical tabular flints, found scattered on the ground surface, as raw material, suggesting that the workshop was *ad hoc* in nature and not associated with flint mines.

Loc. 2004 occupies a gentle slope *ca* 0.8 km north of Barrage 3. The site included a semi-circular feature *ca* 8 - 10 m long, *ca* 4 - 5 m wide and *ca* 0.3 m in preserved height. It was poorly preserved, and its function and date remain unknown.

Supplementary Investigations of the Jafr Neolithic Barrage Systems

On the basis of the results of our research at Wadi Nadiya 2, we conducted a brief re-examination of Wadi Nadiya 1 and Wadi Ghuwayr 106. These supplementary investigations reconfirmed that each of these barrage systems was associated with a large-scale open-cut limestone quarry that supplied construction material and, at the same time, functioned as an *ad hoc* cistern storing seasonal runoff surface water. (The contemporary barrage systems of Wadi Abu Tulayha and Wadi Ruweishid ash-Sharqi were not revisited due to time constraints, but both will be re-examined next season.) It also turned out that the PPNB outpost of Wadi Ghuwayr 17 was equipped with a small cistern. In addition, a brief survey in the eastern part of the Jafr basin provided valuable insights into the functional evolution of the Neolithic barrage system.

Wadi Nadiya 1

The barrage system of Wadi Nadiya 1 was excavated last season, when a large-scale open-cut limestone quarry was found for the first time at Areas 1, 2 and 5 of Barrage 1 (Fujii, Adachi *et al.* 2012). With a view to ascertaining the western extent of the quarry, we enlarged Area 6 and pursued further details of its stratigraphy. The re-examination demonstrated that the quarry extended as far as the western half of the system,

but that the subterranean retaining wall protecting the barrage wall from erosion did not and that it terminated somewhere between Area 2 and Area 6 (**Fig. 18**).

In addition, the re-examination of Area 1 at Barrage 2 confirmed that the lower barrage was also associated with an open-cut limestone quarry *ca* 1 m deep and that the quarry was equipped with protective banks instead of a subterranean masonry retaining wall (**Fig. 19**). It also suggested that, as at the lower three barrages, the poor quality of the construction material procured in the quarry necessitated the construction of foundation banks underlying the barrage wall.

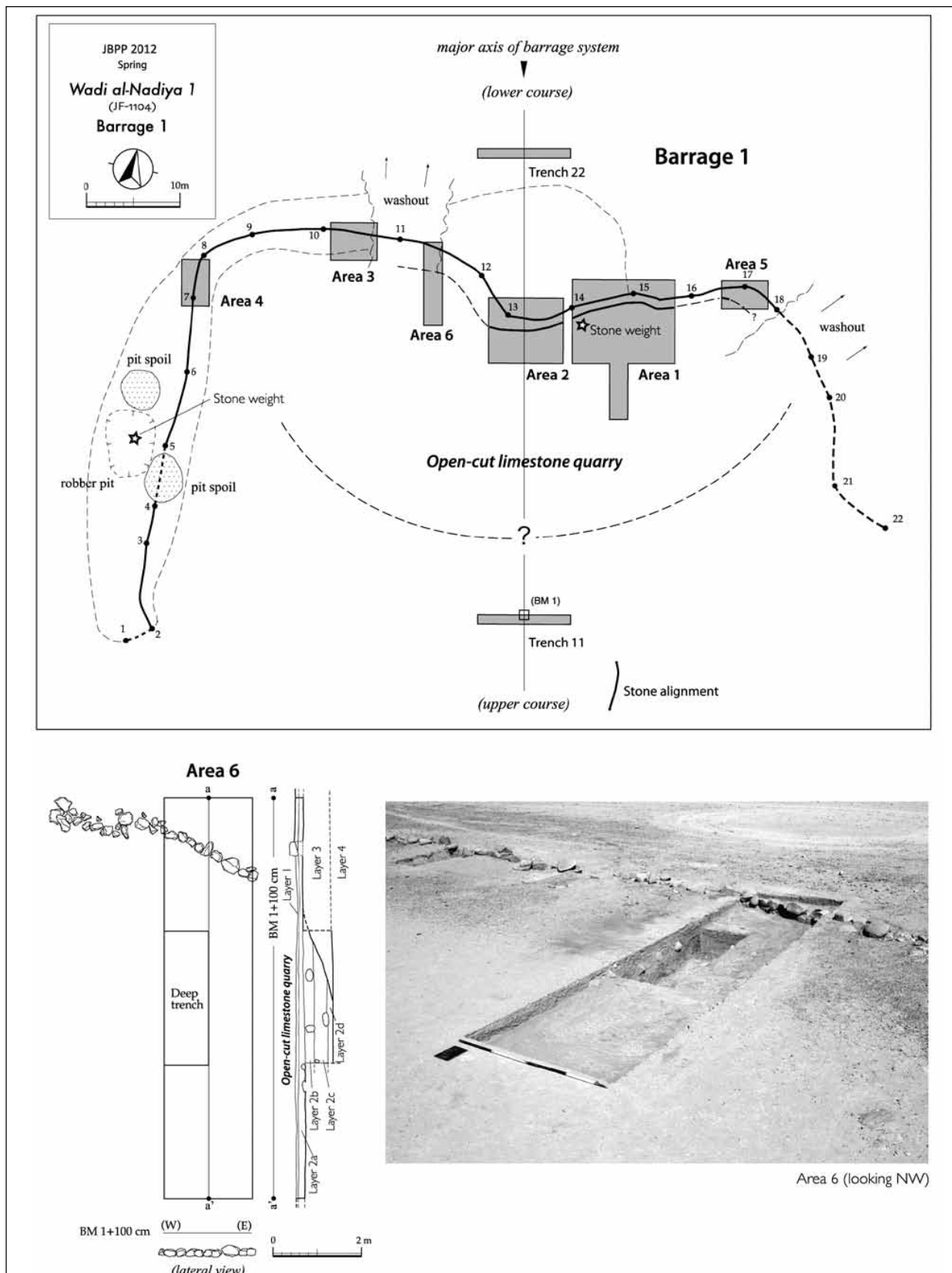
Wadi Ghuwayr 106

The barrage system of Wadi Ghuwayr 106 is located *ca* 20 km south-east of Wadi Nadiya 1 and 2. It was excavated in 2010, but no clear evidence for a quarry was found at that time (Fujii, Adachi *et al.* 2011). The re-excavation of the central parts of Barrages 1 and 2 revealed the existence of an open-cut limestone quarry *ca* 1 - 1.2 m deep in front of both (**Figs. 20 and 21**). Once again, no subterranean retaining wall was associated with the lower edge of the quarries. A stone concentration in front of the main wall of Barrage 1 is worthy of note. Our previous report interpreted it as a remnant of a protruding reinforcement wall aimed at protecting the barrage wall, but further scrutiny this season confirmed that it represents part of the erosion-control material that covered the edge of a subterranean bank in front of the barrage wall.

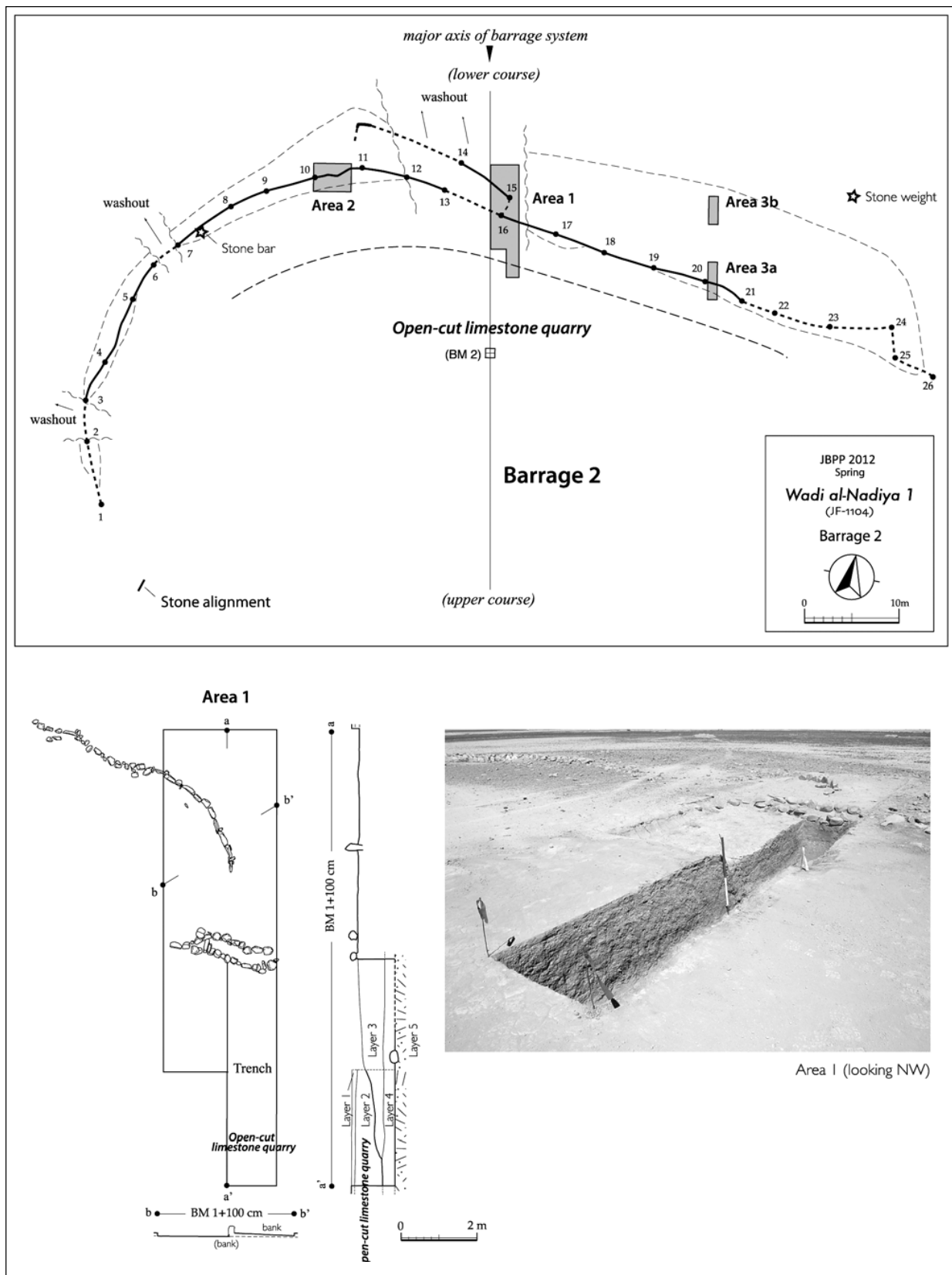
Wadi Ghuwayr 17

Taking advantage of our re-examination of the barrage system of Wadi Ghuwayr 106, we also conducted a brief re-investigation of the neighboring PPNB agro-pastoral outpost of Wadi Ghuwayr 17 (previously excavated in 2010 [Fujii, Quintero *et al.* 2011]). Our operation focused on a short stone alignment *ca* 130 m north of the main body of the outpost, which was found by chance when we revisited the site last season (**Fig. 22**).

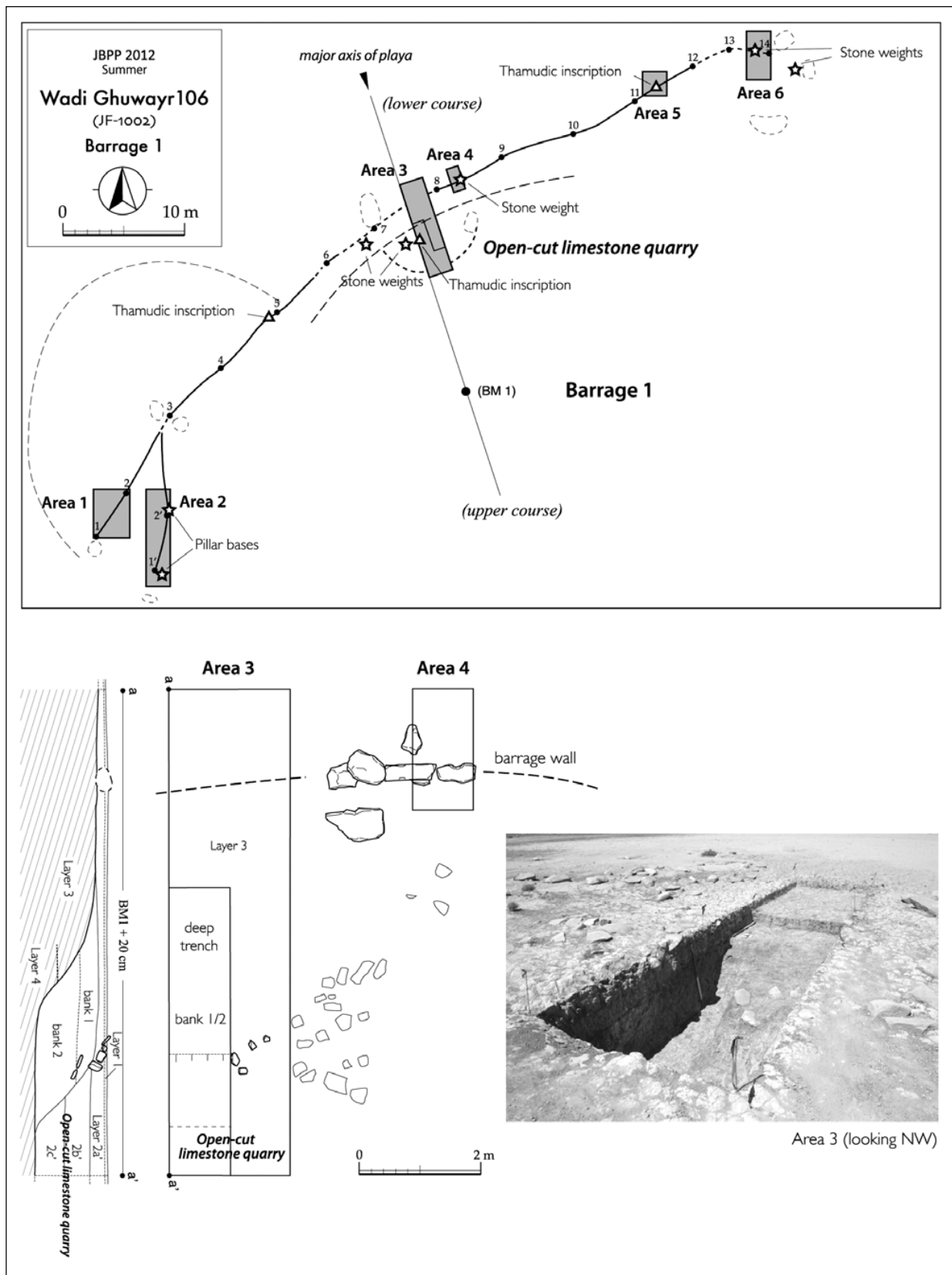
The excavation demonstrated that the stone alignment represented part of a small structure (Structure 101) *ca* 3 m long, *ca* 0.5 - 1.2 m wide and *ca* 0.5 - 0.7 m deep (**Fig. 23**). What is important is that: (1) it is separated from the main



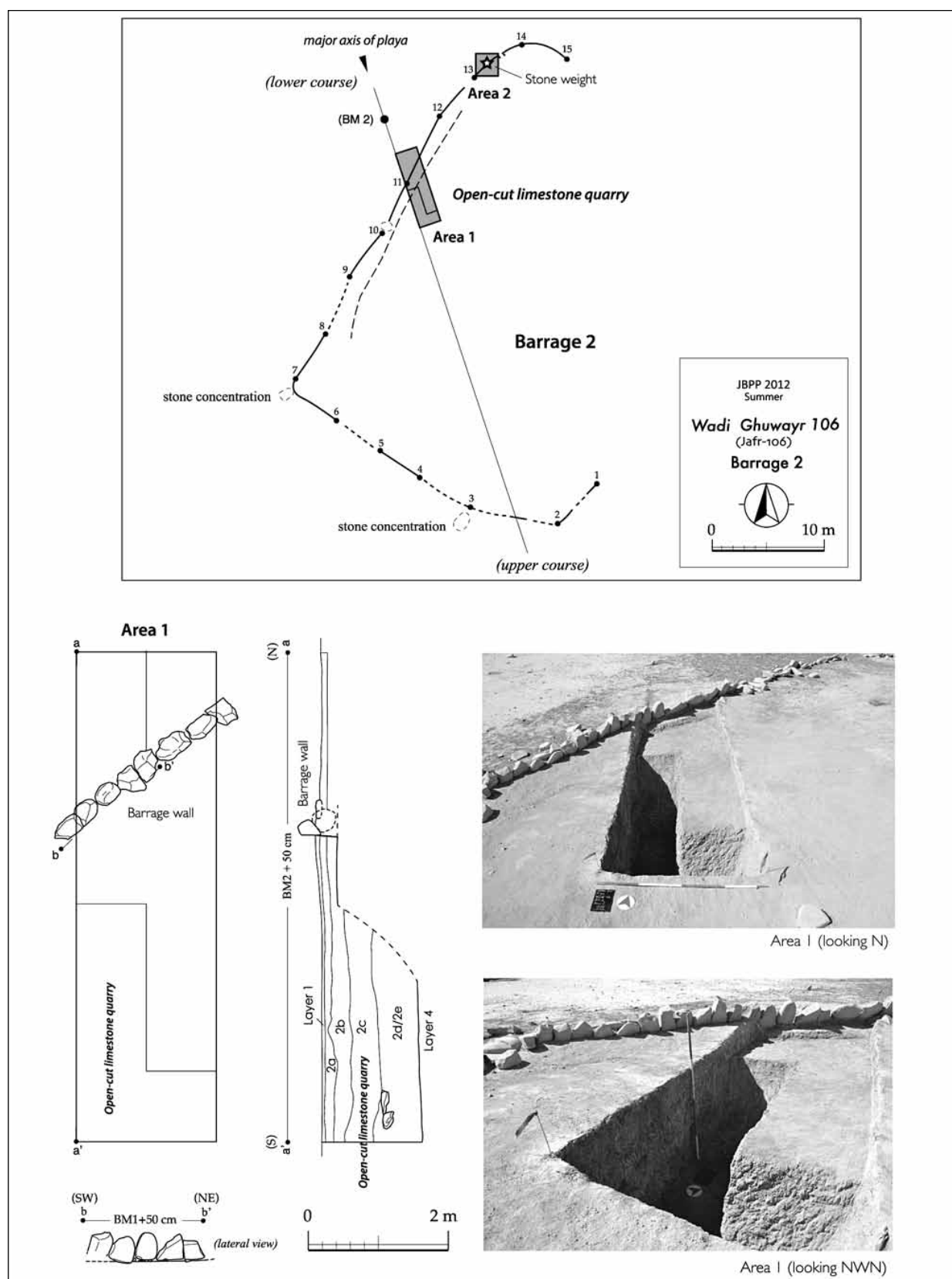
18. Wadi Nadiya 1: plan and section of Barrage 1.



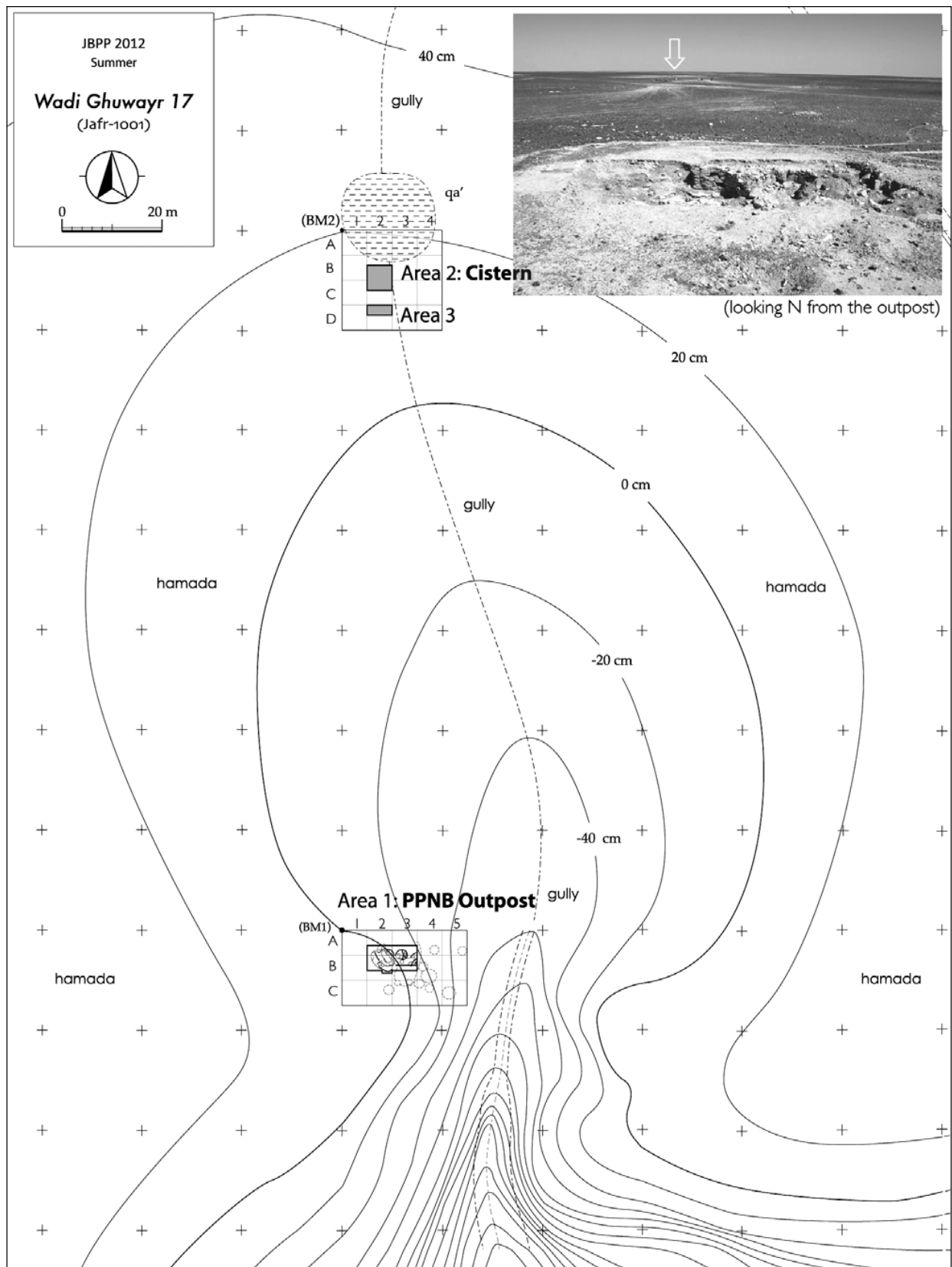
19. Wadi Nadiya 1: plan and section of Barrage 2.



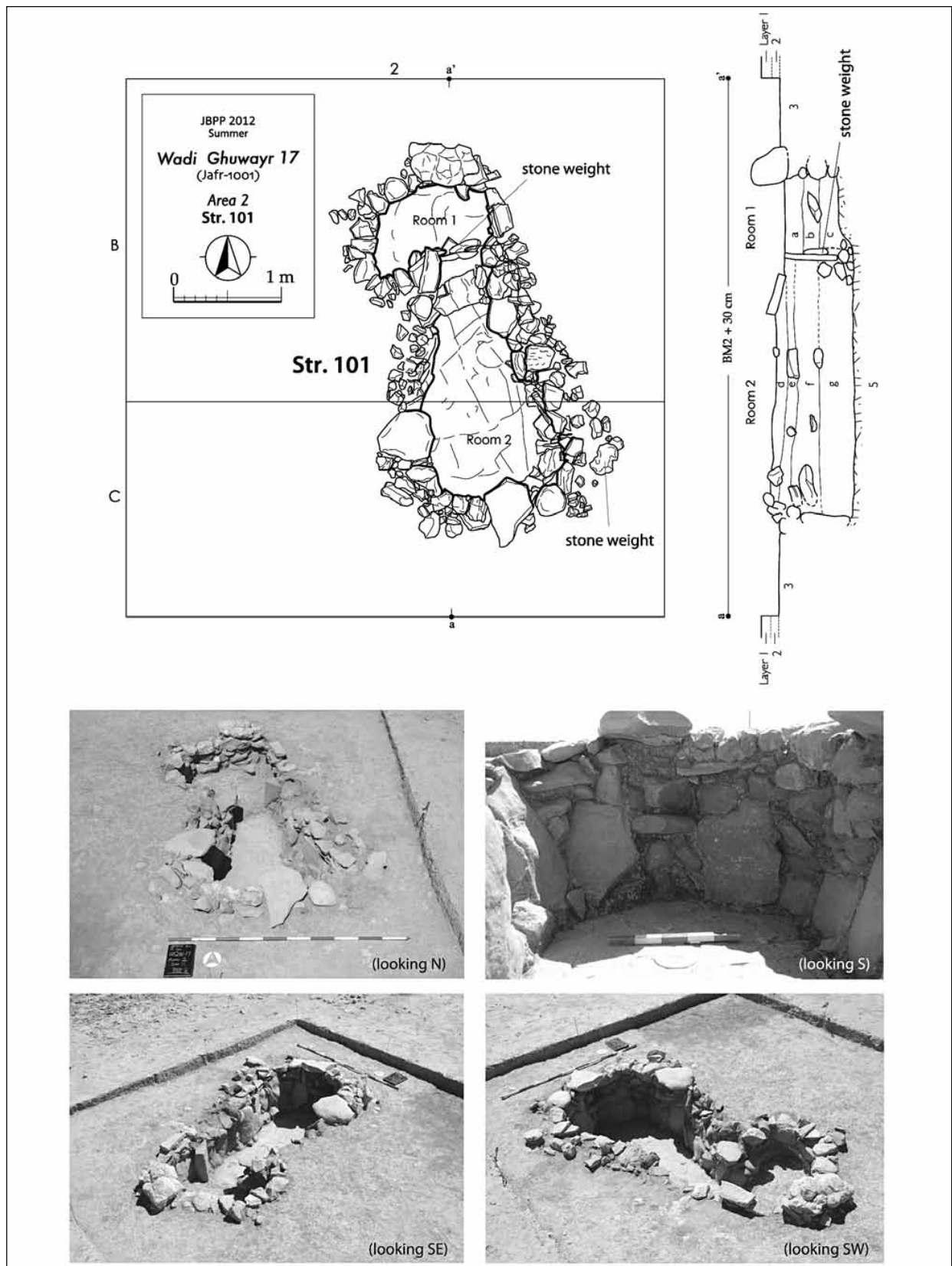
20. Wadi Ghuwayr 106: plan and cross-section of Barrage 1.



21. Wadi Ghuwayr 106: plan and cross-section of Barrage 2.



22. Wadi Ghuwayr 17: site plan.

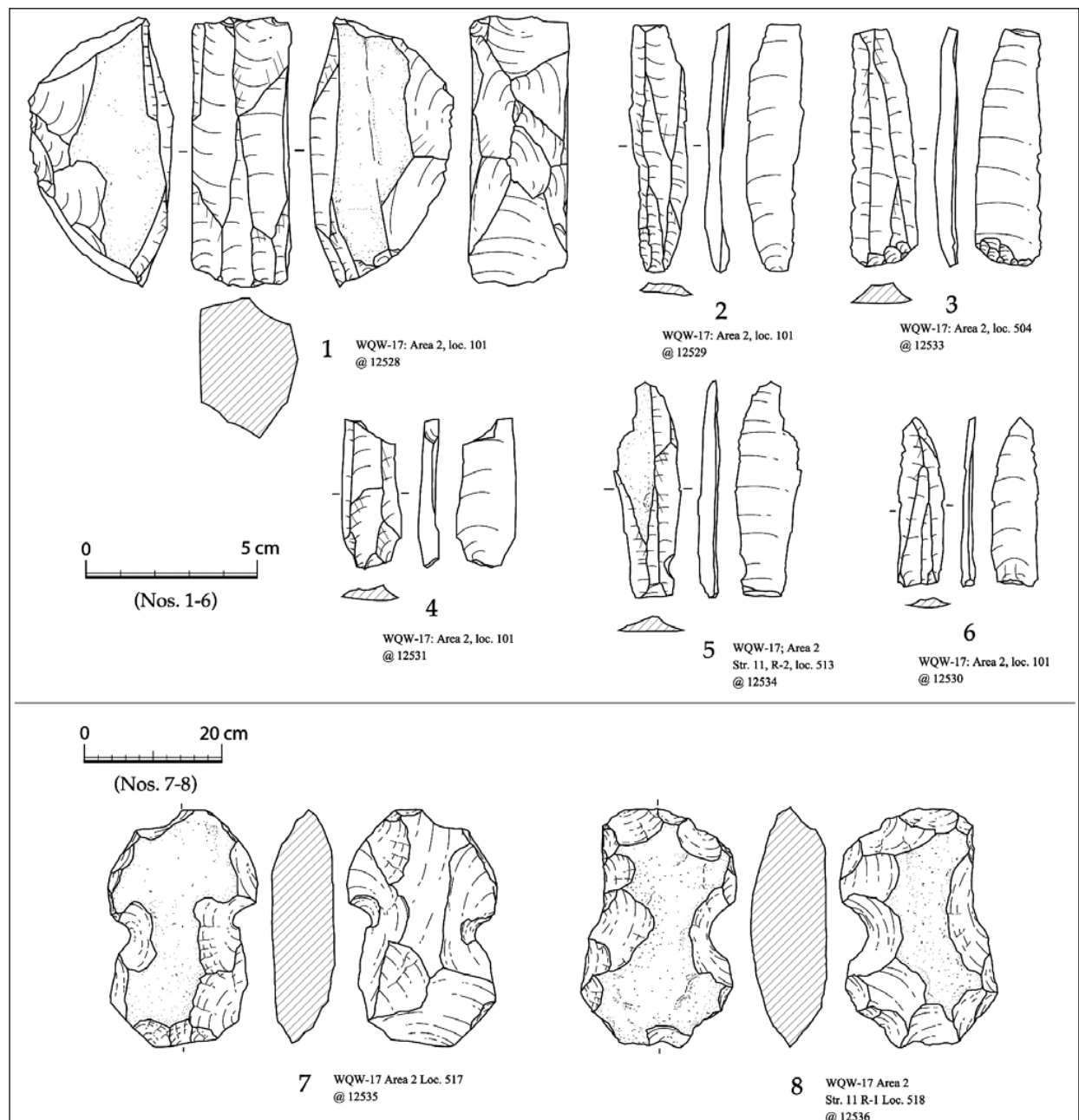


23. Wadi Ghuwayr 17: plan and cross-section of Structure 101.

body of the outpost and, unlike the outpost, occupies a *wadi* bed; (2) as evidenced by excavations at the neighboring Area 3, it is isolated and does not form a structural complex of multiple features; (3) its masonry wall is partially coated with a layer of clay mortar *ca* 5 cm thick. These traits allow us to interpret the feature as a small cistern. In contrast to the neighboring outpost, neither hearths nor *in situ* artifacts were found on the floor of the structure. Even stray finds

from fill layers were very scarce, being limited to a dozen flint artifacts including naviform core and blade components (Fig. 24: 1-6).

Given this functional identification, it would follow that the site is a second example of the 'triple set' of the Jafr Pastoral PPNB (i.e. outpost, barrage system and cistern), after the type-site of Wadi Abu Tulayha (Fujii 2014, n.d.). As a matter of fact, the structure incorporated two diagnostic stone weights into its masonry walls,



24. Wadi Ghuwayr 17: small finds from Structure 101.

suggesting contemporaneity with the neighboring outpost (**Fig. 24: 7-8**). It would appear that the small size of the cistern (*ca* 2 m³ maximum capacity) accords well with the small scale of the nearby outpost (*ca* 0.015 - 0.02 ha; Fujii, Adachi *et al.* 2011: 180).

Eastern Jafr Barrage Survey

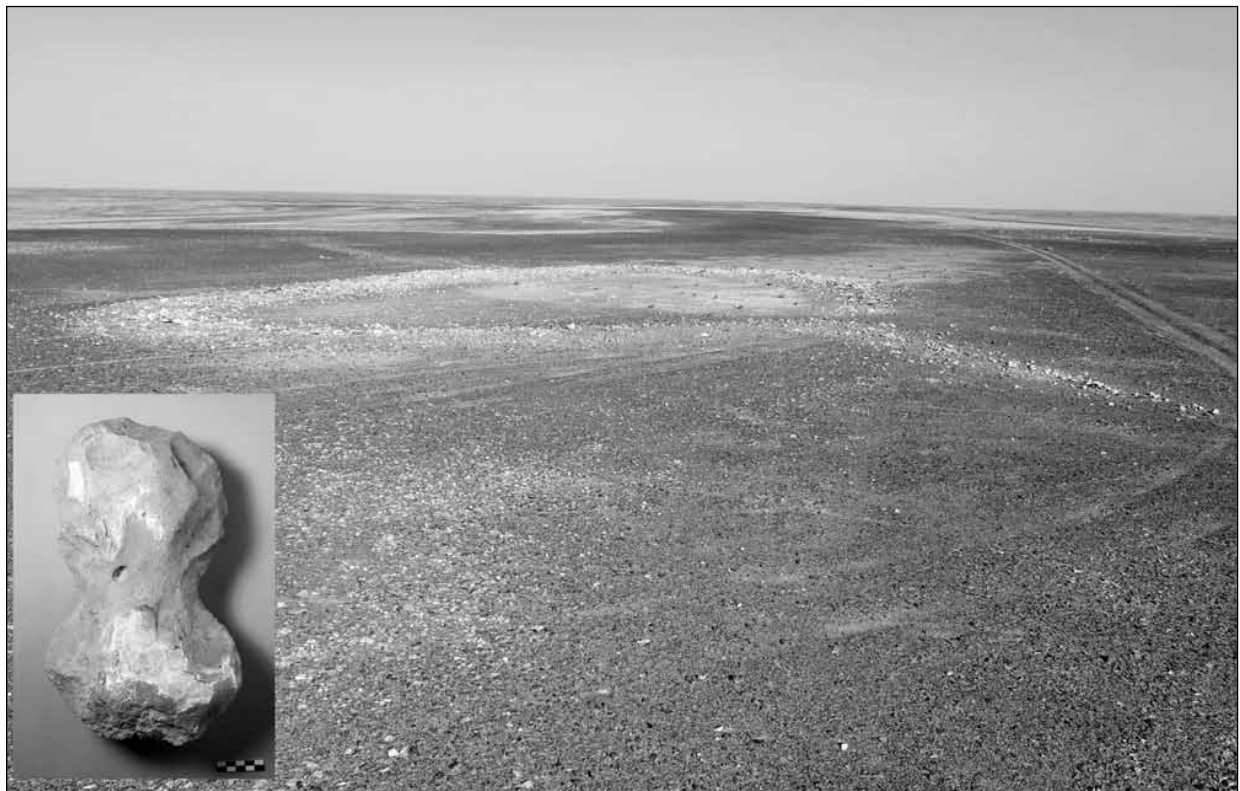
We conducted a brief general survey in the eastern Jafr basin aimed at gathering additional information on the Jafr Neolithic barrages. It was triggered by our tentative hypothesis that the composite barrage systems of Wadi Nadiya 1 and 2 began with the large-scale basin-irrigation barrage and gradually shifted to the small-scale cistern-type barrage. The survey aimed to test this hypothesis in a broader context.

The survey located a few dozen barrages within a relatively limited area (**Fig. 1**). Interestingly enough, most of them were typical cistern-type barrages equipped with a completely closed wall, a few narrow inlets and a few guiding walls (**Fig. 25**). It should also be added that they incorporated a diagnostic stone weight(s) into their wall. Given the suggested techno-

pological sequence of the Wadi Nadiya barrage systems, it would follow that they represent a later form of the Jafr Neolithic barrage. The survey also suggested that while basin-irrigation barrages were more common in the hilly terrain to the west, nearer to contemporary farming communities, the cistern-type barrages penetrated deep into the desert. Furthermore, while the former was often associated with a nearby agro-pastoral outpost, the latter was usually isolated in the middle of *hamada* and was not associated with any fixed ‘operating body’. These observations seem to indicate that the early Holocene Jafr basin witnessed a dramatic shift in water-use strategy. It is our present interpretation that the shift was linked with a change in lifestyle from PPNB pastoral transhumance to subsequent pastoral nomadism, but further scrutiny is required to validate this tentative perspective.

Discussion

The excavations at Wadi Nadiya 2 have demonstrated that the site represents a fifth example of the Jafr Neolithic barrage system, after Wadi Abu Tulayha, Wadi Ruweishid ash-Sharqi (Fu-



25. EJS/Site-11: general view of the site (looking N) and a stone weight found along the barrage wall (below left).

jii 2007b; 2007c; 2010a), Wadi Ghuwayr 106 (Fujii, Adachi *et al.* 2012) and Wadi Nadiya 1 (Fujii, Adachi *et al.* n.d.). However, it differs somewhat from the others, suggesting some difference in date and / or function. The following discussion briefly reviews the results of our research and pursues further details of interpretation.

Date and Function

There is little doubt that the Wadi Nadiya 2 barrage system dates to the PPNB, not least because the site yielded an assemblage of diagnostic limestone and flint artifacts comparable with those from the two PPNB agro-pastoral outposts (i.e. Wadi Abu Tulayha and Wadi Ghuwayr 17) and other barrage systems known in the Jafr basin. The presence of an open-cut limestone quarry in front of the barrage wall is also shared by the other barrage systems, confirming the technological affinities and contemporaneity between them. No less important is the occurrence of the remarkable flint bowlet, which suggests that we could narrow down the date of the barrage system to the LPPNB.

It is also indisputable that the four barrages at Wadi Nadiya 2 were used as water catchment facilities. A series of recurring characteristics - viz. the location across a *wadi* or at the lower end of a closed drainage system, the incurved stone wall 'opening' towards the upstream end of the system, the attachment of a pair of guiding walls and the extreme scarcity of small finds - all highlight the function of these structures as extramural facilities for collecting seasonal surface runoff water. However, the four barrages at Wadi Nadiya 2 differ in location, scale and typology from those of the other barrage systems, including Wadi Nadiya 1, which suggests that they may have differed in function from the others. This leads us to the following discussion.

Chronological Sequence of the Jafr Neolithic Barrage System

A key to shedding light on this issue is our assessment that the Wadi Nadiya 1 barrage system was gradually renewed downstream because of topsoil salinization (Fujii, Adachi *et al.* 2012: Fig. 40). Assuming that this principle is applicable over the lower barrage system as well, it

could be proposed that the Wadi Nadiya 1 and 2 composite barrage system evolved in specific use as follows:

The composite system began with Barrage 1 of Wadi Nadiya 1, the uppermost component. This barrage was large in scale and open in general plan. In view of its location at the lower end of a semi-open (and thus less salt-damaged) playa system and the formation of an extensive, shallow flooded area on permeable silty sand deposits, it is conceivable that this barrage was used for opportunistic basin-irrigation agriculture by PPNB transhumant pastoralists. Of significance is the existence of a large-scale open-cut limestone quarry in front of the barrage wall. Unless it was quickly backfilled, it must have served as an *ad hoc* open-air cistern. In this sense, we could argue that the barrage combined two distinct functions (i.e. basin-irrigation in the flood zone and storage of drinking water in the simple cistern) from the outset. This perspective provides a key to understanding the typological sequence of the six barrages that constitute the composite barrage system.

When Barrage 1 fell out of use because of topsoil salinization, a new barrage (i.e. Barrage 2 of Wadi Nadiya 1) was constructed *ca* 180 m downstream. Although much inferior in construction quality, it shares similar traits with the upper barrage and is thought to have combined the two functions suggested above.

(3) The results of our investigation at Wadi Nadiya 2 suggest that a drastic change in water-use strategy took place at the next stage of downstream renewal. Barrage 1 of Wadi Nadiya 2 was much smaller in scale and more incurved in general plan. These changes meant that the barrage no longer aimed to produce an extensive shallow flood zone. Another notable change was in its location. In contrast to the two upper barrages, which both occupied the lower edge of a semi-open playa system, Barrage 1 was constructed on a bend in a small *wadi*. This suggests that the barrage emphasized storage of drinking water (in the open-cut limestone quarry) over production of a basin-irrigated cereal field. In other words, the third barrage specialized in just one of the two distinct functions that the Jafr Neolithic barrage originally had. The same is probably true of Barrage 11 as well.

Barrage 2 of Wadi Nadiya 2 is also located on

a bend in the small *wadi*. Though much larger in scale than Barrage 1, it is more closed in general plan and traces a semi-circle equipped with a short pair of guiding walls at its inlet. Consequently, its flood zone, albeit slightly larger than that of Barrage 1, was reduced to approximately one-tenth of those of the upper two barrages. This clearly indicates that, as in the case of the third barrage, the fourth example was also used as a cistern-type barrage.

(5) This general trend took an even clearer form at Barrage 3, the final component of the Wadi Nadiya composite barrage system. Though similarly semi-closed in general plan and equipped with a short pair of guiding walls, it was much more compact than Barrage 2. More importantly, its location shifted from a bend in the small *wadi* to the lower end of a small-scale closed drainage system. Both changes can be understood as a device to avoid the washouts that plagued the upper two barrages. In this sense, we can argue that the final barrage represents a further refinement of its specialized function, namely, the storage of drinking water in the open-cut quarry. What is important here is that the builders of the barrage did not return to a semi-open playa system, but instead opted for a closed drainage system. This is probably because topsoil salinization was no longer such a problem for a cistern-type barrage.

Such is our present perspective concerning the chronological sequence and functional evolution of the Wadi Nadiya composite barrage system. Of interest is the fact that the more typical, even more closed cistern-type barrage equipped with long guiding walls appears to have been the norm in the eastern Jafr basin. Taking this into consideration, we may argue that Barrage 3 represents a divergence from the large-scale basin-irrigation barrage of PPNB transhumant pastoralists to the small-scale cistern-type barrage of post-PPNB pastoral nomads. In this sense, barrage chronology may provide valuable insights into the process of pastoral nomadization in southern Jordan, which is the main focus of our research project.

Concluding Remarks

The investigations at Wadi Nadiya 2 have contributed to the establishment of a tentative chronology for the Jafr Neolithic barrage. Avail-

able evidence suggests that it started with the large-scale basin-irrigation barrage and gradually evolved into a smaller-scale cistern-type barrage. While the former appears to have been part of the well-organized social infrastructure of PPNB transhumant pastoralists, the latter most likely represents a ubiquitous, *ad hoc* installation of post-PPNB pastoral nomads. It would follow that, in addition to cairn chronology (Fujii n.d.), we have found another key with which elucidate the process of pastoral nomadization. However, this barrage chronology is still tentative and needs further verification. The next field season aims to continue supplementary investigations of the Jafr Neolithic barrage system and to conclude a series of operations exploring the correlation between the history of water-use in the arid margins and the process of pastoral nomadization.

Acknowledgements

We would like to express our sincere gratitude to the Department of Antiquities of Jordan for their kind co-operation and generous permission to conduct our long-term research project. Our thanks also go to Mr Khalid Tarawneh, representative of the DoA, who supported us in many ways. Kind suggestions and valuable information from many friends - including Dr Hans G. Gebel, Dr Bernd Müller-Neuhof, Dr Wael Abu Azizeh, Mr Hani Farahat (Ma'an), Mr Mohammad al-Marahleh (Wadi Musa) and Mr Amer Bdour ('Amman) - are also highly appreciated. Phase 3 of our research project has been supported financially by the Japan Society for the Promotion of Science (Grant-in-Aid for Scientific Research [A], No. 20251006).

Sumio FUJII
School of Humanities
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
fujiiikun@staff.kanazawa-u.ac.jp

Takuro ADACHI
School of Humanities
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
mppnb@staff.kanazawa-u.ac.jp

Hitoshi ENDO

Research Institute for Humanity and Nature
457-4 Motoyama, Kamigamo, Kita-ku, Kyoto
603-8047, Japan
endo_h@chikyu.ac.jp

Masatoshi YAMAFUJI

Japan Society for the Promotion of Science
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, Japan
m-yamafuji@staff.kanazawa-u.ac.jp

Yui ARIMATSU

Japan Society for the Promotion of Science
Hiroshima University
1-2-3 Kagamiyama, Higashi-Hiroshima, Hiroshima
739-8522, Japan
yui_a_0513@yahoo.co.jp

Kazuyoshi NAGAYA

Graduate School of Letters, Arts and Sciences
Waseda University
1-24-1 Toyama, Shinjuku, Tokyo
162-8644, Japan
kazuyoshinagaya@gmail.com

Bibliography

Fujii, S.

- 2006a Wadi Abu Tulayha: A Preliminary Report of the 2005 Spring and Summer Excavation Seasons of the Jafr Basin Prehistoric Project, Phase 2. *ADAJ* 50: 9-32.
- 2006b A PPNB Agro-pastoral Outpost at Wadi Abu Tulayha, al-Jafr Basin. *Neo-Lithics* 2/06: 4-14.
- 2007a Wadi Abu Tulayha: A Preliminary Report of the 2006 Summer Field Season of the Jafr Basin Prehistoric Project, Phase 2. *ADAJ* 51: 437-402.
- 2007b PPNB Barrage Systems at Wadi Abu Tulayha and Wadi ar-Ruweishid ash-Sharqi: A Preliminary Report of the 2006 Spring Season of the Jafr Basin Prehistoric Project, Phase 2. *ADAJ* 51: 403-427.
- 2007c Wadi Abu Tulayha and Wadi Ruweishid ash-Sharqi: An Investigation of PPNB Barrage Systems in the Jafr Basin. *Neo-Lithics* 2/07: 6-16.
- 2008 Wadi Abu Tulayha: A Preliminary Report of the 2007 Summer Field Season of the Jafr Basin Prehistoric Project, Phase 2. *ADAJ* 52: 445-478.

- 2009a Wadi Abu Tulayha: A Preliminary Report of the 2008 Summer Final Field Season of the Jafr Basin Prehistoric Project, Phase 2. *ADAJ* 53: 173-209.
- 2009b Flint Bowlets: A Comprehensive Review from Wadi Abu Tulayha, Ma'an Region. *Neo-Lithics* 2/09: 20-28.
- 2010a A Comprehensive Review of Neolithic Water Catchment Facilities in the Jafr Basin, Southern Jordan: A Preliminary Report of the Jafr Basin Prehistoric Project, Phase 3, 2009. *ADAJ* 54: 371-386.
- 2010b Wadi Abu Tulayha and Neolithic Dam Survey in the Jafr Basin. *American Journal of Archaeology* 114: 552-554.
- 2010c Domestication of Runoff Water: Current Evidence and New Perspectives from the Jafr Pastoral Neolithic. *Neo-Lithics* 2/10: 14-32.
- 2012a Flint bowlets: Three additional materials from Wadi Ghuwayr 17 and Wadi Nadiya 2, al-Jafr Basin. *Neo-Lithics* 1/12: 33-40.
- 2012b Neolithic Barrage Systems in the Jafr Basin. *American Journal of Archaeology* 116/4: 726-727.
- 2014 A Half-Buried Cistern at Wadi Abu Tulayha: A Key to Tracing the Pastoral Nomadization in the Jafr Basin, Southern Jordan. Pp. 159-167 in G. Rollefson, and Finlayson, B. (eds.), *Jordan's Prehistory: Past and Future Research*. Amman: Department of Antiquities of Jordan.
- n.d. Chronology of the Jafr Pastoral Prehistory and Protohistory: A key to the process of pastoral nomadization in the southern Levant. *Syria* 90, Thematic file on the proceedings of the workshop Current Research on Protohistoric Occupation in Peripheral Desert Areas of Jordan, organized by Abu-Azizeh, W. and Tarawneh, M. (Wadi Mussa, July 2011).
- Fujii, S., Adachi, T., Quintero, L. A., and Wilke, P. J.
 - 2011 Wadi Ghuwayr 106: A Neolithic Barrage System in the Northeastern al-Jafr Basin. *ADAJ* 55: 189-212.
- Fujii, S., Adachi, T., Endo, H., Yamafuji, M., Arimatsu, Y. and Nagaya, K.
 - 2012 Wadi Nadiya 1: Another Neolithic Barrage System in the northern al-Jafr Basin, Southern Jordan. *ADAJ* 56: 131-156.
- Fujii, S., Quintero, L. A., and Wilke, P. J.
 - 2011 Wadi Ghuwayr 17: A Neolithic Outpost in the Northeastern al-Jafr Basin. *ADAJ* 55: 159-188.
- Gebel, H.G.K.
 - 1999 Flint "Bowlets" from the LPPNB of Southern Jordan. *Neo-Lithics* 2/99: 12-13.

PETRA NORTH RIDGE PROJECT: THE 2012 SEASON

S. Thomas Parker and Megan A. Perry

Introduction

This preliminary report summarises results from the first season of renewed work on the Petra North Ridge conducted between 17 May and 14 June 2012, under a permit from the Department of Antiquities.

Personnel

Senior staff included S. Thomas Parker and Megan A. Perry (co-directors), Carrie Duncan, Lauren Souther and Abigail Turner (area supervisors), Anna Hendrick (architect), Jennifer Ramsay (assistant director and paleobotanist), Jonathan Daniel Lowrey (faunal analyst), Laura Kate Schnitzer (conservator and small finds registrar) and Jihad Darwish (departmental representative). Trench supervisors were Cassandra Brigham, Russell Gentry, Geoffrey Hedges, Ashley Jones, Tiffany Key, Pamela Koulianos, Sandor Veigh, and Jessica Walker. Students included Mark Baek, Caitlin Cremer, Lindsay Holman (who also served as pottery regis-

trar), Jordan Karlis, Anna Killmeier, Elizabeth Luttrell, Ian MacAfee, Rachel Murphy, Heidi Rosenwinkel, Carlos Santiago, Gina Stachowicz, Constance Starkey and Emily Sussman. Dakhilallah Qublan served as foreman of about eighteen local workers.

Previous Research

Petra's North Ridge lies just north of the main E-W street extending through the center of the city (**Fig. 1**). The ridge has witnessed several previous archaeological projects, nearly all focused on monumental structures. Perhaps the earliest excavations were conducted at the so-called Conway High Place (Cleveland 1960). Peter Parr conducted soundings along a segment of the northern city wall and some domestic structures nearby (Parr 1986). P. W. Hammond excavated the so-called 'Temple of the Winged Lions' and associated structures over several decades beginning in 1973 (**Fig. 2**). Unfortunately, no definitive final report of any of these exca-



1. Aerial photograph showing major features of the North Ridge and the 2012 excavation areas.



2. Plan of Petra city center with the western end of the North Ridge, and the Temple of the Winged Lions and Byzantine churches (Kanellopoulos 2002).

vations was ever published (Hammond 1996). In 1992 ACOR began excavating the ‘Petra Church’ with its extraordinary mosaics and unique cache of 6th century papyri. The final excavation report promptly appeared (Fiema *et al.* 2001) and several volumes of the papyri have already been published (Frösen *et al.* 2002; Arjava *et al.* 2007, 2011). ACOR next turned its attention elsewhere on the North Ridge. The Petra North Ridge Project was launched later in the 1990s with excavation of the ‘Ridge Church’ and the ‘Blue Chapel’ (Perry and Bikai 2007). In 1998 and 1999 the Petra North Ridge Project excavated two 1st century AD tombs under the Ridge Church. These tombs, despite later disturbance, yielded rich skeletal and artifactual evidence. Tomb 1 had been disturbed in the 4th century and Tomb 2 in the 6th century (Bikai and Perry 2001). Definitive publication of these structures and tombs is still in progress.

In short, with the exception of Parr’s still largely unpublished excavation, all previous excavations on the North Ridge have focused on its public monumental structures. Yet even a cursory examination of the ridge showed that it was pock-marked by dozens of rock-cut tombs and wall lines suggesting the presence of many other structures, including a segment of Petra’s city wall. In 2005 the extent of these tombs and other surface features, such as ancient walls and modern terracing, was documented through a GIS project (Perry 2006). Perry recorded 51 recently robbed tombs and numerous structures within a *ca* 60 m² area, confirming that the North Ridge contains a large cemetery, apparently dating to

the Nabataean period. In 2010, Megan Perry and S. Thomas Parker joined efforts to explore these features on the North Ridge, with the first excavation season commencing in May 2012.

Project Goals

Despite the extent of archaeological research within Petra, surprisingly little is known about the city’s ancient inhabitants, especially the non-elite population. The Petra North Ridge Project seeks to address this gap by excavating Nabataean (primarily 1st century AD) tombs and Roman / Byzantine (1st - 6th century) domestic structures along the North Ridge. The project is examining Petra’s population through several avenues of research:

1. The health and quality of life of the Nabataeans during the city’s 1st century AD florescence will be explored through analysis of the human skeletal material contained within the tombs.
2. The 1st century AD tombs also contain significant evidence regarding Nabataean mortuary practices, filling in the picture presented by continued analysis of the rock-carved monumental tombs within the city.
3. Many ancient structures, some perhaps dating as early as the 1st century AD, overlie these more or less disturbed Nabataean tombs. Excavation of Roman / Byzantine domestic structures will broaden understanding of this still poorly known period of Petra.
4. Petra’s city wall appears on site plans since the beginning of the 20th century. Despite its obvious importance in understanding the history and organic growth of ancient Petra, the wall remains undated (it has been variously dated from the Nabataean to Byzantine periods). The project will excavate segments of the city wall in order to understand its construction and chronology.

The North Ridge thus contains a skeletal, architectural and material cultural sample that can address research questions related to Petra’s history from the Nabataean to Byzantine periods. The evidence will be interpreted in light of the Petra papyri, offering a rare opportunity to correlate material cultural evidence with contemporary documentary evidence from the same sector of the same site. Therefore, this project will combine disparate kinds of evidence (ancient

texts, material culture and skeletal evidence) to allow insight into the economic, cultural and social life of Petra's people as well as their connections with other populations.

A key component of this project is to minimize excavation-related landscape impact owing to Petra's role as Jordan's largest tourist attraction and its status as a UNESCO World Heritage Site. This includes: (1) completely filling tomb shafts upon completion of excavation to protect their interior and prevent accidents; (2) backfilling excavation trenches to preserve exposed architecture until full-scale conservation and presentation of the site at the end of the project; (3) setting up a cooperative effort with the Temple of the Winged Lions Cultural Resource Management (TWLCRM) project to utilize our sifted sand for backfilling and filling of sand bags.

Results from the 2012 Season

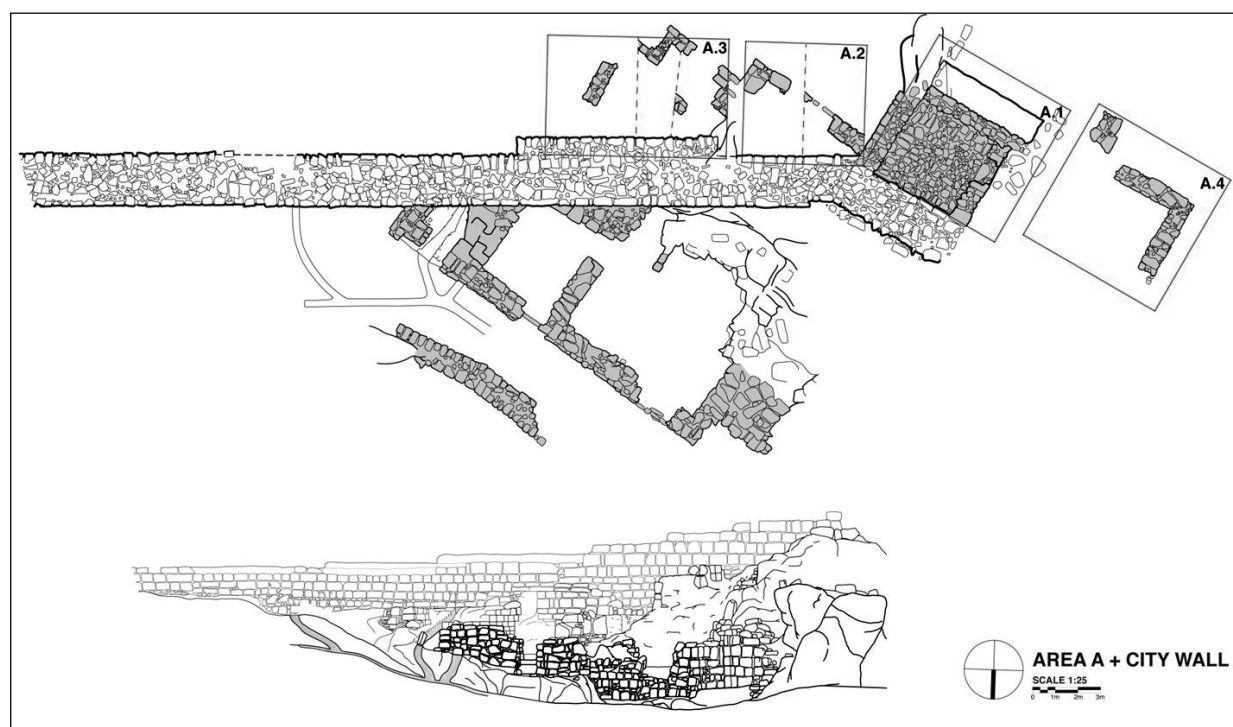
Area A

Four trenches (A.1, 2, 3 and 4) were opened in a roughly E-W line just east of the Ridge Church and just south of the city wall (**Fig. 3**). Trench A.1 measured 5 x 5 m, A.2 was 4 x 4 m, A.3 was 4 x 6 m and A.4 was 5 x 5 m. Excavation

in A.1 - A.3 produced a complete stratigraphic profile from topsoil to bedrock. Excavation in Trench A.4, just west of A.1, was confined to articulating the tops of wall lines extending from Trench A.1 and visible on the surface of A.4. All four trenches were backfilled upon completion of this season's excavation.

In the first period of occupation (1st century AD), a complex of stone structures, apparently domestic in nature, were erected directly atop bedrock. The orientation and alignment of the structures suggested that they once continued downslope to the north of the later city wall, where similar structures were uncovered by Peter Parr in his Trench V in the late 1950s. Unfortunately only a few preliminary plans, sections and elevations of Parr's structures were published (Parr 1986), so this area was documented further with drawings and photographs by the current project's architect.

These structures were subsequently cut by and / or built over by the erection of the city wall. The city wall builders used different techniques for different segments of the wall. In some cases (e.g. A.1) they simply incorporated existing Nabataean walls into the city wall itself. In other cases (A.2; A.3) the city wall builders



3. Plan and elevation of the Petra city wall in PNRP in Area A with location of excavation trenches.

cut a trench through the earlier structures down to bedrock, then laid a thin layer of soil to create a level surface on which to construct the city wall itself (**Fig. 4**). The wall itself averages *ca* 1.5 m in width and consists of two faces of dressed masonry surrounding a core of more roughly coursed masonry and rubble. It still stands in places up to 3 m in height. Attached to the south (inner) face of the city wall in A.3 was a stone buttress that abutted the city wall face but which shared a common stone foundation that extended under both the city wall and the buttress. The latest pottery associated with the wall foundations dated to the early 2nd century, suggesting that the city wall itself was erected in this period. This firm date for the construction of at least this segment of Petra's city wall was a notable achievement of this season.

Later in the 2nd century massive dumps accumulated against the south face of the city wall in A.2 - 3. The dumps proved rich artifactually, with thousands of pot sherds, faunal bones, metal slag and other finds. In contrast, occupation in A.1 continued after construction of the city wall immediately to the north, by laying a new stone floor over an earlier similar floor. Occupation in A.1 continued into the 4th century, possibly being terminated by the 363 AD earthquake, when the structure apparently collapsed and was abandoned.

Area B domestic structures

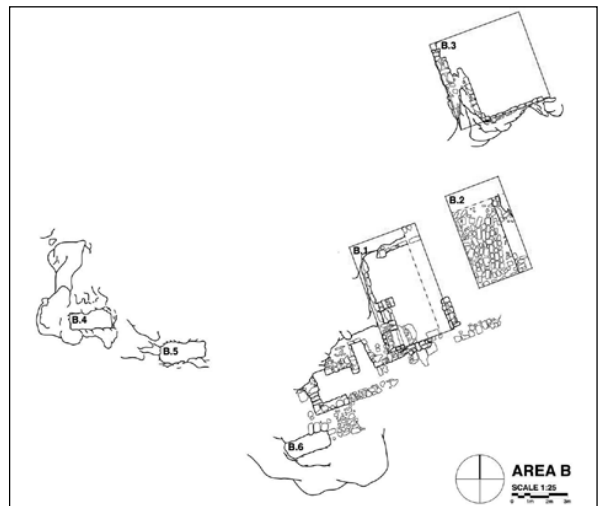
This area lies farther east of Area A on the North Ridge. Area B consisted of two separate operations: (1) apparent domestic structures and (2) rock-cut shaft tombs interspersed among the



4. Trench A.3 showing the stone buttress foundation (under the metre-sticks) extending under both the city wall (upper left) and buttress itself (upper right in shadow).

domestic structures (**Fig. 5**). Trenches B.1, B.2 and B.3 were opened to examine portions of the domestic structures while Trenches B.4, B.5 and B.6 each examined one of the three tombs excavated this season.

Trench B.3 (5 x 5 m) was laid out on a small plateau amidst several wall lines visible on the surface. Trenches B.1 (4 x 6 m) and B.2 (4 x 5.5 m) were laid out directly adjacent to one another on a terrace just below and a little to the SW of B.3. Standing masonry walls farther SW of B.1 - 2, apparently exposed by erosion of the southern slope, suggested the presence of well-preserved structures in this area. These exposed structures, although situated outside the excavated area, were also documented by the project architect. Excavation of B.3 revealed walls on all sides but the north, forming a large rectangular enclosure, apparently too large to be roofed and thus probably an open-air courtyard (**Fig. 6**). The room



5. Plan of Area B showing layout of trenches.



6. Trench B.3: wall collapse, probably from the earthquake of 363 AD, encountered on the surface.

walls were partially laid against cut bedrock, which formed the SW corner of the enclosure. The recovery of numerous storage jar fragments suggested that the courtyard probably was, at least in part, a storage area. Occupation ended with the collapse of the entire eastern wall, with its stone coursing still closely aligned, into the courtyard. Diagnostic pottery from this context suggested that the wall collapsed in the mid-4th century, perhaps in the 363 AD earthquake.

Trenches B.1 - 2 formed two rooms of the complex on the south-facing terrace. The room walls were founded on bedrock and may have extended into caves to the north, but the danger of collapse prohibited excavation of the caves themselves. Excavation began with removal of massive layers of tumbled masonry. The collapsed masonry in B.2 was particularly closely aligned, suggesting it fell from the west, or the common N-S wall separating the two rooms (**Fig. 7**). Under the tumble in B.2 was a beaten earth floor but very little other evidence of occupation. It appeared that the room had been cleaned out prior to the collapse of its walls. In B.1 occupation began with the laying of a plaster floor directly overlying bedrock. Against the northern wall of the room was a cooking installation comprised of two large ceramic jars, the smaller placed within the larger and the former filled with ash (**Fig. 8**). Excavation also produced numerous fragments of red-painted plaster which once decorated the walls and / or ceiling of either this room or perhaps an upper storey. The possibility of the latter was suggested by an L-shaped stone staircase built into the SW corner of this room. Three steps of the

staircase were preserved. Adjacent to the staircase, to the north, was a small plastered cubicle, perhaps a storage area. Occupation of this room also ended catastrophically with massive deposits of stone tumble, including a number of architectural fragments, apparently reused in the walls of the structure. The latest pottery was again mid-4th century, suggesting that the tumble may also date to the 363 AD earthquake.

In short, it appears that the B.1 - 3 structures represent portions of a domestic complex dating from the Late Roman period (2nd / 3rd centuries) and destroyed in the earthquake of 363 AD. There appeared to be no later occupation in this area.

Area B Tombs

Three shaft tombs within the vicinity of the Area B domestic structures were selected for excavation based on their potential to link stratigraphically with the domestic structures in Area B and to represent damage due to varied states of looting and disturbance. The tombs selected were carved into a bedrock outcrop at the uppermost reaches of the North Ridge (**Fig. 5**). Tomb B.6 had the most extensive disturbance, with soil removal and disturbance involving half of the tomb shaft and approximately half of the chamber. Tomb B.4 had slight disturbance in approximately one-third of the shaft that did not seem to extend far into the tomb chamber. Tomb B.5 only showed signs of disturbance in antiquity and had not been pilfered recently. Almost 100 % of tomb fill was sifted during excavation, the only exception being the undisturbed naturally-deposited soil layers that had filled Tomb B.6.



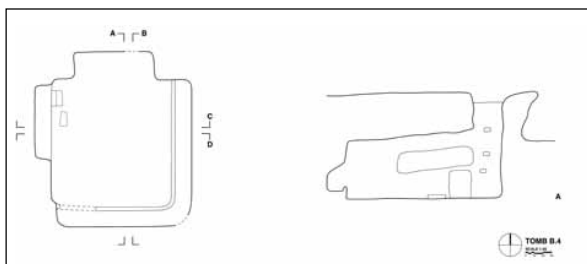
7. Trench B.2: closely aligned tumble reflecting the catastrophic collapse of a wall within this room, probably in the earthquake of 363 AD.



8. Trench B.1: the cooking installation composed of two ceramic jars, one set inside the other, built against the north wall of this room.

Tomb B.4 was a 6.45 m x 6.20 m chamber tomb entered via a 2.13 m x 0.99 m wide, 2.54 m deep shaft cut into the sandstone bedrock (**Fig. 9**). Except for the sector of the shaft disturbed recently by tomb robbers, the tomb had been filled with fluvial and aeolian sediments up to top of the chamber, which measured 1.67 m high on average. These natural soil layers contained only a small amount of intrusive artifacts. This tomb contained many unique architectural features, such as two ‘windows’ and a *ca* 12 - 18 cm deep ‘trough’ running continuously along the northern and western walls of the chamber for placement of the deceased. One window was located mid-way down the shaft on its southern wall, opening onto a bedrock plateau below the level from which the shaft had been carved. The stone in this bedrock stratum is much weaker than the surrounding sandstone and thus the window may have been created naturally through erosion of the bedrock through into the tomb shaft. Any tool marks that would have been created during the carving of the window have long since eroded. The second window, located in the north-west corner of the tomb (and opening directly into the intersection of the northern and western troughs), on the other hand, appeared to have been human-made, either accidentally (by not calculating correctly where the bedrock slopes down in that area and accidentally cutting through to the outside) or on purpose (**Fig. 10**). The window opening was filled with cut stone blocks, large sherds of a storage jar and pieces of molded, flat glass that likely were used to cover the window opening. The window had been covered outside the tomb by accumulated sand and thus was not visible at the surface.

The chamber of the tomb contained the remains of at least 16 individuals. One partial skeleton was found at the southern end of the western ‘trough’, which had been covered with



9. Plan and north - south section of Tomb B.4.

large sherds of more than one ceramic storage jar. In addition, the remains of three individuals, two adults and one child, were discovered within a rectangular niche cut into the eastern wall (**Fig. 11**). All of these burial features had experienced disturbance due to natural factors, predominantly periodic seasonal flooding of the tomb, and some of the skeletal remains had washed out of the burial features and into the soil below. In addition, one intact skeleton, three partially intact skeletons and scattered skeletal elements from another eight individuals were recovered from the soil layers immediately upon the bedrock chamber floor, and a newborn infant a few centimeters above the bottom of the shaft floor (**Fig. 12**). A complete lamp was recovered from one of the eastern niche burials and a complete *unguentarium* from the only intact burial on the floor. The lower levels of chamber fill also included a large number of ceramic sherds. The artifactual evidence points to use of the tomb during the 1st century AD.

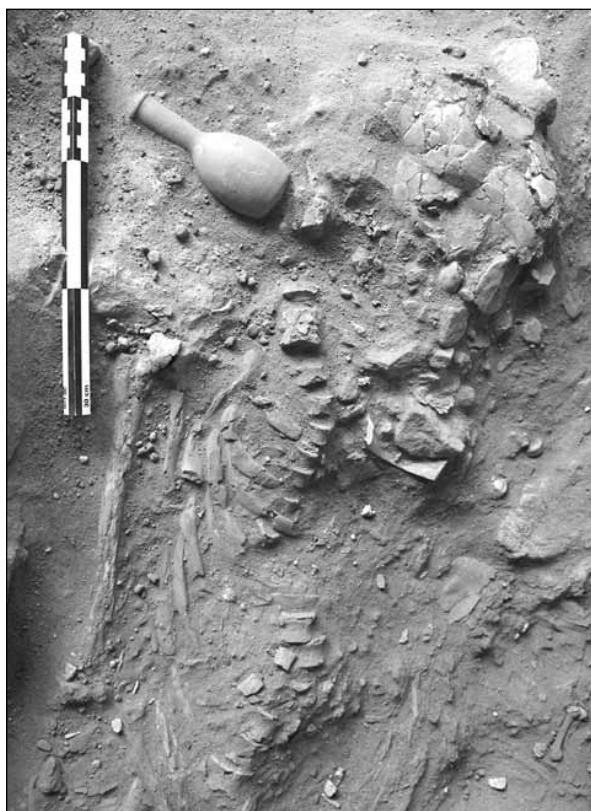
Tomb B.5 (**Fig. 13**), located *ca* 5 m to the east



10. The ‘window’ in the north-western corner of Tomb B.4, showing the northern and western ‘troughs’.



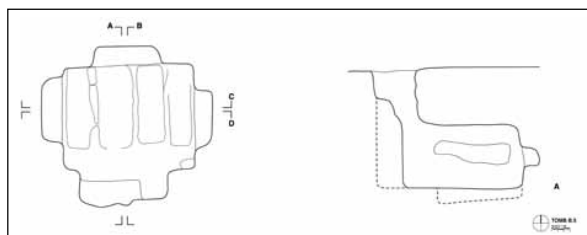
11. The burial niche in the eastern wall of Tomb B.4 with stones likely used to cover the opening.



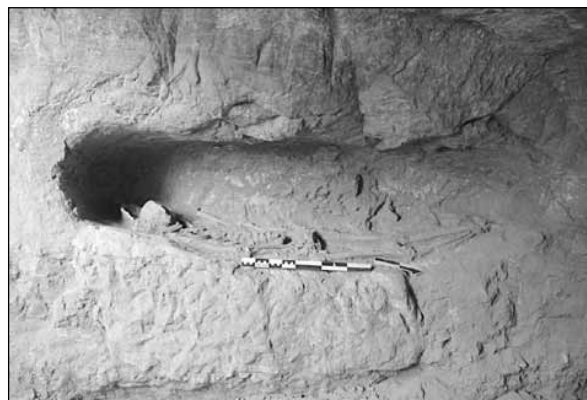
12. The superior portion of skeleton B.4:22.

of Tomb B.4, consists of a shaft measuring 2.4 m x 0.7 m which drops 3.1 m below the surface bedrock and a 3.54 m x 2.80 m chamber. The tomb was filled to its entire 1.67 m height with relatively sterile, naturally-deposited fill, similar to Tomb B.4. The earlier layers of tomb fill contained many ceramic sherds and other material culture fragments. This tomb contained many features cut into the bedrock for interring the dead. Three rectangular niches similar to the one in Tomb B.4 were cut into the western, northern and eastern chamber walls (**Fig. 14**). In addition, three shaft graves were cut into the floor of the tomb, one of which still contained capstones *in situ*. Stonemasons had started work on a fourth shaft grave at the eastern end of the chamber, which was never finished.

A minimum number of 22 individuals were interred within this tomb. Single adult burials were found within the western and northern niches, while the eastern niche was empty. The partial remains of one individual was recovered from the bottom of the eastern-most completed shaft grave (**Fig. 15**), surrounded by a possible 'coffin shadow'; the pelvis and lower limbs of



13. Plan and south - north section of Tomb B.5.



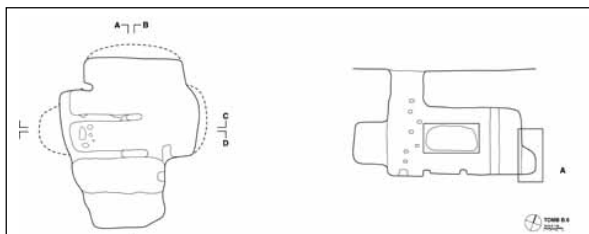
14. Burial B.5:12 within the western niche of Tomb B.5.



15. The capstones over the eastern shaft grave in Tomb B.5.

another skeleton were found scattered in the upper fill layers of the shaft. Most of the skeletal remains in Tomb B.5 were found in soil layers immediately above the unfinished shaft grave and the capstones of the next shaft grave to the west, all in the eastern half of the tomb. Two partial skeletons were discovered in the soil layers, in addition to the scattered, commingled remains of another 18 individuals. A majority of the bones were integrated into or just above a thick (*ca* 10 - 15 cm) layer of burned chunks of unidentified material that do not contain the cellulose structure expected in wood. The nature of this material remains a mystery, but our preliminary hypothesis is that it is incense. The two western-most shaft graves were left unexcavated and will be reopened during the proposed 2014 excavation season.

We began excavation of Tomb B.6 (Fig. 16, 17) at the beginning of the second week of excavation. The extensive disturbance of the tomb suggested that it would not take long to remove the tomb fill and excavate the burials within. The tomb consists of a shaft measuring 3.1 m x 0.8 m, a larger 2.27 m x 3.10 m chamber to the north of the shaft and a smaller 0.85 m x 2.75 m chamber to the south of the shaft. The tomb



16. Plan and south - north section of Tomb B.6.



17. View of Tomb B.6 from within the northern chamber into the shaft and the smaller southern chamber, including the unexcavated shaft graves at the forefront.

shaft was excavated down to the bottom, about 2.7 m below the bedrock surface. In addition, all recently disturbed and naturally deposited soil within the north chamber was excavated down to the top of approximately six shaft graves excavated into the floor. Another possible *loculus* blocked by fallen bedrock extends to the east of the chamber near the shaft, and the smaller chamber to the south also probably contains a shaft grave or other burial feature. We decided at the beginning of the fourth week of the project to cease excavation in this tomb, realizing that we would not have the time or experienced personnel to properly excavate these burial features. We hope to reopen the tomb during the proposed 2014 excavation season.

The three tombs explored during the 2012 season presented some intriguing insights into Nabataean mortuary material culture. In addition to complete lamps, cups and *unguentaria*, and sherds of many other ceramic vessels, the tombs contained personal jewelry and other mortuary accoutrements. Small bronze bell-like objects were found in all of the tombs, a common feature in Nabataean mortuary contexts both within and outside of Petra (Horsfield and Horsfield 1939: 151; Murray and Ellis 1940: 45; Zayadine 1970: Fig. 12, 1973: 40, 1979), including within the tombs excavated by Perry and Bikai on the Petra North Ridge in 1998 and 1999. In addition, sheep / goat *astragali* gaming pieces were found within Tomb B.4, discovered near the infant in the tomb shaft. Fragments of coroplastic figurines also were recovered, similar to those in previously excavated North Ridge tombs.

Post-excavation Conservation / Protection Measures

This project is acutely aware of the need for protection and conservation of Jordan's cultural heritage, particularly the structures and features within the heavily-trafficked site of Petra. To that end, we backfilled 50 % of the completed excavation trenches (A.1, A.2, A.3, B.1, B.2 and B.3) to preserve the structures that they revealed, with the future goal of consolidation of the structures and appropriate signage as enough of the complexes have been excavated to be meaningful to tourists and others at the site. These tombs were backfilled using their own soil dumps, removing these features from

the site. We left the well-dressed architectural stones arranged near Area B for future study by the project's historical architect.

The tombs do present a danger to humans and animals, and thus the shaft entrance of the completed Tomb B.4 was backfilled completely; the shafts of Tombs B.5 and B.6 were backfilled partially and covered with metal sheeting. The tombs were backfilled from the sift piles and any remaining soil from the sift piles was used to cover an endangered building to the east of Tomb B.6 and fill three shaft tombs left open to the elements by tomb robbing activities. Any remaining sifted soil will be used by the Petra Church restoration project for backfilling and the Temple of the Winged Lions project for filling sandbags during the autumn and winter of 2012 - 2013.

Acknowledgements

The Petra North Ridge Project is sponsored by East Carolina University and North Carolina State University and is affiliated with the American Schools of Oriental Research and the American Center of Oriental Research (ACOR). Funding for the 2012 season was provided by East Carolina University, North Carolina State University, the Al-Hima Foundation, the Foundation for Biblical Archaeology and private donors. The participation of one student, Lindsay Holman, was facilitated by a Jennifer C. Groot Fellowship in the Archaeology of Jordan, awarded by ACOR. Invaluable assistance was provided by Faris Hmoud, Jihad Haroun, Ahmed Lash and Mohammad al-Shobaki of the Department of Antiquities, Barbara Porter, Director of ACOR, and Tahani al-Salhi and Dr Emad Hijazeen from the Petra Archaeological Park. The authors are grateful to all these agencies and individuals for their support.

S. Thomas Parker
Department of History
North Carolina State University
Raleigh, North Carolina
27695 USA

Megan A. Perry
Department of Anthropology
East Carolina University
Greenville, North Carolina
USA

Bibliography

- Arjava, A. Buchholz, M. and Gagos, T. (eds.)
2007 *The Petra Papyri III*. Amman: American Center of Oriental Research.
- Arjava, A., Buchholz, M., Gagos, T. and Kaimio, M., eds.
2011 *The Petra Papyri IV*. Amman: American Center of Oriental Research.
- Bikai, P. M. and Perry, M. A.
2001 Petra North Ridge Project Tombs 1 and 2: preliminary report. *Bulletin of the American Schools of Oriental Research* 104: 59-78.
- Cleveland, R. L.
1960 *Excavation of the Conway High Place (Petra) and Soundings at Khirbet Ader*. *Annual of the American Schools of Oriental Research*. 34-35.
- Fiema, Z. T. Kanellopoulos, C. Waliszewski, T. and Schick, R.
2001 Reconstructing the history of the Petra Church: data and phasing. Pp. 7-119 in *The Petra Church*. Amman: American Center of Oriental Research.
- J. Frösén, J., Arjava, A. and Lehtinen, M. eds.
2002 *The Petra Papyri I*. Amman: American Center of Oriental Research.
- Hammond, P.C.
1996 *The Temple of the Winged Lions, Petra, Jordan, 1973-1990*. Fountain Hills, AZ: Petra.
- Horsfield, G. and Horsfield, A.
1939 Sea-Petra, The Rock. Of Edom and Nabatene. The Finds. *Quarterly of the Department of Antiquities of Palestine* 9: 105-204.
- Kanellopoulos, C.
2002 A new plan of Petra's city center. *Near Eastern Archaeology* 65: 251-254.
- Murray, M.A. and Ellis, J.C.
1940 *A Street in Petra*. London: British School of Archaeology in Egypt.
- Parr, P.
1986 The Last Days of Petra. Pp. in 192-203 in M.A. Bakhit and M. Asfour (eds.), *Proceedings of the Symposium on Bilād al-Shām During the Byzantine Period*, vol. 2, Amman: University of Jordan.
- Perry, M. A.
2006 Petra: North Ridge Project. *American Journal of Archaeology* 110: 482-84.
- Perry, M. A. and Bikai, P. M.
2007 Petra's churches: the Byzantines and beyond. Pp. 435-43 in T. Levy; P. M. M. Daviau; R. W. Younker; and M. Shaer (eds.), *Crossing Jordan: North American Contributions to the Archaeology of Jordan*, London: Equinox.
- Zayadine, F.
1970 Une tombe nabatéenne près de Dhat-Râs (Jordanie). *Syria* 47: 117-135.
1973 Excavations at Petra (April 1973). *ADAJ* 18: 81-82.
1979 Excavations at Petra (1976-1978). *ADAJ* 21: 185-197.

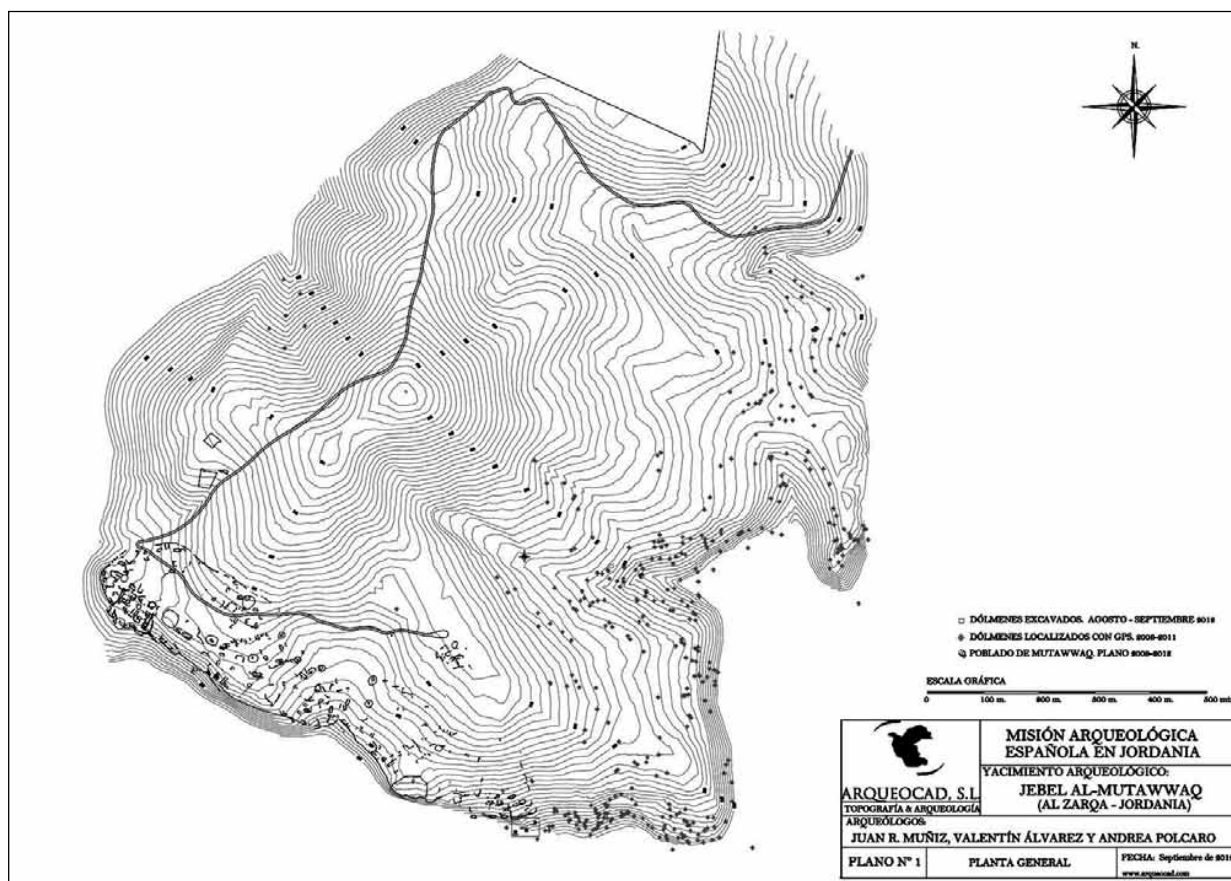
PRELIMINARY RESULTS OF THE FIRST SPANISH - ITALIAN EXCAVATION SEASON AT THE JABAL AL-MUṬAWWAQ DOLMEN FIELD: AUGUST - SEPTEMBER 2012

Valentin Alvarez, Juan Muniz and Andrea Polcaro¹

I. Introduction

Jabal al-Muṭawwaq (JADIS site no. 2418.011) is located in the middle section of Wadi az-Zarqa (lat. 32°12'56"N long. 35°59'54"E), flanking the river on its southern bank. The archaeological site is located near the spring of Khraysan,

ca 1 km to the south. The Early Bronze Age settlement and the dolmen field are located on the summit and slopes of the mountain, which is delimited on its western side by Wadi Hmeyd (**Fig. 1**). The presence of the springs and Wadi az-Zarqa itself, one of the most important sea-



1. Topographic map of Jabal al-Muṭawwaq.

1. Valentin Alvarez is prehistorian based at Oviedo University, Spain. Juan Muniz is a researcher at Pontificia Facultad de San Esteban, Salamanca University, Spain. He led the Spanish team during the August - September 2012 season. Dr. Andrea Polcaro is a researcher based

at Perugia University, Italy. He led the Italian team during the August - September 2012 season. Andrea Polcaro wrote sections II, III and IV; Valentin Alvarez and Juan Muniz wrote sections I, V, VI; A. Polcaro, J. Muniz and V. Alvarez wrote section VII.

sonal rivers in the Jordanian highlands, facilitated the establishment of human communities. In particular, Jabal al-Muṭawwaq is a strategic location on the seasonal herding routes that cross Wadi az-Zarqa in this area. The landscape around the site is therefore ideal for socio-economic interactions between farmers and herders that would have encouraged, in the proto-urban historical contexts of the southern Levant during Early Bronze Age I, the development of ideological identities associated with the creation of a megalithic landscape.

The Spanish archaeological mission to Jabal al-Muṭawwaq started in 1989, thanks to Juan Antonio Fernández-Tresguerres and the support of the Spanish Embassy at Amman². Since 1992, the project has also been supported by the Spanish Ministry of Culture. Excavations conducted at the site and in its vicinity have revealed traces of human activity from the Palaeolithic to Ottoman periods. During previous seasons, some of the nearby archaeological sites north of Jabal al-Muṭawwaq were investigated (e.g. Hawettan, Wadi Hmeyd and Jebel Makhad Khazua) in order to understand the topographical and geographical networks between similar settlements in the area.

After an initial investigation of the dolmen necropolis (Fernández-Tresguerres and Junceda 1991), the Spanish excavations of Oviedo University mostly concentrated on the Early Bronze Age settlement, located in the southern part of the site. The village comprises several curvilinear houses, with circular stone walls, megalithic doors and post holes (Fernández-Tresguerres 2005). Other kinds of structures, such as open courtyards, are also present and may have served a number of different houses. The most important building discovered at the site is the Temple of Snakes, a sacred area with *temenos*, temple and working areas (Fernández-Tresguerres 2008a). According to Fernández-Tresguerres, all the pottery and lithic material discovered at the village dates to the end of the Late Chalcolithic or to EB I (Fernández-Tresguerres 2008a).

In August - September 2012 a new project started under the direction of Juan Muniz, with the collaboration of the Department of Antiqui-

ties of Jordan and that of an Italian team from Perugia University headed by Andrea Polcaro. The work was supported by the Spanish Embassy at Amman and Perugia University.

II. 2012 Excavation Season

Although the dolmens of Jabal al-Muṭawwaq are distributed all over the mountain, three different clusters or fields are observable (Polcaro 2010): (1) the largest is 400 m from the village, on the north-eastern slopes of the mountain; (2) the second is on the western slopes, but has almost disappeared because of agricultural activity; (3) the third is located close to the village, along the southern slope of the mountain. The new excavations focused on this last dolmen field, in the areas nearest to the eastern and southern edges of the village, in order to better understand the stratigraphic and chronological relationship between the dolmens and settlement, and to assess whether the dolmen field represents a megalithic necropolis used by the EB I villagers of the site.

Three 5×5 m excavation squares were opened, centered on three dolmens that appeared to be in a relatively good state of preservation (nos 232, 228 and 318). The three dolmens are spaced no more than 4 m apart (**Fig. 2**). Dolmens 228 and 232, excavated by the Italian team, are located on the southern slope of the mountain, while dolmen 318, excavated by the Spanish team, is in a higher position to the north. Dolmens 228 and 318 were almost completely covered by the natural soil, with just the capstone visible, and both had complete walls made of a row of large stones that surrounded the structures (**Fig. 3**). Dolmen 232 was also covered by soil to a depth of at least half of the lateral stone slabs, but the stone circle - often interpreted by archaeologists as a platform or enclosure - was clearly disturbed in its north-eastern sector, near the entrance. The generally good state of preservation, especially of dolmens 228 and 318, is due to the *ca* 30° slope on this part of the mountainside. This led to a natural accumulation of earth that covered and preserved the dolmens. Moreover, the location of these structures in a place not easily

2. The earliest references to Jabal al-Muṭawwaq come from late 19th century explorers, who were surprised by the large number of megalithic monuments on the mountain. In 1989 Hanbury-Tenison published the

results of his 1987 survey; this was the last publication to appear before the Spanish mission started work (Hanbury-Tenison 1989).



2. Area of excavation from the east.



3. Dolmens 228 and 318: before excavation.

reached by man or machine has discouraged, the demolition or robbery of the heavy stone slabs in both ancient and modern times.

All the pottery and chipped stone recovered from the three excavated area was collected and entered into a database, in order to assist with definition of archaeological phasing and chronology. Stratigraphic excavation allowed the identification of phases of construction, use, emptying, sealing and abandonment for each dolmen. A locus number, along with a typological letter (W = wall; S = slab; L = chamber), was assigned to the walls, slabs and chamber of each structure.

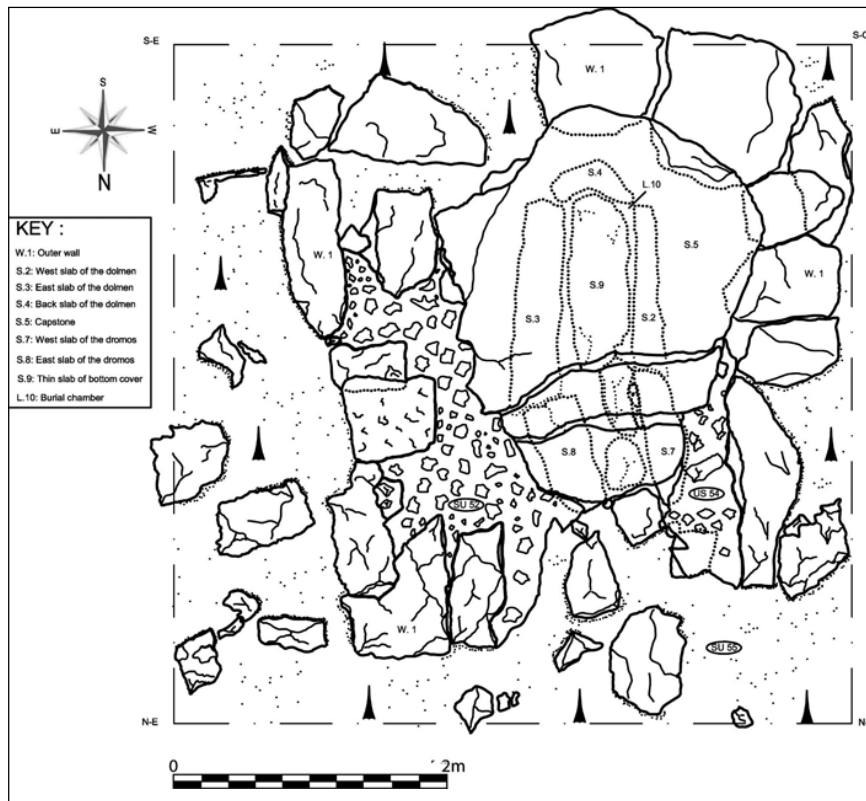
The principal aim of this season was to understand the construction methods and original configuration of these dolmens in order to shed light on the megalithic landscape of Jabal al-Muṭawwaq.

III. Dolmen 228

Description

Dolmen 228 (**Figs. 4 and 5**) is a large example of this type of megalithic monument (5 m long; 4 m wide; 1 m high), constructed close to the southern cliff of the mountain and following the natural slope of the bedrock. Even before excavation, this monument appeared to be one of the most impressive dolmens in this part of the necropolis. Its entrance faces due north, whilst its back slab is positioned against the southern cliff face.

It has an apsidal enclosure wall (W1), originally constructed of one row of large stones at the front and two at the back (**Fig. 6**). The dolmen itself had two lateral slabs (S2; S3), one slab at the back (S4), a large capstone (S5) and one floor slab (S6) (see Table 1). The entrance was sealed with another large stone and had a 2.5 m-



4. Dolmen 228: plan.



5. Dolmen 228: general view from the north.



6. Dolmen 228: surrounding apsidal wall, from the west.

long *dromos*, consisting of two lateral slabs (S7; S8), in front of it. Another narrow capstone (S9) fitted under the dolmen's main capstone and a near-square large stone was found collapsed on to its back. The corridor was constructed on the sloping bedrock, with two steps made of large stones leading into the funerary chamber.

Stratigraphy and architectural analysis

The excavation identified five different phases: construction (Phase I), use (Phase II), emptying (Phase III), sealing (Phase IV) and aban-

donment (Phase V). Phase V (abandonment) is represented by stratigraphic units SU51 and SU53, which are depositional layers consisting of soft, grey-brown earth that were only identified in front of the dolmen, covering the surrounding wall and northern collapse (SU56). Phase V is also represented by SU58 and SU59, which were identified within the *dromos* entrance and funerary chamber (L10); they are soft soil layers, naturally deposited by means of a small crack just under the capstone. Just under SU58 and SU59, there are other two other

layers (SU60 and SU61), consisting of small stones, compact earth and sherds that completely fill the entrance and internal chamber of the dolmen. These layers represent Phase IV (sealing): SU60 contained sherds and animal bone fragments, while SU61 was sterile. The last action of Phase IV involved the closure of the entrance corridor with a large squared stone. SU62, a thin layer of soft, brown soil representing Phase III (emptying), was deposited over the floor slab of the funerary chamber and yielded sherds and bones. Phase II (use of the dolmen as a tomb) was not identified during excavation, as the corridor and funerary chamber had been completely emptied. However, it is evident that the sherds and some bone fragments, possibly human³, recovered in SU62 (Phase III) are associated with the original use of the dolmen as a tomb. Phase I (construction) is represented by the dolmen, the *dromos*, its surrounding wall, SU57, SU52 and SU54. SU57 is a thin layer of pebbles and stones, exposed over the entire excavation area, that served to level natural cracks in the slope of the bedrock in order to facilitate the placement of construction slabs. SU52 and SU54 are layers of small stones and compact earth that completely fill the space between the surrounding wall and the lateral slabs of the dolmen and *dromos*, both on the eastern and western sides. They may represent the remnants of a rough cairn or tumulus covering most of the structure. However, it is evident that the tumulus could not have covered the capstone of the dolmen, which remained in view, nor the *dromos* entrance. It is plausible that, when the dolmen was originally in use, it was completely covered

by the tumulus and that the surrounding apsidal wall was the retaining wall of the cairn. The corridor might have remained clear, being sealed with a large stone so that it could be reopened for new depositions. It was only in Phase IV that the *dromos* and funerary chamber were emptied of their contents and filled in.

With regard to the method of construction, it is clear that the first two slabs to be erected after the bedrock had been levelled were the lateral ones, which also set the orientation of the entrance. The back slab, floor slab and lateral slabs of the entrance corridor were then positioned. Finally, the surrounding apsidal wall was constructed and the empty space filled with small stones. The last stage of construction was the placement of the thin covering slab over the corridor, followed by the positioning of the main capstone on the top of the dolmen, which also part-covered the *dromos*. The cairn heaped up around the lateral slabs would have been useful during this last phase, as a ramp by means of which the heavy capstone could have been raised to the tops of the lateral slabs⁴.

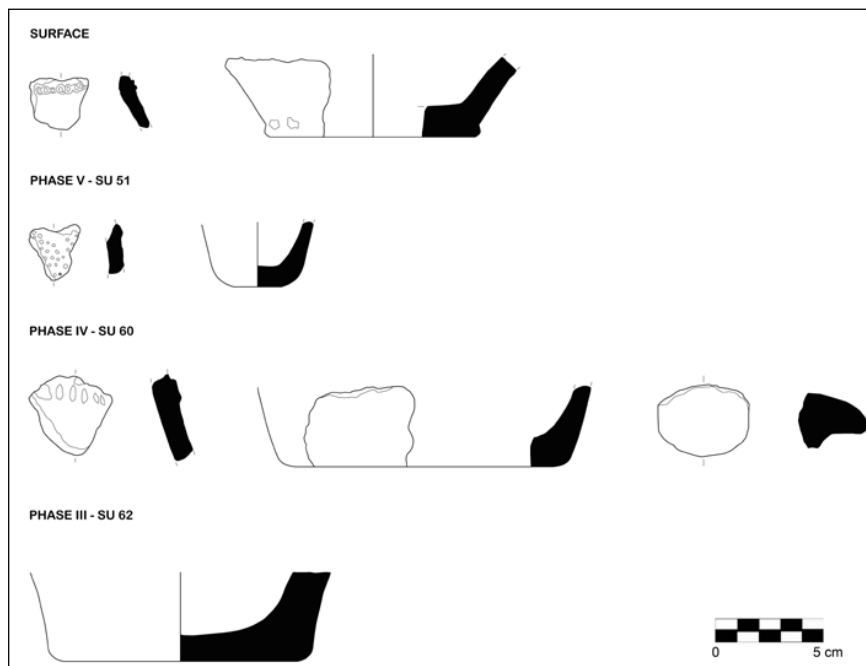
Finds and Chronology

Pottery from dolmen 228 is homogeneous and seems to date to EB IA (Fig. 7). It consists mostly of low fired, hand-made simple ware, with a reddish-orange fabric and limestone inclusions⁵. Traces of red slip are rare⁶. The absence of burnished ware, grain-wash decoration, line-painted ware and spouted vessels suggests that the monument was abandoned before EB IB⁷.

One flat base of a small jar and three plain ledge handles were associated with Phase V⁸.

3. Further analyses are necessary for these fragments to be identified as animal or human, owing to their high degree of fragmentation and poor state of preservation.
4. This method of construction was identified at Damiye by Stekelis (1961: 53-55), who argued for the presence of a tumulus over the dolmens that might also have facilitated the placement of the heavy capstones.
5. The fabric and presence of limestone inclusions have good parallels at other EB I sites in the Wadi az-Zarqa area, such as the nearby Jebel Abu Thawwab (see Douglas and Kafafi 2000: 102-105).
6. Red slip is a common EB I surface treatment (see Jebel Abu Thawwab [Douglas and Kafafi 2000: 101], Bab edh-Dhra [Rast and Schaub 1989: 257] and Tell es-Sultan [Sala 2005: 171-173]).
7. The transition from EB IA to EB IB was recognised in the Bab edh-Dhra cemetery tombs not only by a changes in funerary architecture and inhumation practices

- (from secondary to primary [see Polcaro 2006: 147-150 and Chesson 2008]), but also by the appearance of spouted vessels and line- and band-painted decoration (see Rast and Schaub 1989: 234-273). At Tell es-Sultan, in the Sultan IIIa1 and Sultan IIIa2 phases (i.e. EB IA and EB IB), an increase in line-painted ware was noted, to the extent that this ware became a chronological indicator of EB IB (see Sala 2005: 174-175). Moreover, the EB IB dolmen excavated at Tell el-Umeyri yielded pottery similar to that from the Jabal al-Muṭawwaq dolmens in terms of shapes, but with the additional presence of spouted vessels and band- and line-painted decoration (Dubris and Dabrowsky 2002: 174-176, Figs. 8.3-5).
8. Plain ledge handles are common at EB I sites within the so-called 'Zarqa triangle' area, e.g. Tell Umm Hammad (Betts 1992: 364, Fig. 239: 71), and in northern Jordan (see examples from Jawa [Betts 1991: 300, Fig. 128]).



7. Pottery from Dolmen 228.

Phase IV was represented by a flat base⁹ of a jar and a sherd with traces of finger-pointed band decoration¹⁰. A loop handle, low stump base and flat base were all associated with Phase III.

Many broken chipped stone tools were collected from both the ground surface and the abandonment phase of the dolmen (**Fig. 8**). Points and blades are particularly common. A basalt grindstone and a scraper were also recovered. It seems clear that all these objects, which were found in naturally accumulated deposits, are derived from the village on the top of the mountain. Only future, more extensive investigation of the necropolis could demonstrate that these tools are the remains of working or ritual activities in the area of the dolmens.

IV. Dolmen 232

Dolmen description

Dolmen 232 (3 m long; 3.5 m wide; 0.9 m high) is located on a ledge on the southern cliff, west of dolmen 228 and south of the settlement wall (**Figs. 9 and 10**). It initially seemed to be in a good state of preservation but, after a preliminary clean-up of the area, it was clear

that at least the northern part of the surrounding wall was disturbed. Dolmen 232 has its entrance oriented due north; it also has a circular surrounding wall (W11) consisting of a single row of large stones, one of which is missing. The dolmen is constructed of two lateral slabs (S12 and S13), a rear slab (S14), a horizontal capstone (S15) and a floor slab (S16) (see **Table 1**). There is no evidence for a genuine *dromos* in front of the entrance; a squared stone, not *in situ*, was found near the entrance and probably functioned as a door. The surrounding circular wall is smaller than that of dolmen 228 and there is less space between it and the slabs. The funerary chamber, delimited by the lateral and back slabs, was designated L17.

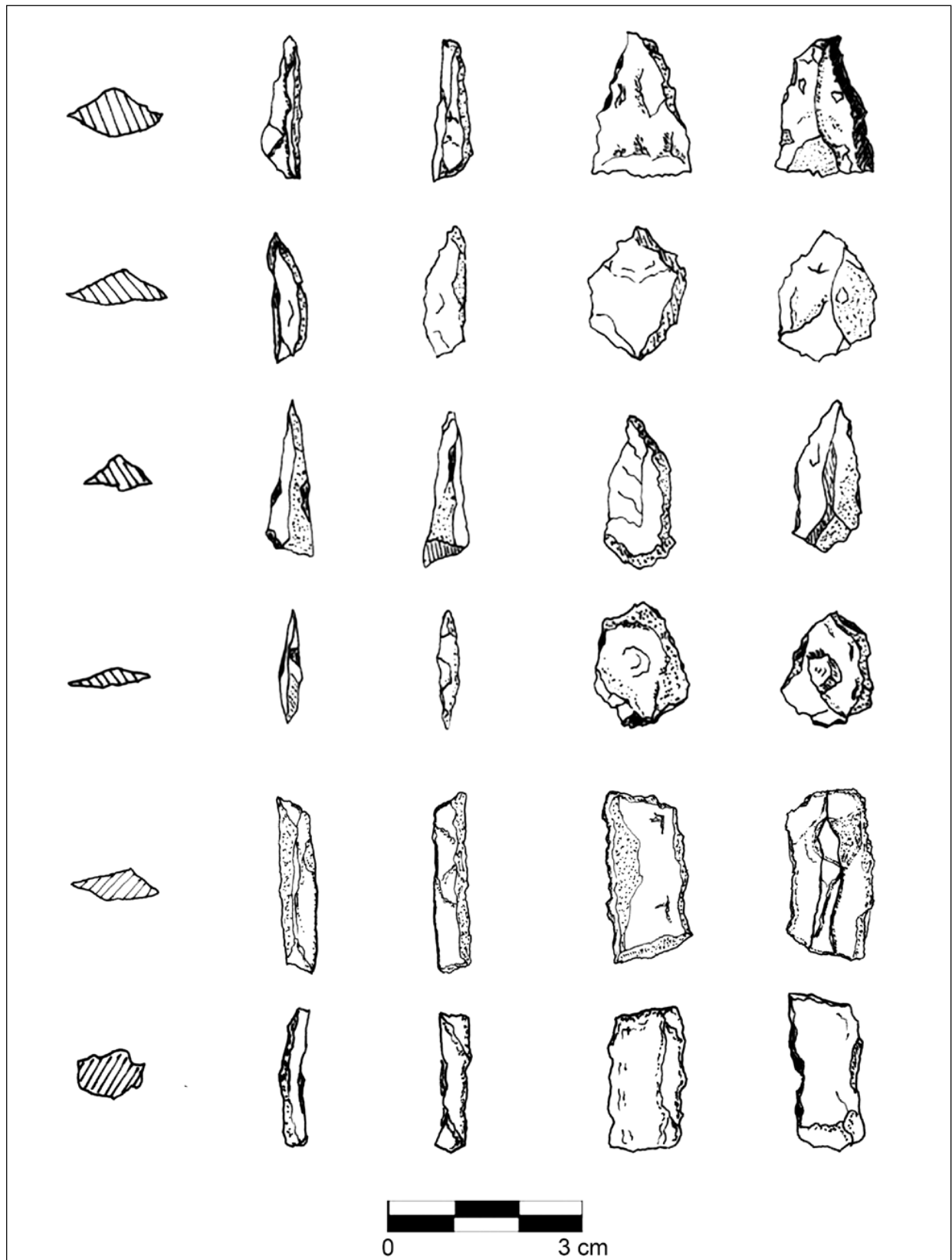
Stratigraphy and architectural analysis

The excavation of dolmen 232 identified six different phases: construction (Phase I), original sealing (Phase II), first abandonment (Phase III), Islamic-period reuse (Phase IV), second sealing (Phase V) and final abandonment (Phase VI). Phase VI is represented by SU1, a layer of soft, brown soil that covered the entire struc-

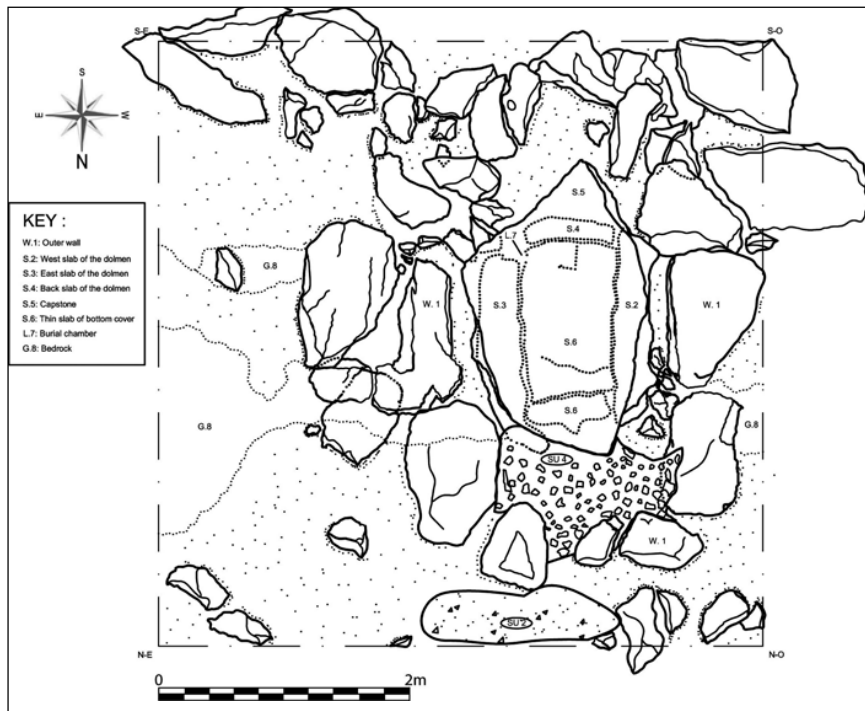
9. Flat bases and low pedestal bases are common at Jordanian EB I sites (see examples from Jawa [Betts 1991: 65, 265, Fig. 96]). Moreover, the flat base of the small jar from Phase IV is comparable to some examples from the Damiya dolmen field excavations (see

dolmen no. 164 [Stekelis 1961: 69, Fig. 21: 172]).

10. Impressed pointed decoration, placed under the rim, has many parallels at Jawa (see Betts 1991: 301, Fig. 129) and Tell Umm Hammad (Betts 1992: 365, Fig. 240: 73).



8. Stone tools from the area of Dolmen 228.



9. Dolmen 232: plan.

ture. Phase V is represented by SU3, a naturally infilling layer of small stones and soft, grey-brownish earth identified inside the funerary chamber, designated L17. This is probably the most interesting phase, indicating that whoever violated the dolmen in later times took good care to reseal it, perhaps out of respect or fear for the ancient tomb. Under this layer, directly on the floor slab of the funerary chamber, SU5 (associated with Phase IV) was identified. It was a layer of compact, greyish-brown earth, which yielded fragments of an Islamic jar. Phase IV represents a violation of the dolmen, also evidenced by the squared sealing stone of the entrance being

moved on to its side (**Fig. 11**). L17 was reused, perhaps as a store or something similar. Phases III and II, which relate to the abandonment and initial sealing of the monument, were not recognised during the excavation. However, it is evident from the finds in SU3 (associated with Phase V) that the second sealing of the dolmen probably reused older material associated with the original sealing. Phase I is represented by the dolmen itself, the surrounding wall, SU2 and SU4. This last layer, identified over the entire area, consisted of small stones and a compact, brown soil that leveled the natural bedrock so the stones of the surrounding wall and dolmen



10. Dolmen 232: general view from the east.



11. Dolmen 232: stone sealing the dolmen entrance, from the north.

slabs could be positioned on flat ground. SU2 consisted of small and large stones in a friable, grey-brown soil matrix that lay over SU4, but only in the western space between S12 and W11. It probably represents the remnants of a cairn that originally filled the space between the retaining wall and dolmen 232, albeit one that was smaller and less well-preserved than that of dolmen 228. The sequence of construction was similar to dolmen 228: first the bedrock was leveled, and then the surrounding wall and floor, lateral and rear slabs of the dolmen were positioned. The cairn that was most likely retained by the surrounding wall was probably used to facilitate the construction process in the same way as that of dolmen 228.

Finds and chronology

The pottery from dolmen 232 was mostly hand-made, low-fired, unburnished simple ware, with a reddish-orange fabric and limestone inclusions.

A fragment of a small jug¹¹ and a fragment of a small bowl with a loop-pierced handle¹² were associated with Phase IV (SU4). These two small vessels, typically found in EB IA funerary contexts (although they continue on into EB IB), are probably associated with the original inhumation in L17. This strongly suggests that the violators of the dolmen during the Islamic period resealed it with material derived with the original emptying and sealing phases of the Early Bronze Age (Phase II). Finally, two fragments of a Geometric Painted Ware jar with brown-painted spiral motifs on a white slip (**Fig. 12**) found just over the floor slab (SU5) clearly date the last use of the megalithic monument to the Middle Islamic or, more precisely, the Mamluk period¹³.

The only stone tool to be recovered was a basalt grinding stone found on the surface, which probably came from the village on top of the mountain.



12. Fragment of Mamluk jar from Dolmen 232.

V. Dolmen 318

Dolmen description

Dolmen 318 (**Figs. 13 and 14**) is located at the southern rock cliff of the mountain, following the natural slope of the bedrock, and is close to the other two dolmens excavated during the same season further up the mountainside.

The initial identification of the structure was both inconclusive and unable to reconstruct its morphology, as practically all constructional elements were buried. After initial clearance of the excavation area, the main architectural elements of the dolmen could be defined, *viz.* the burial chamber, access corridor and platform.

The burial chamber, initially the only recognisable element, is smaller than those of nearby dolmens. Unlike the other excavated dolmens, large stone blocks were used in its delimitation.

Stratigraphy and phasing

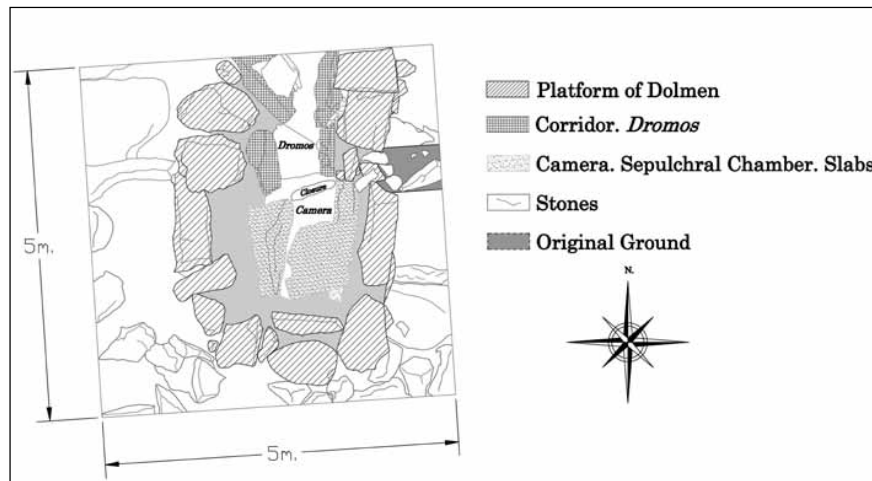
Nine stratigraphic units (SU) associated with five phases were identified during excavation: construction (Phase I), intentional sealing

11. This type of jug has many parallels from EB I tombs and domestic contexts in the southern Levant, e.g. Jericho (Nigro 2005: tab. 32:11), Bab edh-Dhra (Rast and Schaub 1989: 141, Fig. 83), Damiye (Stekelis 1961: 63, Fig. 15:125, 68, Fig. 19:167) and dolmen K at Tell el-Umeiry (Dubis and Dabrowsky 2002: Fig. 8.3:6-7).

12. This type of bowl has many parallels from EB I tombs

and domestic contexts, e.g. Jericho (Nigro 2005: tab. 32:8), dolmen K at Tell el-Umeiry (Dubis and Dabrowsky 2002: Fig. 8.4: 4-5), Damiye (Yassine 1985: Fig. 6.1: 3, 5). Parallels for the loop-pierced handle can be found at Tell Umm Hammad (Betts 1992: Fig. 240: 4-7).

13. For parallels see Parapetti 2008: Fig. 1.



13. Dolmen 318: plan.



14. Dolmen 318: general view from the north after excavation.

(Phase II), first phase of natural infill (Phase III), second phase of natural infill (Phase IV) and erosion (Phase V).

Phase V (SU100) is related to natural erosion processes. On the surface there was a significant

quantity of archaeological material, especially chipped stone but also pottery. Phase IV relates to two stratigraphic units (SU101 and SU107) that were evenly distributed around the dolmen. These were characterised by small stones in an earth matrix. The archaeological material, pottery and chipped stone alike, were not particularly informative.

Phase III includes stratigraphic units SU102, SU105 and SU108. These three archaeological layers were characterised by medium-sized stone blocks found across the area of the monument. The layers were typically *ca* 0.5m thick, although inside the dolmen (i.e. access corridor and burial chamber) their depth was much less. More than half the archaeological material recovered came from these layers. The finds have clear parallels with pottery and stone tools documented at the Jabal al-Mutawwaq settlement. The presence of a large quantity of animal bone is noteworthy¹⁴.

Phases III and IV relate to natural sedimentation associated with geological slope processes. Two interrelated issues account for the relative density of archaeological material in these two phases: (1) the spatial proximity of the dolmen to the settlement wall suggests that dolmen 318 was used by the village community; (2) the use of areas immediately outside the settlement as dumping grounds (common at Jabal al-Mutawwaq [see Tresguerres 2008b]).

Phase II relates to the most recent use of the burial space and the final sealing of the monument. This phase includes two stratigraphic

14. A preliminary field analysis indicated a large quantity

of sheep and / or goat.

units (SU106 and SU109), respectively associated with the access corridor and burial chamber. These levels are characterised by earthy soil containing a compact mass of stone that prevented access to the sealed chamber. This fill yielded chipped stone, pottery and human bone fragments, which were scattered across the area of the floor slab. The presence of human bone attests to the use of this space as a mortuary area. The pottery and chipped stone from this phase have clear parallels with material recovered from the EB I village of Jabal al-Muṭawwaq.

Phase I, comprising SU104 and SU103, is associated with the construction of the monument. SU104 corresponds to a lower level associated with the construction of the burial chamber, its access corridor and the large blocks of the perimeter platform. SU103 consists of an artificial fill, comprising flat slabs (that form 'wedges') and compacted dumps. This latter level is located between the inner platform and the outer perimeter wall of the burial chamber. Its main function was to provide stability to the entire dolmen structure, tying all elements together into a compact structure. The archaeological material (pottery, bone and chipped stone) from these last two stratigraphic units is similar, and shares common features with material from elsewhere in the archaeological sequence.

Architectural analysis

Different functional elements were identified during the excavation. The natural ledge upon which the dolmens were constructed provided the essential prerequisites for the installation of the monument. Bedrock provided a perfect foundation upon which to raise the megalithic structure, whilst the natural limestone terraces probably served as a quarry for construction material¹⁵.

The main element of Dolmen 318 is the tomb. This can be divided into two spaces: the access corridor and the burial chamber.

The narrow access corridor served to link the exterior of the dolmen with the burial chamber. It was constructed of a double (parallel) row of stones. It was built as a stepped *dromos* in order to deal with the natural slope. A slab (part-pre-

served) was placed at the entrance to the chamber, partially sealing it.

The burial chamber occupies the central area of the monument. The floor consisted of a flat limestone slab, tilted slightly to the east. The front slab was very fragmented and had been moved from its original position. Inside, the chamber had a volume of (ca. 1m³)¹⁶.

Finally, an artificial platform provided both a foundation for and perimeter around the monument. It was constructed with three straight walls of stone slabs that were placed to create an apsidal shape, which was in places preserved to a height of three courses of large, rectangular stone blocks. The back of the dolmen was built as an 'artificial podium' to help support the entire structure.

One interesting constructional detail documented during excavation was an intentional fill (SU103) placed between the apsidal perimeter wall and the lateral slabs of the dolmen. In contrast to the other two dolmens excavated this season, it consisted of deliberately placed small and medium flat stone slabs. The aim of this fill was most likely to strengthen the megalithic structure.

The artificial platform thus had two distinct architectural functions: (1) to serve as a functional element that provided strength and stability to the burial chamber; (2) to monumentalise the dolmen as a whole. It also created an enclosure that differentiated outside from inside, perhaps even - symbolically speaking - the living from the dead.

Finds and chronology

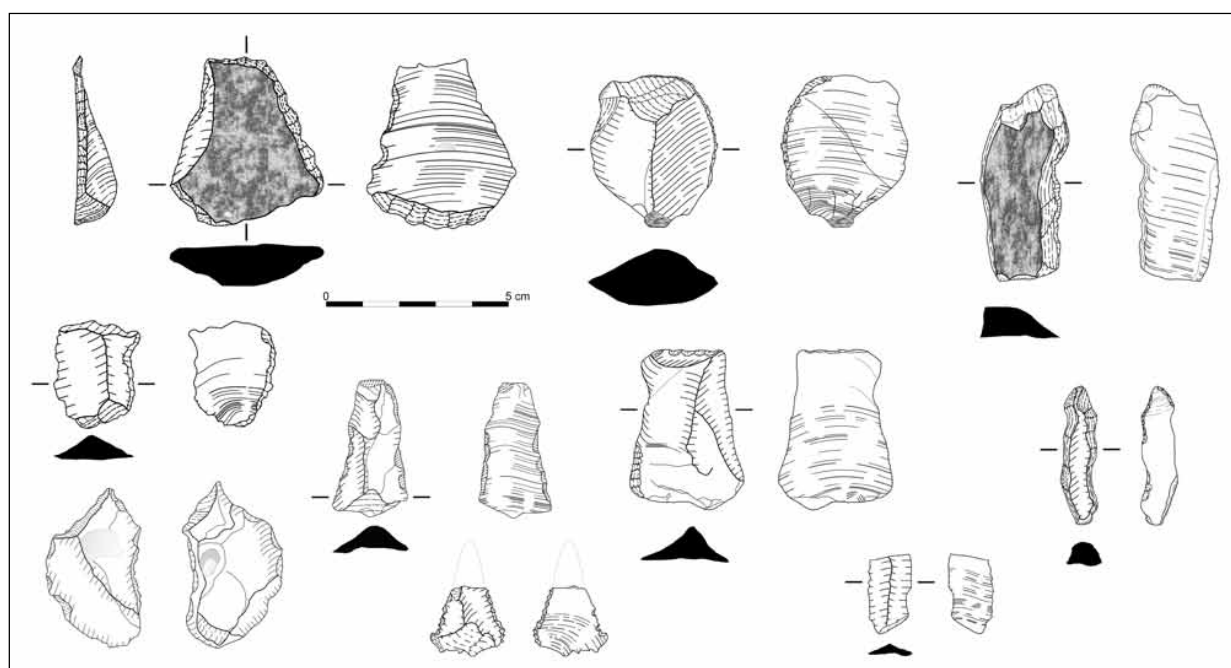
During the excavation a great quantity of archaeological material was recovered from dolmen 318, principally pottery and chipped stone. The latter comprised two main rock types: chert and basalt. Identified flint tools included scrapers, arrowheads, drills and blades (**Fig. 15**). With regard to the pottery (**Fig. 16**), diagnostic sherds associated with the three main archaeological phases (Phases I, II and III) reveal something of the chronology of dolmen 318.

Hundreds of sherds were recovered from

15. Geological analyses will be carried out in future seasons in order to test this hypothesis.

16. This may not have been large enough to accommodate an entire human body, supporting the proposal

that dolmens were used for secondary burial (Fernández-Tresguerres 1993: 390). This proposal was based on an observed preponderance of long bones in some excavated dolmens.



15. Stone tools from the area of Dolmen 318.

Phase III stratigraphic units. Amongst them were horizontal, flat ledge handles of large storage jars, clearly similar to pottery recovered from the EB I settlement (**Fig. 16a**). A bowl with a globular body and curved rim was also recovered. Phase II, associated with the intentional sealing of the tomb, yielded a number of flat dishes and three small sherds with finger-pointed band decoration (**Fig. 16b**). Pottery was scarce in Phase I, with just a few sherds of flat bases being collected (**Fig. 16c**). These have a reddish fabric, like the vessels from the other phases.

The Phase III and Phase II pottery and chipped stone are undoubtedly contemporary with material recovered from the EB I settlement.

VI. Material Comparison Between the Settlement and Cemetery

The sudden death of Professor Tresguerres meant that his studies on Jabal al-Muṭawwaq were left unfinished. His work over two decades, which aimed to define the material culture of the EB I village and megalithic necropolis, has not yet been published. This will be a future aim of our project.

The pottery from the EB I settlement provides a very good record and the shapes are

almost complete. Thus, it has been possible to identify numerous vessels of storage, kitchen and simple wares. The most common shapes are large storage jars and hemispherical bowls (Fernández-Tresguerres 2008b: 48). This ceramic repertoire is comparable with other EB I sites in Jordan, such as Jawa, Jebel Abu Thawwab and Tall Umm Hammad (see Betts 1991 and 1992; Kafafi 2001).

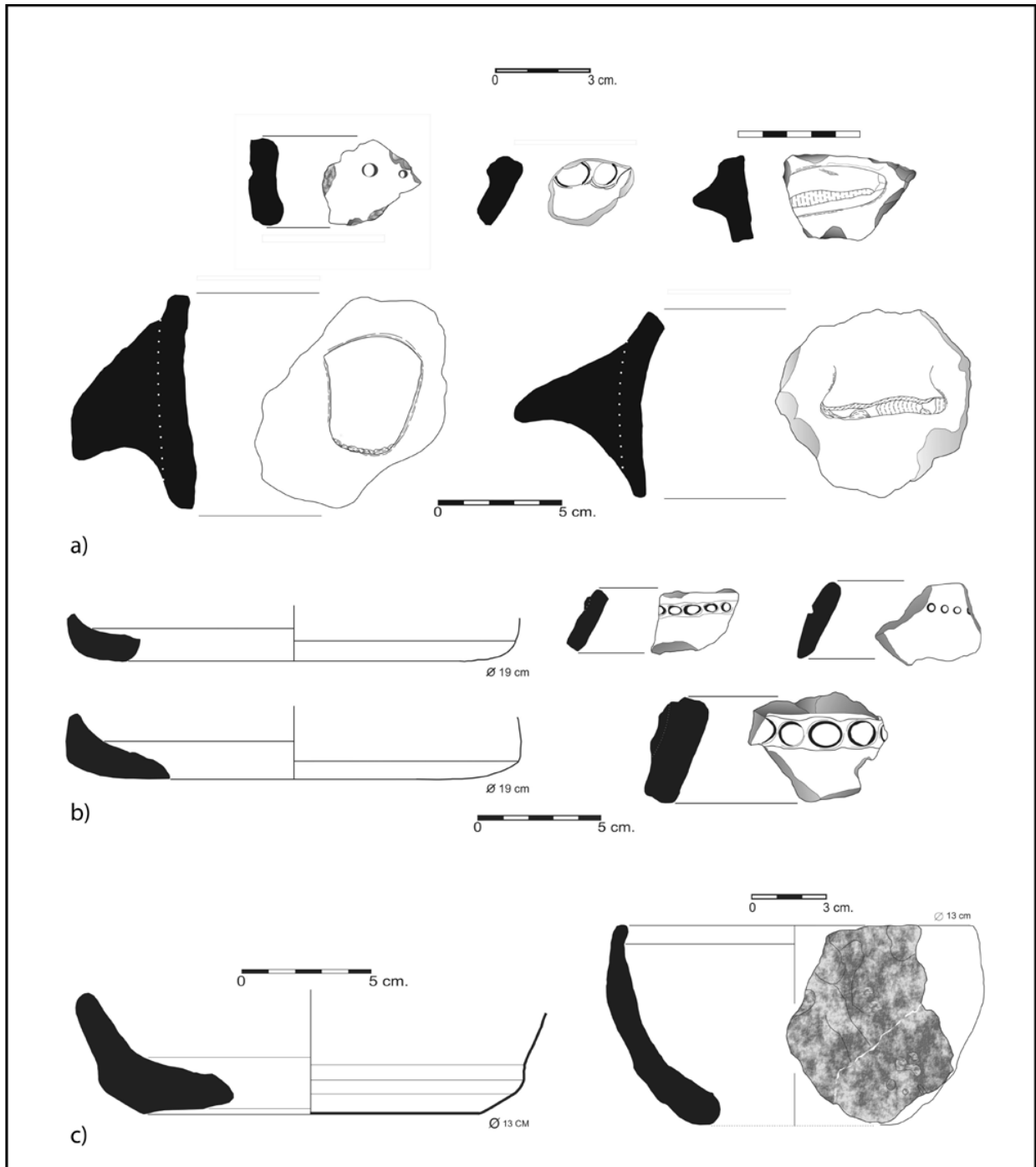
Although the pottery recovered during this excavation season was highly fragmented, the original shapes are similar to those of the EB I village.

The clay seems to have been sourced nearby, most likely from clay beds located along Wadi az-Zarqa¹⁷. The vessels are hand-made, in some cases using a vegetable base mat. Archaeological evidence of this was found on a significant number of bases that still retain the negative mat impression (Fernández-Tresguerres 2008: 48). The basic firing technique led to crude results, with irregularly oxygenated fabrics.

The sherds that can be attributed to exact shapes, such as the flat ledge handles, have clear parallels within the ceramic repertoire of the Jabal al-Muṭawwaq settlement (**Fig. 17**). Other parallels with the pottery recovered from the dolmens include finger-pointed band decoration,

17. Future geo-archaeological studies will be conducted

in order to test this hypothesis.



16. Pottery from Dolmen 318: (a) Phase III; (b) Phase II; (c) Phase I.

which is typical of storage vessels recovered from the houses of the EB I settlement. Three types of pottery decoration (incision; plastic; painted) are known from the EB I settlement, but only finger-pointed band decoration was noted on this season's pottery from the dolmens.

With regard to the stone tool assemblage, spe-

cifically chipped stone tools made on chert, the excavations carried out by Prof. Tresguerres inside the settlement houses mainly recovered finished stone tools. It is therefore possible that the knapping areas were located outside the village (Fernández-Tresguerres 2008b: 43), perhaps around the dolmen cemetery area. Amongst the



17. Complete decorated jar from house 81 of the EB I settlement at Jabal al-Muṭawwaq (Juan Fernández-Tresguerres).

chipped stone tools recovered from the EB I village are circular scrapers that retain much of the cortex, flint blades and sickles. Another group consists of choppers, drills and burins (Fernández-Tresguerres 2008b: 43). During the excavation of the dolmens, a large quantity of chipped stone was recovered, although in most cases it was debitage, flakes and blades that displayed no clear signs of use. However, some good examples of flint tools were recovered, including arrowheads, scrapers, drills, some retouched flint blades and a good number of flakes with retouch around the perimeter. Of these, the circular scrapers closely resemble examples documented by Prof. Tresguerres at the settlement. The presence of Cananean blade fragments in

the dolmens should also be noted; in dolmen 318 one such fragment was recovered from inside the chamber in SU109 (associated with the deliberate sealing episode). This type of blade is typical of the Early Bronze Age (Rosen 1983).

VII. Preliminary Results from the Dolmen Field

This first excavation season of the new Spanish - Italian archaeological project at the Jabal al-Muṭawwaq dolmen field has yielded important results that give a better understanding of the megalithic phenomenon in Jordan during the Early Bronze Age. From the pottery recovered in the earlier constructional phases, it is clear that dolmens 232, 228 and 318 were built in Early Bronze Age IA (3,500 - 3,100 BC)¹⁸. The settlement on the southern slope of the mountain top was also occupied during this period (C₁₄ dates from house 76 are 5,290 - 5,040 BP and 5,270 - 5,170 BP, respectively calibrated to 3,340 - 3,030 BC and 3,320 - 3,220 BC)¹⁹. The sanctuary was occupied until at least the end of the Late Chalcolithic (3,900 - 3,800 BC), but for how much longer remains unclear (see Fernández-Tresguerres 2008a: 33). The stratigraphic and chronological relationship between the settlement and necropolis is therefore still not entirely clear. Clarifying this issue will be the first objective of the next season.

It is clear from dolmens 228 and 318 that, at the end of their EB I use, the monuments were emptied and sealed. This pattern might reflect a ritual tradition maintained at Jabal al-Muṭawwaq, a hypothesis that future excavation of other dolmens on the site might verify. However, it is also possible that the sealing of the monuments was linked to a quick and traumatic flight from the site, although destruction layers are not attested to at either the settlement or necropolis.

The construction technique of the excavated dolmens was reconstructed. The habit of covering part of the structure with a cairn, leaving just the entrance and large capstone in view, sug-

18. The problem of EB I chronology in the southern Levant has been debated by scholars for many years. It is generally accepted that EB IA started some time between 3,600 and 3,300 BC (see C₁₄ dates from Palestinian sites in Dessel and Joffe 2000: 38-39, tab. 2.1; see also discussion in Yekutieli 2000). The beginning of EB IB, traditionally associated with the appearance of Narmer seals in western parts of the southern Levant, is typically dated to between 3,100 and 3,000

BC, i.e. the beginning of the first Dynasty (see Braun 2001). Other C₁₄ data from the Bab edh-Dhra settlement, founded in EB IB, confirm that the period started between 3,300 and 3,000 BC (see Rast and Schaub 2003: 638-648).

19. See Fernández-Tresguerres 2008b. The latest C₁₄ date from abandonment layers at the Tuleilat al-Ghasul sacred area is 5,100 BP, calibrated to 3,800 BC (Seaton 2008: 141-142).

gests that the surrounding wall served to retain the tumulus. This architectural feature, which would also have helped in positioning the heavy capstones, was also noted by Stekelis (1961: 53-55) at Damiye, but there the cairns are built with large squared slabs and not small rounded stones as at Jabal al-Muṭawwaq. Although there are some differences between the two dolmen fields (e.g. the type of stone [limestone at Jabal al-Muṭawwaq; travertine at Damiye]; the presence of front slabs with portholes at Damiye [absent at Jabal al-Muṭawwaq]; the varying distance from a contemporary EB I settlement)²⁰ there are also similarities. Both dolmen fields are situated along the Wadi az-Zarqa river, in two key topographic locations: Damiye in the 'Zarqa triangle' area, facing the confluence of Wadi az-Zarqa with the River Jordan, and Jabal al-Muṭawwaq in the middle section of the valley, where the river swings from north to west, at its confluence with two important tributaries, viz. Wadi Hmeid and Wadi Suweināt. Moreover, the prevailing northerly orientation of the Damiye dolmens is similar to that identified at Jabal al-Muṭawwaq and seems different from the prevailing easterly orientation of dolmens in the southern dolmen fields of Jordan (see Belmonte, Gonzalez and Polcaro in press).

Finally, the pottery recovered from the excavation areas confirms a possible reuse of some dolmens later in the Bronze Age (particularly during the Middle and Late Bronze Ages), supporting the survey observations of Hanbury Tenison (1986 and 1989). Having said that, in this season we only identified an Islamic (probably Mamluk) period reuse of dolmen 232. Future work at the dolmen field might clarify the extent and nature (sporadic vs systemic) of reuse of the Jabal al-Muṭawwaq megalithic necropolis in later periods.

Acknowledgments

We wish to thank Mr Fares al-Hmoud, Director General of the Department of Antiquities of Jordan, and all members of the Department of Antiquities for their kind help and assistance in the field. We also thank Ehab Jariri, of the De-

partment of Antiquities, who carried out the topographical survey and set up the archaeological grid. Great thanks are due to HE Javier Sangro de Liniers, the Spanish ambassador in Amman, for his support and to Prof. Giorgio Bonamente, Dean of the Faculty of Human Science at Perugia University in Italy, for his assistance to our project. We also wish to thank the Angelicum University at Rome, which will participate in future work at the site, in particular Prof. Pablo Zambruno, who participated in the 2012 excavations and made a major contribution to the work.

Bibliography

- Belmonte, J. A., Gonzalez, C.G. and Polcaro, A.
In press On the Orientation of Megalithic Monuments of the Transjordan Plateau: New Clues for an Astronomical Interpretation, *Journal for the History of Astronomy* 2014.
- Betts, A.V.G. (ed.)
 1991 *Excavations at Jawa 1972-1986*, Edinburgh.
 1992 *Excavations at Tell Um Hammad, The Early Assemblages (EB I-II)*, Edinburgh.
- Braun, E.
 2001 Proto, Early Dynastic Egypt, and the Early Bronze Age I-II of the Southern Levant: Some Uneasy C14 Correlations, *Radiocarbon* 43: 1279-1295.
- Chesson, M.S.
 2008 Remembering and Forgetting in Early Bronze Age Mortuary Practices on the Southeastern Dead Sea Plain, Jordan, Pp. 109-139 in N. Laneri (ed.), *Performing Death*, (Oriental Institute Seminars 3), Chicago.
- Dessel, J.P. and Joffe, A.H.
 2000 Alternative Approaches to Early Bronze Age Pottery, Pp. 31-58 in G. Philip and D. Baird (eds.), *Ceramics and Change in the Early Bronze Age of the Southern Levant*, Sheffield.
- Douglas, K. and Kafafi, Z.
 2000 The Main Aspects of the Early Bronze Age I Pottery from Jebel Abu Thawwab, North Jordan, Pp. 101-111 in G. Philip, D. Baird (eds.), *Ceramics and Change in the Early Bronze Age of the Southern Levant*, Sheffield.
- Dubis and Dabrowsky
 2002 Field K: The Dolmen and Other Features on the South Slopes of Tall al-'Umayri, Pp. 171-177 in L. G. Herr et al. (eds), *The 1994 Season at Tall al-'Umayri*, Berrien Springs.

20. Tell Umm Hammad, the nearest known EB I village, is located about 4 km from Damiye, much further than the situation at Jabal al-Muṭawwaq, where the settle-

ment is located just few metres from the southern part of the large dolmen field excavated in 2012.

Fernández-Tresguerres Velasco, J. A.

2005 Jabal Muṭawwaq, *ADAJ* 49: 365-372.

2008a The "Temple of the Serpents", a Sanctuary of the Early Bronze Age I in the village of Jabal al-Muṭawwaq (Jordan), *ADAJ* 52: 23-34.

2008b Jebel al Mutawwaq (Jordania), Pp. 39-50 in V. Álvarez, D. González and J.I. Jiménez, (eds.), *Actas de las I Jornadas de Arqueología en Asturias, Oviedo*.

Fernández-Tresguerres Velasco, J. A. and Junceda, Q.F.

1991 Jebel Mutawwaq (Jordania). Campañas 1989-1991. *Estudios Bíblicos* 49: 523-542.

1993 Los dólmenes de Jebel Mutawwaq (1990-1992), Pp. 35-40 in C. Ayaso *et al.* (eds.), *IV Simposio bíblico español. Biblia y culturas. Tomo I, Granada*.

Hanbury-Tenison

1986 *The Late Chalcolithic to Early Bronze I Transition in Palestine and Transjordan* (BAR International Series 311), Oxford.

1989 Desert Urbanism in the Fourth Millennium, *Palestine Exploration Quarterly* 121: 55-63.

Kafafi, Z. (ed.)

2001 *Jebel Abu Thawwab (Er-Rumman), Central Jordan. The Late Neolithic and Early Bronze Age I Occupations*, Berlin.

Nigro, L. (ed.)

2005 *Tell es-Sultan/Gerico alle soglie della prima urbanizzazione: il villaggio e la necropoli del Bronzo Antico I (3300-3000 a.C.)*, (ROSAPAT 01) Rome.

Parapetti, R.

2008 An Overview of the Italian Excavations in the 'Amman Citadel 1927-1938, *ADAJ* 52: 159-171.

Polcaro, A.

2006 *Necropoli e costumi funerari in Palestina dal Bronzo Antico I al Bronzo Antico III*, (CMAO

XI), Rome.

2010 Jebel Mutawwaq Dolmens: Cult of Ancestors in EB I Wadi Az-Zarqa Valley, Jordan, Pp. 553-566 in P. Matthiae *et al.* (eds.), *Proceedings of the 6th ICAANE, Rome 5-10 May 2008*, Volume 2, Wiesbaden.

Rast, W.E. and Schaub, R. T.

1989 *Bab edh-Dhra: Excavations in the Cemetery Directed by Paul W. Lapp (1965-1967)*, Winona Lake.

2003 *Bab edh-Dhra: Excavations at the Town Site (1975-1981)*, Winona Lake.

Rosen, S.A.

1983 The Canaanite Blade and the Early Bronze Age. *Israel Exploration Journal* 33.

Sala, M.

2005 Le produzioni ceramiche gerichite del Bronzo Antico I: materiali stratificati provenienti dal tell, Pp. 167-178 in L. Nigro (ed.), *Tell es-Sultan/Gerico alle soglie della prima urbanizzazione: il villaggio e la necropoli del Bronzo Antico I (3300-3000 a.C.)*, (ROSAPAT 01) Rome.

Seaton, P.

2008 *Chalcolithic Cult and Risk Management at Teleilat Ghassul, the Area E Sanctuary*, (BAR International Series 1864), Oxford.

Stekelis, M.

1961 *La necrópolis megalítica de Ala Safat, Transjordan*, Barcelona.

Yekutieli, Y.

2000 Early Bronze Age I Pottery in Southwestern Canaan, Pp. 129-152 in G. Philip and D. Baird (eds.), *Ceramics and Change in the Early Bronze Age of the Southern Levant*, Sheffield.

Yassine, Y.

1985 The Dolmens: Construction and Dating Reconsidered, *Bulletin of American School of Oriental Research* 25: 63-69.

QUṢAYR ‘AMRA WORLD HERITAGE SITE: PRELIMINARY REPORT ON DOCUMENTATION, CONSERVATION AND SITE MANAGEMENT ACTIVITIES IN 2012-2013

Giovanna De Palma, Gaetano Palumbo, Asma Shhaltoug, Ignacio Arce, Chiara Arrighi, Angela Atzori, Carlo Birrozzi, Giulia Sara De Vivo, Stefania Di Marcello, Wesam Esaid, Maria Carolina Gaetani, Romel Ghraib, Jehad Haron, Hossam Hjazeen, Hussein Khirfan, Ahmed Lash, Marie-José Mano, Francesca Mariani, Alessandra Meschini, Alex Sarra and Cristina Tomassetti

Introduction

Following the success of the first three conservation seasons in 2010 - 2012 (De Palma *et al.* 2012), two more seasons of investigation and conservation took place at the World Heritage site of Quṣayr ‘Amra, the first from September to November 2012 and the second from April to June 2013. The project is a partnership between the Department of Antiquities of Jordan (DoA), the Istituto Superiore per la Conservazione ed il Restauro, ISCR and the World Monuments Fund (WMF)¹. Conservation of the exterior of the monument is carried out by a DoA team supervised by WMF consultant Alex Sarra and ISCR consultant arch. Carlo Birrozzi. Mural paintings conservation is carried out by expert conservators trained at the Istituto Superiore per la Conservazione ed il Restauro in Rome (ISCR) under the supervision of Giovanna De Palma, Maria Carolina Gaetani and Marie-José Mano. Archaeological investigations were carried out by DoA archaeologists and WMF staff and consultants, while the site management planning process and associated metric surveys activities are conducted by a joint DoA - WMF team. Funding for the project is provided by the Italian Government through the ISCR and private donors through WMF.

The site and its state of conservation are extensively described in our first preliminary report (De Palma *et al.* 2012) and in previous in-depth studies of the monument (Vibert-Guigue and Bisheh 2007).

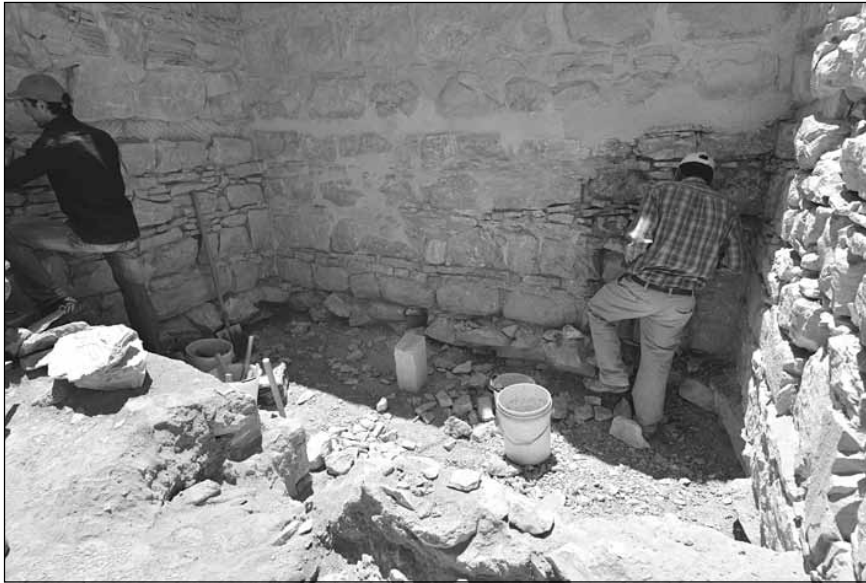
The autumn 2012 and spring 2013 seasons addressed the following aspects of the project:

1. Completion of the conservation of the exterior of the building and of the *saqiya*, with the exception of the *prae-furnium* area.
2. Removal of the 1964 cement cistern inside the *prae-furnium* and archaeological investigations in the room.
3. Cleaning and archaeological investigation of the *caldarium* and *tepidarium* floors.
4. Mural paintings conservation of the western wall of the western aisle, vault and wall above the western arch.
5. Consolidation of the interior northern wall and vault of the eastern aisle.
6. Archaeological surveys in the archaeological core zone, within approximately 1 km from the Quṣayr.
7. Study and suggested conservation intervention for the second *saqiya* located east of the Amman - Azraq highway.
8. Soundings and partial consolidation of a new building found 50 meters south of the visitor centre.
9. Site management planning activities by a DoA - WMF team in order to produce a plan for official adoption by the DoA, also in response to a UNESCO World Heritage Centre request to provide such document. Activities included tourism surveys and the preparation of a new topographic plan and of a 3D laser scanning model of the site.

A first preliminary report of these activities follows below.

1. ISCR is the oldest and most prestigious institution in Italy dedicated to the conservation of cultural heritage monuments. WMF is a not-for-profit institution dedi-

cated to the protection and conservation of cultural heritage worldwide.



1. Removal of the modern cistern in the *praefurnium*.

1. Exterior Conservation and Cleaning of *Caldarium* and *Tepidarium* Rooms (activities 1 - 3)

Repointing following the same methodology already described in the 2012 report was conducted on the walls of the *saqiya*. A sounding conducted on the northern side of the structure revealed the presence of a compact mortar pavement sloping away from the structure. Approximately 25 meters to the north, a small structure, perhaps a water basin, was identified, partially buried in *wadi* silt. Other interventions on the structure included the cleaning of the water tank situated behind the well and the consolidation of a large gap created in the past by looters (?) on the *cocciopesto* floor of the tank itself, and the consolidation of the pillars of the wooden structure built in the mid-90s to present to the public a working model of the *noria* located besides the well.

Works in the *praefurnium* room included the removal of the cistern built in armed concrete along the southern side of the room and exploration of the foundations of the building, found at only 30 cm below the level of the ground inside the room (but the floor of this room is approximately 60 cm below the exterior ground level, meaning that at least in this area foundations are approximately 1 m below the present ground level) (Fig. 1).

Soundings were also conducted on the western side of the room, where the bedding mortar of an ancient floor (now disappeared) was



2. Remains of a preparation for a floor in the *praefurnium*. found mixed with ashes and charcoal (Fig. 2). A charcoal sample was carbon-dated at Geochron Laboratories (Chelmsford, Mass.). Sample GX-33763-AMS, from the *praefurnium*'s north-west corner gave a date of 1,270 BP \pm 20 (680 AD

+/-20), which could be explained either by the use of old wood for the furnace, or by the presence of an earlier building phase dated to the late Byzantine or early Umayyad period.

The corridor leading from the *prae-furnium* into the hypocaust of the *caldarium* was also cleaned, revealing a well preserved flagstone pavement made of relatively small, irregular flat stones set in lime mortar. This same floor continued inside into the *caldarium* and *tepidarium* rooms. These floors were also thoroughly cleaned of dust and rubbish that had entered the building through the corridor mentioned above. Since only an iron grill was placed there in the past, leaving this side open for pests and dust to enter the building, it was decided to remove the grill and put in its place instead a Plexiglas sheet to 'seal' this entrance while allowing the public to see the relationship between the *prae-furnium* and the *caldarium* room. The floors of both *caldarium* and *tepidarium* were excavated at the time of the Spanish mission in the 1970s. Some small pockets of original archaeological deposits were nonetheless found and these were carefully excavated, revealing the presence of fragments of the *tubuli* which were used to carry the hot air from the space between the *suspensurae* and wall cladding into the hot and tepid rooms above. Other material found in these small deposits included glass *tesserae* of various colors with mortar still attached to them which originally decorated the niches and pendentives of the dome above, and ash and charcoal derived from the use of the bath house. One

of the samples was also analyzed at Geochron Laboratories. Sample GX-33762-AMS from the *caldarium*'s locus 5 in area Z5 provided a date of 1,220 BP +/-20, corresponding to an absolute date of 730 AD +/-20, which perfectly matches our understanding that the monument was in use during the last period of the Umayyad dynasty, probably by Walid II.

The *pilae* in the middle of these rooms were made of basalt cut in one piece and were found lying on the floor. Mortar traces on the floor allowed the repositioning of the *pilae* in their original location, thus allowing a better presentation of these two rooms (Figs. 3, 4).

2. Mural Paintings Conservation (activities 4 - 5)

Techniques of execution and materials were found to be similar to those observed on the south wall of the same aisle (De Palma et al. 2012). Raking light inspection allowed also the identification of *pontate*, or spreading phases of the mortar preparation upon which the mural paintings were executed. As for the south wall, the spreading was done from top to bottom and from left to right.

The paintings were done by drawing orange-red outlines of the figures and main decorations. In some areas there are thin direct incisions, remarked by the orange-red preparatory drawing. On this wall several phases of painting execution were identified. The first phase probably includes the blue backgrounds as well as the pink background colours of plants, skins, textiles and of the onagers' hide.



3. Scattered *pilae* in the *caldarium* before intervention.



4. The caldarium floor after cleaning and conservation.

This first stage was followed by a sequence of pictorial layers with protein binders. During this phase, some details – now partially lost – were completed. Among them, the characters' skin and hair, the highlighting effect (*lumeggiatura*) on the textiles, the circle and flower-patterned decoration of the frame running along the side and upper edges of the scenes, and the Kufic Arabic and Greek inscriptions above the six kings' heads.

The colour palette included many precious pigments such as lapis lazuli – widely used for backgrounds, although covered by several layers of paint – as well as natural and rare synthetic pigments: lead white, white arsenic, *bianco Sangiovanni*, red lead, natrojaroside, ochre and cinnabar².

The portion of the vault above the arch shows a slightly different situation: the succession of layers reveals that the rocks, blue water background and the characters' skin were painted after the preparatory drawing and main pink backgrounds.

As on the south wall, a large number of graffiti are present on the painted surfaces covering almost all decorative bands and causing the fall of large sections of plaster, mainly around the characters' faces. The static instability of the building produced a structural fracture all along the vault of this aisle. Around the edges of this fracture, some portions of the painting are missing. Percolation of rain water mixed with dust

entered through the air intakes on the west wall and the fracture in the vault, producing carbonate concretions and also absorbing charcoal deposits owing to fires lit inside the building.

The intervention on the paintings performed by Alois Musil in the early 1900, as well as the one carried out in the 1970s to complete the restoration of the painted surfaces, neither improved the paintings' state of conservation nor contributed to a correct reading of the decorations. The extensive structural operations conducted between the 1970s and 1980s to secure the walls and plasterwork by using large amounts of concrete and cement mortars was also ineffective. The central band of the west wall shows large gaps in the plaster by some of the male characters' faces, usually identified as the 'kings' defeated by Islam. Analysis of the historical record testifies that the loss of the first two 'kings' heads and part of their busts, as well as the damage concerning the other four 'kings' figures, are the result of Alois Musil's failed attempt to detach the paintings.

The researcher discovered the site in 1898. Afterwards, together with the Austrian painter Alphonse Mielich, he visited it again intending to remove part of the pictorial decoration and bring it to Europe. However, the difficulty of the operation and some adverse conditions forced him to limit this intervention to a few fragments, now displayed in Berlin's Pergamon Museum.

2. Cf. analysis by the Diagnostic Laboratory for Conser-

vation and Restoration of the Vatican Museums.

Only a small portion of the west wall, which portrays the head of the first character on the left and a few fragments of an inscription, is held by the German museum. Four deep incisions in the plaster – two vertical and two horizontal cuts which framed the upper half of the 'kings' panel' – suggest that the operation was never accomplished. Unfortunately, the traumatic intervention irreversibly damaged some valuable details, such as the bilingual inscriptions that used to identify the characters.

Mielich also carried out the first cleaning intervention on the paintings, aimed at removing the thick charcoal covering resulting from fires lit inside the rooms, which hindered the painting's readability. The use of aggressive and inadequate materials caused the loss of major parts of the *fresco-secco* pictorial film, as well as the depletion of the plaster's binding components. As a result, the pictorial film shows a large number of abrasions and gaps.

In 1970 a number of interventions were performed with the purpose of conserving and restoring the paintings. Plasterwork was consolidated by employing vinyl resins, while the large gaps in the preparatory layers were sealed all along the edges, filled in with twisted cotton fibres soaked in the same resins, and then painted with yellow tempera. Some of the fillings around the central band were also covered with plaster and painted with the same yellow tempera.

This paint was also spread upon the vault and upper bands of both walls, in order to hide the significant residuals of charcoal concretions which covered large portions of the painting. During this intervention, the paintings of the west wall were irregularly cleaned and then covered with a layer of natural resin (shellac), except for the top of the vault. A film-forming substance was employed with the aim of reviving colours, modifying the refractive index of the surface - which had become matt as a result of cleaning - and making it homogeneous.

Nevertheless, traces of charcoal, coherent particles and saline concretions of different sorts were never removed and still prevented the read-

ability of some of the original details. Therefore, pictorial reintegration was necessary in order to clearly outline the characters and other elements, where they were still visible. Drapery and textiles were partially and freely repainted.

The shellac layer, transparent at the time of its application, had turned amber-coloured over the last forty years because of oxidation and is now also covered by many layers of atmospheric fine particles.

As already mentioned, the 1970s mission carried out different interventions on the paintings of the vault and eastern side of the aisle, compared to those performed on the west wall. Some of the most significant differences are the absence of shellac traces and the fact that the edges of gaps weren't secured with cotton soaked in vinyl resin.

As far as the vault is concerned, the painted surface is affected by large deposits of thick and coherent charcoal, made worse by later carbonation phenomena. Rain water infiltration though the large fracture in the centre of the vault has caused carbonate concretions which absorb and fix charcoal, dust deposits and remains of wasps' nests. Clear signs of colour alteration are also evidenced by wide greying or blackening portions of the pictorial film.

The first phases of the intervention on the south section of the west and east walls and the vault addressed the consolidation of the preparatory layers. Adhesion faults between the plaster and the masonry were restored by using hydraulic mortar³, while surface consolidation was achieved by employing acrylic resin in 25% water emulsion⁴. Afterwards, inadequate fillings were removed. Plaster fillings were mechanically treated and sealed; cotton and vinyl resin fillings were removed by soaking them in a mixture of different solvents⁵.

Cleaning was performed in a selective manner, checking each step. Both walls were treated as follows:

1. Repainting and shellac layers were removed.
2. Charcoal residues, coherent particles and saline concretions of different sorts were removed.

3. Previously mixed low-pressure injection hydraulic mortar (Ledan TB1 A/L 40/50 - Tecnoedile toscana) was used for plaster detachments from the walls; low-pressure injection hydraulic mortar (Ledan Ri.stat A/L 50/50 base B - Tecnoedile toscana) was used for plaster

detachments from the vault.

4. Acrylem 33.

5. Solvent mixture made with a 1:1:1 ratio of water, acetone and ethyl alcohol.

3. Yellow tempera was removed.

On the west wall, shellac was removed using a mixture of organic solvents⁶ in poly-acrylic acid gel⁷ for variable exposure times (60 - 120 minutes), according to thickness. In some areas, this operation had to be repeated until complete removal of the substance was achieved.

The painted surface was then treated with Japanese paper tablets soaked in 10 % pH6 ammonium citrate⁸ and exposed to the same agent in poly-acrylic acid gel for 5 minutes' exposure time. The same treatment was also employed to remove the yellow tempera. On the east wall, in the upper area immediately under the band decorated with circle flower patterns, the painted surface was cleaned by removing the thick saline concretions.

Tests were run to verify the effectiveness of paper pulp tablets, which were then applied with a 1:3 disodium EDTA (*Ethylene Diamine Tetra acetic acid*) solution (30 gr/litre) and bicarbonate ammonium (60 gr/litre) ratio for 3 minutes' exposure time.

On the wall above the arch and vault, yellow tempera residues that persisted after the first cleaning were removed by employing synthetic colloidal clay⁹. Unfortunately, this did not yield positive results: although the product effectively removed paint residues, the dried clay was hard to remove.

The large cement filling of the fracture in the vault could not be removed without causing damage to the structure and the paintings. It was however lowered under the painted surface's level. In this way, without compromising the vault's structural stability, the edges of the original plaster were restored and its stratigraphy became readable.

Cleaning the vault required slightly different methods compared to the walls. The thick layer of yellow tempera applied during the 1970s intervention was removed in stages. First of all, it was removed using Japanese paper tablets soaked in 10% pH6 ammonium citrate. Afterwards, as the tempera had penetrated into the

more porous white plaster, cleaning was repeated applying ammonium carbonate tablets in paper pulp for 5 minutes' exposure. After cleaning the surfaces of the west and east walls, as well as of the vault, were carefully washed with deionized water. Finally, electrical conductivity and pH tests were run to check for possible residues of the cleaning substances.

The damaged pictorial film was reintegrated using less intense watercolour glazes compared to the original pictorial film. Similarly, the colour intensity of etched incisions considered of historical interest was mitigated using watercolour glazes. Gaps in the preparatory layers suitable for reintegration were plastered and levelled using an aerial mortar made of three parts white calcareous dust (sieved through a 0.5 mm mesh) to one part slaked lime and were then reintegrated using the *tratteggio* technique (see also De Palma *et al.* 2012). In contrast, gaps in the preparatory layers which were impossible to restore were plastered along the edges, in order to obtain greater resistance and adhesion. The treatment of gaps in the preparatory layers that left the stone masonry exposed is described below.

The first band of the decoration on the west wall, representing imitation marbles, has a large number of gaps. The masonry is deprived of the preparatory layers and is completely exposed. The surface, made of regularly laid stone ash-lars, is covered with charcoal layers and saline concretions of different sorts that alter its look. The interstitial mortar between the ash-lars also has several gaps. Therefore, the restoration intervention was designed to recover the structural integrity and colour of the stone which – being in plain view – had become part of the decoration.

Cleaning was carried out using a 20% disodium EDTA solution in deionized water added to cellulose pulp and methyl hydroxide ethyl cellulose for 24 hours' exposure time. The surface was then carefully washed with deionized water. As necessary, cleaning was completed with mechanical tools. Major stone irregularities were

6. 50% benzyl alcohol, 40% isopropyl alcohol and 10% ligroin. A substitute mixture was also developed in order to decrease solvent toxicity: 50% isopropyl alcohol, 30% methyl ketone and 20% ligroin. This latter mixture was less effective than the former and was therefore used exclusively on thinner shellac layers.

7. Carbopol Ultrez 21 added to Ethomeen C25 amine (for

polar solvents) and Ethomeen C12 (for non-polar solvents). The solvent gel used during this phase was composed of 1 gr Carbopol, 9 ml Ethomeen C25 and 1 ml Ethomeen C12 for each 100 ml of solution.

8. pH6 allowed the taking advantage of the saline solution's chelating properties only.

9. Laponite (Rockwood additives)

restored by employing a mortar made of five parts siliceous sand (sieved through a 0.5 mm mesh), one part white calcareous dust (sieved through a 0.5 mm mesh), one and a half parts black volcanic sand (sieved through a 0.5 mm mesh), half part wadi grit (retained on a 5 mm mesh) and slaked lime, according to a 2.5 : 1 charge to binder ratio.

This composition was developed after a number of tests run on samples, since the mortar used for restoration had to be clearly distinguishable and not interfere with the original mortar's colour. Light watercolour glazes helped to harmonize – where necessary – the reintegrated colours with the surrounding surface.

Finally, an intervention was carried out on the eastern aisle in order to consolidate fragments detaching from the vault and to 'reattach' the northern wall of this aisle to the vault. A cleaning test was carried out on one of the figures of the craftsman scene in order to verify its state of conservation. The resulting cleaning allowed a better view and interpretation of this character, which is represented on the edge of a pool using a spear to break the lumps of quicklime being slaked there.

3. New Iconographic Details

The conservation intervention brought to light remarkable new scenes and iconographic details. The group of six characters wearing long decorated robes and making a gesture with their hands pointing towards the south wall has been identified as a kings' parade (Fowden 2004) or representing a 'Family of Kings', ancestors of the Umayyad rulers (Grabar 1954). This theory derives from a bilingual inscription – in Greek and Arabic – located above the figures' heads and probably identifying them.

One of the fragments detached in the early 20th century by Alois Musil and now conserved in Berlin's Pergamon Museum shows the Greek letters *AP* above the head of the first character on the left, leading to a possible interpretation of the word as *KAICAP*. In the same manner, the central figure is topped by the partial inscription *APOIC* or *ΔPOIC*. These two fragments seem to suggest that two specific royal titles were represented in the painting, namely the Byzantine emperor – titled *KAICAP* at that time – and the Persian Sassanid king, commonly titled *KUCA-*

ROIC or *KUCDROIC*, from the name of the Persian king Chosroes.

As well as this hypothesis (largely accepted by experts), the fact that the painted characters didn't have the more usual beard initially raised the possibility of the presence of female figures among them. Cleaning however revealed not only the beards of all three of the kings whose faces are conserved, but also another important detail, viz. the central figure's headwear, whose peculiar shape with two 'wings' can be recognized in all coeval representations of Persian kings from Chosroes I onwards (Fig. 5). The cleaning also exposed the very skilled representation of the kings' faces and their garments (Fig. 6). The high quality of this composition, among the most beautiful found so far in this monument, should be recognized by attributing these specific paintings to a master artist who may have worked for the Umayyad caliphs (Fig. 7).

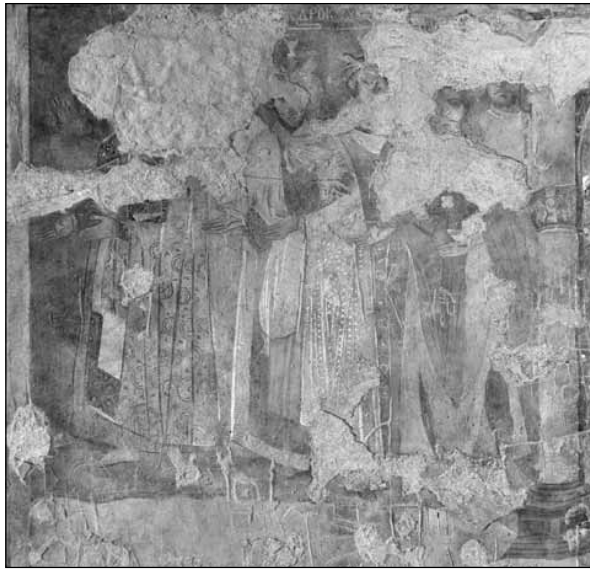
The cleaning of the hunting scene above the kings' figures facilitated the discovery of previously unknown details, such as small plants and bushes, the complete figure of a falling horseman



5. Portrait of Chosroe after conservation.



6. Two portraits of kings after conservation.



7. Kings' scene after conservation.

(at the extreme left of the composition) and the 'disappearance' of two tents drawn by Spanish conservators. In place of the latter, the conservation intervention allowed for the discovery of a different detail, *viz.* the presence of three men hiding in a hole dug in the ground. This type of hunting technique is described in historical texts (Bisheh personal communication). Moreover, under the yellow layer of paint the rest of the hunting scene was discovered, allowing the complete scene to be read for the first time (**Fig. 8**). The scene discovered under the paint layer includes other flame- and flag-bearers scaring the animals into a trap, as well as the rest of the trap made of long ropes terminating, on the right side of the composition, in a netted area where the onagers are eventually killed.

On the northern portion of this wall, below the hunting scene, there is a representation of a game or competition involving two teams.



10. Might it be another representation of Walid? On the basis of the discovery of a Kufic inscription mentioning

Cleaning showed that the two 'teams' have different skin tones, the first 'whiter', the second 'darker'. Moreover on the extreme right of the scene, something violent seems to be happening: one of the characters has his hands tied behind his back and another character seems to be in the act of hitting him with his fist; the latter is being held back by another character, the only one that seems bearded¹⁰ (**Fig. 9**).

On the portion of the wall above the arch and immediately below the vault, cleaning brought a previously unknown scene to light that – although severely compromised – remains clearly legible. It portrays two standing figures: a man wearing only a light-blue loincloth and a naked woman he is helping out of the water. He is holding her up by slipping his left arm around her waist. She shows her back partly covered by long, dark and curly hair. Her face is missing, but a few fragments suggest that she was portrayed in profile, her face close to the man's. She is clinging to him, with her left hand grabbing his right, extended arm and the other slipped around his neck. He leans his foot on the rocky bank of a stretch of water, painted in deep blue, while the river banks are covered with small branches, leaves and round fruits (**Fig. 10**).

To the left of this scene the wall is severely damaged, but a garden with trees and fruits seems to be represented. Further to the left, just above the top of the arch, a three-headed dog is recognizable. Unfortunately most of its body is missing, but the three heads clearly belong to the same animal and it is certainly not a representation of three separate animals near each other. We are actually facing Cerberus, the guardian of Hades in classical mythology (**Fig. 11**). Further to the left, above the northern spandrel of the arch, two standing figures were al-

8. Hunt scene on the upper register of the western wall after conservation.

Walid Ibn Yazid, we now believe that this monument was commissioned by him (see De Palma *et al.* 2012).



9. Representation of a game (?) on the middle register of the western wall.



10. Previously unknown scene on the vault of the western aisle.



11. A newly discovered representation of Cerberus on the vault of the western aisle.

ready known to exist, but cleaning has revealed that one of them clearly carries a basket full of grapes and that this personage is flanked by a panther standing on its hind legs (**Fig. 12**). It is logical to recognize here the figure of Dionysus, who is often represented with a panther besides him. The meaning of this entire scene is still being investigated and more careful readings of this entire portion of the monument will be necessary to achieve a correct interpretation. The presence of Dionysus in the pictorial representations of Qaşayr ‘Amra was already presented as hypothesis by scholars (Blazquez 1981), based on interpretation of other scenes in the monu-

ment. However there was no clear, direct and certain iconographic reference to him before these discoveries.

The conservation intervention finally eliminated the yellow paint and soot on the vault, revealing a geometrical / architectural decoration in perspective view, framed by rosettes whose complex pattern runs all along the vault’s crown (**Fig. 13**).

4. Archaeological Survey and Second *Saqiya* Conservation Study (activities 6 - 7)

Extensive archaeological surveys were conducted over an area of approximately 1.5 square



12. A newly discovered representation of a panther near a standing figure with grapes.



13. Geometric and architectural representations on the vault of the western aisle.

kilometers in the area around the main building. New archaeological sites identified included Lower Palaeolithic, Middle Palaeolithic, Epipalaeolithic and Chalcolithic flint scatters, and new structures and features belonging to the Umayyad period. The latter include a water basin north of the *saqiya*, probably used to distribute water in the garden area in front of the main building, and the quarry from which the stone used to build the on-site structures was extracted.

Aerial photographs from the mid-1970s were also procured from Spain and used to identify buried features which were disturbed ten years ago by Ministry of Tourism activities on site (construction of paths, visitor center etc.). This assessment was very useful in the placement of the emergency intervention described below. A condition assessment was also conducted on the second *saqiya*, east of the road, which is in a very disturbed condition (Fig. 14). Measurements and analysis of the structure and of architectural elements still present *in situ* allowed the preparation of a project for its anastylosis.

5. Archaeological Soundings (activity 8)

Tourists and their guides were observed on several occasions collecting glass mosaic *tesserae* in an area between the visitor center and the main building. Fearing the existence of buried features that were being disturbed by this activity, it was decided to open two small soundings in order to understand the nature of

these findings. Simple brushing of the surface revealed the existence of a long building, oriented east - west along the edge of the plateau dropping into the *wadi*. The building is arranged alongside a main wall less than 50 cm wide and is divided into several rooms approximately 3 - 4 m wide. Two of these rooms were partially excavated, demonstrating the presence of a 60 cm deep deposit. Little in the way of material remains was found in these rooms. A *tannour*-type oven, which was not entirely excavated, was found in the corner of one of them and then consolidated by conservators and re-buried *in situ* (Fig. 15). Both rooms had a compact lime plaster floor upon which a 20 - 30 cm sterile layer of windblown sand was found. The second sounding, 1 m wide by 3 m long, was characterized by stone rubble and sandy soil mixed with thousands of glass *tesserae* of various colors and composition, including many with gold leaf sandwiched between two glass layers (Fig. 16). Similar *tesserae* were found during the cleaning of the *caldarium* and, still *in situ*, in the mosaics of the alcove rooms inside the main building. However, the *tesserae* found in the soundings do not have any sign of mortar attached to them, indicating that they were never used. This and the fact that, together with the *tesserae*, there were many glass chips and edges of the glass 'pie' that was later broken up into *tessera*-sized pieces indicate that the *tesserae* were prepared for use in this location



14. Poor state of conservation of the second *saqiya*.



15. A tannour discovered inside a room of the newly identified building.



16. Loose mosaic tesserae found in a room of the newly identified building.

and perhaps separated by color. At this stage it is impossible to say whether the oven found in one of the rooms was used for the production of *tesserae* or other material, or was instead used for cooking. It is however almost certain that this was a service building associated with the use of Qaşayr ‘Amra or with its construction. This hypothesis may also find confirmation in the mural paintings of the eastern aisle of the main hall, where artisans and workmen are represented performing various operations at what seems to be the Qaşayr ‘Amra building site. Unfortunately the southern side of the building found in these soundings was bulldozed dur-

ing works conducted about 10 years ago by the Ministry of Tourism to set up paths to the site from the visitor center. This also explains why the *tesserae* are so close to the surface, having been removed by the bulldozer from their location in one of the rooms and spread over a concentrated area. The entire area of the soundings was recorded, mapped and backfilled, and recommendations were drafted for excavations to be conducted in the future in this area, which promises to provide important information for coming to an understanding of the genesis of the building and the techniques used in its construction.

6. Site Management Planning, Metric Surveys and Tourism Surveys (activity 9)

The management of a heritage site is key to the long-term conservation and enhancement of the site's Outstanding Universal Values, authenticity and integrity. This is why UNESCO has required a Site Management Plan to be a fundamental component of World Heritage Dossiers since 2005. To comply with this requirement and to fulfil Jordan's commitment and obligations towards the international community, one key component of the Quşayr 'Amra project entailed the preparation of the Quşayr 'Amra Site Management Plan. The management planning process, which is coming to an end as this article is being written, has been developed in close collaboration with the Department of Antiquities of Jordan and the Ministry of Tourism and Antiquities, through a Site Management Plan Team that was officially set up in early 2012 and then met regularly throughout the planning process to discuss various elements of the site management planning process and data collection strategies. The planning process developed throughout 2012 and 2013, and was articulated in three key phases:

1. Site documentation, including mapping of the area and collection of historical and archival information on the site.
2. Site analysis and assessment, including an evaluation of its cultural and natural values, the assessment of key threats and risks affecting the site, and the identification and analysis of its current management system.
3. The definition of a vision, aims and policies to guide the use, conservation, protection, management, maintenance, investigation and presentation of the site, as well as the identification of actions required to implement these in the short, medium and long term.

In order to ensure broadest participation in the process, a preliminary action was the identification of the stakeholders concerned with the conservation and use of the site. These included, among others, the national authorities variously concerned with heritage and tourism management, as well as the protection and exploitation of the site and its environmental context. They also included the municipalities of Azraq and Muwaqqar, together with the representatives from the *bedouin* tribe of Beni Sakher, who have

been in charge of this part of the eastern *badiya* for centuries. A number of meetings were held with various government officials in order to define the boundaries of the site, mainly with the Ministry of Agriculture (Rangeland and Forestry Departments), the Department of Lands and Survey, and the Ministry of Water and Irrigation, as well as with the Royal Botanic Garden and the Royal Society for the Conservation of Nature. Stakeholders were met with on an individual basis and, in addition, three Stakeholders' Workshops were organized in 2012 to promote plenary exchange and discussion on the preservation and management of Quşayr 'Amra. At the time of writing, the Site Management Plan is being finalized for publication with the intention of submitting it to UNESCO in January 2014.

With the view to allow the design of needs-based tourism management policies and actions in the Site Management Plan, and to integrate existing data with up-to-date, in-depth qualitative and quantitative data, between 2012 and 2013 the WMF and the Hashemite University in Zarqa conducted a series of tourist surveys, coordinated by Prof. Zeidan Kafafi (Dean) and Prof. Firas Alawneh of the Queen Rania Institute for Heritage and Tourism, under the guidance and technical coordination of WMF. The surveys took place for one week in June 2012, during the low season, and then again in November 2012 and in May 2013 during the high season. The surveys collected two types of data: (1) overall visitor numbers at Quşayr 'Amra and their flow trends within the main building; (2) interviews with a selected number of visitors on their visit to the site. The former datum intended to provide an overall understanding of visitor flows at the site, including their daily and hourly visit trends and the average duration of their stay within the main building. The latter aimed to provide more detailed information on the average characteristics of tourists and visits at the site. Interviews were conducted on the basis of a purposely devised questionnaire. The survey interviewed approximately 800 people and monitored the flow of more than one thousand (**Fig. 17**).

As part of the WMF educational and participatory strategy for site management planning, and with the additional aim of reinforcing students' engagement in heritage preservation



17. Interviews conducted by students of the Hashemite University.

and management, between April and May 2013 the WMF also collaborated with the Hashemite University on a field-based activity on Quşayr ‘Amra’s presentation means and tools. This activity aimed at allowing hands-on heritage conservation learning, with the long-term aim of enhancing national capacities and skills in heritage management. At the same time, the activity intended to allow brainstorming on key presentation problems and possible solutions at Quşayr ‘Amra. The activity was conducted with Prof. Arwa Badran and involved about 50 students from the course in Museum Studies. It included a site visit followed by a class exercise where ideas were presented on how to improve on-site visitor facilities.

The definition of site boundaries and a buffer zone is explicitly requested of the Department of Antiquities by the World Heritage Committee, as well as being an activity that needs to be completed for the purpose of the Site Management Plan’s proper compilation and future implementation. The boundaries and buffer zones were defined by Ministerial decree on the basis of recommendations from the team and Department of Antiquities, after a complete re-survey of the site and the preparation of detailed topographic maps. This defined an area of over one square kilometer as the core area of the World Heritage Site and a further three square kilometers as a buffer area surrounding the site. This was necessary in order to reduce the threat associated with the construction in recent years of

several dams and barrages along the courses of nearby *wadis* by the Ministries of Agriculture and Water and Irrigation, which are reducing the amount of water available for the sustenance of natural life and of the ancient terebinth trees bordering the *wadi* near Quşayr Amra.

A 3D laser scan of the interior and exterior of the monument and its immediate surroundings was carried out by a Department of Antiquities team. The resulting digital model was elaborated by Departmental experts and by the Zamani project at the University of Cape Town. Orthorectified photographic documentation of the internal and external elevations and a 3D didactic model were produced¹¹. These are being used to assist with the documentation of the building, the preparation of a database of images of the site and for presentation purposes (Fig. 18).

Conclusions

The fourth and fifth seasons of documentation and conservation at Quşayr ‘Amra have confirmed the extraordinary results of the first years of work at the site. The application of sophisticated conservation methods have allowed the removal of soot, grime and other materials applied to the monument in the past and led to the discovery of previously unknown details and entire scenes, which are likely to change our knowledge and perception of Umayyad art. At the same time the archaeological and documentation activities conducted on-site are allowing a better understanding of the monument in its archaeological and historic context. The holistic site management planning approach is also creating a methodological model that can be applied to other major archaeological sites in the kingdom. The involvement of the local community and of Jordanian students in the process will hopefully generate public interest in the issues of site protection, management and sustainable use, to benefit the economic, social and cultural growth of the *badiya* region of Jordan. The Site Management Plan is currently being finalized; it will be presented to the national and international communities of stakeholders in 2014, to officially mark this important milestone in the management of archaeological and World Heritage Sites in Jordan.

11. Developed by Ignacio Moscoso for WMF and the

Spanish Mission.



18. 3D model generated from a laser scan of the site (Department of Antiquities).

Giovanna De Palma, Maria Carolina Gaetani and Marie-José Mano (with consultants Chiara Arrighi, Carlo Birrozzi, Giulia Sara De Vivo, Stefania Di Marcello, Francesca Mariani, Alessandra Meschini and Cristina Tomassetti)

ISCR
Via di San Michele, 23
00153 Rome – Italy
giovanna.depalma@beniculturali.it

Gaetano Palumbo (with consultants Ignacio Arce, Chiara Arrighi, Angela Atzori and Alex Sarra)
WMF
350 5th avenue, suite 2412
New York, NY 10118 – USA
gpalumbo@wmf.org

Asma Shhaltoug, Wesam Esaid, Romel Ghraib, Jihad Haron, Hossam Hjazeen and Ahmed Lash
Department of Antiquities
P.O. Box 88

Amman – Jordan
shhltg@yahoo.com

Hussein Khirfan
Ministry of Tourism and Antiquities
Amman – Jordan

Bibliography

- Blazquez, J.M.
1981 Las pinturas helenísticas de Quşayr 'Amra, (Jordania) y sus fuentes. *Archivo Español de Arqueología*: 160-163.
- Fowden, G.
2004 "The Six Kings at Quşayr 'Amra", Pp.263-273 in *La Persia e Bisanzio, Atti dei convegni Lincei*, vol. 201. Roma: Accademia Nazionale dei Lincei.
- Grabar, O.
1954 "The painting of the six kings at Quşayr 'Amrah". *Ars Orientalis* 1: 185-187.
- Vibert-Guigue, C. and Bisheh, G., (coll. Imbert, F.)
2007 *Les peintures de Quşayr 'Amra. Un bain omeyyade dans la badiya jordanienne, BAH 179-Jordanian Archaeology 1*. Beirut: IFPO / DAJ .

QAṬANAH: RESCUE EXCAVATION

Jehad Haron, Ahmad Lash and Abdalla Nabulsi

The Geographical Location

The site is located near Queen Rania al-Abdulla Street towards the University of Jordan (**Fig. 1**), and this area is known for being a fertile land for agriculture before it was used as a residential area. The geological formation of the area merely consists of a limestone layer. The coordinates of the site: Long. 35.89460, Lat.31.98589

The Field Work

During the demolishing works of an old house, a number of caves were revealed that contained pottery and human bones. And due to the importance of the site and the findings, the archaeological rescue excavation works started in July 2011.

Ruins of burial rooms were revealed carved in the soft lime stone; unfortunately parts of the original roof was destroyed by the construction works which made it difficult to Determine the

original shape of the entrance, if either it was a shaft or an open entrance. (**Fig. 2**)

Architectural Analysis: The Cemetery Description

The top plan for the cemetery shows the presence of three carved in the limestone chambers for the burring.

Tomb 1: (4X5 m), it has one chamber for burying and there were 3 jars with some remains of human bones (**Fig. 3**) (they were in bad condition due to the high humidity).

Tomb 2: (4X9 m) it consists of two chambers, pots were found with two human skeletons remains.

Tomb 3: (4X6 m) it consists of one chamber, and it was covered with dirt and fallen stones. (**Fig. 4**)

The primary analysis confirms that presence of the cemetery that dates back to the Early



1. The destruction of the site.



2. The destruction of the site.



3. Tomb number 1 from inside.

Bronze IV; it consists of a number of burial rooms carved into the limestone, this type of burials known in Jordan during the Early Bronze period (3300-1900 BC).

Pottery Analysis

The excavated pottery can be classified into pots and jugs that have the Early Bronze IV characteristics were found in the tombs dates back to the EB IV. Many parallel examples in Jordan such as Umm el-Bighal Cemetery “west Amman”(Helms 1988: 329)

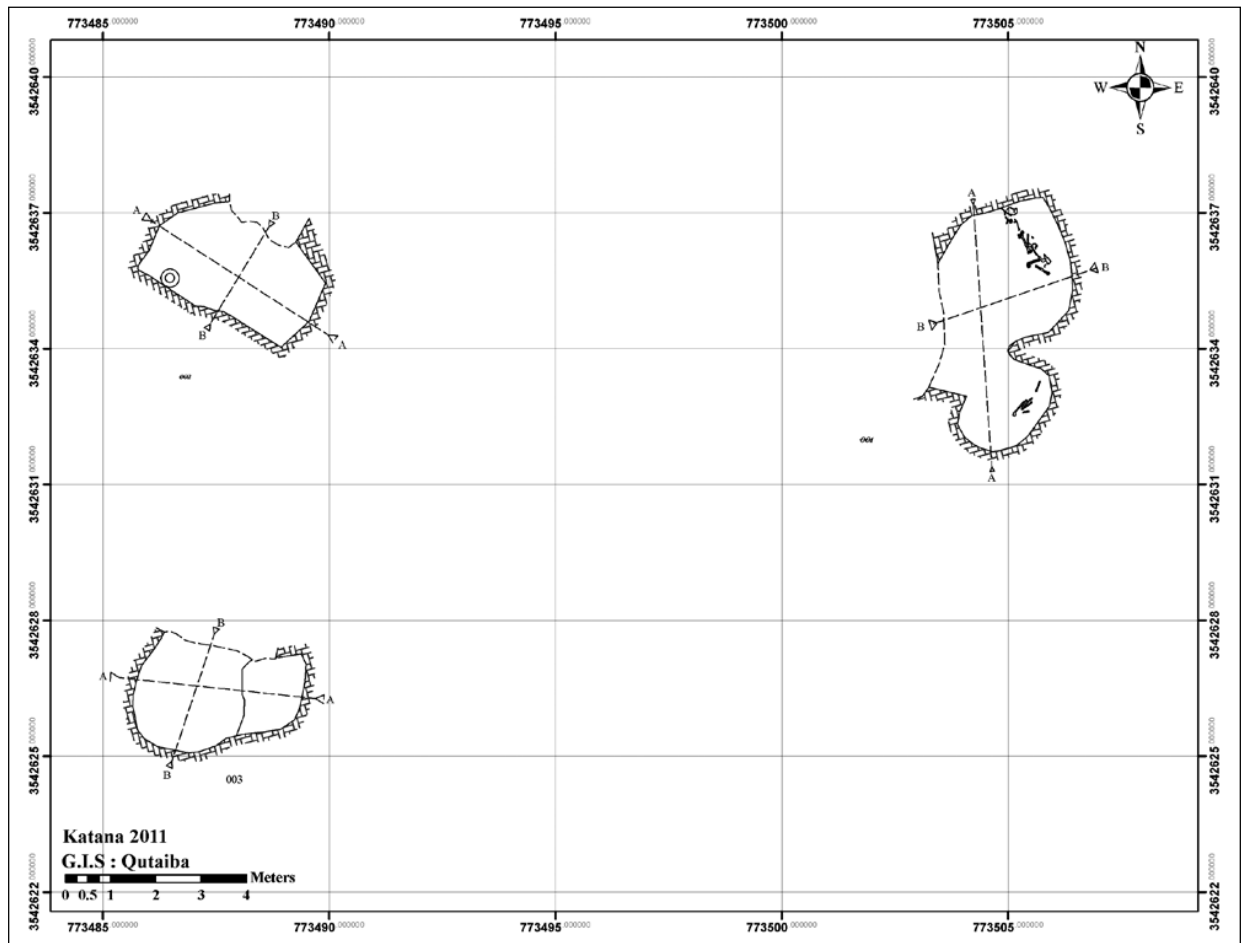
Osteology Analysis

The sorted strongly fragmented and scanty

human skeletal remains belonged to 3 individuals, 2 from Tomb1 (A and B) and one in Tomb2. The bones were covered by calcareous deposits from the limestone of the cave tomb. During the brush-cleaning, the bones smelled lightly perfumed! Bone analyses were undertaken as possible using standard macroscopic methods (related subjects detailed in Knußmann 1988, Bass 1995, White and Folkner 2005).

Tomb 1-A

Only fragmentary and scanty postcranial bones were available, neither skull nor teeth. It was possible to recognize and partly reconstruct the right humerus, clavicular shaft, incomplete



4. The top plan of the site.

long bones of the lower extremities, the vertebrae axis; C7; L2; L3 and body of L4 or L5. Few feet bones were present but were difficult to distinguish from those of individual B. The bones evidently belong to an adult individual. The trabecular bone of proximal epiphyses in some long bones indicates an age above 25 years. General bone robusticity suggest that the remains were of a male individual. The age at death of individual A could be much higher than 25 years. This is indicated by strong degenerative changes observed on the *facis articularis anterior* and *posterior* of the axis grade IV and V, with eburnation, deposits and porosity. Body surfaces of the lumbar vertebrae L2 and L3 revealed lesser degenerative changes, grade III. Small Schmorl's nodes were observed on the on C1 and the L4,5 (Fig. 5). A brown coloration was observed in the shaft's middle part of the right humerus. Within that area, a lesion-like defect penetrated the cortex and reached the tra-

becular bone. The structure could be pathologic or postnatal induced by the corrosion of an iron object placed nearby (Fig. 6). The sharp edge in the lower third of the left tibia, along the *margo anterior* is a normal anatomic variant.



5. The available vertebrae from tomb 1.



6. The long bones of individual A of tomb 1

Tomb 1-B

The very scanty postcranial fragments (**Fig. 7**) probably are of a young adult (~20year), indicated by recent epiphyseal fusion and ossification of available long bone parts. Though the material could be that of a female individual, evidence remains weak. The material allowed no further analyses.

Tomb 2

The fragmentary human bone material, allocated to one individual, was mostly from the distal extremities. It also included two incomplete humeri, radial shaft. The fragments also include one vertebral, one of the left pelvic bone, two cranial, and multiple small ribs, but none of the teeth or pectoral parts. The left pelvic piece revealed a wide sciatic notch thus indicating a female burial. The femur revealed



7. All the remains available from individual B from Qatana's Tomb1.

completed epiphyseal fusion, which was not the case in the upper humeral epiphyses. This allowed estimating an 18-22 years age at death for this individual (**Fig. 8**). This was supported by finding no trace of any degenerative changes on the available joint surfaces. On the right tibia, just below the epiphyses, the shaft appears like a slightly deflated tube. This unusual shape in that region resulted from a relative thick blood vessel, marked by the elongated depression area, entering through the nutrient foramen, i.e. not pathologic. Few measurements were possible on some bones. The right femur and tibia length (439, 366mm respectively) might suggest a 162-165cm body height.

The use of incenses

The use of incenses, ointments and perfumes is well known from ancient Egyptian burials as attested by resin "cakes" found in pre-dynastic burials (Raven, 1990:10), their use in mummifications of subsequent dynasties and in later Graeco-Roman as well as Coptic burials (Lucas, 1930; Raven, 1990: 13; Manniche, 2009:2; Wise, 2009:68). It is probable that the custom spread from Egypt to neighbouring East Mediterranean communities, from which many of the substances were imported, i.e. Lebanon, Palestine (Lucas, 1930:51; Raven, 1990:8). Yet, the available evidence is mostly restricted to suggesting the presence of perfume vessels, such as glass, pottery, metal and others, in the buri-



8. Bones of the lower extremities from Qatana's Tomb2 burial revealing the long depression (arrow) leading to the nutrient foramen of the right tibia. Notice the trace of recent distal epiphyseal fusion of the r. femur.



9. 3d laser scan for some of the artifacts.

als, particularly in Iron Age burials as reported from Crete (Gesell *et al.* 1990: 24), Asia Minor (Isin, 2002), Phoenicia (Gras *et al.*, 1991: 138) and Palestine (Rosik, 2001:52). During the Hellenistic and Roman periods the practice became popular in both urn and inhumation burials. This was evident in Roman burials from Greater Amman area (e.g. Abu-Shmeis and Nabulsi, 2009: 521) Jerash and many of the Khirbat as-Samrā Byzantine burials, as observed by the authors.

The Surrounding Archaeological Sites and the Parallel Examples:

Through the previous studies and the archaeological surveys in the areas around the cemetery site, we were able to identify some of the archaeological sites such as; Qatanah settlement, but it dates back to the Roman times (Abu-Shmeis 2006:4), in addition to the Roman cemeteries (i.e Sports City cemetery), (Haron 2004).

It was possible to identify this site by studying the surrounding archaeological sites and the parallel examples through the previous studies and surveys. Nevertheless, the archaeological excavations did not prove any existing off during the Early Bronze Age, and in 1972 a cemetery was found near Qatanah which dates back to the EBIV. And it consists of a cave that has a burial chamber with a shaft entrance. As well as to the cemeteries found in Amman like; Jabal Taj (Dajani 1967\68), Jabal Jufah (Hadidi1982), Tilāl al-‘Ali (Suliman1985), al-Bassah (Wa-heeb 1994), and Umm al-Bighal.

And as for the pottery findings were revealed in the cemetery that dates back to the EBIV, that was proven through the features that were represented on the jars and jugs, and it is similar to the finding in Umm al-Beghal, and others.

Conclusion

The cemetery dates back to the Early Bronze Age IV as explained before, according to the evidence revealed. However, the lack of presence of settlements near or connected to the cemetery sheds the light on the question about who are these people, are they the original citizens, or are they a group of people who moved from the southern and northern parts of Syria and settled in the area during the end of the Early Bronze Age?

Through analysing the excavated tombs, we could not relate the site to any ethnic group. However, while cleaning the bones, a smell of perfume appeared and maybe this explains a new method of burying the dead in the EB IV, and it is connected with either a certain sect or an ethnic group (**Fig. 9**).

Jehad Haron,
Ahmad Lash
Department of Antiquities of Jordan.

Dr. Abdalla Nabulsi
Hamburg University, Germany

Bibliography

- Abu-Shmeis, A.
2006 Qatana Excavation Report ,Unpublished Report, Department of Antiquities Archive,1.17B.
Abu-Shmeis, A. and Nabulsi, A.
2009 Cremation Burials in Amman, Jordan. *Studies on the History and Archaeology of Jordan*, 10: 513-525.
Bass, W. M.
1995 *Human Osteology: A laboratory and field manual of the human skeleton*. Columbia, Missouri: Missouri Archaeological Society.
Dajani, R.
1967-68 An (EB-MB) Burial from Amman. *ADAJ* 12/13: 68-69.

- Gesell, G. C., Day, L. P., Coulson, W. D. E.,
1990 Tombs and burial practices in the Early Iron Age Crete. *Expedition* 32: 22-30.
- Gras, M., Rouillard, P, Teixidor, J.
1991 The Phoenicians and death. *Berytus* 39: 127-176.
- Isin, G.
2002 Ointment or Medicine Vessels from Patara: An Overview of a simple Hellenistic Form in the Ancient Mediterranean World. *Archäologisch-Anzeiger* 2: 85-96.
- Knußmann, R.
1988 Anthropologie, Bd I/1, Gustav Fischer Verlag, Stuttgart. With contributions by Schultz, M.: 480-496, Sjøvold, T.: 444-480, and Szilvássy, J.: 421-443.
- Lucas, A.
1930 Cosmetics, Perfumes and Incense in Ancient Egypt. *The Journal of Egyptian Archaeology* 16: 41-53.
- Manniche, L.
2009 Perfume. In Willeke Wendrich (ed.), *UCLA Encyclopedia of Egyptology*, Los Angeles.
- Raven, M. J.
1990 Resin in Egyptian magic and symbolism. *Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden* 70: 7-22.
- Rosik, M.
2001 Burial Customs in the Land of the Bible from the Chalcolithic Period to the Herodian Period (4300 B.C. – 70 A.D.). *General View, Przegląd Archeologiczny* 49: 47-58
- White, T. D. and Folkens, P. A.
2005 Human Osteology. San Diego, Academic Press Inc.
- Wise, E.
2009 An “odor of sanctity”: the iconography, Magic, and ritual of egyptian incense. *Studia Antiqua* 7: 67-80.
- Hadidi, A.
1982 ‘An(EB-MB) Tomb at Jabel Jofeh in Amman, *ADAJ* 26: 283-286
- Haron, J.
2004 Madfan al madina al-Ryydieh, *ADAJ* 48: 37-40
- Helms, S. and McCreery, D.
1988 Rescue Excavations at Umm El-Beghal : The pottery. *ADAJ* 32: 319-341.
- Suliman, E.
1985 ‘An EB\MB Tomb at Ta’ el –Ali, *ADAJ* 29: 179-180.
- Waheeb, M. and Palumbo, G.
1994 An Early Bronze Age IV Cemetery al-Bassah near Iraq al-Amir, *ADAJ* 38: 57-62.

THREE SEASONS OF EXCAVATIONS AT KHIRBAT ISKANDAR: 2007, 2010 AND 2013

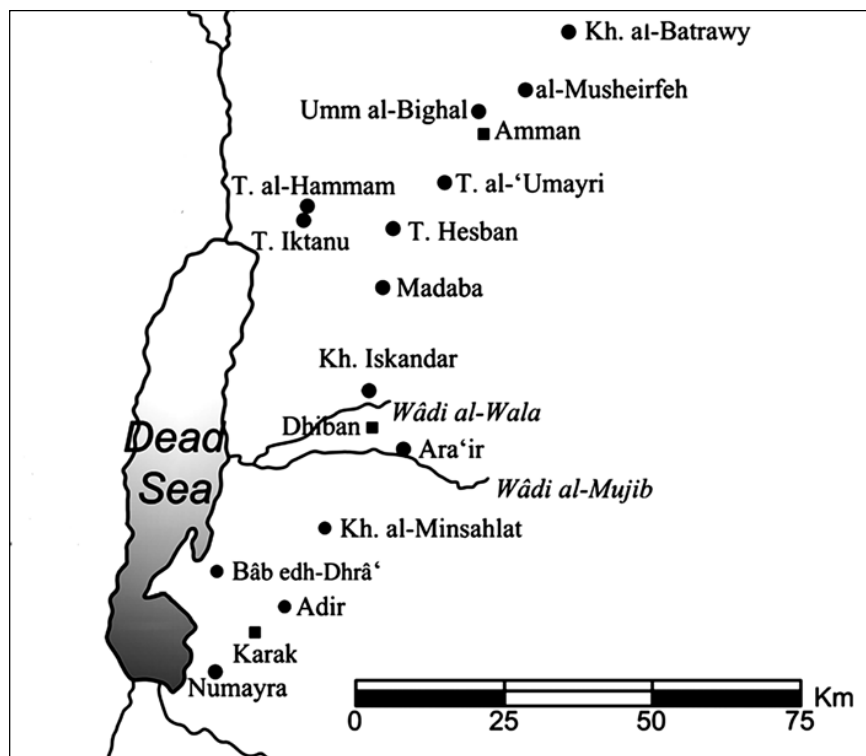
Suzanne Richard, Jesse C. Long (Jr), Rikke Wulff-Krabbenhøft and Susan Ellis

Introduction

This article summarizes the results of the last three seasons (2007, 2010 and 2013) of excavations at the site of Khirbat Iskandar. The consortium members for these three seasons were, once again, Gannon University, Lubbock Christian University and McMurry University. Suzanne Richard served as Principal Investigator and as Co-Director with Jesse C. Long (Jr). Field supervisors were Rikke Wulff-Krabbenhøft and Susan Ellis. The 2007 season took place from 1 June 1 to 9 July, the 2010 season from 20 May to 28 June and the 2013 season from 24 May to 29 June.

The site of Khirbat Iskandar is located on

Wadi al-Wala about 20 - 25 km south of Mada-ba on the King's Highway (**Fig. 1**). The mound itself (**Fig. 2**) covers 2.7 hectares, although as Glueck pointed out (1939: 127), there was an area of ruins just as large to the east where there were structures, menhirs and stone-circles, dated by EB IV sherds. The current project was able to survey and excavate this lower rise to the east before it was destroyed by plowing and the planting of olive trees. The combined area of the two suggests that in antiquity Khirbat Iskandar was a center of over 5 hectares and probably more, given the occupation found by Glueck north of the site, as well as to the south where the famous Khirbat Iskandar menhir



1. Map showing the site of Khirbat Iskandar located on the Wadi al-Wala.



2. Site of Khirbat Iskandar on the north side of the Wadi al-Wala.

once stood (Glueck 1939: Fig. 48). The fortified Early Bronze Age site of Khirbat Iskandar owes its prominence to the perennial Wadi al-Wala, to the caravan route that passed close by the site and to the expansive agricultural lands contiguous to the site (Cordova and Long 2010: 21-35; Cordova 2007: Figs. 5.8 and 6.6, and see pp 189-90). The latter geoarchaeological study has illuminated Khirbat Iskandar as a prosperous Early Bronze Age agricultural site that was eventually abandoned at the end of the EB IV period, owing to unabated erosion and destruction of the floodplain. Among a number of causes, it is likely that a drying trend in the mid-third millennium BC, in combination with intensive land use, steadily diminished the carrying capacity of the landscape. This data set informs our study of the urban and post-urban periods at Khirbat Iskandar in the third millennium BC.

There have been nine major excavation seasons at the site: 1982 (Richard 1983; Richard and Boraas 1984), 1984 (Richard and Boraas 1988), 1987 (Richard 1990), 1997, 2000 and 2004 (Richard and Long 2005), plus the three reported on here: 2007, 2010 and 2013. Along with two pilot seasons, Phase 1 in 1981 (Richard 1982) and Phase 2 in 1994 (Richard and Long 1995), two seasons were devoted solely to restoration: 1998 (Long and Libby 1999) and 2006, although restoration, preservation and consolidation of walls is an integral component of each excavation season. The major archaeological periods investigated at the site thus far date to

the EB III and EB IV, although earlier materials have been encountered on the *tall* and in the cemeteries (EB I and EB II).

This article focuses on Area B, reporting on the following elements: (1) the history of continuous rebuilding of the fortifications at the site, (2) the EB III settlement phasing, (3) additions to the EB IV settlement plans and (4) a summary of the progress of restoration at the site (see **Fig. 3** for squares discussed in this report).

Research Design

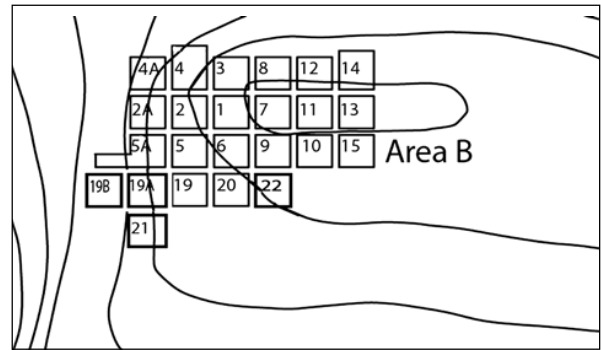
The project's overriding research design includes two major objectives: (1) to study cultural change at the end of the third millennium BC in the southern Levant - a dramatic transition from urban institutions to non-urban economies - and to investigate the rise and collapse of urbanism at the site during the Early Bronze Age (3600 - 2000 BC). Except for recent excavations, work at the site has focused on the first objective, namely the enigmatic EB IV non-urban period. Khirbat Iskandar is one of the best-preserved and best examples of a well-established, multiphase *tall* site in the southern Levant during the rural EB IV period. The recovery of, for example, a 'public building / storeroom', a gate, well-preserved neighborhoods and reuse / rebuilding of earlier walls, as well as the continuous development of antecedent ceramics has demonstrated beyond cavil that there was a high level of complexity in the rural EB IV period and strong continuities with Early

Bronze Age tradition. Excavations at Khirbat Iskandar support an alternative view of EB IV society that contrasts with the traditional model of pastoral-nomadism for the period (and alternate identification of the period as the Intermediate Bronze Age), emphasizing instead that an important sedentary component to the population was extant as well (see summaries of the period in Richard 1987, 2003: 294-300, 2010: 3-5; Palumbo 1990; Gophna 1992; Prag 2014). On the basis of a growing corpus of connections with the subsequent Middle Bronze Age culture (Richard 2000: 403, 2006: 120; Richard and Long 2010: 274-75), we believe that the EB IV sedentary component across the southern Levant kept institutional traditions alive, thus facilitating re-urbanization at the beginning of the Middle Bronze Age, as is seen, for example, in the EB IV - MB IIA occupation at Tall al-Hayyat (Falconer 1994).

With the unique EB IV gate in Area C as well as the EB IV cemeteries published in Vol. 1 of the Project Series (Richard *et al.* eds 2010) and Vol. 2 in preparation (the EB IV settlements in Area B), the project has redirected its focus to the second objective of our research design, namely the investigation of the pre-EB IV strata on the mound.

Overview

Although known primarily for its EB IV multi-phase occupational stratum, excavations at this south-central Jordanian plateau site substantiate an observation made by P. Parr, based on a few ceramic indicators, that there was EB III (and earlier) occupation at the site (1960: 130-32). Excavations over the past three seasons in Area B (**Fig. 3**) have revealed a substantial urban EB III stratum with sub-phases, including multiple rebuilds of the fortifications. Although some aspects of the settlement and fortifications have been known from earlier seasons, it is only recently that the phases of the fortifications, their date and their relation to occupational levels have come into sharper focus. Settlement (*tall*) sites with both EB III and EB IV occupation, like Khirbat Iskandar, are a characteristic of the central and southern plateau areas in Transjordan, including the south-eastern Dead Sea area (Palumbo 1990: 46; Chesson *et al.* 2005, table 8; Schaub 2009: 101-110).



3. Topographic map of Khirbat Iskandar showing Area B and excavated squares, at the northwest corner of the mound.

Previous reports (see Richard 2010 *et al.* eds, and earlier reports cited therein) have tentatively identified six phases (A - F) in Area B. From the top, Phases A (domestic settlement) and B ('storeroom / public building') represent the EB IV occupation. Phase C (EB III) includes an upper destruction level (C1) and founding settlement (C2), as well as the outer fortifications. Phase D is the earlier stage of fortifications, the mud-brick / stone base inner wall, previously thought to be EB II (but see below). Phases E - F, discovered in early seasons, were dated to EB I - II on the basis of few diagnostics. Little more is known about these two superimposed layers of wall fragments north of and running below the corner 'bastion / tower'. Although our overall understanding of the phasing in Area B still stands, new discoveries in the last few seasons require some modification (see below) to the stratigraphic profile and dates previously published.

The two major discoveries that impact and shed light on the stratification of the site are: (1) the discovery of a new EB III fortification line and (2) the discovery of EB III occupational remains that run under the EB III fortifications on the north. Both of these were unexpected discoveries that help to resolve several questions about the construction history of the fortifications and their respective dates, both conundra for a number of years. The new data inform the nature of the EB IV fortifications at the site. Still puzzling is the seeming dissonance between the (two-phase EB IV) stratigraphy of Area B and the (three-phase EB IV) stratigraphy of Area C. In the latter area, the earliest phase was termed transitional EB III / IV (see stratigraphic report in Long 2010). There

are hints of a similar phenomenon in Area B, where sub-phasing may provide an explanation. If not, there may simply be a disconnect between the two areas or, alternatively, the substantial EB III destruction / EB IV rebuilding activities in Area B have obscured the data.

Fortifications

The EB III fortifications: Phases C - D

Throughout the 2007, 2010 and 2013 seasons, work concentrated on exposing more occupational ties to the fortifications, excavating probes and sections of the fortifications, all in an endeavor to clarify, once and for all, the relationship of Phase C to Phase D and to date both definitively. It would be useful at this point to review the site's fortifications as previously published in preliminary reports.

The 3 m wide northern fortifications comprise two wall traces, an inner mud-brick / stone base wall (B3014) and an outer stone line (B3017), with a rubble layer (B3019) in between (Richard and Boraas 1984: Fig. 14; Richard 1990: Figs. 3 and 5). At the north-west, the outer curtain bonded to the corner 'bastion / tower' whose preserved height was 2.25 m. A balk section between Squares B3 / B4 illustrates the various components, the rubble appearing to be a buttress against the fallen inner wall (**Fig. 4**). We called the mud-brick / stone base inner wall Phase D; the outer line and its various constitutive parts (rubble fill / buttresses / 'tower') we interpreted as a subsequent (Phase C) fortification built to shore up and expand the site's defenses following an apparent destruction of Phase D. Also part of the discussion at the time



4. Khirbat Iskandar Sq. B4/B3 balk: collapsed inner Phase D mud brick/stone base wall, outer Phase C stone wall on left, rubble/buttress in-between, at the northwest corner. Looking east.

was the consideration that the two were constructed originally as a double-wall defensive system, a possibility that can now be dismissed.

The continuation of the Phase C outer curtain wall on the west was a 3 m wide rubble-covered sloping wall abutting the south-western corner of the 'bastion / tower'. This 'rubble' wall also had three components, but its construction technique differed appreciably from the northern outer curtain (**Fig. 5**). A section through the wall and beneath the 'rubble' cap, revealed a one-row 1.65 m high inner wall (B2024B), an outer wall of two to three courses and two rows (B2A005), and a rubble interior (B2A005A). The wall's rough abutment to the 'bastion / tower', including a massive monolithic stone, gave the appearance of a later block (Richard and Long 2005: Fig. 4). The disparity in construction technique between the northern and western fortification lines notwithstanding, the 'rubble wall' appeared to be the only candidate for a Phase C western fortification line. This assessment is coming into serious question in light of the 2013 season. Finally, a section through



5. Khirbat Iskandar "rubble wall": outer line (between sandbags), inner line at top and rubble in-between; looking east.

the ‘rubble wall’ in Squares B2 / B2A showed it to be superimposed over an earlier wall system (identified as Phase D), which included a mudbrick / stone base wall of the same construction technique as the ‘inner’ curtain wall on the north. The wall was also associated with a type of buttress / pier, as on the north (Richard and Long 2005: 270, Fig. 9; here **Fig. 6**).

In the past three seasons, we have uncovered more of the Phase C and D fortifications, such that we believe we have a much better grasp of their construction history and dating. It is now clear that the Phase D fortifications represent an early phase of EB III, as occupational surfaces excavated in 2013 attest (see below). In 2007, work renewed in Squares B2 / B2A (just mentioned) for the specific purpose of investigating the newly uncovered Phase D fortification lying below the ‘rubble wall’. Continued excavation has delineated a curvilinear stone wall (B2108), on top of which lay a solid mass of mud-bricks and mud-brick debris. It gave every appearance of a tower, including being later buttressed by stone structure / pier B2A007 (**Fig. 6**).

A second (Phase D) curvilinear wall (B2A077) - likewise lying below the ‘rubble wall’ - came to light in the 2010 season juxtaposed opposite curvilinear wall B2108. A stone threshold between the two enhanced the probability that we had a Phase D passageway (gate?) between the two curvilinear structures (**Fig. 7**). The bottom row of W. B2A077 ran up to (and below) the Phase C ‘bastion / tower’, giving every appearance of having been cut by the latter



7. Khirbat Iskandar Phase D: threshold and two juxtaposed curvilinear “towers,” W. B2A077 to left and W. B2108 to right. Corner of “bastion/tower” top.

construction. It is almost certain that the curved structure B2A077 relates to the Phase D inner wall to the north, although the later ‘bastion / tower’ obscures the connection. As we shall see, further evidence for curved structure B2A077 being cut by a later Phase C wall became evident in 2013, when we discovered a new fortification line on the west.

This past season, a section was excavated against the exterior face of the ‘rubble wall’ (B2A005) in order to trace the underlying Phase D curvilinear wall (B2A077) and determine if, indeed, it was a tower. The expanded section not only revealed the continuation of the curved Phase D wall, but also that it had been cut by a substantial fortification line, new wall B2A120 (**Fig. 8**). Expanding the section to Square B4A,



6. Khirbat Iskandar Phase D mud brick/stone base wall with Phase C buttress at right; both below the “rubble wall” (left).



8. Khirbat Iskandar northwest fortifications: “bastion/tower” (top); rubble wall” B2A005, including partial remains of rubble interior (center), overlying curvilinear wall B2A077 either side; new fortification line B2A120/B4A006 to left under meter stick.

the new fortification proved to abut the ‘bastion / tower’ at its north-west corner (B4A006) and to be of a construction similar to it and to the northern outer Phase C curtain wall (and founded some 1.5 m lower than the ‘rubble wall’). It is now clear that this new wall is the original Phase C western perimeter wall and that the ‘rubble wall’ is a later phase (see below).

The 2013 discovery of the new Phase C (EB III) fortification wall (B2A120 / B4A006) has clarified not only the construction history of the fortifications, but also the nature of the strengthened north-west corner. As is clear in **Fig. 8**, in the original Phase C construction, there was no tower projecting beyond the curtain wall, as appeared to be the case with the abutment of the ‘rubble wall’ against the south-west corner of the ‘bastion / tower’. The Phase C strengthened defenses at the north-west corner represent an interior bastion or platform of some sort. Based on the stairway and the interior space, it clearly included a guardroom (see Richard and Boraas 1984: Figs. 12-13). About 4.5 m from the south-west corner, there is a four-step stairway leading up to what we call a platform, which extends 10 m up to a transverse wall. The expanded defenses enclosed the inner mud-brick wall and collapse, extending the width of the fortifications to 7 m at this point (see **Figs. 8** and **11**). As at other Early Bronze Age sites, for example Bab adh-Dhra’ (Rast and Schaub 2003: 280-83) and Numayra (Coogan 1984), the builders incorporated transverse walls perpendicular to the fortification line, but whether these functioned as an earthquake device or simply a segmental construction method is unknown. Khirbat Iskandar thus joins other sites where the erection of bastions and platforms attest to the strengthening of defenses within the EB III period, as at Tell Yarmut (de Miroschedji 1990). The strengthened north-west corner, the highest point on the mound, along with its occupational evidence (below) suggests a possible public area.

Finally, work over the past three seasons has recovered a candidate for the ‘missing’ Phase D curtain wall on the west (B5A043). The latter - of a construction similar to mud-brick / stone base curvilinear W.B2108, including the buttress / pier - lies to the south of B2108 in contiguous Square B5A (**Fig. 9**). Although a balk separates the two walls (B5A043 and B2108)



9. Khirbat Iskandar: Phase D mud brick/stone base curtain wall (B5A043) on western perimeter; curvilinear Phase D “tower” on other side of balk to north. Stone buttress at bottom right corner.

and although they do not line up, these two similar constructions are almost certainly contemporaneous and related. In 2013, a section to investigate the buttress against W. B5A043 showed that it too ended against a mass of mud-brick collapse, as noted elsewhere. Again, the series of Phase C buttress / pier constructions apparently served as a technique to stabilize the earlier (Phase D) collapsed wall in the rebuilding and expanding of the fortifications.

The EB IV fortifications

As has, hopefully, become apparent in this discussion of the Khirbat Iskandar fortifications, the ‘rubble wall’ (B2A005 and components) is the last major rebuild of the fortifications. We have shown that this relatively insubstantial construction superseded newly discovered Phase C EB III western perimeter wall B2A120 / B4A006. The ‘rubble wall’ is in many ways the most complex defensive element stratigraphically speaking, since, as well as being associated with the Phase C bastion and outer curtain wall on the north, it is also intertwined with Phase A, B and C walls along the western perimeter of the site. To review, the ‘rubble wall’ overlies Phase C pier / buttress B2A007 that abuts Phase

D curvilinear W. B2108 (**Fig. 6**). The ‘rubble wall’ likewise overlies Phase D curvilinear wall B2A077 (**Fig. 8**). There is a thin soil layer between the upper and lower phase constructions. Although the ‘rubble’ wall may represent a late EB III effort to quickly shore up the defenses on the west once the Phase C curtain wall (newly discovered W. B2A120 / B4A006) went out of use, there is mounting evidence to support the view that the EB IV population not only used, but rebuilt - and very possibly erected - the ‘rubble wall’. Germaine to this proposition are multiple lines of pertinent data, in addition to the above stratigraphic evidence.

We have noted in previous seasons that the Phase B ‘storeroom’ was built against and reused the outer Phase C curtain wall on the north, as demonstrated by W. B14025. Also, in earlier excavations, several courses of walls were found to have built up the height of the ‘rubble wall’; the bastion and the rubble cap to the ‘rubble wall’ appear to be deliberate. These data now are comprehensible and correspond well with an EB IV rebuild. Phase B occupational surfaces, in particular, have in the past been found linked to the ‘rubble wall’. The clearest evidence for EB IV construction in relation to the defenses, however, comes from the last three seasons of excavations in Squares B5A and B19A on the western perimeter, south of the bastion.

In the western half of Square B19A, four substantial intersecting walls converge (B19A021, B19A043, B19A042 [‘rubble wall’] and B19A020). Moreover, as mentioned earlier, there are Phase A, B and C walls intertwined and reused, for example, Phase A W.B19A003 reuses as a threshold Phase B - C wall B19A021. Both of the above factors render a definitive stratigraphic analysis challenging, to say the least (see **Fig. 10**). Nevertheless, it is possible to make the case for EB IV construction in relation to the ‘rubble wall’; thus three-course Phase B domestic wall B19A019 (east part of square) was definitively shown in 2013 to continue as six- to seven-course W. B19A043 and to intersect with the ‘rubble wall’ (B19A042). (In the previous, 2010, season a cache of whole and restorable EB IV vessels was found on the surface associated with W.B19A019). Combined W. B19A019 / B19A043 is founded at a higher level than the three other intersecting walls with



10. Khirbat Iskandar: Phase B EB IV wall B19A019/ B19A043 (under meter stick) intersecting with “rubble wall” at right and with Phases A-B-C wall B19A021 at left; at the bottom of the photo is W.B19A020. Above Phase B wall is Phase A wall stub B19A003 to right of pillar (not in-situ).

which it is associated, ending at Surface 19A041 on a layer of destruction. The other three walls continue through a layer of silt and appear to end at a layer of destruction (B19A044); in fact, the ‘rubble wall’ appears to overlie a course of mud-bricks.

Despite the limited exposure of the four walls, the data are compelling enough to posit not just a reuse, but a late rebuild of the defenses at the site in Phase B; viz. EB IV W.B19A019 / B19A043 intersects with earlier non-domestic walls of great depth, including the ‘rubble wall’. We are positing as a hypothesis to test that the ‘rubble wall’ was constructed in the EB IV period. At the present time, we are considering it an EB III / IV fortification. The cumulative data correlate nicely with the description of the site provided by Nelson Glueck (1939: 127-28).

As he noted, there were prominent fortifications visible around the site, along with towers, and an east - west wall bisecting the site. These visible defenses, now affirmed by excavation, relate to the latest occupation discovered on the mound: the EB IV period.

The Fortifications and the Amended Khirbat Iskandar Site Phasing

The new Phase C outer wall (B2A120 / B4A006) has provided the missing link in the construction history of the Khirbat Iskandar fortifications. The wall helps us to explain some heretofore unresolved questions about the defensive system at the site; it also requires that we amend our earlier reported phasing (above).

The amended sequence is as follows: Phase D fortifications (inner mud-brick / stone base wall and curvilinear structures, as well as the mud-brick / stone base western curtain wall) are the earliest, now confidently dated to the early EB III period (see occupational evidence below). Subsequently constructed, the Phase C fortifications (bastion / platform associated with outer walls on north and west, along with other Phase C components (piers / buttresses / transverse walls) also date to the EB III, based on occupational surfaces associated with these fortifications. When the Phase C western curtain wall (B2A120 / B4A006) went out of use, the 'rubble wall' - a less substantial construction - was erected at the south-west corner of the bastion. We are presently identifying it as an EB III / EB IV (Phase C - B) wall, based on the sum of the evidence detailed above.

The EB III Settlement

Phase C

Since the earliest EB III settlement (Phase D) has limited exposure to date, we begin with the somewhat later, Phase C settlement. As reported previously (see Richard and Long 2005 for details), the EB III (Phase C1) settlement was discovered under a major destruction layer. This phase comprised the B1 / B7 central room with pillar base and numerous storage jars, the B2 well-preserved (1.0m high) 'doorway wall' (**Fig. 11**) and the B5 storeroom / workroom with its enigmatic mud-brick bench (B5024A) feature (see Richard and Long 2005: 3, 10, 12). The collapse also included remains of wooden beams,



11. Khirbat Iskandar: EB III central room with "doorway wall" at top, bastion/platform to right. Looking west.

quantities of carbonized seeds, and whole and restorable vessels. The 2007 season exposed more of the central room in the east, where a distinct activity area in a paved corner included a horn core, small mortar and a pithos neck used as a stand (Richard and Long 2005: 271). In 2010, in the small area between the B1 'doorway wall' and the diagonal (partition?) wall of the central room, we uncovered an interesting activity area of hearths, one fairly large (1 x 9.75 m), a smaller one and one found previously in the balk (**Fig. 12**). The 2010 and 2013 excavations also provided evidence for additional activity areas just to the south.

On the basis of a large open area in B6 to the south of the central room, it is probable that what we have is a courtyard, based on the activity areas contiguous to the mud-brick bench-like feature in B5. Several installations came to light: a well-made stone bin and pavement, mortar encircled with stones and two small postholes (**Fig. 13**), all connected by a plaster surface to the surface of the central room. The surface turned patchy, especially in the south-east corner of B6, the location of two midden levels yielding an abundance of bone fragments, pottery sherds and seeds, together with several



12. Khirbat Iskandar Phase C hearth found in B1, east of the “doorway wall.”



13. Khirbat Iskandar courtyard features in B6: bin, mortar, and post holes; mud-brick bench feature to right.

grinding stone fragments, hammer stones and a few lithics. It is likely that these middens contained the refuse from activities in the courtyard and, perhaps, from the mud-brick feature. As reported in an earlier article (Richard and Long 2005: 273, Fig. 12), the enigmatic B5 mud-brick bench-like structure included two ledges, on one of which sat a large EB III jar. Hoping to clarify the function and plan of the feature, as well as to pull the contiguous areas together, we removed several balks in 2010 and 2013. Unfortunately,

only the very fragmentary and poorly preserved eastern half of the mud-brick feature remained. However, the activity areas mentioned earlier may provide a context that enhances one of the several explanations proffered in the past for the feature (kiln; bench; work area; storeroom). It is likely that it was a workshop. Found in association with it were a number of ground stone vessels, e.g. a lovely hematite bowl, a mace-head, a stamp seal, a potter's tournette, a number of bowls with one or two depressions (or only partial depressions) and grinding stones (see details in Richard and Long 2005: 273-74).

In combination, the features discovered in association with the central room / courtyard provide evidence of activities related to pottery (tournette and whole vessels), to ground stonework (numerous objects discovered), to food preparation and storage (grain; mortar; hearth; bin), disposal (the middens) and possibly others. It would be fair to say that significant activities took place in the vicinity of the central room, where the evidence of seeds and grain from pithoi and storage jars of various sizes suggests it may have been a storage facility.

The contiguity of the various installations, a specialized workshop perhaps, and activity areas in relation to the central room with its imposing entrance (the ‘doorway wall’), all within the strengthened defenses at the north-west corner of the site, does offer a new lens through which to view the character of occupation in the area in EB III. Although much more finds processing and study of the material culture in the Phase C1 settlement thus exposed is essential, it is likely that we have uncovered a public area.

Phases D / E

In 2013, in order to expose more Phase D occupation with as little destruction to the Phase C settlement as possible, we excavated the small area east of the B2 ‘doorway wall’ (Fig. 14). Reestablishing the B2 / B1 balk, the goal in Square B2 to the west was, hopefully, to find the continuation of curvilinear wall / ‘tower’ (B2108) which seemed to disappear under doorway wall B2095. Although excavation did not uncover the wall (it apparently follows the line of W. B2095), important stratigraphic information came to light below the pavement associated with the threshold of the Phase C ‘doorway



14. Khirbat Iskandar: Sq. B2 on right with Phase C pavement and threshold in "doorway wall;" on left in Sq. B1 is new Phases D-E structure running under Phase C platform at bottom.

wall'. The pavement overlay a hard mud-brick surface. It is a recurring pattern at the site to find the top of mud-brick debris leveled to serve as a surface. Below the debris layer - clearly related to the Phase D destruction - two additional surfaces were traced that corresponded to surfaces on the west side of the 'doorway wall'. Significantly, clear EB III diagnostics (platter rims and ledge handles) on the surfaces gave us our first indication that Phase D was within the EB III period.

In the Square B1 excavation to the east, work began by excavating the early surfaces connected with the Phase C hearths, described above. Below the latter residue and two layers of collapse, the corner of a large stone structure (B1102/103) began to appear, one wall continuing eastward under the partition wall of the central room, the other running northward under the platform. Two interior beaten earth surfaces, seemingly coeval with those found in adjacent Square B2, were excavated, below which a thick layer of ash and collapsed mud-brick was encountered. Excavation ended at the founding level surface associated with the 1 m high structure. The surface was some 0.5 m lower than the Phase D fortifications. Although we kept expecting EB II pottery, what we found inside the structure was early EB III (EB IIIA) ceramics. More exposure is necessary before we can understand this structure's broader context, but its stratigraphic position is clear: the structure lies below Phase C, was reused in Phase D and was founded earlier than the Phase D fortifications. Tentatively, we are designating the struc-

ture Phase D - E and are looking to correlate it with the wall fragments discovered in earlier seasons to run under the north-west corner bastion (see above).

The EB IV Settlement

Over the past three seasons, several newly opened squares have expanded our perspective on the EB IV Phase A - B settlements, as well as providing new information on their relationship to the fortifications. For reports on these settlements prior to 2007, see Richard and Long (2005).

Phase A settlement

This report presents the most significant new information garnered about the Phase A settlement plan over the last three seasons, *viz.* greater exposure of the B19 building in the southwest (Richard and Long 2005: Fig. 7), a new line of domestic buildings (as seen in B22) on the south side of the projected street and more architectural tie-ins to the fortifications. Note that since the last preliminary report (Richard and Long 2005: Figs. 5 and 8), we have determined that the two deep circular silos (in B15 and B20) should probably be dated to the Iron Age. Originally, it was not clear whether or not the bins were in association with EB IV surfaces or had cut them. The latter appears to be the case, especially regarding the B15 bin, where the evidence is clearer than in B20. Without further excavation of the latter feature, we cannot be certain of its attribution.

The Phase A settlement is the most extensive plan at the site, stretching over 25 contiguous squares. Its interconnected long- and broad-room buildings around courtyards reflect a domestic phase, evidenced by a great deal of domestic material remains (e.g. *tabuns*, sunken mortars, stone work tables, stone table with depression, stone benches, many querns, grinders and food preparation material. A unique aspect of the settlement is the existence of Phase A2 pillared buildings (rows of stacked drums and orthostats; see Richard 1990: Figs. 6-7) which were filled in to make solid walls in Phase A1. The use of pillars in various ways seems to be characteristic of the site. On the southern edge of the building complex, there was an apparent corridor or street lined with cobbles.

The B19 / 19A multi-roomed building - one room of which we interpreted as a kitchen (Richard and Long 2005: Figs. 5, 7) - proved to be a large multi-roomed structure (12 m in length). In 2010, excavation exposed another room in which two different-sized pillars, along with an associated row of cobbles, had been erected opposite the doorway. Given the disparate sizes of the pillars and the fact that no other structures at the site have two central pillars, it is tempting to see this room as a domestic cult room. On the south, the building ends in B21, where new excavations uncovered a stone-lined bin outside the building.

That there was a line of domestic buildings south of the above-mentioned corridor / street / open cobbled area is affirmed by recent excavations in Square B22, where a new row of structures emerged (**Fig. 15**). A corner house continued into B20 to the west and into the south balk. Architectural features to the south, as well as a pillar base, were associated with the building by means of a hard-packed surface (the top of the Phase B roof collapse) that extended through most of the square.

Finally, excavation resulted in the discovery of several more architectural tie-ins of Phase A walls to the late western fortification, the 'rubble wall' discussed in detail above. In addition, to the south-west in B5A and B19A, walls B5A003, B5A074 and B19A045 ran up to the 'rubble wall'. There were also features such as bins (e.g. B5A007). The architectural wall tie-ins often represent a second or third rebuild and complicate the disentanglement of Phase A, B and C walls on the west, which are under fortifications as discussed above.



15. Khirbat Iskandar: new Phase A (EB IV) structure and features in Square B22.

Phase B settlement

In the last three seasons, thanks to more horizontal exposure of the underlying Phase B settlement, it is possible to situate the 'public building / storeroom' within a broader context. As reported previously, constructed against the outer fortifications on the north was a multi-roomed structure comprising three contiguous rooms, viz. a bench room, a central room with pillar bases and a third room at the eastern end (see Richard 1990: Figs. 8-17; Richard and Long 2005: Fig. 6). A doorway in the south wall of the central room led to an apparent courtyard, as well as a 'corridor' room. Earlier reports have discussed the contents of the 'storeroom' (150 restored vessels to date; see also Richard 2000), the well-appointed and interesting array of features, including a stone bin and stone-lined pit with a bowl containing a bovid hoof in association with two horn cores. The cumulative evidence (including numerous miniatures) from this exceptional EB IV building, suggested the presence of social stratification, perhaps an elite enclave occupying a well-defended area at the north-west corner, as may have been the case in EB III (above). The unmistakable markers of a storeroom and hints of ritual activities seemed convincing enough to identify a public building in this EB IV rural period. Recent excavations have enhanced our view of this remarkable complex and have expanded our understanding of the Phase B buildings further to the west.

In 2007 and 2010, excavations under Phase A walls in B10, B11, B13 and B15 discovered that the 'public building' was more extensive than originally thought, as two additional rooms came to light just east of the 'corridor' room, bringing to six the number of rooms thus far excavated. Work in B10 also showed the 'corridor' room to extend further to the south than originally projected. As mentioned above, wall B14018/25 definitively connected with the outer fortifications.

Elsewhere, work exposed more complete architectural plans to the west and south-west. Excavations in Square B21 in 2013 contributed the context for the whole vessels found the previous season in the roof collapse associated with east - west W. B19A019 (connected to the 'rubble wall', as reported above). We now know that W. B19A019 was the northern boundary

of a two-roomed structure (Fig. 16), comprising a bench room where a lovely intact EB IV ‘teapot’ sat on the Phase B surface and a second room where excavators meticulously recovered 15 whole vessels *in situ* (Fig. 17). The team recovered another 13 bags of restorable pottery. There was an unusual predominance of vessels close in size range, *viz.* small closed jars, small bowls, cyma-profile bowls and even a miniature jar found previously only in the cemeteries (Petersman and Richard 2010: Fig. 10.7: 1-2, 5-8). The room also yielded a lovely metal rolled toggle pin (Fig. 18) and a bone amulet decorated with two rows of circles.

In the north balk of Square B5A, a large stone-lined bin (B5A050) was discovered built against the ‘rubble wall’ (Fig. 19). Analogous to the ‘storeroom’ bin (see Richard 1990: Fig. 10), the B5A feature was likewise extremely well-made with large stone slabs, although it was more elongated (1.4 x 0.6 - 0.75 m) and shallower (0.4 m) than the ‘storeroom’ bin (1 m diameter and depth). The construction of both subterranean bins cut through Phase C mud-brick debris; a coat of plaster covered the leveled top of the mud brick, becoming the major surface for Phase B. Notably, two miniature jars and a miniature teapot lay near the ‘storeroom’ bin, while two votive cups sat on the surface near the B5A bin. Importantly, the latter bin sheds light on previously discovered remains in B5A near the balk: a wall fragment on whose associated surface lay a zoomorphic figurine, a pestle and a small mortar.

As for the context of the B5A bin and other features mentioned above, the removal of balks and several Phase A walls afforded us an expanded view of relatable features, albeit more study



16. Khirbat Iskandar: Phase B (EB IV) structure in Square B21, to right a bench-lined room, to left a room filled with small-sized vessels; Phase A wall at top.



17. Khirbat Iskandar: vessels in situ in the western room of the Square B21 (Phase B) structure



18. Khirbat Iskandar: Rolled-head metal toggle pin discovered in B21 (Phase B).



19. Khirbat Iskandar: Phase B elongated bin built against ‘rubble wall’ in Square B5A north balk

is needed to piece everything together. The bin sits opposite a doorway, framed by two monumental pillar bases protruding from the B5 west balk. One base connects integrally to another feature jutting out of the B5 west balk: a square stone platform, 1.25 m in width x 3 m in length thus far, including several layers of pavers at the north end. Associated with the platform was a unique pillar composed of a lower vertical (fluted) drum and a flat horizontal stone on top (**Fig. 20**). Additionally, a small two-stone pillar came to light just north of the platform. When pieced together, this area is quite unlike anything seen elsewhere in Phase B, given the monumentality of the platform and contiguity of the various features mentioned. It should be noted, in this regard, that it was on Phase B mud-brick surface B5007, near the west balk and platform where a bronze miniature socketed spearhead was previously found (Richard 2006: 119-132, esp. Fig. 2). This constellation of features hints at specialized activities in the vicinity of the bin (as we have inferred for the 'storeroom' bin).

Finally, aside from additional Phase B wall lines found in the B9 north balk, new square B22 provided a glimpse of occupation south of the 'storeroom'. Discovered below the Phase A wall discussed earlier was a Phase B wall continuing into Square B20 to the west in association with several restorable storage jars in roof collapse. Again, additional linkages between the Phase B settlement and the late western fortification, i.e. the 'rubble wall', confirm - we believe - that the EB IV population rebuilt and continued to use the fortifications.



20. Khirbat Iskandar: a unique pillar in association with Phase B platform in B5/B5A balk; looking south.

Conservation

The conservation, consolidation and preservation of the Early Bronze Age settlements uncovered at Khirbat Iskandar are an integral component of our research design every season. With the completion in 2006 of the restoration of the gate in Area C at the south-east corner of the mound (Long and Libby 1999), the project now concentrates on Area B EB III - IV architecture. Virtually every major wall has been consolidated, including the corner bastion / platform, as well as standing walls throughout the field. Our overall field research and strategy for excavation is, to a certain extent, driven by our designation of certain areas of the mound for Phase A, B, C or D preservation. For example, we intend not to excavate below the Phase B storeroom complex, we are leaving the exceptional and extensive Phase A building complex in B19 / 19A at the south-west corner and we are preserving the Phase C settlement in the middle of Area B, as well as the various phases of the fortifications. Ultimately, Khirbat Iskandar should be a showcase for viewing the important stages in the urban / non-urban Early Bronze Age.

Acknowledgments

The authors would like to acknowledge their gratitude for the wonderful support of the Department of Antiquities over the past three seasons, especially the late Director-General, Dr. Fawwaz el-Khraysheh, and acting Director, Mr. Fares al-Hmoud. Thank you also to Ali el-Hayyat and Mr Yezid Elian, both of whom were very helpful to the project as directors of the Madaba District Office. A special note of thanks goes to our Departmental representatives: Khaled Ahmad al-Hawawreh, Husam Hjazeem and Amal Khaled. We would also like to thank the staff at ACOR for their wonderful assistance and support, in particular, the director, Dr Barbara A. Porter, and Assistant Director, Dr Christopher A. Tuttle. A great deal of thanks goes to Professor Bill Libby, co-director of the Khirbat Iskandar consortium, for his invaluable assistance. These three seasons were made possible by the financial support of the consortium schools, Gannon University and especially the Collins Institute for Archaeological Research, Lubbock Christian University and McMurry University, and private donors. We would like

to acknowledge grants supporting the project and staff from Gannon University, the Harris Foundation, the Heritage Foundation, the Harrelson Fellowship and the Jennifer Groot Fellowship. We would like to acknowledge our senior staff members in the field: Rikke Wulff-Krabbenhøft and Dr Susan Ellis (field directors), Romulo Rama and Gary Kochheiser (photographers), Dr James D'Angelo (Survey Leader), Paul Stanley Holdorf (Information Specialist / camp manager), Dr JoAnn Long (Camp Manager), Dr Richard Moodey (Artist), Dr Louise Bertini (faunal analyst), Tina Curtis (pottery registrar), Dr Marta D'Andrea (objects registrar / supervisor) and Fawwaz Ishakat of the Hashemite University (surveyor / architect). It goes without saying that without the great work by the supervisory and volunteer staff - too numerous to mention here - this report would not have been possible. To all of them, we are sincerely grateful.

Addresses

Suzanne Richard
Gannon University
Erie, PA 16505
USA
richard@gannon.edu

Jesse C. Long (Jr)
Lubbock Christian University
Lubbock, TX 79407
USA
jesse.long@lcu.edu

Rikke Wulff-Krabbenhøft
Uppsala University
Uppsala
Sweden
rikke.wulff@gmail.com

Susan Ellis
Wayne State College
Wayne, NE 68787
USA
suellis1@wsc.edu

Bibliography

Chesson, M.S., Makarewicz, C., Kuijt, I., and Whiting, C.
2005 Results of the 2001 Kerak Plateau Early Bronze Age Survey. *AASOR* 59: 1-62. Boston: American Schools of Oriental Research.

- Coogan, M.D.
1984 Numeira 1981. *Bulletin of the American Schools of Oriental Research* 255: 75-82
- Cordova, C.E.
2007 *Millennial Landscape Change in Jordan: Geoarchaeology and Cultural Ecology*. Tucson: University of Arizona Press.
- Cordova, C. E. and Long, J. C., Jr.
2010 Modern and Ancient Environment. Pp. 21-35 in S. Richard, J. C. Long, Jr., P. S. Holdorf, and G. Peterman (eds.), *Archaeological Expedition to Khirbat Iskandar and Its Environs*. Vol. 1: Khirbat Iskandar Final Report on the Early Bronze IV Area C "Gateway" and Cemeteries. *AASOR* 14. Boston: The American Schools of Oriental Research.
- deMiroshedji, P.
1990 The Early Bronze Age Fortifications at Tell Yarmut – An Interim Statement. Pp. *48-* 68 in *Eretz Israel* 21 (Amiran Volume). Jerusalem: IES.
- Falconer, S.
1994 Village Economy and Society in the Jordan Valley: A Study of Bronze Age Rural Complexity. Pp. 121-42 in G. M. Schwartz and S. E. Falconer (eds.), *Archaeological Views from the Countryside: Village Communities in Early Complex Societies*. Washington and London: Smithsonian Institution Press.
- Glueck, N.
1939 Explorations in Eastern Palestine III. *AASOR*: 18-19. New Haven: American Schools of Oriental Research.
- Gophna, R.
1992 The Intermediate Bronze Age. Pp. 126-158 in A. Ben-Tor (ed.), *The Archaeology of Ancient Israel*. New Haven and London: Yale University Press
- Long, J. C., Jr.
2010 The Stratigraphy of Area C. Pp. 37-68 in S. Richard, J. C. Long, Jr., P. S. Holdorf, and G. Peterman (eds.), *Archaeological Expedition to Khirbat Iskandar and Its Environs*. Vol. 1: Khirbat Iskandar Final Report on the Early Bronze IV Area C "Gateway" and Cemeteries. *AASOR* 12. Boston: The American Schools of Oriental Research.
- Long, J. and Libby, B.
1999 Khirbet Iskander. Pp. 498-99 in V. Egan and P.M. Bikai (eds.), "Archaeology in Jordan, 1998 Season." *AJA* 103.3.
- Palumbo, G.
1990 The Early Bronze Age IV in the Southern Levant: Settlement Patterns, Economy, and Material Culture of a "Dark Age". *Contributio-Materiali di Archeologia Orientale III*. Roma. Università di Roma 'La Sapienza'.

- Parr, P. J.
1960 Excavations at Khirbet Iskander. *Annual of the Department of Antiquities in Jordan* 4-6: 128-133.
- Peterman, G. and Richard, S.
2010 Excavation of the Area D, H. and J Cemeteries. Pp. 159-63 in S. Richard, J.C. Long Jr., P. Holdorf and G. Peterman (eds.), *Khirbat Iskandar Final Report on the Early Bronze IV Area C "Gateway" and Cemeteries*. AASOR 14. Boston: The American Schools of Oriental Research.
- Prag, K.
2014 The southern Levant during the Intermediate Bronze Age. Pp. 388-400 in M. L. Steiner and A. E. Killebrew (eds.), *The Oxford Handbook of The Archaeology of the Levant c. 8000-332 BC*. Oxford: Oxford University Press.
- Rast, W.E. and Schaub, R.T.
2003 *Bab edh-Dhra': Excavations at the Town Site (1975-1981)*. 2 vols. Winona Lake, Ind.: Eisenbrauns.
- Richard, S.
1982 Report on the 1981 Season of Survey and Soundings at Khirbet Iskander. *Annual of the Department of Antiquities of Jordan* 26: 289-299.
1983 Report on the Expedition to Khirbet Iskander and its Vicinity, 1982. *Annual of the Department of Antiquities of Jordan* 27: 45-53.
1987 The Early Bronze Age in Palestine: The Rise and Collapse of Urbanism. *Biblical Archaeologist* 50: 22-43.
1990 The 1987 Expedition to Khirbet Iskander and Its Vicinity: Fourth Preliminary Report. Pp. 35-56 in W. E. Rast (ed.), *Bulletin of the American Schools of Oriental Research Supplement* 26. Baltimore: Johns Hopkins University Press for the American Schools of Oriental Research.
2000 Chronology vs. Regionalism in the Early Bronze IV Period: An Assemblage of Whole and Restored Vessels from the Public Building at Khirbet Iskander. Pp. 399-417 in L. E. Stager, J. A. Greene, and M. D. Coogan (eds.), *The Archaeology of Jordan and Beyond: Essays in Honor of James A. Sauer*. Winona Lake, IN: Eisenbrauns
2003 Early Bronze Age of the Southern Levant. Pp. 280-296 in S. Richard (ed.), *Near Eastern Archaeology: A Reader*. Winona Lake, IN: Eisenbrauns.
- 2006 Early Bronze IV Transitions: An Archaeometallurgical Study. Pp. 119-132 in S. Gitin, G. Edward Wright, and J.P. Dessel (eds.), *Archaeological and Historical Essays on Ancient Israel in Honor of William G. Dever*. Winona Lake, IN: Eisenbrauns.
- 2010 Introduction. Pp. 1-19 in Richard, S., Long, J.D., Jr., Holdorf, P, and Peterman, G. (eds.), *Khirbat Iskandar Final Report on the Early Bronze IV Area C 'Gateway and Cemeteries* (ASOR Archaeological Reports 14). Boston: American Schools of Oriental Research.
- Richard S. and Boraas, R. S.
1984 Preliminary Report of the 1981-82 Seasons of the Expedition to Khirbet Iskander and its Vicinity. *Bulletin of the American Schools of Oriental Research* 254: 63-87.
1988 The Early Bronze IV Fortified site of Khirbet Iskander, Jordan: Third Preliminary Report, 1984 Season. Pp. 107-130 in W. E. Rast (ed.), *Bulletin of the American Schools of Oriental Research Supplement* 25. Baltimore: Johns Hopkins University Press for the American Schools of Oriental Research.
- Richard, S. and Long, J. C.
1995 Archaeological Expedition to Khirbet Iskander, 1994. *Annual of the Department of Antiquities of Jordan* 39 (1995): 81-92.
2005 Three Seasons of Excavations at Khirbat Iskandar, 1997, 2000, 2004. *Annual of the Department of Antiquities of Jordan* 49: 261-275.
2010 Summary and Conclusions. Pp. 271-79 in Richard, S., Long, J.D., Jr., Holdorf, P, and Peterman, G. (eds.), *Khirbat Iskandar Final Report on the Early Bronze IV Area C 'Gateway and Cemeteries* (ASOR Archaeological Reports 14). Boston: American Schools of Oriental Research
- Richard, S., Long, J.C., Jr., Holdorf, P, and Peterman, G. (eds.)
2010 *Khirbat Iskandar Final Report on the Early Bronze IV Area C 'Gateway' and Cemeteries* (ASOR Archaeological Reports 14). Boston: American Schools of Oriental Research
- Schaub, R.T.
2009 The Southern Ghors and the Kerak Plateau in EB IV. Pp. 101-110 in P. J. Parr (ed.), *The Levant in Transition*. Palestine Exploration Fund Annual 9). London: Maney.

2013 ARCHAEOLOGICAL SURVEY IN WADI QUSAYBA AND THE MANDAH PLATEAU, IRBID REGION, JORDAN

E. B. Banning, P. Hitchings, K. Abu Jayyab, Steven Edwards, Rasha Elendari, Kevin Gibbs, Darren Jablonkay, Hossein al-Jarrah, B. Letham, Salim Razzaz, Isaac Ullah and Rebecca Weston

From 31 July to 5 September 2013, a team from University of Toronto continued the survey begun the previous year of the region west of the town of Taiyyiba, stretching down to the Jordan valley in the ravine of Wadi Qusayba, north of Wadi Taiyyiba, south of the village of Makhraba and east of Waqqas (**Fig. 1**). The survey area now includes the small Wadi Umm ad-Dabbar north of Wadi Qusayba and a small *wadi* between Wadi Taiyyiba and Wadi Qusayba, both on the edge of the Jordan valley. We have divided this survey area into five sub-regions: (1) the main channel of Wadi Qusayba; (2) its northern

tributary, Wadi Darraba; (3) its southern tributary, Wadi Khadra and Wadi al-Bir; (4) the ridge north of Wadi Qusayba and Wadi Darraba, along with Wadi Umm ad-Dabbar; (5) the small *wadi* north of Wadi Taiyyiba and the slopes west of Subregion 3 that drain into it (**Fig. 2**).

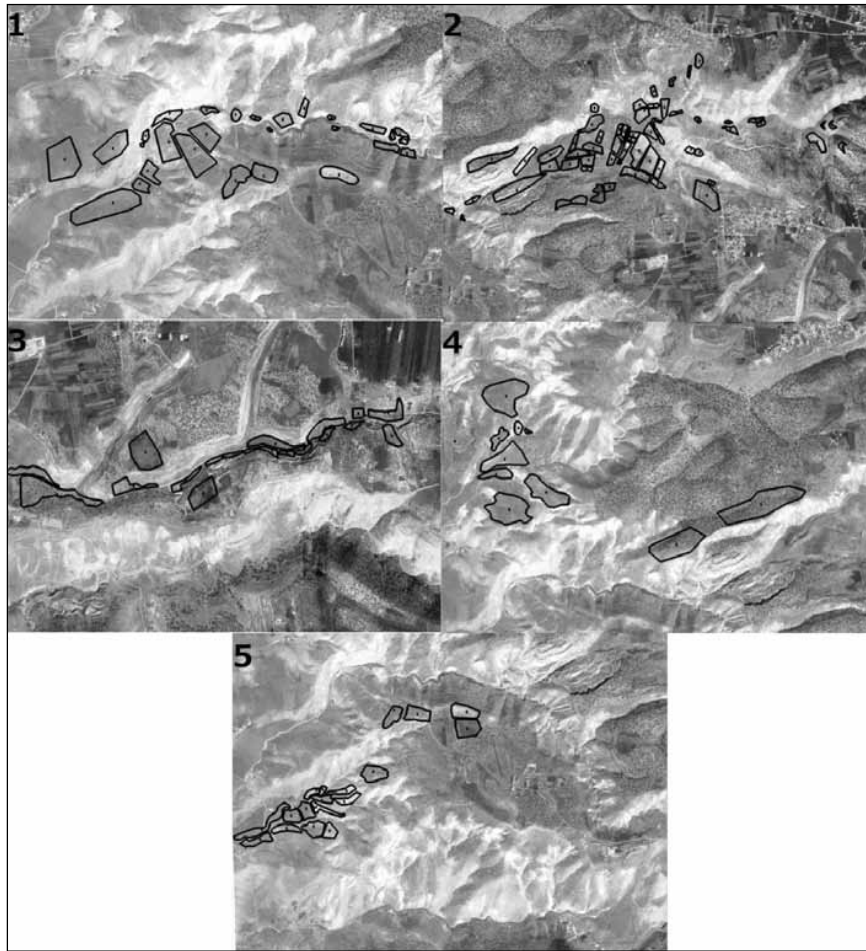
A particular focus of our project, as an extension to previous work in Wadi Ziqlab and Wadi Taiyyiba (Banning 1996; Field and Banning 1998; Kadowaki *et al.* 2009; Maher 2005, 2011; Maher and Banning 2001) has been the Epipalaeolithic, Neolithic and Chalcolithic periods, which were not represented in Glueck's (1951) results from his brief survey in this region. We also document sites we encounter that belong to other periods and made monitoring visits to some known sites. One of the important goals of the 2012 season, on which we have expanded in 2013, was to try out and elaborate methods to allocate survey effort to landforms that have the best potential for preserving evidence for the late prehistoric periods. We were unable to apply these new methods fully in the 2012 field season, owing to some computational difficulties, so 2013 allowed us to carry out a much more thorough test of our allocation algorithm. In addition, we continue to assess our survey effectiveness through measurement of surveyors' 'sweep widths'.

Methods and Predictive Modelling

Our previous experience in both Wadi Ziqlab and Wadi Qusayba has shown us that portions of the landscape where sediments formed during the Epipalaeolithic and Neolithic are preserved in limited spaces, but are fairly predictable. Sites of these periods were often located on what was then the floor of the *wadi*, often close to the stream or to springs. Downcutting



1. Wadi Qusayba Project Survey Area.



2. Five survey sub-regions showing “polygons” or landscape elements for the allocation of survey effort.

of the stream channel over more than 6000 years has destroyed most of this old valley floor, leaving only small fragments stranded some way up the side of the modern valley. In addition, these remnants are often buried by more recent colluvium (Banning 1996; Beaumont 1985; Field and Banning 1998; Maher 2011; Maher and Banning 2001). Although both archaeologists and geologists have recorded this phenomenon in many parts of the world, including Jordan, for many decades (notably Butzer 1982: 136; Copeland and Vita-Finzi 1978; Vita-Finzi 1964, 1966), its effects have not explicitly guided most surveys or the practice of archaeological predictive modelling.

In our survey of Wadi Qusayba and its vicinity, we attempt to improve our probability of discovering ‘target’ sites by employing a predictive model that is not restricted to attempts at predicting where human settlement was likely to be in the past, since it is very clear that many

of these places have already been destroyed or deeply buried in the case of the deeply-incised valleys on the margins of the Jordan rift valley. More specifically, our predictive model helps us to predict where such traces that have survived millennia of *wadi*-forming processes are most likely to have survived and to outcrop near the modern surface, so that they have some reasonable probability of being detectable by surface survey. As we have discussed in our previous report (Banning *et al.* 2014), this involves predicting the probabilities that various landforms or ‘landscape elements’ in the survey area meet the following criteria:

1. They contain sediments or old land surfaces preserved since the Epipalaeolithic, Neolithic or Chalcolithic,
2. The ancient land surfaces are not so sloped as to have discouraged permanent or seasonal settlement in those periods,
3. Visibility of those surfaces or associated arti-

facts is not too compromised by either overlying, more recent deposits (chiefly colluvium) or dense vegetation.

In addition to these overarching criteria, our model also takes into account some of the key elements of prehistoric decision-making, notably the presence of current or exhausted springs (cf. Shreideh 1992) and the confluences of *wadis* that probably had perennial water in the past.

Our initial predictive model, constructed in GRASS GIS, identified a large number of stream terraces and other landscape elements with slopes of less than 12 degrees as potential targets for survey on the basis of a DEM made with ASTER and SRTM imagery. The first step in an iterative process was to conduct reconnaissance to check on the accuracy of these ‘polygons’ (landscape elements) and to see if any other conditions made them poor candidates for survey. During the reconnaissance phase, we also conducted survey transects across enough of the polygons to assess whether, on the basis of artifacts found and geomorphological indications, some of the terraces were too young (i.e. too low) to have existed prior to about 6000 years ago, or too high above the *wadi* channel to have been close to the *wadi* floor during late prehistory. This process eliminated some polygons from the model or resulted in assigning them low prior probabilities (see below) and allowed us to adjust the boundaries of some and to add others. To a large extent, we completed this phase of the model testing during the 2012 season, but still had to carry out this phase in Subregions 4 and 5, which we only added to the survey area during 2013. Later iterations of the model took distance above the modern *wadi* channel into account and modelled the effects of deep colluviation on the likelihood of site burial.

Sweep Widths and the Probabilities of Archaeological Detection

Among the more innovative aspects of our survey project is an element that is also crucial to the effective use of our predictive model. This is our explicit attempt to estimate the probabilities that the amount of survey effort we have applied to different locations will actually result in the detection of prehistoric artifacts, should they be present on the modern surface. As described in our previous publication on this survey (Ban-

ning *et al.* 2014), this probability depends on both the amount of search effort (e.g. the total distance walked by all surveyors searching a particular area) and the distance of the ‘target’ (i.e. artifact) from the searcher’s path (Banning 2002a, 2002b; Banning *et al.* 2006; Koopman 1980; Stone 1975; Washburn 1981). The most straightforward way to assess the latter factor is ‘sweep width’ (Banning *et al.* 2011) which, when multiplied by total transect length, yields the amount of area covered. To put it in simple terms, sweep width is the breadth of a searcher’s path or transect within which the number of artifacts he or she fails to detect is equal to the number of artifacts he or she finds outside it. For example, if the sweep width is 1.6 m (0.8 m to left and right of the search path) and there were 100 artifacts potentially visible on the surface in the 1.6 m swath over which the searcher passed, the searcher might find 70 artifacts within the search width and 30 artifacts a little way outside it. Consequently, the number of artifacts actually found is the same as it would have been had he or she found all 100 artifacts inside the sweep width and none at all outside it. Sweep width is wider when surveyors search slowly and narrower when they search more quickly, so it summarizes the effects of both search effort, search speed and range. ‘Coverage’ is the total area covered or ‘swept’ (sweep width multiplied by total transect length) divided by the area of the surveyed space.

Our estimates of average sweep widths of surveyors on the Wadi Qusayba survey, in both 2012 and 2013, are based on ‘calibration runs’ that we conducted on several parts of the landscape that had characteristics of visibility and terrain similar to what we would expect during the survey, but which appeared to have no significant number of ‘real’ archaeological artifacts on them. We randomly ‘seeded’ these calibration locations with modern sherds and replicated flint flakes in known locations along a 150 m transect that we divided into three 50 m segments with stakes or stone cairns; we used 50 m tapes to mark the path (**Fig. 3**). Members of the survey team each walked the transect multiple times and on different days over the course of the survey, recording their start and finish times and their estimates of the distances to any artifacts they could see within each segment of the



3. Calibration runs used to measure sweep widths involved walking known and measured distances in search of seeded artifacts.

transect. Subsequently, we analyzed the data to determine what proportion of seeded artifacts were successfully detected at different ranges from the transect line and used this information to calculate the sweep width.

The results of these calibration surveys for

the 2013 team (**Table 1**) allow us to calculate ‘swept area’ (total transect length times sweep width) for each polygon we survey, as well as its ‘coverage’, and to update these values in cases where a polygon was resurveyed, as long as our survey speed is similar to that in the calibration runs. Calibrations controlled only coarsely for artifact size and colour, and of course the actual survey requires team members to detect artifacts of a range of colours and sizes. Consequently, our estimates of sweep width are only approximate. Coverage is a direct estimate of the probability that we would find artifacts in a polygon, given that they are there: with coverage of 10%, for example, we could expect to find 10% of the artifacts (Banning *et al.* 2011; Frost 1999).

The ability to estimate the probability of detecting artifacts of course also entails its opposite: the probability that we could have missed something. It is this latter probability that is so critical to predictive modelling because it allows us to escape the unrealistic assumption that any space we surveyed without finding anything is devoid of archaeological material. As should be quite obvious, although it is typically ignored in practice, not finding sites in a region that has been surveyed at very low intensity does not at all mean there is nothing there. It is rather more likely that our coverage was simply too low for us to find it. As we also all know, some kinds of site or artifact are quite a bit easier to find than others, irrespective of visibility.

Table 1: Summary of calibration surveys of the 2013 field season and calculated estimates of sweep width based on integrating the detection functions for detection by range from the transect centre line. After data for individual dates are figures for cumulative (“Cum”) results on the same ground cover (include data from both previous calibration runs). *Data are suspect due to the fact that the random distribution put almost none of them within 5m of the transect line. — Insufficient data for good estimate of W.

#	Date	Ground Cover	Mean Search Time (min)	Small Lithics W (m)	Large Lithics W (m)	L Red Sherds W (m)	S Red Sherds W (m)	L Yellow Sherds W (m)
1	3/8	Harvested field with chaff	13.6	1.8	1.3	—	3.1	0*
2	14/8	“	15.7	0.04*	0.81	2.1	2.1	0*
	Cum	“		.89	2.0	2.4	2.4	0*
3	15/8	Plowed Orchard	17.1	1.6	2.2	1.7	0.57**	0
4	21/8	“	13.2	1.4	3.8	2.7**	0.44	0.39
	Cum	“		1.2	3.3	2.4**	0.38	0.27

Estimates of sweep width are thus extremely important simply to evaluate whether or not we have surveyed a given space adequately to determine whether there are sites in it or not. However, these estimates are also critical to our use of the predictive model, since we employ it in an iterative way. What this means is that we regularly (ideally daily) update the predictive model with information gained since the survey began and allocate new survey effort accordingly. As our allocations of survey effort are tied to probability densities (the probability that a 'polygon' contains a detectable site of interest divided by the polygon's area, see below), it is important to note that our changing evaluations of the probabilities take into account the conditional probability that a 'polygon' contains a site, given the amount of survey effort that we have already applied to that polygon. When we survey a polygon without detecting 'target' materials, the probability that that polygon contains material of interest is lower than it was before the survey, but in some cases not by much. Consequently, the algorithm for allocating survey effort (see below) could direct us to resurvey it if its new probability density was still high; in practice we resurveyed some polygons many times.

Although the probability of finding artifacts is not exactly the same as that of finding a site (most of the sites we find are somewhat dense clusters of artifacts), the types of sites we are finding are generally not very recognizable unless we find at least one or two diagnostic tool types, such as sickle elements or bladelet cores. Consequently, the probability of finding individual artifacts is a reasonable proxy for the probability of finding a site of interest.

Initially, and especially in 2012, our estimates of sweep width were very rough and, at the beginning of the 2013 season, guided by our calibrations of the previous year under rather different vegetation conditions. As we added new calibration runs during 2013, we were able to update our sweep-width estimates with new information that was better able to account for the current crew composition and vegetation characteristics.

Our estimated sweep widths from the repeated calibration runs were used to guide us in the selection of rough estimates of sweep widths in the actual survey, generally settling on some-

thing close to the sweep widths for reasonably large (lengths *ca* 5 to 10 cm) lithics. It is very clear that our actual sweep widths for some artifact classes, especially small Epipalaeolithic bladelets, are much narrower than these estimates. We subjectively adjusted our daily estimated sweep widths by reference to the calibration runs and how the visibility conditions at each transect or transect segment compared with those where the calibrations were conducted. While in the field, for relatively good visibility on ploughed fields or olive groves, we typically used sweep widths in the range of 1.5 to 2.0 m per crew member. For poorer visibility, with combinations of bare rock and patches of weeds and shrubs, we used sweep widths of 0.75 to 1.0 m; for cases of still worse visibility we estimated quite low sweep widths (e.g. 0.5 m). Although we used a generalized sweep width to estimate our daily coverages for the purposes of allocating effort to polygons, our data allow us to evaluate coverage for small and large lithics and pottery separately during later evaluation of the survey's results. In addition, our final estimates of coverage that we will use to evaluate our overall survey effectiveness will take into account all of our calibration runs, including the last ones that were too late in the season to have had an effect on our survey practice.

Optimal Allocation of Survey Effort

Probably the most novel aspect of our survey was our attempt to adapt methods designed to allocate limited survey resources in a way that optimizes the probability of finding artifacts and sites of interest in a very short field season and with a relatively small crew. In any survey, especially in one with limited resources, it is necessary to make tough decisions about how to distribute survey effort, as it is simply not possible to survey everything. However, it is also clear that some spaces are highly unlikely to reward even a great deal of survey effort with tangible results, either because geomorphological formation processes have destroyed or deeply buried things or simply because visibility or other factors make survey slow and difficult. Search theory also shows us that the survey effort applied to a finite space has diminishing returns; at some point it becomes more sensible to move on to the next space rather than expend further effort

in the space we've already surveyed. Bayesian probability theory provides the tools to assist us with these tough decisions. We were only able to use a suboptimal version of this approach in 2012, but were able to employ a much better allocation algorithm in 2013.

Our initial GIS model, which selected spaces based on slope and relationship to *wadi* bottoms on the basis of satellite imagery, identified sets of 'polygons' that would be the initial focus for survey. Early in the survey of each subregion, we attempted to ground-truth these polygons, some of which turned out to be more steeply sloped or more heavily colluviated than the predictive model had led us to expect. It also allowed us to discover some springs and former springs that were previously unknown to us, and which we could now incorporate into our model, and to examine the geomorphology of some of the terraces and alluvial fans, thus allowing us to improve the predictive model.

Then, taking the polygons in a particular subregion of our larger survey area, we assigned prior probabilities of having detectable late prehistoric material, taking into account how well they fit the various factors listed above, as well as the lead project members' subjective assessments. These initial probabilities, divided by the polygon areas, resulted in 'probability densities'. We then used a Bayesian optimal-allocation algorithm (Koopman 1980: 146-152; Banning 2002a) that determined the total length of transect we should devote to each of the polygons that met the conditions (these were always the several polygons with the highest probability densities), given the total amount of effort that we could afford to expend on a particular field day. After we surveyed a polygon, our coverage for that polygon (sweep width times total transect length) allowed us to estimate a posterior probability (or revised probability), which becomes a new prior probability in the next iteration of the allocation. In a case, for example, where we allocated a considerable density of search effort and still did not find clear evidence for a cluster of late prehistoric artifacts, this probability would be considerably lower than our original estimate.

Our experiments with this allocation method took considerable fine-tuning, particularly as our initial probability estimates were not suffi-

ciently differentiated. This led the algorithm to allocate most of our effort to the smallest polygons, even when large ones had significantly higher probability. As the season progressed, we were able to achieve more reasonable allocations of effort, but we also reserved some effort for purposive or judgmental survey, especially to take advantage of travel time between target polygons.

Other Aspects of Survey Method

As in the 2012 survey, we used a paperless recording system on iPads, with database fields compatible with the Jordanian Department of Antiquities' Mega-Jordan database.

As mentioned in our report on the 2012 season (Banning *et al.* 2014), we use the FileMaker Go App as our documentation system. In 2013, we were able to run this on nine Apple iPads and a corresponding FileMaker database running on two MacBook Pro laptops. The database includes fields for details of transects, GPS waypoints, sites, polygons, photographs and other observations in the field (e.g. **Fig. 4**). At the end of each field day, we uploaded the data from all nine iPads to a single database on one of the laptops. We also used the iPads and FileMaker to document the calibration surveys and make individual sherd records.

Each day, our survey team consisted of eight to eleven people, each of whom walked one or more transects across a polygon, recording on an iPad. Usually the team consisted of nine, each with his or her own iPad; when there were more people, or we were short one iPad, two would share one and walk adjacent transects, and the sweep width would be double that of others in the same polygon. We also had three Garmin GPS devices with which to check the GPS coordinates of the iPads' on-board GPS occasionally, but principally to track the length of transects to ensure that we allocated approximately correct amounts of search effort to each polygon (see 'Optimal Allocation' above). Team members used 'counter' buttons on the transect form of the iPad to count every sherd and lithic seen, whether collected or not.

Surveyors walked fairly straight or somewhat curved paths, mostly maintaining a distance between transects of approximately 5 m. Since our sweep widths for most artifact types are consid-

4. Example of electronic database record for collecting information in the field using iPad tablets

erably less than this spacing, we would not expect overlap in coverage except where we did multiple surveys of the same polygon; the exact transect spacing is not as important as our estimate of area swept. Longer transects were subdivided into ‘segments’; we changed segment whenever there was a change in terrain, visibility, artifact density or direction of path.

Samples of mainly diagnostic artifacts were collected and bagged by transect segment, but all observed artifacts were counted by tapping the lithic and sherd counters on the iPad. While this approach emphasizes diagnostic artifacts, such as rim sherds, where densities were quite low we collected all artifacts we could see, even though most of these were not very diagnostic flakes and body sherds.

Survey Results

Changes in the Predictive Model

As you would expect, given our methods, one result of the survey was a gradual refinement of the predictive model that we use to guide the survey, including changes to the shape and size of some polygons and changes to the probability densities and estimated coverage of almost

all the polygons. Several polygons were added in the five subregions on the basis of field observations; our discovery of more springs (now typically weak or dried up entirely) that did not appear on any maps strongly increased the prior probability of Epipalaeolithic and Neolithic sites (as well as sites of later periods) in polygons close to these springs, as proximity to permanent water is a strong predictor for such sites.

Identification and Dating of Prehistoric Landscape Elements

One thing that the Digital Elevation Model (DEM) of the GIS cannot do on its own is to identify for us which landforms were available for use or occupation during the target periods of Epipalaeolithic, Neolithic and Chalcolithic. Only ground-truthing through initial reconnaissance survey could help us accomplish this, which often resulted in substantial revision of our preliminary assessments of the probability that polygons could contain relevant archaeological material. Notably, we could quickly establish that some valley terraces were much too young (generally too low in the *wadi*) for our purposes, with the result that their probabilities of containing late prehistoric sites fell to values near zero. Once we found artifacts of the target ages on even a few of the terraces, the approximate elevations of these terraces provided evidence to increase the probabilities of containment for nearby terraces of similar elevation.

Identification of Sites

As in the previous field season, we detected archaeological material both inside and outside the polygons or landscape elements that the predictive model identified. We considered some polygons to be candidates for late prehistoric site locations when they contained low-density scatters of artifacts, although some of these are likely palimpsests that accumulated over a considerable period or are concentrations that were deposited with colluvium. However, we did not generally define these as sites or site elements as defined in the Department of Antiquities’ Mega-Jordan database. Some of these ‘non-site’ scatters can still be informative about the distribution of late prehistoric activities in the region, including probable agricultural land use, while others are potential sites that can only be con-

firmed through test excavation because of overlying colluvium (Banning 1996; Field and Banning 1998). For some of the periods of greatest interest to us, especially the Neolithic, we have candidate sites for which the material evidence is slim at best without such further work. For example, some places yielded typical Neolithic sickle elements but otherwise had only very low lithic densities. We discuss the most promising of these in the appropriate section but have not typically assigned a site element number unless there is also more certain evidence of use during another period, such as Iron Age. Most of the site elements outside target polygons belonged to periods either earlier (Palaeolithic) or later (Iron Age to Ottoman) than the target periods, and we surveyed them either to monitor their condition or as we encountered them while travelling to and from target polygons. In what follows, we only summarize the new site elements added during this year's survey, but provide a table including last year's as well.

Palaeolithic

Many of the highest terraces and the tops of ridges separating the *wadis* have Palaeolithic flakes on their deflated surfaces, but the distribution of these artifacts probably does not retain very much spatial or stratigraphic information. Many of these show evidence of Levallois technique; several points, blades and flakes removed from Levallois cores were found in quite a number of polygons, signaling a likely Middle Palaeolithic age, especially in polygons 401 and 402. Palaeolithic material also occurs on somewhat lower terraces along the edge of the Jordan valley, notably a broken Levallois core in polygon 509 and many flakes removed from Levallois cores there and in polygon 507.

Epipalaeolithic

Bladelets and what appear to be fragments of bladelet cores suggest a likely Epipalaeolithic age for artifacts in a number of polygons, such as polygon 404 and in site 121. Unfortunately, we found no bladelets that had been retouched into microlithic tools, apart from a single possible trapeze / rectangle in one polygon and a single backed bladelet as an isolated find south of the site of Tell Abu ul-Hussayn. We are therefore currently unable to date this material very close-

ly, or even to confirm with certainty that it belongs to the Epipalaeolithic, since narrow bladelets were sometimes the products of Neolithic, Chalcolithic and even much later flint-knapping.

Site element 212, high above the western portion of Wadi Darraba's valley, yielded several blades, bladelets and fragments of what appear to be bladelet cores that might be of Epipalaeolithic age. However, none of these were highly diagnostic pieces, such as retouched tools or typical cores, making it difficult to date these closely; the majority of artifacts at this site date to the Iron Age.

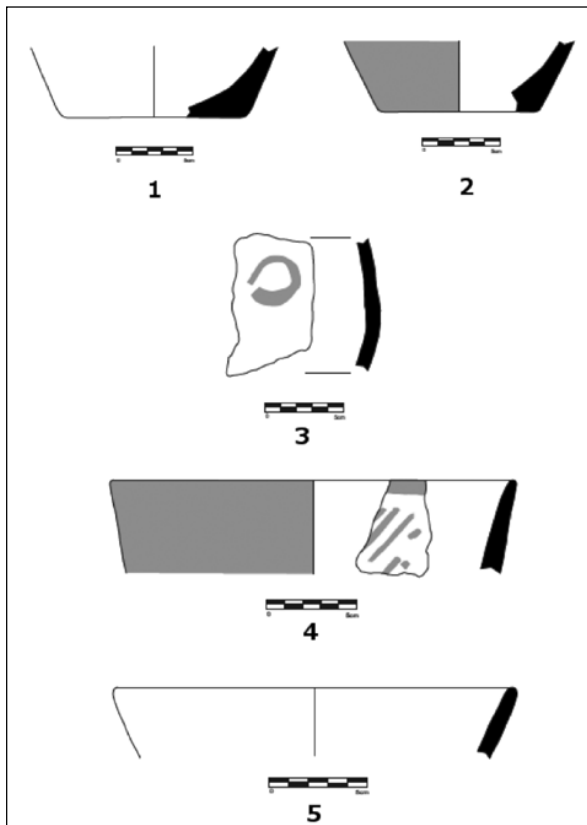
Overall, well-preserved Epipalaeolithic deposits appear to be less common in Wadi Qusayba and its near neighbours than in Wadi Tayyiba or Wadi Ziqlab (Maher 2003, 2007, 2011; Maher and Banning 2001, 2002). Nor were we able to find evidence of the red paleosol that appears to date to Epipalaeolithic times in Wadi Ziqlab, except in a deeply buried and currently inaccessible location under a huge landslide at the boundary between Subregions 1 and 2.

Neolithic

The survey detected some clear Neolithic artifacts, usually sickle elements, in many locations. However, the 2013 survey was not able to confirm the presence of any Neolithic settlement sites that had not already been discovered in 2012. It did identify some candidate sites in some of the polygons, but these are heavily colluviated terraces, making it unlikely that significant numbers of diagnostic artifacts would appear on the surface or in shallow gullies.

A local farmer reported finding several groundstone artifacts of likely Neolithic or Chalcolithic age in one of these high-probability polygons, 335. Included in the finds from this site are a few pieces of likely Late Neolithic pottery (**Fig. 5**). To date, however, our best candidates for Neolithic settlements are both in Wadi Qusayba's main channel, WQ 117 and WQ 121, the former being a clearly Yarmoukian site found in 2012 that has suffered greatly from erosion and the bulldozing of a crude road.

Allocation of additional survey at the confluence of Wadi Darraba and Wadi an-Nuhayr, in polygon 228, helps to confirm the impression of the 2012 survey that this may represent a small PPNB site (WQ 207). Once again, none of the



5. Late Neolithic Pottery from Polygons 335 (1-3) and 355 (4-5)

- 1- 32821.1: Inclusions: Limestone, medium and very frequent; Chaff, large and rare. Color: 10YR6/4 light yellowish brown. Incomplete oxidation firing.
- 2- 32821.2: Inclusions: black, bubbly particles that could be disintegrating limestone, small to large, frequent; limestone, medium and rare; iron oxide, fine and rare. Color: 5YR7/4 pink. Medium firing.
- 3- 32821.3: Inclusions: Limestone, fine to medium, common; iron oxide, fine and occasional; black, bubbly particles that could be disintegrating limestone, medium size and occasional. Color: 5YR7/4 pink. Medium firing.
- 4- 32762.1: Inclusions: Clay nodules, large and frequent; limestone, medium and occasional; chert, large and rare; calcite, small and rare. Color: 10YR8/4 very pale brown. Medium firing. Paint color: 10R4/6 red.
- 5- 32752.1: Inclusions: Limestone, fine to large, common; clay nodules, large and occasional; calcite, medium and rare; chert, medium and rare. Color: 10YR7/4 very pale brown. Medium fired.

lithics found are highly diagnostic, such as navi-form cores or projectile points, but many of them are long, narrow blades made from high-quality flint, a number of which appear to have been struck from bidirectional cores. In addition, there are some lithics of likely Middle or Upper

Palaeolithic age. This location would have benefitted from perennial water supply from 'Ayn an-Nuhar and 'Ain Milih in Wadi an-Nuhayr. Today, an abandoned well and pump station lies about 50 m west of the site.

We also returned briefly to the Yarmoukian site (WQ117) that was discovered in polygon 118 in Wadi Qusayba in order to monitor its condition and better assess its preservation. It seems likely that the road that has been bulldozed through the site, in combination with erosion by the *wadi* channel, has destroyed the greater part of this site, but some portions appear to survive that could warrant excavation.

As in 2012, sickle elements that most likely date to the Late Neolithic occurred on some relatively high terraces and ridges. To date, we have found these up high in polygons 126, 127 and 401. We also found sickle elements on lower terraces in polygons 103 and 118. Although the find locations of most of these pieces probably do not correspond with settlements, the fact that some of them, on the tops of ridges, are not colluvial suggests the possibility that they mark portions of the landscape that Neolithic farmers exploited for agricultural production. The challenge remains to find their associated settlements which, where they survive at all, are probably buried under colluvial deposits on terraces below them.

Chalcolithic

The 2013 survey found no clearly Chalcolithic sites (but see Early Bronze). We collected a further small sample of artifacts from WQ 302 in Wadi Khadra, but the sherds and lithics are not very diagnostic. We also collected a few more from the largely destroyed site of WQ 122.

Early Bronze Age

Polygon 233 in the vicinity of Mendah, on a terrace below the Early Bronze Age site of Ras Abu Lofah (Glueck 1951: 185-186; WQ 210), unsurprisingly exhibited considerable Early Bronze pottery and groundstone. Again, the more diagnostic artifacts appear to date to EB I and II.

We also returned to monitor a dolmen field (WQ304, Kerem Dahleh), which probably dates to the Early Bronze Age (Prag 1995; Yassine 1985). Mega-Jordan has this site listed as 'Mendah Jamla' (no. 3185). We took further way-

points to define its boundary more accurately and to document damage to the site that has occurred since last year. Someone has bulldozed two roads through the site, knocking down some of the dolmens and piling the stone slabs, apparently indicating plans to develop the site for residential construction. This makes it all the more urgent to document this site in detail before most or all of the dolmens are lost. Very few dolmens at this site are now standing.

Iron Age

Polygon 403, whose position at a stream confluence near two or three springs made it a high-probability candidate for Neolithic occupation, yielded finds that more strongly point to Iron Age use of the site (WQ 403). There has been at least some bulldozing on this site that has damaged some of the Iron Age remains there. The survey identified numerous Iron Age sherds and many basalt fragments and nearly complete grinding stones, as well as a limestone bowl or mortar, at the site. This was not documented in the East Jordan Valley Survey (Ibrahim *et al.* 1976: 49). Although some of the groundstone artifacts have forms that would not be out of place on a Neolithic site, these forms are not very chronologically diagnostic and, given the large number of Iron Age sherds and lack of distinctively PPNB or Late Neolithic stone tools or cores, it seems likely that they are of Iron Age date.

Site WQ 212, on a hill and accompanying slope and saddle that overlooks the eastern end of Wadi Qusayba's ravine and the western valley of Wadi Darraba, shows some slight evidence for prehistoric use (see above) but more abundant evidence for Iron Age occupation. It is not clear what kind of site this is without further investigation, including some excavation, but it may be a small village site.

We also made a brief revisit to Tell Mudawwar (WQ 406), previously documented by the Jordan Valley Survey (Ibrahim *et al.* 1976) and more recently by Hussein al-Jarrah. The site shows evidence for significant Iron Age occupation as well as some sherds of Early Bronze II and classical periods.

Hellenistic, Roman and Byzantine

Artifacts of the classical periods are nearly ubiquitous in the region, but usually at very low

densities that are more likely to reflect agricultural activities than Roman, Byzantine or early Islamic settlement.

Site WQ 405, next to a modern pump-house at the hot spring, 'Ain ad-Dabbar, has a sherd scatter of Late Roman, Byzantine and / or early Islamic pottery associated with various stone walls, including those of a large building some 18 m x 28 m in size.

Site WQ 404 consists of a classical-period cemetery that has mostly been robbed out in recent years. The tombs are dug into the relatively soft, chalky limestone of a hillside on the edge of the Jordan valley, immediately east of Tell Muddawar, and it is likely that it was the cemetery for Tell Muddawar's Roman - Byzantine population.

Tell Muddawar (WQ 406) is a large *tell* that had already been identified in the Jordan Valley Survey (Ibrahim *et al.* 1976) and was re-surveyed by Hussayn al-Jarrah of the Department of Antiquities. We made a brief revisit to this *tell* to monitor its condition (see above, under Iron Age).

Early Islamic or Mediaeval

Many of the 'Byzantine' sherds found in low densities during the survey could easily date to the Umayyad period. However, we found relatively little evidence for later Islamic artifacts. There were small numbers of Ayyubid / Mamluk body sherds in polygons 104, 221, 226, 242, 334, 349, 507, 509 and 513, and an Ottoman pipe fragment in 226.

Summary of Sites

Table 2 summarizes the sites recorded in 2012 - 2013 and the periods most likely represented at each, where discernable. Site numbers beginning with 1 are in the lower ravine of Wadi Quseiba, those beginning with 2 are in Wadi Darraba, those beginning with 3 are in Wadi Khadra or Wadi al-Bir, those beginning with 4 are in Wadi Umm ad-Dabbar and those beginning with 5 are in the small *wadi* between Wadi Taiyyiba and Wadi Qusayba. Periods summarized are Middle / Upper Palaeolithic (MLP), Epipalaeolithic (EPL), Neolithic (NL), Chalcolithic, Early Bronze (EB), Middle / Late Bronze (MLB), Iron Age, Classical and Islamic (ISL, including Umayyad, Abbasid and Ayyubid / Mamluk).

Table 2: Summary of the sites or site elements surveyed during the 2012 and 2013 field seasons with their most likely periods of use or occupation. Those with no period marked are of unknown date, and those with question marks indicate probable but uncertain date. * indicates sites that were previously known, but some of them were not correctly located by Glueck (1951) or MEGA-J.

Site No.	Character	MLP	EPL	NL	Chal.	EB	MLB	Iron	Clas.	Isl.
101	Lithic scatter	□								
102	Isolated structure							?		
103	Lithic scatter	□								
104	Cemetery								□	
105	Cemetery								□	
106	Cemetery								□	
107	Cemetery							?	?	
108	Settlement								□	
109	Lithic scatter	□								
110	Lithic scatter			□						
111*	Tell					□	?	□		
112	Lithic scatter		?							
113	Lithic scatter	□								
114	Lithic scatter	□								
115	Destroyed tell			?				□		
116	Lithic scatter			?						
117	Settlement			□						
118	Settlement			□						
119	Lithic scatter									
120	Stone walls							□		
121	Settlement?		?	?				□		
122	Sherd scatter				?	?		?		
201	Walled hilltop									
202	Long wall									
203	Sherd scatter					□		□		
204	Rock-cut tomb								?	
205	Rock-cut tomb								?	
206*	Settlement					□		□	□	□
207	Lithic scatter	□		?						
209	Sherd scatter									
210*	Settlement					□				
211	Sherd scatter									□
212	Settlement		?					□		
301	Terrace wall									
302	Settlement?				?					
303	Sherd/Lithic scatter				?					
304*	Dolmen field					□			□	
403	Settlement							□		
404	Cemetery								□	
405	‘Ain ad-Dabbar								□	?
406*	Tell					□		□	□	
501	Settlement							□		
502	Lithic scatter	□	?	?						

Conclusions

Considering the short field seasons (less than four weeks each), small crew size and geomorphological obstacles to prehistoric preservation and visibility, the Wadi Quseiba project was quite successful at detecting late prehistoric sites and candidate sites. This was, we believe, made possible by the strategy put into use here, where locations in the modern physical landscape predicted to be ideal for the preservation of prehistoric material were allocated varying degrees of survey effort based on iterative probability assignments. This allowed for the survey (and often re-survey) of these areas in such a way that those most likely to reveal promising material remained the focus of the survey crew's attention, while those least likely - or deemed so via projections of past landscape evolution in a GIS and groundtruthing in the field - saw less time allocated to them. In essence, much smaller amounts of time were wasted on areas where prehistoric material was unlikely to have survived because of geomorphological processes or was unlikely to be visible on the surface. With this in mind, gradually refining the probabilities also allowed us to exploit the often overlooked possibility that, even though no archaeological material was detected in previous survey, it may indeed exist and be discoverable by allocating survey effort to high-probability areas repeatedly. In at least one case (polygon 335, where Late Neolithic material was finally discovered) it was only on the crew's third inspection of the survey area that material was successfully located, demonstrating the effectiveness of this survey method.

Acknowledgments

The authors would like to extend their gratitude for the support of the Department of Antiquities of Jordan, the Director of Antiquities Dr Munther Dahash Jamhawi, the University of Toronto and the Social Sciences and Humanities Research Council of Canada (SSHRC) without whom this research would not have been possible.

Ted Banning
Department of Anthropology
19 Russell St
University of Toronto
Toronto, Ontario, Canada M5S 2S2
ted.banning@utoronto.ca

Bibliography

- Banning, E. B.
1996 Highlands and lowlands: Problems and survey frameworks for rural archaeology in the Near East. *Bulletin of the American Schools of Oriental Research* 301: 25-45.
2002a *Archaeological Survey*. New York: Kluwer Academic/Plenum Publishing.
2002b Archaeological survey as optimal search. *Archaeological Informatics — Pushing the Envelope*. In *Computer Applications and Quantitative Methods in Archaeology*: 341-350. BAR International Series. Oxford: Hadrian Books.
Banning, E. B., Abu Jayyab K., Bikoulis P., and Hitchings, P.
2014 Archaeological survey in Wadi Qusayba and the Mandah plateau, Irbid region, Jordan, 2012. Annual of the Department of Antiquities of Jordan.
Banning, E. B., Hawkins, A. L., and Stewart, S. T.
2006 Detection functions for archaeological survey. *American Antiquity* 71: 723-742.
2010 Detection functions in the design and evaluation of archaeological surveys. Pp. 123-124 in F. Niccolucci and S. Hermon (eds.), *Beyond the Artefact: Digital Interpretation of the Past. Proceedings of CAA2004. Prato 13-17. April 2004*. Budapest: Archaeolingua.
2011 Sweep widths and the detection of artifacts in archaeological survey. *Journal of Archaeological Science* 38: 3447-3458.
Banning, E. B., Rahimi, D., and Siggers, J.
1994 The Late Neolithic of the southern Levant: Hia-tus, settlement shift, or observer bias? The view from Wadi Ziqlab. *Paléorient* 20: 151-164.
Bartov, Y., Stein, M., Enzel, Y., Agnon, A., and Reches, Z.
2002 Lake levels and sequence stratigraphy of Lake Lisan, the Late Pleistocene precursor of the Dead Sea. *Quaternary Research* 57: 9-21.
Beaumont, P.
1985 Man-induced erosion in northern Jordan. Pp. 291-296 in A. Hadidi (ed.), *Studies in the History and Archaeology of Jordan II*. Amman: Department of Antiquities.
Butzer, K.
1982 *Archaeology as Human Ecology: Method and Theory for a Contextual Approach*. Cambridge: Cambridge University Press.
Copeland, L. and Vita-Finzi, C.
1978 Archaeological dating of geological deposits in Jordan. *Levant* 10: 10-25.
Cordova, C. E.
2000 Geomorphological evidence of intense prehistoric soil erosion in the highlands of central Jordan. *Physical Geography* 21: 538-567.
2007 *Millennial Landscape Change in Jordan: Geo-*

- archaeology and Cultural Ecology. Tucson: University of Arizona Press.
- Field, J.
1994 Rainfall patterns and landscape changes in Wadi Ziqlab, Jordan. In *Archaeology and the Environment: A Fragile Coexistence*. Proceedings of the 24th Annual Chacmool Conference. Calgary, Alberta: University of Calgary.
- Field, J., and Banning, E. B.
1998 Hillslope processes and archaeology in Wadi Ziqlab, Jordan. *Geoarchaeology* 13: 595-616.
- Frost, J. R.
1999 *Principles of Search Theory*. Fairfax, VA: Soza & Company, Ltd.
- Glueck, Nelson
1951 Explorations in Eastern Palestine IV. *AASOR* 25-28. New Haven, CT: American Schools of Oriental Research.
- Ibrahim, M., Sauer, J. A., and Yassine, K.
1976 The East Jordan Valley Survey, 1975. *Bulletin of the American Schools of Oriental Research* 222: 41-66.
- Kadowaki, S., Gibbs, K., Allentuck, A., and Banning, E. B.
2009 Late Neolithic settlement in Wadi Ziqlab, northern Jordan: al-Basafin. *Paléorient* 34: 105-129.
- Koopman, B. O.
1980 *Search and Screening: General Principles with Historical Applications*. New York: Pergamon Press.
- Maher, L.
2003 Wadi Ziqlab survey, 2002. *American Journal of Archaeology* 107: 449-451.
2005 *The Epipalaeolithic in context: Palaeolandscapes and Prehistoric Occupation of Wadi Ziqlab, Northern Jordan*. Unpublished doctoral dissertation, University of Toronto.
2007 2005 excavations at the Geometric Kebaran site of 'Uyun al-Hammam, al-Koura district, northern Jordan. *Annual of the Department of Antiquities of Jordan* 51: 263-272.
2011 Reconstructing paleolandscapes and prehistoric occupation of Wadi Ziqlab, northern Jordan. *Geoarchaeology* 26: 649-692.
- Maher, L., and Banning, E. B.
2001 Geoarchaeological survey in Wadi Ziqlab, Jordan. *Annual of the Department of Antiquities of Jordan* 45: 61-69.
2002 Geoarchaeological survey and the Epipalaeolithic in northern Jordan. *Antiquity* 76: 313-314.
- Prag, K.
1995 The Dead Sea dolmens: Death and landscape. In S. Campbell and E. Green (eds.), *The Archaeology of Death in the Ancient Near East*. Oxbow Monograph 51. Oxford: Oxbow.
- Shreideh, A. M.
1992 *Water Resources and Systems in Wadi Abu Ziyad Basin and their Relationship with Human Settlement: A Hydrological and Archaeological Study*. Unpublished Masters thesis, Yarmouk University, Jordan.
- Stone, L. D.
1975 *Theory of Optimal Search*. New York: Academic Press.
- Ullah, I.
2010 A GIS method for assessing the zone of human-environmental impact around archaeological sites: A test case from the Late Neolithic of Wadi Ziqlab, Jordan. *Journal of Archaeological Science* 38(3): 623-632.
- Vita-Finzi, C.
1964 Observations on the Late Quaternary of Jordan. *Palestine Exploration Quarterly* 96(1): 19-33.
1966 The Hasa Formation: an alluvial deposit in Jordan. *Man* 1: 386-390.
- Washburn, A. R.
1981 *Search and Detection*. Arlington, VA: Operations Society of America.
- Yassine, K.
1985 The dolmens: Construction and dating reconsidered. *Bulletin of the American Schools of Oriental Research* 259: 63-69.

ONCE MORE UNTO THE BEACH: NEW ARCHAEOLOGICAL RESEARCH INTO JORDAN'S PORT ON THE CHINA SEA

Kristoffer Damgaard¹ (University of Copenhagen) and Michael D. Jennings² (University of Chicago)
With contributions by Patrick Lorient, Lena Tambs, Aiysha Abu-Laban, Sara Jerichau and Christina Seyer

Since Antiquity, Aqaba has been a node on important trade and transportation routes – especially those related to the Red Sea. With the sanctification of Mecca and Madinah in the 7th century AD, and the success of Islam's political expansion, the Hijaz achieved a political and economic standing that it had never had before. The increased influence entailed new commercial opportunities and a re-organisation of intra- and interregional trade, but also involved a rising number of annual pilgrims from all levels of society. This amplified activity demanded a material and social framework in which to unfold, one that was revaluated and adapted continuously, and the archaeological site of Aylah is one such manifestation. Because of the site's intactness and chronological span, it could potentially be one of the most informative sources on the development of both urban and commercial landscapes in the Early Islamic Period (c. 650 - 1100 AD).

Historical Setting

Trade in the northern Red Sea boomed for more than five hundred years as a result of the demand for exotic products in the Greco-Roman world. Activities included the importation of rare and exotic goods such as Indian spices, Arabian frankincense and African ivory.³ While the Roman trade of the 1st centuries BC and AD relied heavily on the southern entrepôts of Egypt (*e.g.* Myos Hormos and Berenike), by the

3rd century AD, trade increasingly depended on a combination of southern middlemen (*e.g.* in Ethiopia and Yemen) and more northern emporia, such as the Sinaitic ports of Aqaba (Aila) and Suez (Clysma). With the territorial expansion of Islam in the 7th century, Aila was among the first Byzantine towns to come under Muslim hegemony. According to al-Baladhuri, control of Aila was surrendered by the local bishop / chief to the Prophet Muhammad via treaty (*sulh*)⁴, and in time this prompted the construction of a new urban unit in close proximity to the extant one. So began Islamic Aylah, which could well be the first town built by a Muslim ruling class specifically for Muslim settlers, and thus among the earliest 'Islamic cities' in the world.

The original town was constructed using many features known from classical cities, including an orthogonal layout, monumental gates indicating cardinal directions and broad streets. It nevertheless evolved differently, with new notions of spatiality and material identity replacing those of Antiquity. Aylah was founded in the mid-7th century AD and remained occupied at least until the early 12th century, when it appears that settlement shifted south to the area that today is dominated by Aqaba Castle.⁵

Although not of major administrative standing, Aylah's strategic location at the head of the Gulf made it an important Muslim trading emporium. The Red Sea littoral had a strong commercial dynamic of its own, but this was ampli-

1. kd@hum.ku.dk

2. mdj@uchicago.edu

3. Tomber, R. (2008). *Indo-Roman Trade. From Pots to Pepper*. London: Duckworth.

4. Hitti, P.K. (2002). *The Origins of the Islamic State. Being a translation of Kitâb Futûh al-Buldan of Abu-l Abbas Ahmad ibn Jabir al-Baladhuri*. Gorgias Press,

Piscataway NJ.

5. al-Shqour, R., J. De Meulemeester and D. Herremans (2009). "The 'Aqaba Castle Project,'" In *Studies in the History and Archaeology of Jordan X*, ed. F. al-Khraysheh, 641-55. Amman: Department of Antiquities.

fied by its role as a maritime corridor between the Indian Ocean and Mediterranean basins. Moreover, Aylah lay at the nexus of Arabia, Syria-Palestine and Egypt: three crucial regions in the Islamic world. In addition to being a trade hub, Aylah became the culmination point of the *Darb al-Hajj* (Pilgrims' Road) across Sinai and a major station for pilgrims coming from North Africa and Spain.⁶ It was, in other words, a town bustling with merchants, seafarers and pilgrims. It even had a vibrant scholastic community.⁷ This interface of cultures, coming together under the aegis of religion and trade, gave Aylah a cosmopolitan atmosphere, which is reflected in the archaeology. The following article presents the preliminary results of a new archaeological initiative that focuses on the hitherto unexplored south-west quadrant of the walled town.

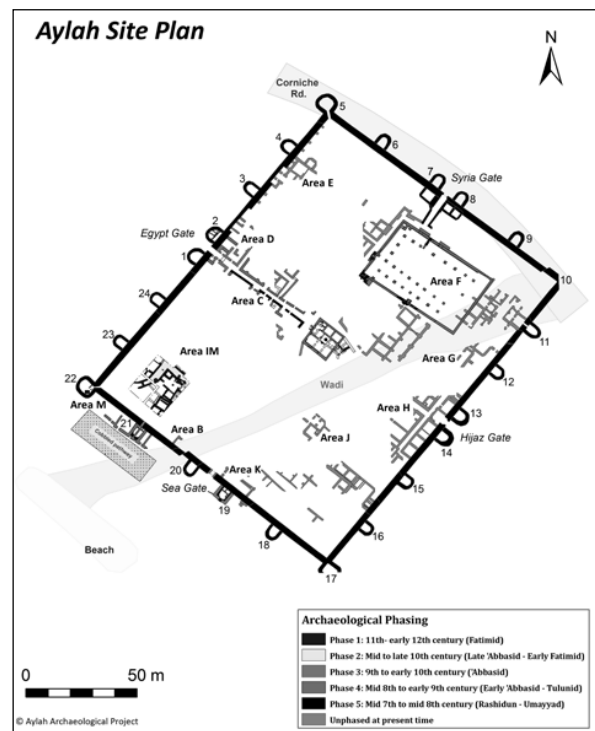
Background of the Aylah Archaeological Project

The following presents the preliminary results of renewed excavations at the archaeological site of Aylah, in modern Aqaba. The current excavations are conducted by the *Aylah Archaeological Project* (henceforth AAP), a joint venture spearheaded by the University of Copenhagen. However, the return to Aylah began under different circumstances. In 2008, the Belgian-British *Aqaba Castle Project* was reconceptualised as the *Islamic Aqaba Project* (IAP) and this saw the expansion of the project's scope to include the Early Islamic urban core as well. The primary scientific aim was a more comprehensive mapping of diachronic settlement patterns in Islamic (650 - 1922 AD) Aqaba, in order to achieve a fuller understanding of the town's settlement history and urban morphology.

The IAP included an exploratory season at Aylah (with Damgaard functioning as field director), which entailed the excavation of a 10 by 10 metre diagnostic trench in the south-west quadrant of the site and a 5 by 2 metre trench along the exterior of the city wall, immediately

south of the so-called Egypt Gate (**Fig. 1**).⁸ The excavation units were termed IM (*intra muros*) and EM (*extra muros*) respectively. The plan was to return the following year for more large-scale excavations, but sadly IAP director Prof. Johnny De Meulemeester (Universiteit Gent) passed away unexpectedly in early 2009, causing the project to come to a sudden halt and leaving many important questions unanswered. Steps were therefore taken by the authors to acquire independent funding to continue our research and the AAP is the result of these efforts.

Before presenting the results and their implications, it must be stressed that even though the renewed excavations at Aylah have undergone an institutional and a fiscal reorientation, the project has continually been executed as a coherent and clearly defined archaeological endeavour. The following article thus constitutes a prelimi-



1. Phased plan of the archaeological site of Aylah. The new excavations are in the southwest quadrant (© AAP).

6. Tamari, S. (1982). *Darb al-Hajj in Sinai: an historical-archaeological study*. Memorie Scienze Morali, Serie VIII, Vol. 25.4. Accademia Nazionale dei Lincei, Roma.
7. Cobb, P. M. (1995). Scholars and Society at Early Islamic Ayla. *Journal of the Economic and Social History of the Orient* 38: 417-428

8. A preliminary report on this season can be found in Damgaard, K. (2013). Between Castrum and Medina: A preliminary note on spatial organisation and urban development in Medieval Aqaba. In *Egypt and Syria in the Fatimid, Ayyubid and Mamluk Eras VII*, edited by U. Vermeulen and K. D'hulster, pp. 39-65. Peeters, Leuven.

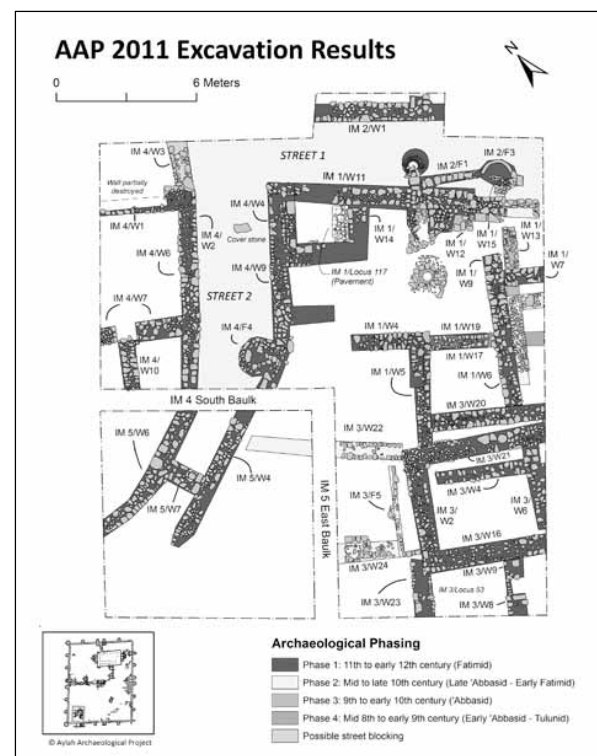
nary report of the totality of results achieved so far; the subdivision of material into the initial 2008 season and subsequent campaigns merely serves to structure the archaeological data and the progress of our work.

The AAP constitutes an effort to illuminate what life was like in an Early Islamic Red Sea port. Aylah was discovered by Donald Whitcomb in the mid-1980s and between 1986 and 1995 his team excavated a large part of the town.⁹ In addition to its independent research objectives, the AAP has been conceptualised as means of framing and augmenting the results of the American excavations, and a joint and full publication of the site is envisaged at the project's completion.

2008: A Diagnostic Season

Owing to the preliminary nature of the 2008 season at Aylah, the ambition was to excavate two diagnostic units and to use these to establish a solid stratigraphic profile. Whitcomb left the south-western quadrant untouched for future archaeological exploration. In addition to the fact that no archaeological exploration had been undertaken in this quadrant before, the selection of this part of the site was guided by a number of rationales. Firstly, the topography generally slopes towards the beach, yet this quadrant, though closest to the sea, is the highest part of the archaeological mound. This suggests a different taphonomic process to the rest of the site. Secondly, because we initially sought to understand the organisation and morphology of Islamic Aqaba as an extended archaeological landscape, identifying specific composite parts of the urban environment was central to extrapolating patterns and off-beats from the archaeological data. Whitcomb's identification of an Abbasid *sug* constructed against the exterior of the western end of the south wall indicated that there was a distinct possibility that this may have constituted part of an expanding commercial district, in which the south-west quadrant may have been the core.

Based on this rationale, an arbitrary 10 by 10 metre grid was established in alignment with the city wall, and an excavation unit (IM1) defined in its centre (**Fig. 2**). A second excavation unit (EM1) was defined outside the walls, extending 5 metres south-west along the city walls from the Egypt Gate's southern tower (T1). This specific area was selected both because it constituted the only part of city's west wall that had not yet been excavated and, perhaps more importantly, because previous excavations have shown that the Egypt Gate appears to have held dramatically shifting meanings during the lifespan of the town.¹⁰ It was originally adorned with a carved Qur'anic inscription – the *Ayat al-Kursi* (Throne verse) – now on display in Aqaba Museum. This particular inscription seems to have been a constituent part of a Hijazi - Muslim form of urbanism, for it has been located at a number of 8th century foundations in Saudi Arabia (including



2. Phased plan of excavation area in the southwest quadrant of Aylah (© AAP).

9. An extensive corpus of publications exists, many of which can be found in back issues of the *Annual of the Department of Antiquities*. Most recently see Whitcomb, D. (2009): Ayla at the Millennium: Archaeology and History. In *Studies in the History and Archaeology of Jordan 10*. Ed. F. al-Khraysheh, pp.123-32.

Department of Antiquities, Amman.
10. Whitcomb, D. (1995). A Street and the Beach at Ayla: The Fall Season of Excavations at 'Aqaba, 1992. *Annual of the Department of Antiquities of Jordan 39*: 499-507

Rabadhah, al-Jar and Hawra).¹¹

It has previously been suggested that the Egypt Gate constituted the interface between the established Late Antique town and the new Islamic unit.¹² Similarly, it may have functioned as the access point for pilgrims and traders coming from Egypt, North Africa, Sicily and Spain – areas we know brought a significant amount of people and wealth to Aylah. In order to understand the nature of Aylah vis-à-vis the established settlement that continued to function, one cannot avoid a consideration of its walls. Whitcomb effectively challenged the notion that this massive construction was initiated for defence purposes.¹³ Rather, he suggested that the walls were an ‘emblem of urbanity’, emphasizing their symbolic importance.

One may thus presume that this was an access point that at least initially saw a considerable amount of traffic and activity and, if *extra muros* expansion indeed was a norm seen in places other than Whitcomb’s Abbasid *suq*, that this would have been an area particularly susceptible to such a process.

The 2008 excavations confirmed that Aylah has a long and complex depositional history, including numerous periods of destruction, re-use, rebuilding, cutting and in-filling. In some areas of IM1 there was good and clearly defined stratigraphy, but owing to the site’s long history and numerous historical disturbances, a complete and coherent stratigraphic sequence could not be established for the upper strata. Even so, five distinct phases could be clearly defined, independently confirming Whitcomb’s phasing.¹⁴

The historical strata were sealed by a 20th century occupation layer, which was removed after it had been recorded. Most of the subsequent architectural features were left *in situ*, which increasingly limited the area available for excavation. Of the five identified phases of historical occupation, the latest one (Phase 1) was the best represented. From this level, the exposed architectural elements decreased, so that only a single wall was defined in Phase 5. Each phase was associated with a number of strata. While some of these constituted actual use surfaces, most of them consisted of fills or gradual depositions. During a study season in 2009, a tentative chronology was created using the retrieved ceramics. In combination with the architectural and stratigraphic evidence, this allowed the following phases to be defined:

Phase 1 – Fatimid (10th to late 11th Century AD)

The majority of the structures found in IM1 during the 2008 campaign belonged to the most recent identified phase of medieval occupation, which corresponds roughly to the occupation levels termed Phases E and D by Whitcomb.¹⁵ It consists of three main clusters of architecture and the intermediate open spaces created between them. In the southern end of the unit, the corners of two individual building units were identified. In the south-east corner, a north-east to south-west running wall (#6) was abutted on its east side by a somewhat lower return, running north-west to south-east and disappearing into the south-east baulk (#7). These are the

11. Damgaard, K. (2011). *Modelling Mercantilism: An Archaeological Analysis of Red Sea Trade in the Early Islamic Period (650 - 1100 AD)*. Unpublished PhD dissertation, University of Copenhagen.

12. Damgaard, K. (2009). A Palestinian Red Sea Port on the Egyptian Road to Arabia: Early Islamic Aqaba and its many hinterlands. In *Connected Hinterlands: Proceedings of the Red Sea Project IV held at the University of Southampton, September 2008*, edited by L. Blue, J. Cooper, R. Thomas and J. Whitewright, pp. 85-97. Archaeopress, Oxford.

13. Whitcomb, D. (2006). The Walls of Early Islamic Ayla: Defence or Symbol? In *Muslim Military Architecture in Greater Syria. From the Coming of Islam to the Ottoman Period*, edited by H. Kennedy, pp. 61-74. Brill, Leiden & Boston.

14. Even though our chronology was corresponding, a decision was made to re-label the phases. The reason for

this is mostly practical in that the deep probe of the 2008 season opened the possibility that occupation in the south-west quadrant may predate the construction of the Early Islamic settlement. In light of this, we decided on a reverse labelling that allows additional phases to be added below the 7th century foundation of the walled enceinte. Our phasing applies numbers that progress from top to bottom. So the initial historical phase dubbed Phase E by Whitcomb is Phase 1 in our chronology.

15. The extensive area excavated by the OI team permitted a differentiation of the two ‘late’ phases. While Whitcomb’s Phase E mostly consisted of add-ons to the standing, but often deteriorated architecture, Phase D constituted the last period of town-wide spatial re-organization. These two phases appear as one in Area IM.

earlier structures in the south-east cluster. Later, they were augmented by a smaller wall (#18) in the same L-shape as Walls 6 and 7. This was built directly against the east face of Wall 6 and at roughly the same level. Wall 6 was at some stage extended by about 1 meter to the north, but whether this was an expansion of space or a reinforcement of the extant structure remains unclear.

In the south-west corner of the trench, a square unit similar to Walls 6 and 7 was identified (#4 & #5). Again, one is left with the impression of an individual building not fully exposed; however, in this case no additional structures were added. From the exterior it seems that these walls were constructed as a single phase, but excavation inside the walls (L84) showed that the two upper courses constitute a later addition, as they extend almost 20 cm in width beyond the lower courses.

It is noteworthy that the corners of the two abovementioned structures adhere to the presumed orthogonality of Aylah's original grid, and there is a clearly definable open space between them. In the fills associated with this intermediary space, a rich and varied yield of artefacts was retrieved. Worth mentioning was the presence of many diagnostic sherds belonging to small amphora (**Fig. 3**). In addition a number of large basalt grinding tools were discovered here. While the seeming accessibility may indicate that it was a public domain, the associated artefacts would suggest that it was used for some kind of manufacture, treatment or packing of goods.¹⁶

The most prominent and complex set of structures is found in the northern part of the excavation unit and extends across into IM2 (**Fig. 4**). The basic axis of these structures is a substantial north-west to south-east running wall. Its north face constituted the southern boundary of a subsidiary street, parallel to the 'Egyptian Street'. The axis is created by two walls (#8 & #11), breached only by a well-built drain gutter.



3. Selection of miniature amphorae retrieved from central open space in IM1 (© AAP/Henrik Brahe).



4. Fatimid drainage system including two cess-pits dug into the street (© AAP).

16. Uzi Avner and Jodi Magness have published an outline of the ubiquitous production initiatives of the Wadi Arabah and southern Negev in the 7th to early 10th centuries (Avner, U. & J. Magness [1998]. *Early Islamic Settlement in the Southern Negev. Bulletin of the American Schools of Oriental Research* 310: 39-57). In it, the authors suggested that this production

complex was tied to Aylah, which would have functioned as the hub for the collection and redistribution of agricultural produce and ore. While there is little published evidence to suggest this activity was sustained into the Fatimid period, the correlation is obvious and tempting.

The gutter, which originally had a superstructure of fired brick, runs along the west side of a large installation, the exact nature of which remains unclear, but which clearly dealt with the disposal of some kind of liquid. The structure consists of a stone-lined feature with an earth fill that was topped with larger flag-stones. This gives the impression of a solid installation, while allowing liquid to seep between the top course and into the earth fill below. The feature is not intact and, from the section on its fractured side, the internal fill shows a clear micro-stratigraphy, indicating that the in-filling may have been gradual before it was sealed. A drainage canal divides the walls and slopes downwards into the associated street surface. The section of the drain situated in the actual street had originally been subterranean. It was covered by substantial stone blocks and culminated in a large cesspit discussed in detail below. The cesspit's access point was sealed with a circular basalt lid that originally had been a quern-stone. Extending from the covered drain in the street was a second covered drain canal, which culminated in what appeared to be a well that had been re-used as a cesspit.

This installation was located in the northern end of the excavation unit and the unit's dimensions prevented us from exploring its immediate context. However, the drain was an important clue to suggest that the space north of the installation was a street. This notion was further corroborated by the well-built façade of Wall 8's north face and a north baulk consisting of numerous laminated and horizontal strata characteristic of a street surface. A potential street at this location would furthermore create an axis perpendicular to the city's west wall and parallel to the 'Egyptian Street'. Nevertheless, in order to confirm the hypothesis, a decision was made to expand excavations between 1.5 and 3.5 me-

tres north, establishing the irregular excavation unit IM2 shortly before the 2008 season came to an end. Several of the features described above were in fact revealed in IM2. The confirmation of our street hypothesis nevertheless came in the form of a second wall running exactly parallel to IM1's Wall 8 and demarcating the other side of the street. This wall had the same fine coursing towards the thoroughfare, and the short excavated section of this street appears to have the same width as the west end of the Egyptian Street.

The structures of Phase 1 were built using a technique consisting of a socle of uncut stone – mostly local limestone and highly salinized granite – superimposed with a mud-brick superstructure of which little more than traces usually remain. The uncut stones were set in a mud-slurry that deteriorates rapidly after exposure and which would only have functioned in combination with a mud-brick superstructure and the plastering of the wall bases above ground.¹⁷ In a few places cut blocks do appear, but these are *spolia* originating from earlier phases of construction at Aylah or from the nearby abandoned townships of Nabatean, Roman and Byzantine Aila. The finds associated with Phase 1 were similar to those identified by Whitcomb as belonging to the Fatimid period.¹⁸

Phase 2 –Tulunid to Late Abbasid (late 9th to mid-10th century)

Only a few structures were associated with this phase; indeed, it may be considered an intermediary between Phases 1 and 3, or perhaps even a later augmentation of Phase 3.¹⁹ The only structures are an earlier phase of walling (#12) that maintains the axis of Walls 8 and 11, but extends further south-east. It is physically separated from them by a sand fill roughly 50 cm thick, a fragmented crushed limestone floor surface (L46) and an area of plastered paving (Wall 12)

17. This technique has been identified as a common construction technique in the Hijaz and southern Negev. Nevertheless, it cannot be associated with a specifically 'Islamic' building tradition, as preserved walls using the same technique have been identified at Roman and Nabatean Aila (see Parker, S. T. [2002]. The Roman 'Aqaba Project: The 2000 Campaign. *Annual of the Department of Antiquities of Jordan* 46: 409-429; [2003]. The Roman 'Aqaba Project: The 2002 Campaign. *Annual of the Department of Antiquities of Jordan* 47: 321-333). The technique makes efficient

use of local building material and appears to have used regionally until the early 20th century (for travellers' accounts see *Modelling Mercantilism*, Appendix 1, Table 2.3).

18. See Whitcomb, D. (1988). A Fatimid Residence at Aqaba, Jordan. *Annual of the Department of Antiquities in Jordan* 32: 207-224.

19. It corresponds roughly to Whitcomb's Phase C, which was intermittent and difficult to identify (pers. comm. November 2008).

associated with the circular installation reused as a secondary cesspit in Phase 1. This feature was only partially excavated because it extends into the north baulk of IM1 and its original function thus remains unclear. It is nonetheless located in the street and may have been a public source of water.

Phase 3 – Abbasid (mid-8th to late 9th century AD)

Phase 3 is a substantial period of construction. The surfaces and features associated with this phase were relatively easy to distinguish from Phase 4 because the beginning of this phase is defined by a ubiquitous levelling fill composed of the pink and coarse granite gravel native to Aqaba (**Fig. 5**). The levelling appears to be associated with a period of widespread reconstruction following a significant collapse – perhaps a result of the 749 AD earthquake.²⁰ Most of the structures are built directly on the levelled gravel surface and, unlike previous phases, seem more closely bound together as a single whole. The area is defined by a number of walls. To the south-east it is delineated by Wall 13, of which only the two lowest courses remain. The axis created by this wall is met with the negative profile of a deliberately removed wall (**Fig. 6**).

Although nothing of its foundation remains, the negative is clear and divided the open area of Phase 3 in two parts. That the negative was in fact the remnants of a wall now gone was confirmed by a patterned collapse of mud-brick (including a carbonised wooden beam) on its south side. This contained numerous air pockets under and between the individual bricks, implying that its destruction was sudden and unintentional. The negative runs across the open area and aligns with Wall 16, which belongs to Phase 3. Interestingly, this wall includes a small buttress protruding south-east from the corner and in line with the wall negative. The fact that the negative did not extend all the way to this buttress may signify a possible doorway.

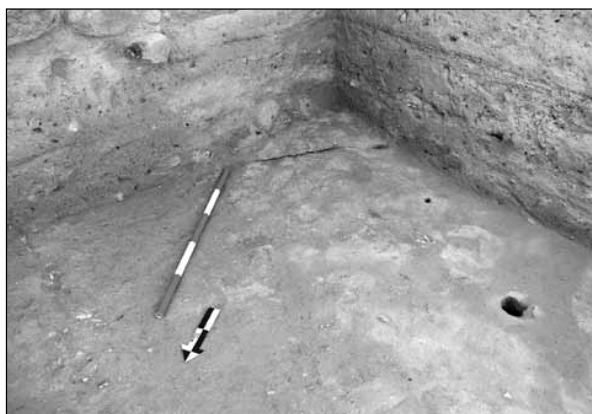
North of the wall negative, a stone-lined well was identified (Feature 14). Although clearly reused in later periods – a substantial pit had been cut into the surface of Phase 2 in order to reach it – this installation was dug into the fill level that was covered by the pink gravel. It could thus potentially be an earlier installation, but this remains unconfirmed. Excavation took place inside the well until the current water table was reached, after which it was abandoned for safety reasons. At this stage the bottom of the well had not been reached and it yielded no



5. View of a section in IM1. The loose pink granite gravel that had been used as a levelling fill is visible in the lower part of the section (© AAP).

20. There has been some debate as to the dating of this seismic event, although our evidence has little to contribute to this. We apply the dating established by Nicolas Ambraseys (2009). *Earthquakes in the Medi-*

terranean and Middle East. A Multidisciplinary Study of Seismicity up to 1900. Cambridge University Press & Academy of Athens, Cambridge & New York.



6. Negative profile of removed wall with associated mud-brick collapse that presumably deriving from the wall's superstructure (© AAP).

artefactual material to indicate its date of use or construction. When excavation was halted, we had reached a depth of 2.70 metres below its top course.

Immediately above the levelling fill defining Phase 3, a thick deposit rich in artefacts was identified (L70). Locus 70 is worth singling out because of its location in our stratigraphic sequence, but also because of the contents of its ceramic assemblage. It is in this fill that the character of our ceramic corpus shifts into what might confidently be termed Abbasid, with a high proportion of local and imported cream wares. We find the local Mahesh ware in many forms at Aylah, from large bowls and basins to jars and jugs.²¹ The imported cream ware – also known as *Islamic Cream Ware* or ICW – usually consists of smaller forms and thinly thrown vessels. Alan Walmsley has dated the appearance of ICW to the mid-8th century and considers it the “distinct beginning of the Abbasid tradition”.²² Something similar can today be said of Mahesh

ware, though a recent petrographic study has demonstrated that the Mahesh tradition resulted from a more gradual development of local ceramic production techniques²³ and may have been a local emulation of the immensely popular cream wares produced in Iraq and eastern Syria. An Abbasid date for this stratum is confirmed by a fragment of a typical cream ware lamp with moulded vegetal decoration.

Phase 4 – Umayyad - Early Abbasid (8th century AD)

This early phase in the occupational history of Aylah is only represented by a few features. However, this is mainly due to the fact that only very little of the excavation area was penetrated to sufficient depth. It has been termed Umayyad both because it is the phase that predates the late 8th century collapse of Phase 3 and because the ceramic material associated with it increasingly takes on characteristic Umayyad traits. We know of extensive local production of ceramics from the late 7th to mid-8th centuries at Aylah from Whitcomb's 1993 kiln excavations.²⁴ Loci from these phases yielded ceramics with typical late Byzantine and Umayyad forms and fabrics, especially variations of the well-known cream surface, often ribbed and sometimes with wavy-line decorations.²⁵

The structures dating to this period consist of a single phase of walling (#17) that follows the axis of Wall 5 and the wall negative in Phase 3. It was, however, constructed using much larger blocks than we see in the later periods, but the stones continue to be either uncut or *spolia*. Wall 17 rests upon an even earlier phase, although it is separated from it by a fill of approximately 40 cm.

21. Whitcomb, D. (1989). Mahesh Ware: Evidence of Early Abbasid Occupation from Southern Jordan. *Annual of the Department of Antiquities of Jordan* 33: 269-285.

22. Walmsley, A. (2001). Turning East. The Appearance of Islamic Cream Ware in Jordan: The “End of Antiquity”? In *La Céramique Byzantine et Proto-Islamique en Syrie-Jordanie (IVe-VIIIe Siècles Apr. J.-C.)*. *Actes du Colloque Tenu à Amman les 3, 4 et 5 Décembre 1994*, edited by E. Villeneuve and P. M. Watson, pp. 305-313. Bibliothèque Archéologique et Historique. Institut Français d'Archéologie du Proche-Orient, Beirut.

23. Raith, M., P. Yule and K. Damgaard (2013). The View from Zafar: An Archaeometric Study of the Aqaba

Pottery Complex and its Distribution in the 1st Millennium AD. *Zeitschrift für Orient-Archäologie* 6.

24. Melkawi, A., K. 'Amr and D.S. Whitcomb (1994). The Excavation of Two Seventh Century Pottery Kilns at Aqaba. *Annual of the Department of Antiquities in Jordan* 38: 447-468; Whitcomb, D. (2001) Ceramic Production at Aqaba in the Early Islamic Period. In *La Céramique Byzantine et Proto-Islamique en Syrie-Jordanie (IVe-VIIIe Siècles Apr. J.-C.)*. *Actes du Colloque Tenu à Amman les 3, 4 et 5 Décembre 1994*, edited by E. Villeneuve and P. M. Watson, pp. 296-303. Institut Français d'Archéologie du Proche-Orient, Beirut.

25. For an update and elaboration on the Aqaba pottery complex see ‘The View from Zafar’.

Phase 5 – Early Umayyad (mid-7th to early 8th century)

The earliest architectural phase identified in the 2008 excavations consisted of a single north-west to south-east running wall (#19). The wall runs directly under Wall 17 but is built of large dressed limestone ashlar of a distinctly higher architectural quality than later structures. The stratigraphic interfaces associated with Phase 5 were difficult to identify because of penetrating ground water.²⁶ In spite of this problem, at least one distinct surface was identified (L101). This deposit contained an extremely high density of ceramic and faunal remains. A preliminary interpretation was therefore that we had reached a 7th or 8th century dump. The deposit also contained a high density of ash and charcoal, of which several samples were collected. An uncontaminated charcoal sample taken from locus 101 yielded a calibrated (sigma 2) radiocarbon dating of between 382 and 576 AD. This cannot be seen as solid evidence for dating the deposit; however, similar samples taken in later seasons (which are discussed below) strongly corroborate the realistic span of this date.

The ceramic finds retrieved from locus 101 are typical of the transition from the late Byzantine to the Early Islamic period and can be attributed to either era (**Table 1, Figs. 7-10**). However, along with a large corpus that could be called late Byzantine in style, locus 101 also contained ceramics clearly datable to the pre-Islamic period. These include four sherds of burnished red ware (possibly sigillata 4), one of which had an incised wild boar, one of the emblems of the *Le-*

gio X Fretensis stationed in Aila from the late 3rd to late 4th century AD (**Fig. 11**). In spite of these indications, the strong representation of 7th century wares prompted an initial reading of locus 101 as Rashidun - Umayyad with earlier inclusions. Continued excavations in the deep probe in the following seasons have since confirmed this supposition and are discussed further below.

EM

Outside the city wall, a 5 by 2 metre trench was laid out (**Fig. 12**). The occupational phases identified in Area IM were not as clear here, although at least two phases of construction and several use surfaces were identified. Most distinct was an architectural phase and associated walking surface consisting of a single wall (#3) built perpendicularly against the city wall and extending in a north-westerly direction beyond the limit of the excavation unit. We attribute this wall to Phase 3 and possibly Phase 4 on the basis of both building technique and its contextual artefact yield. The wall was constructed using a technique similar to that observed in Phase 3. Although highly disintegrated, profiles of mudbricks were clearly identifiable in the deposits on top of the low stone coursing (**Fig. 13**). The ceramic corpus associated with this feature is typical of the Abbasid period, including Mahesh wares, early splash wares and an Abbasid cream ware lamp. Whitcomb's excavations of the Egypt Gate in 1987 and 1989 clearly demonstrated that it became increasingly cordoned off throughout the 9th and 10th centuries, until it was finally reduced to little more than a drain.²⁷

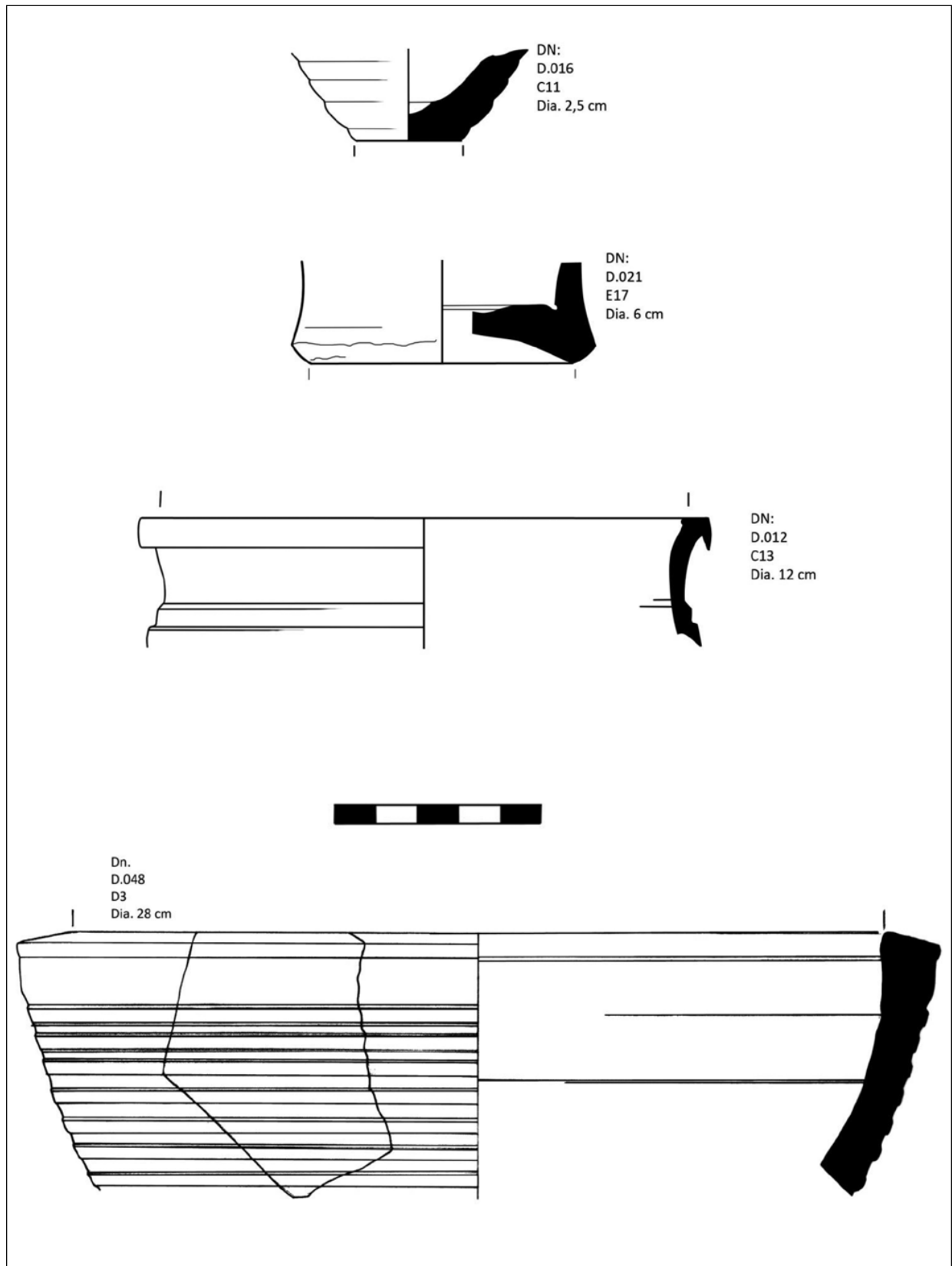
26. The early strata excavated by both Whitcomb and the authors suggest that either the 7th century water table was decidedly lower than today, or that the weight of subsequent strata have 'pushed' these phases into the water table. Observations made by 19th and early 20th century travellers reveal that the shallow water-table was a phenomenon that predates the turn of the century. Alois Musil relays how during ebb, fresh water gushes from natural springs all along the beach (Musil, A. [1926]. *The Northern Heḡāz. A Topographical Itinerary*. New York: American Geographical Society of New York & Czech Academy of Sciences and Arts, p. 88), whereas Nelson Glueck remarks on the many gardens built right along the shoreline (Glueck, N. [1939]. *Explorations in Eastern Palestine III*. New Haven: American Schools of Oriental Research, pp. 1-4). The ability of the Aqaba plain to sustain limited agricultural initiatives is generally commented upon by most 19th century travellers (see *Modelling Mercantilism*, Appendix 1, Table 2.3 for an overview and references) and

has also been confirmed archaeologically (De Meulemeester, J. and D. Pringle [2005]. The 'Aqaba Castle Project 2004-5. *Newsletter of the Council of British Research in the Levant*: 42; De Meulemeester, J. and R. al-Shqour [2006]. The 'Aqaba Castle Project 2006. *Bulletin of the Council for British Research in the Levant* 1: 27-28). Geological analyses have ascertained the presence of a large and shallow aquifer running under the Wadi Arabah, which shifts east at the mouth of the wadi and disperses under the coastal shelf of Aqaba (Cimiotti, U.K. [1980]. On the Geomorphology of the Gulf of Elat - Aqaba and its Borderlands. In *Beiträge zur Geomorphologie und Länderkunde*, edited by B. Hofmeister and A. Steinecke, pp. 155-175. Berliner Geographische Studien 7, Berlin).

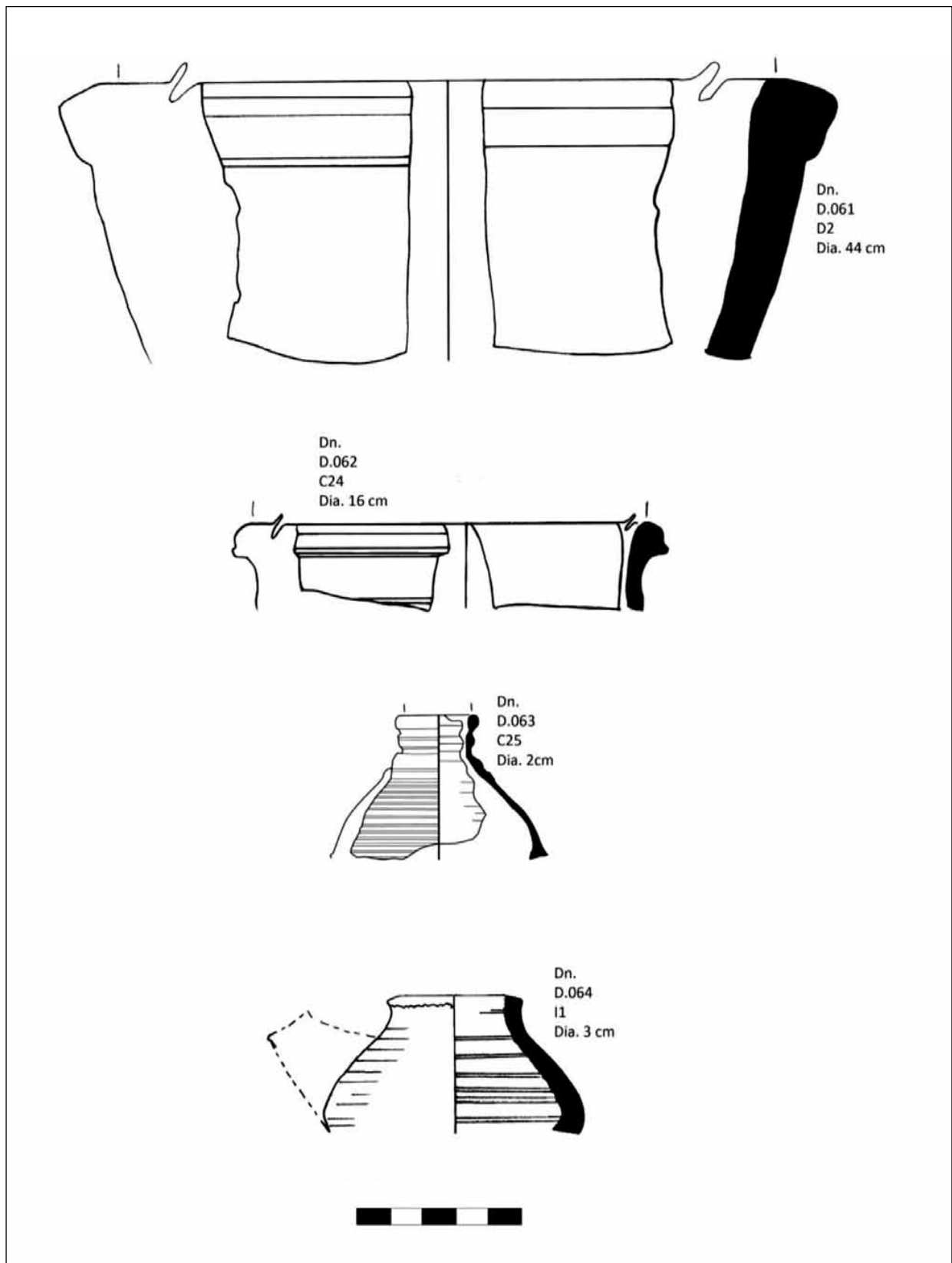
27. Whitcomb, D. (1990). Aqaba. *Oriental Institute Annual Reports* 1989-1990: 41-49; (1995). A Street and the Beach at Ayla: The Fall Season of Excavations at 'Aqaba, 1992. *Annual of the Department of Antiquities of Jordan* 39: 499-507 (especially 499-502).

Table 1: Representative typology of ceramic forms retrieved from the deep probe and tentatively dated as belonging to the 7th century or Byzantine-Umayyad transition (© AAP/Alex Wood).

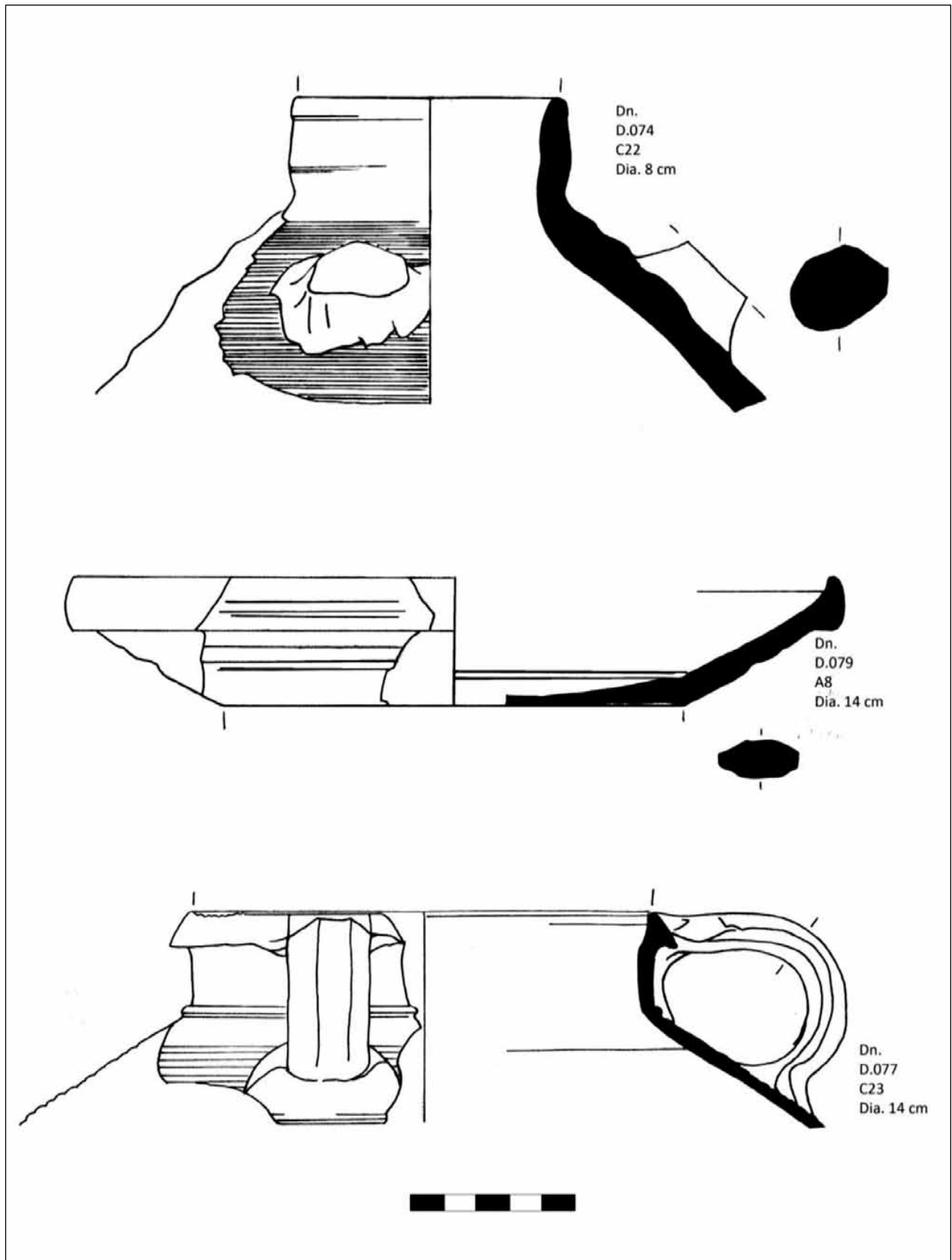
Type	Provenance (unit/locus)	Description	Phase	Drawing No.	Figure No.
C11	IM1/103	Red ware bowl or jar; flat base; ribbed body; medium sand and grit inclusions.	5	D.026	Figure No. 7
E17	IM1/103	Medium cream-surface ware jar; concave base; outward carination; medium sand and mica inclusions.	5	D.021	
C13	IM1/103	Medium red ware jar; out-turned rim; folded lip; sand and mica inclusions.	5	D.012	
D3	IM1/104	Coarse cream-surface ware bowl/basin; wheel-thrown; straight rim; flat lip with slight outward slant; angularly ribbed body; medium sand and crushed lime inclusions.	5	D.048	
D2 (B5)	IM1/106	Coarse red ware basin with cream slip on exterior; orange-reddish fabric; out-turned and folded rim; flat lip; sand, grit and mica inclusions.	5	D.061	Figure No. 8
C24	IM1/106	Medium red ware bowl/basin; wheel-thrown; out-turned rim; rounded lip; incised lines on body; light sand and mica inclusions.	5	D.062	
C25	IM1/106	Fine red ware juglet, wheel-thrown, out-turned rim and rounded lip; ribbed neck and body; fine sand inclusions.	5	D.063	
I1	IM1/106	Medium to fine green-grey ware lamp; folded notched rim; bulbous ribbed body; light sand and possible lime inclusions.	5	D.064	
C22	IM1/106	Medium red ware storage jar; wheel-thrown; straight rim and rounded lip; finely ribbed body; attached vertical handles; medium mica and grit inclusions.	5	D.074	Figure No. 9
A8	IM1/106	Very fine red ware plate of Late Roman type; wheel-thrown; folded and slightly rounded rim; slightly convex base; fine sand inclusions.	5	D.079	
C23	IM1/106	Fine red ware storage jar or cooking pot (traces of soot on exterior); outward folded rim, attached vertical handles (probably 3 in total); medium sand, grit and mica inclusions.	5	D.077	
C47	IM1/108	Red ware jar; flat base; smooth body of varying thickness; rounded base with slight groove; medium sand and mica inclusions.	5	D.168	Figure No. 10
E37	IM1/108	Medium cream-surface ware juglet (orange core); out-turned rim and slightly inward slant on lip; light sand inclusions.	5	D.075	
E38	IM1/108	Medium cream-surface ware bowl; wheel-thrown; slightly out-turned rim with thick rounded groove; outward slanted lip; sand and mica inclusions.	5	D.070	
E21	IM1/108	Medium cream-surface ware bowl or jug; wheel-thrown; flat base; medium sand and mica inclusions.	5	D.073	
E36	IM1/105	Medium cream-surface ware basin or cooking pot; wheel-thrown; out-turned rim with overhang; slanting lip; sand inclusions.	5	D.067	
E32	IM1/108	Medium cream-surface ware basin or large bowl; wheel-thrown; folded rim; outward slant on lip; flat base; sand and mica inclusions.	5	D.080	
E22	IM1/108	Medium cream-surface ware amphora (Aylah type); wheel-thrown; straight rim and flat lip; interior groove for lid; double vertical handles attached to rim; light mica and sand inclusions.	5	D.078	



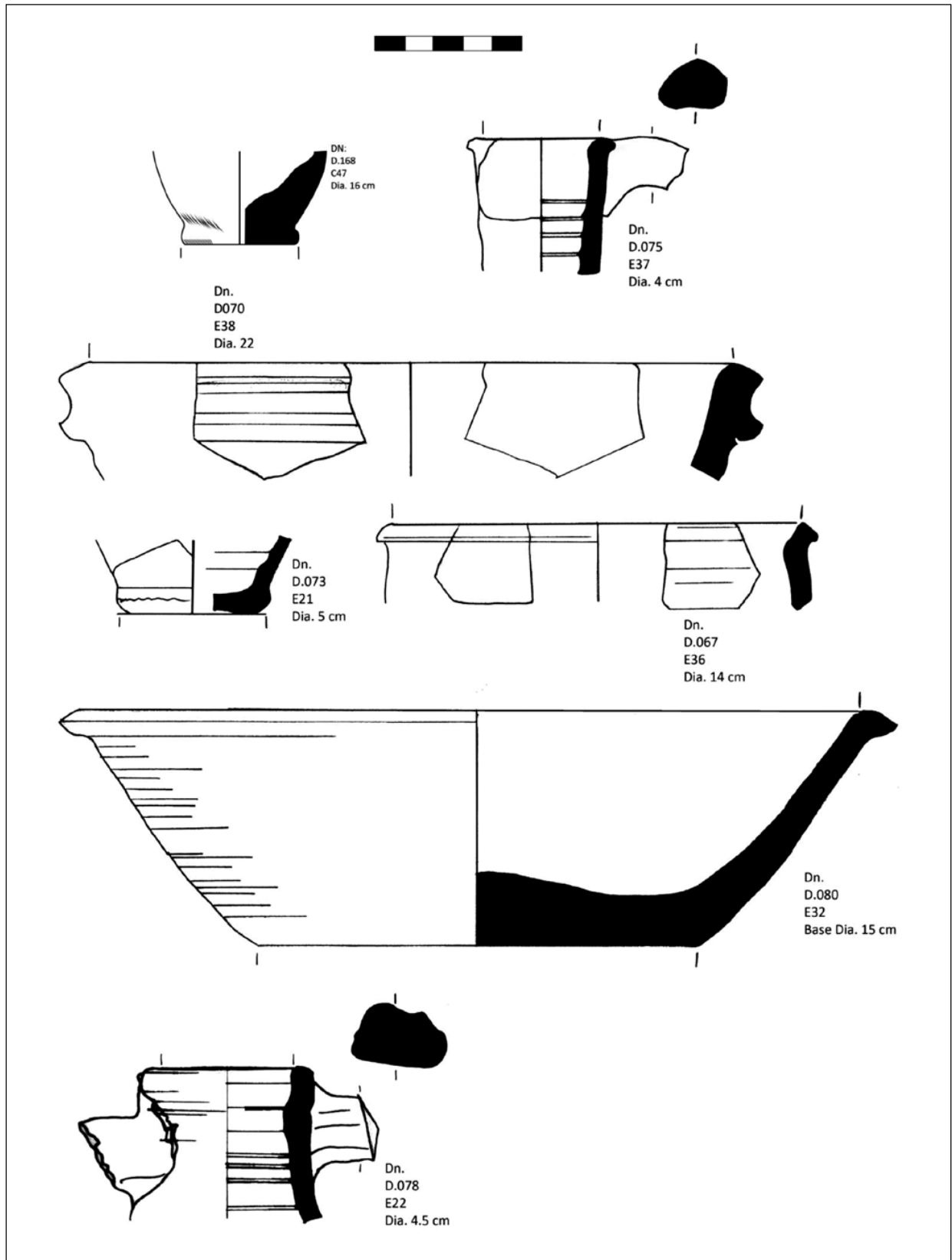
7. Type: C11, E17, C13, D3.



8. Type: D2 (B5), C24, C25, I1.



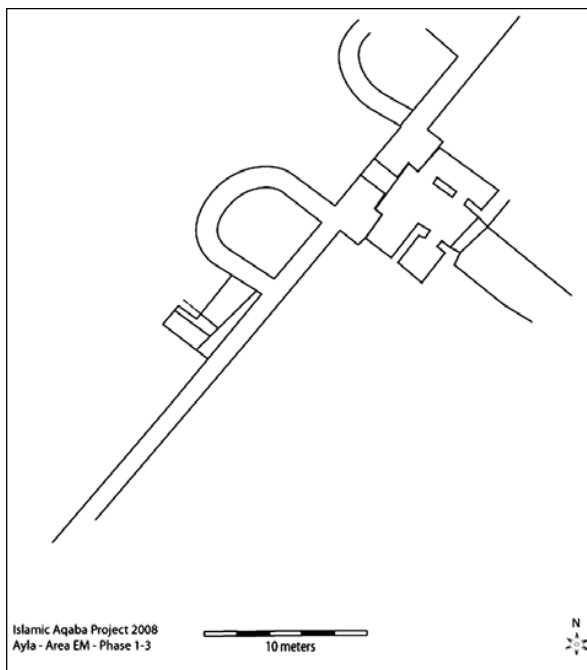
9. Type: C22, A8, C23.



10. Type: C47, E37, E38, E21, E36, E32, E22.



11. Burnished red-ware sherd (possibly sigillata 4) with incised wild boar (© AAP/Henrik Brahe).



12. Plan of EM trench outside Egypt Gate (© AAP).

Whether or not the construction of Wall 3 is related to the cordoning process remains unclear, but its presence is a significant indicator of the existence of *extra muros* structures along Aylah's north-west flank.

The EM trench also provides a window onto the final phase of occupation at Aylah, a traumatic period that saw both a major earthquake in 1068 AD and a serious and ongoing conflict with the Banu Jarrah. Within Area EM, we found both collapsed and standing remains of the city wall, which may constitute the result



13. Vertical view of stone wall with mud brick superstructure identified against the exterior of Aylah's circuit wall (© AAP).

of either. The standing remains were of particular interest because they demonstrated that the city wall itself has been significantly offset from its original axis, most likely due to the violent seismic activity of the 1068 AD earthquake. A destruction layer (locus 4) underneath some collapsed stone blocks abutted the standing, off-axis remains of the city wall and was spread across the entire trench area. This contained a large corpus of glazed ceramics attributable to a late Abbasid cultural horizon, including bright yellow Fayyumi wares, a variety of splash wares, turquoise glazed wares from Raqqa or Zabid, alkaline glazed wares with barbotine decoration and a rim sherd from a lustre ware bowl. Locus 4 was situated above a large fill (loci 5 & 6) that we confidently label as Fatimid, as its loci produced artefacts typologically consistent with our Phase 1, including many sherds of the characteristic hand-made wares.

EM yielded interesting results pertaining to earlier periods as well. In the deepest level of the trench, at the southern end, an earlier phase of walling was identified in section. This appears to run directly below Wall 3, but is separated by a fill approximately 50 cm thick. The material yield from the fill and surfaces associated with this earlier wall phase is predominantly early Abbasid, including some forms known from the kiln site. The wall has therefore been allocated to occupation Phase 4. Finally, at the end of the 2008 season, we exposed a segment of the city wall to below its foundation revealing tantalising but ambiguous evidence that this monumental structure has distinct construction phases and

that the original wall was subjected to significant damage and rebuilding long before the site was abandoned.²⁸

Expanding Our Understanding: The 2010 and 2011 Seasons of the AAP

The work conducted in 2008 was intended as preliminary and diagnostic, and it was no surprise that little could be concluded regarding the exact nature of the area excavated, or indeed of the individual structures identified. What was evident, however, was that the south-western quadrant was occupied and maintained for the entire lifespan of the city. Furthermore, we could identify changing conceptions of urban space over time, yet it was also clear that significant continuities in the occupational history of the city endured. In addition to a partial maintenance of the orthogonal layout, completely new structures were built directly in line with earlier phases both inside and outside the walls – usually separated by an earth fill. The finds, and the deposits from which they were retrieved, also gave no clear indication of whether we were dealing with public or private space. Ultimately, the data that was retrieved in the initial season allowed a glimpse into the occupational history and stratigraphic phasing of the south-west quadrant, but little as to the quadrant's social or economic life. This has since been remedied by the continuation of archaeological work at Aqaba through the *Aylah Archaeological Project*.

Continuing the work begun by the IAP, the AAP has hitherto limited excavations to the south-west quadrant of the site in order to focus our investigations. Two pivotal issues regarding the town's history have defined our efforts so far:

1. Ascertaining the extent and location of mercantile facilities related to the Red Sea / Indian Ocean trade (e.g. warehouses, processing compounds, markets and administration).
2. Explaining the nature and background of the urban morphology between the 9th to 11th centuries.

Excavations have recovered artefacts that demonstrate commercial ties with regions as far away as Yemen, Iraq and China. Yet there is little evidence for the facilities that would have accommodated such a trade. The possibility of a causal relationship between the activities in the south-west quadrant and the Abbasid construction of a *suq* against the Sea Wall was mentioned above. Whether the *extra muros* structures in fact are the remains a *suq* is hard to establish, as they have been buried by the closed beach facilities of the Mövenpick Hotel. Nevertheless, it is possible that these structures accommodated the maritime trade going through Aylah. In this scenario, these well-built structures could for example have constituted part of the town's mercantile administration that registered and taxed goods. Such offices are known from historical descriptions of Fatimid ports of similar size and capacity to Aylah,²⁹ and imply that this was a standardised means of enforcing economic control in the period. The AAP was thus in part launched to investigate whether a similar system was in place at Aylah and, if so, whether the facilities related to the town's mercantile life were located in the south-west quadrant.

The 2010 season saw the excavation of two new trenches, IM3 and IM4, each conceived with a strategic purpose. IM3 was targeted to explore the nature and function of the south-west quadrant of Aylah, especially its morphological relationship with the *extra muros* facilities by revealing structures parallel to the southern city wall. The unit lies directly opposite a secondary entrance way into the city, which in the Abbasid period linked the exterior *suq* with the interior township. For its part, IM4 was laid out to ascertain to what degree the street layout adhered to a regular grid pattern and to verify whether the street exposed in 2008 intersected with a north-south street linking up with the Egypt Street. In 2011, a fifth excavation unit (IM5) was opened south of IM4 and west of IM3 in order to create

28. For a recent overview of the extensive architectural modifications taking place in architecture during the Umayyad period see Arce, I. *The Archaeology of Umayyad Construction. An approach to production processes at Qusayr 'Amra, Hallabat, Qastal & Amman Citadel*. In *Beyond Borders: Recent Advances in Islamic Archaeology. Proceedings from a seminar*

held in Jerusalem, 7th-8th February 2013, edited by K. Damgaard, K. Cytryn-Silverman and D. Whitcomb. Oriental Institute, Chicago (forthcoming).

29. Lev, Y. (1999). *Tinnīs: An Industrial Medieval Town*. In *L'Egypte Fatimide: Son Art et Son Histoire*, ed. M. Barrucand, 83-96. Paris: Presses de l'Université de Paris-Sorbonne.

a larger coherent area of excavation. Work was also continued in IM1 and IM2.

IM1

Since 2008, IM1 has only been subject to focussed excavation in key areas. The primary objective was to document the deposits associated with Aylah's initial construction and occupation systematically, hence the deep probe excavated in 2008 was continued. Based on the experiences of prior archaeological projects at Aylah,³⁰ we expected these deposits to be highly water-logged and difficult to access. The inaccessibility of the Umayyad town is in all likelihood due to a combination of a shallow aquifer, tectonic activity and the subsequent occupation pushing the early phases deeper into the sand. The proximity of the water table to the level reached in 2008 was obvious, and even though the moisture stems from ground water, the high salinity has caused stones to disintegrate (limestone and sandstone) or crumble (granite). These decaying rocks were easy to confuse with patches of coloured sand or gravel deposits. As a result, the deep probe was excavated in arbitrary spits of between 20 and 50 cm.

As noted above, the artefacts retrieved from the deep probe under the IAP were suggestive that we had penetrated a 7th century dump. As part of the continuing excavations here, an additional charcoal sample was taken from what we perceived to be the bottom of the dump (locus 108). This yielded a date (calibrated sigma 2) of 1563 ± 32 BP, corresponding to a chronological range of between 420 - 570 AD (at 95.4% probability). In spite of another pre-Islamic date, we interpret this mixed deposit as the initial filling of the walled enclosure in order to create a level surface on which to construct the new township. While the limited nature of the probe precludes certainty, the proposed date for the fill was corroborated by an abundance of 7th century ceramics (Figs. 7-10), but with no recognisable 8th century wares such as Mahesh wares or

ICW. The deep probe was rich in finds. A large quantity of faunal remains, metal fragments and ceramics were retrieved, including three intact oil lamps and a small basin or large bowl of the locally produced cream-surface ware (Fig. 14).

Moreover, multiple pieces of worked ivory were discovered. This corpus is most interesting as it contained remnants of a variety of artefacts. Most obvious were the pieces of polished ivory, which included aligning fragments of a circular box or pyxis, as well as the remnants of jewellery such as fragments of bracelets and a ring. More tantalising was the recovery of seven fragments that appear to have been deliberately discarded. Their dimensions and form prevented them from being used functionally; most likely these are waste from an ivory workshop located in Aila / Aylah in the 7th century (Fig. 15)³¹ If this is the case, we have evidence for a class of craftsmanship that was directly related to the town's nodal position in the Red Sea trade networks. Furthermore, it implies that ivory was a material with which the inhabitants of Aylah were familiar.

Below locus 108 there was a distinct change in soil composition from highly organic to sandy. At the same time, the density of artefacts



14. Reconstructed cream-surface ware bowl discovered in the deep probe. This ware is locally produced and reflects a long tradition of pottery manufacture that spans the 4th to 9th, and possibly into the 10th centuries (© AAP).

30. Parker, S. T. (2002). The Roman 'Aqaba Project: The 2000 Campaign. *Annual of the Department of Antiquities of Jordan* 46: 409-29 (especially p. 421); Whitcomb, D. 1989. Evidence of the Umayyad Period from the Aqaba Excavations. In *The Fourth International Conference on the History of Bilâd al-Shâm during the Umayyad Period*, eds M.A. Bakhit & R. Schick, 164-84. Amman.

31. In early 2013, small samples were taken from all of the ivory fragments retrieved from IM. These are currently being analysed by Dr Ashley Coutu (University of York) in order to establish a DNA profile that will confirm the artefacts as ivory and identify the species they came from. Isotope analyses will hopefully contribute to identifying the exact region in which the source animals lived.

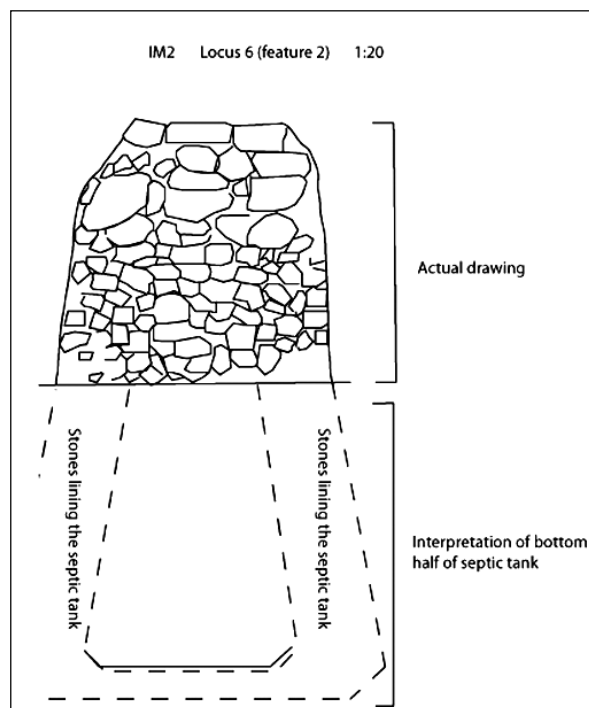


15. Discarded ivory fragments discovered in the deep probe of IM1 (© AAP).

dropped significantly, with no bones or metal at all and only very few ceramics. In the next locus (109) we found the remains of a Late Roman / Byzantine lamp and noticed a general shift in the ceramic corpus to being more Late Roman in character. A new phase was therefore tentatively defined below the 7th century dump, formed by the interface of loci 108 and 109. The subsequent locus (112) continued to contain archaeological material but could not be penetrated further owing to the penetrating ground water and the risk of collapsing baulks. Samples intended for C₁₄ dating were nevertheless retrieved from this point and yielded calibrated dates of 2165 ± 27 BP (mollusc) and 1852 ± 25 BP (charcoal), corresponding to 190 - 580 AD and 85 - 235 AD respectively (with 95.4% probability). When excavation was halted here at the end of the 2010 season, the probe had reached more than 8 metres below the original surface and was partially backfilled for safety reasons.

IM2

IM2 was opened in 2008 as a small trench intended to confirm the presence of a street. The excavated area was delineated by a sturdy wall of a building on the northern flank of the identified street (**Fig. 4**). In 2010, the excavation unit was significantly expanded with the objective of exposing and documenting the Fatimid drainage system that was initially identified in IM1 and which extended into the street in IM2. This consisted of a double canal leading liquid from the large structure in IM1 to a tear-shaped, stone-lined cesspit dug into the laminated strata of the street (**Fig. 16**). The canal was covered with



16. Section drawing of the drainage pit dug into the street surface of IM2 (© AAP).

flat stones and contained a fine sandy soil of the same yellow discolouration seen in the overflow of the second unexcavated cesspit in IM1. No artefacts were found in this fill.

Excavation of the canals and pits allowed us to determine that the longer canal leading to the lower unexcavated cesspit was the earlier of the two. This initial pit (or possibly a re-used well) was eventually filled to the brim, but this did not stop the drainage process as is evidenced by the same yellow deposits superimposing it and constituting a significant overflow. The overflow problem was eventually solved by constructing a short second channel leading to a new stone-lined pit immediately outside the drain exit. Whether this replaced the older drainage system or simply enhanced it is not yet clear, but if this is the case - and the lower pit is much earlier than the tank in IM2 - it implies that Aylah's inhabitants had a solid understanding of the town's morphology and knew how to re-use older installations. This impression is corroborated by the positioning of new walls along the same axes as predecessors, though not necessarily in direct contact with them (often separated by a 30 - 50 cm fill). The western half of the drain was lined with small flat stones along the bot-

tom, presumably to facilitate flow. Why a similar lining was not present in the eastern canal is unclear, but it may have been related to the fact that this canal is both shorter and steeper.

In order to investigate the purpose of these drainage pits, the upper one was excavated and partially dismantled, so as to show a full profile of both installation and content. The exposure allowed the contents to be accessed archaeologically. The first metre was completely sterile. Our supposition is that the feature had not been filled prior to the abandonment of its use and that the sterile upper stratum is the result of seeping loose sand. The deposits stemming from the drain's original function were located underneath a thin layer of gravel separating the sterile from the actual contents.

In spite of clear compositional distinctions between these two phases, there was a paucity of artefacts in the deposits stemming from the pit's original usage as well. If an actual sewage system, one would normally expect a certain quantity of artefacts to have fallen to the bottom. Yet in spite of sieving 100 % of the pit's contents, only a small quantity of ceramic and bone was retrieved. The ceramic profile was quite mixed and contained red ware, cream-surface ware and cream ware fabrics, suggesting a rather broad chronology from the 8th to the 10th centuries. These were all covered with a greenish patina, which was a result of the chemical composition of their context. What exactly this context constitutes requires a detailed analysis of the soil samples collected inside the pit, but a charcoal sample yielded a calibrated date of between 990 and 1155 AD (990 ± 25 BP).

The feature was constructed by excavating a deep pit into the street and lining it with stones from within. A mud-slurry was used as bonding agent. This method of construction explains the amygdaloid form, which lends structural support to the narrow upper part of the pit. The structure consists of an exterior course of large- and medium-sized stones, and an interior course of medium-sized stones. Between these was a fill of smaller stones. The largest stones are used at the very top, presumably to lend extra support to the upper part of the feature, which would have been exposed to the pressure of day-to-day traffic. At the top, the installation was equipped with a manhole no more than 40 cm in diam-

eter. From here, a bottleneck opening opened up into a globular space inside. At its bottom, the feature was both 1.5 metres wide internally and partially open to allow gradual seepage into the ground below. A large basalt lid, consisting of a re-used basalt grinding stone, covered the manhole. Around this was a packing of small stones and pebbles set in mud to keep the lid in place. Both packing and lid were presumably hidden just below street's surface.

In 2011, IM2 was expanded further with the objective of revealing more of the east - west running street and its junction with an equally impressive street discovered in IM4 running parallel to the city wall. The area was taken down to the level of IM4, which corresponds to Fatimid / Jarrahid levels and the latest historical phase of occupation at Aylah (Phase 1). As expected, the strata consisted mainly of laminated fill layers. In the western end of IM2, the modern trash pit identified in IM4 last season was removed and the historical strata under it exposed. The fill consisted of a moist dark brown soil with a high density of burnt olive pits. The complete lack of modern contamination confirmed that historical layers had been reached and samples of the olive pits were taken for future laboratory analysis.

IM3

IM3 was laid out as a southwards elongation of IM1. The main objectives were to investigate what kind of structures bordered the interior Sea Wall and to address our hypothesis that the structures proposed to be an *extra muros suq* could have been facilities to register and tax goods moving in and out of town. An important substantiation of this would be the presence of related infrastructure (e.g. storerooms) behind the city wall.

The excavation unit was opened in 2010 but little progress was made in regard to depth, as the excavation contained a large number of modern walls that had been integrated with the historical Phase 1 walls and were built using the same techniques and materials. This, combined with the sheer number of walls, obfuscated the architectural morphology and limited the area available for excavation. A primary goal of the 2011 season was therefore to document and remove those features that were securely identified as modern. This goal was largely accom-



17. View of Fatimid (Phase 1) period doorway and *in situ* water jug of handmade ware. Insert of vessel after excavation and reconstruction (© AAP).

plished and allowed several historical surfaces and undisturbed archaeological contexts to be exposed; all belonged to Phases 1 - 2 (10th - early 12th centuries).

Two pisé features were also uncovered in this square. The pisé-walls are suggested to function as (possibly temporary) supporting walls to the stone walls they abut (#2 & #16). The outer face of the pisé walls was coated with a thin layer of chalk or lime paste. The same substance was found in high densities in the fill layers, which suggests that these included the detritus of similar structures. In the south-east corner, a structure that had been built using dressed limestone blocks was identified. Excavation confirmed them to be pier-like doorjambs of an entrance to a building that continues eastwards beyond the limits of the excavation unit. Part of this building was at some stage removed to construct other walls and the exact purpose of the doorway is not clear. A hand-made globular storage jar of the type referred to by Whitcomb as ‘tupper-ware’ was found *in situ* standing on the ground west of the entrance way (Fig. 17).³² The position of the jar on the surface in front of the door may indicate that we are within a larger complex,



18. Stamped glass weight from Fatimid period surface associated with a mercantile artefact horizon (© AAP/Henrik Brahe).

but this remains speculation.

The two related surfaces (loc. 53 and 63) were identified on either side of the doorway. This area is the edge of our excavations and the closest we have come to the interior of the ‘Sea Wall’ and its associated structures. Our notion that this area was engaged in mercantile activities was significantly corroborated by the finds on this Fatimid-period surface. Amongst the retrieved artefacts were two intact but illegible glass weights of the stamped, thick-rimmed kind known from other Early Islamic commercial sites (Fig. 18).³³ A third glass weight was found embedded in a lump of highly corroded iron, in which several unidentifiable copper coins were also stuck. In close proximity, three small and thin-sheeted copper bowls were found (Fig. 19). These must originally have been part of a weighing device capable of fine measurements and when seen in light of the broad range of fine weights retrieved by the OI excavations (Fig. 20), it seems reasonable to assume that this was a device used for expensive commodities such as spices or gold dust.³⁴ The same surface also yielded several small hand grinders, a basalt pestle and a whetstone, next to which the

32 For a description of the ware see Whitcomb, D. 1988. A Fatimid Residence at Aqaba, Jordan. *Annual of the Department of Antiquities of Jordan* 32: 207-224.

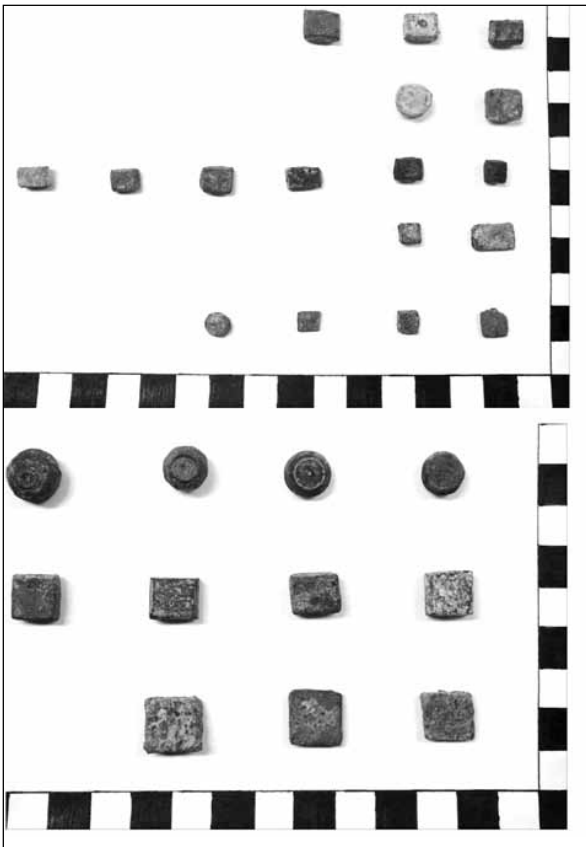
33. See for example Balog, P. (1976). *Umayyad, Abbasid and Tulunid Glass Weights and Stamps*. New York: The American Numismatic Society (see especially nos. 654, 661, 737, 754 and 756); Morton, A.H. (1985). *A Catalogue of Early Islamic Glass Stamps in*

the British Museum. London: British Museum Publications (especially nos. 368 and 535).

34. While spices may have travelled across great distances via the maritime trade networks, gold dust was extracted in the nearby Wadi Tawahin. See Avner, U. & D. Nahieli (1993). Wadi Tawahin (Eilat). *American Journal of Archaeology* 97: 160-62.

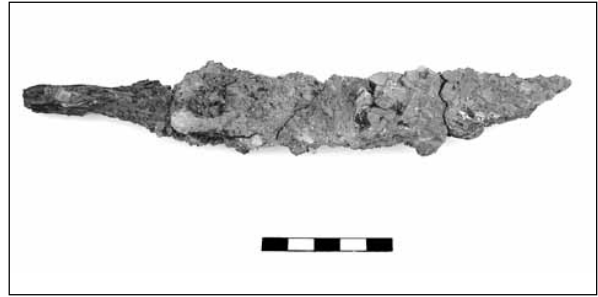


19. Thin copper weighing bowls found in close proximity to several glass weights, an iron knife and several coins (© AAP/Henrik Brahe).



20. Representative sample of weights retrieved by the Oriental Institute excavations and currently held in the archaeological laboratory of the Oriental Institute, Chicago (© OI/Whitcomb; Photo by Damgaard).

corroded remains of a curved iron knife in a beautifully braided iron sheath were found (Fig. 21). The common theme in this remarkable and distinct artefact horizon is that it points unequivocally in a mercantile direction.



21. A highly corroded curved iron knife in its sheath (© AAP/Henrik Brahe).

In 2010, it was not possible to unambiguously connect the structures in IM3 with those in IM1 for safety reasons. However, following the partial backfilling of the deep probe excavation continued. At the beginning of the 2011 season, a number of walls (#1, #3, #10, #11 and #15) were confirmed as modern and removed. This allowed three continuations of walls identified in IM1 to be identified in the northern part of IM3 (#19, #21 and #25). Even so, the complexity and density of walling in IM4 has prevented excavations to penetrate deeper than Phase 2 (10th century) deposits. In the western half of the excavation unit, two fills were excavated, revealing the upper course of a wall (#24) and a more makeshift feature that could be either the remnants of an animal pen or an irregular dilapidated wall. Further excavation of this area is planned for the coming season.

IM4

When this excavation unit was opened, only the north-east half was excavated. This allowed us to use the relatively short 2010 season to establish a diagnostic phasing while confirming the presence of an intersection in the town's street network. Four particular elements were identified: a central street, a large western building (formed by Walls 1 & 2), a cesspit and an eastern building with a threshold (Wall 4). In 2011, the excavated area was expanded in order to gain a greater appreciation of these features and to relate them to the features previously identified in both IM1 and IM3.

The streets

In 2010, an almost three metre-wide strip running north - south between two structures was exposed. This area was quickly identi-

fied as a street based on cumulative evidence. A narrow strip of the east - west running street first identified in IM1 and IM2 was also identified in the process. The latter reached what we currently hold to be an open intersection with IM2's street and was flanked on either side by Walls 2 and 4 (**Fig. 2**). Both walls suggest we are dealing with a street: Wall 2 is constructed of large stone blocks with a dressed outward face. Wall 4 does not present a similar facade to the street, but has suffered from significant damage. A large part of Wall 4 constitutes a threshold that provided access from street into the building with the large drainage installation in IM1. A sealed cesspit had been dug into the street in the same manner as in IM2, but was seemingly never taken into use. Its depth from aperture to current soil level is 290 cm. As with that in IM2, it gradually bulges outward to form a pear-shape. For safety reasons no one ventured inside, and it is unclear whether it contains an artefact horizon.³⁵

The stratigraphic sequence of its installation shows that the pit was dug into an existing street surface and subsequently covered with the cover stone, which in turn was camouflaged with a shallow fill to match the functioning street level. Beneath the stone slab, a subterranean channel extends from under the threshold in Wall 4 and into the pit. The channel was dug into the street and was obviously intended for the discard of liquid waste, being related to the drainage system of IM1. It should be pointed out that the sophisticated hydrological technology identified in this area is unlike anything documented in the rest of the town. Identifying the nature and function of this substantial building and its installations will be an important step in ascertaining what was going on here, but seemingly not elsewhere in town, and thus by implication determining if and how the south-west quadrant differed from the remaining townscape.

In 2011, the rest of the excavation unit was opened. In the southern end of the street, a larger stone-lined well was identified and excavated. The fact that this was a well and not another cesspit is suggested by its open and round shape, a significantly broader diameter and the richness of discarded artefacts found inside it. Several

samples of organic remains were taken from inside the well; in due course these will be dated using C14.

Surprising results in IM 5 force our understanding of the street network to remain tentative. As the street proceeds south, it appears to veer off to the west and in the direction of the south-west corner tower of the circuit wall. This nevertheless remains only an impression, as the possible westward turn is hidden by the baulk between IM 4 and IM 5, and IM5 only has been partly excavated. The fact that the street is narrower and preserved at a higher level in IM5 may indicate that our results here constitute a late remodelling that did not extend as far north as IM4. It is important to understand in what phase the change in orientation occurs, as this would allow us to explore the resilience of Aylah's orthogonal layout.

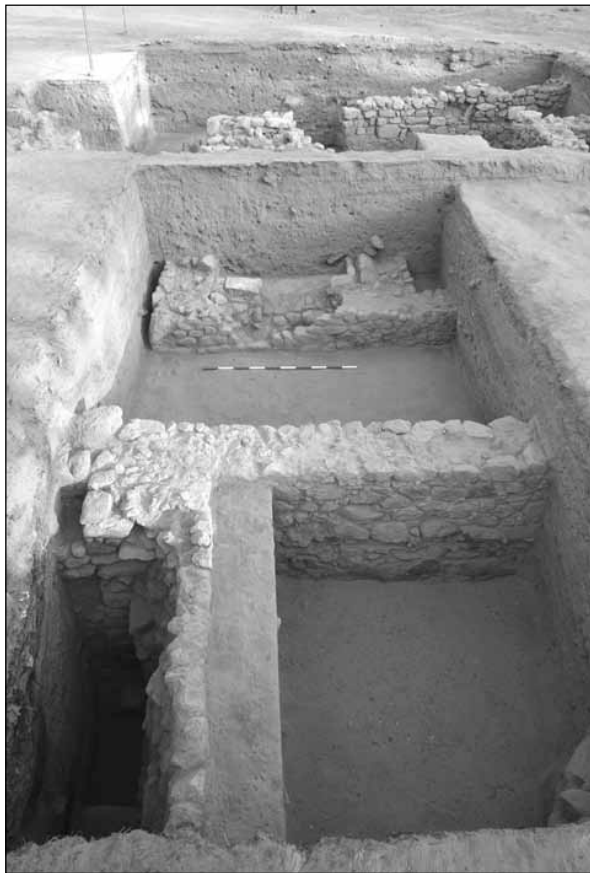
In spite of these difficulties, the discovery of a broad subsidiary street flanked by impressive stone architecture and running roughly in the direction of the Abbasid *extra muros* structures is potentially significant. The north - south running street in IM4 must have been an important thoroughfare leading to and from the beachfront, where presumably a substantial part of the goods passing through Aylah were loaded on and off local watercraft. The current hypothesis is that this street played a role in the transfer of goods into the south-west quadrant for processing and distribution, and thus constitutes an important part of the town's mercantile infrastructure.

The eastern building

The wall (#4) that delineates the east - west oriented street in IM1 continues, but rather than maintain the axis, it turns 90 degrees south-east to form a corner and the junction of two streets. As with most of the Phase 1 architecture, and with the exception of a dressed but highly disintegrated cornerstone, Wall 4 consisted of uneven coursing with medium-sized undressed granite stones. It flanks the north - south running street, but is interrupted by a doorway of which only threshold remains. It was partially cut into by a modern trash pit that contained both asphalt discard and beer bottles. Wall 4 is part of the structure identified in IM1. As it juxtaposes an-

35. A video of the interior, achieved by lowering a small camera into the pit, can found at www.miri.ku.dk/projekts/aap

other building across the street, it is here termed the 'eastern building' for ease of reference. The exposed architecture has several interesting elements, including a damaged threshold that opens directly onto the street. Two stone blocks, one of which is an ashlar, form this feature (**Fig. 22**). On the interior of the threshold and superimposed on Wall 4 we exposed a compact layer of grey ashy mortar that seems to be a sub-floor packing into which some type of paving was set. A chute runs along the southern edge of the



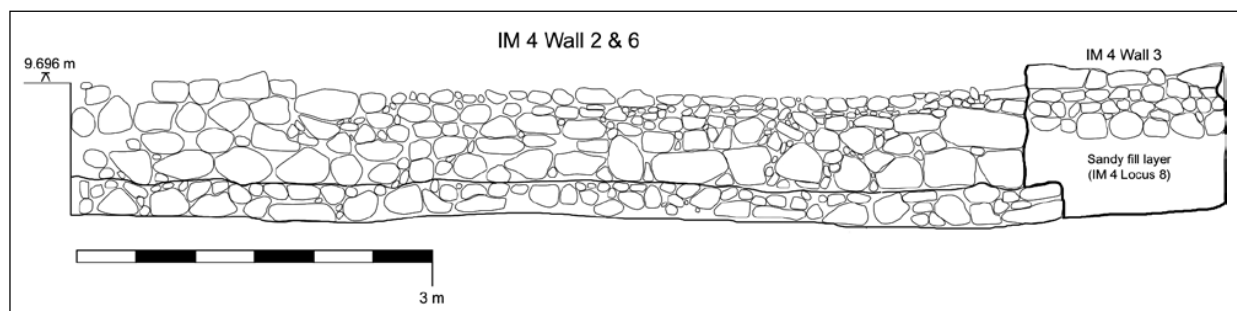
22. IM4's Wall 1 and 2 showing the partly destroyed threshold in Wall 1 (© AAP/Henrik Brahe).

threshold and drops beneath it to become the subterranean channel described above.

In 2011, we removed the east baulk of IM4 in order to gain a better understanding of this building. The removal of the baulk allowed us to begin visualizing the building as a coherent whole (**Fig. 2**) and will be an important step towards understanding and explaining this seemingly anomalous building. When seen in conjunction with the advanced hydrological installations, we currently imagine that the building was engaged into some type of intensive processing, but further excavation and analysis of the soil retrieved from the cesspit of IM2 will be necessary before anything can be concluded.

The western building

The first architectural features exposed in IM 4 were Walls 1 and 2, which align at a right angle and were bonded to form a strong corner of a substantial building unit. Wall 1 was almost completely destroyed by a deep modern pit in which trash had been burned. All that remains is a single row of cobbles, about 14 - 20 cm thick, corresponding to the wall's inner face. Wall 2 has two visible phases, the lower of which has so far only been partially excavated (**Fig. 23**). This runs along a north - south axis facing the street and is mostly comprised of large granite blocks with dressed outer faces at the bottom of the upper phase. With the exception of a large corner stone, the size of the stones diminishes in the upper courses until finishing at an even level suggestive of a missing mud-brick superstructure. The lower phase of the wall belongs to Phase 2 and is 5 - 7 cm wider than the upper phase. At the bottom of a deep trench excavated between Wall 1 and the northern baulk, two large, flat stones were exposed. These continue into the northern baulk, but there is insufficient



23. Profile drawing of the exterior of IM4's Wall 2 showing the phasing as it is currently visible (© AAP).

room to discern whether they are part of a collapse layer or represent an architectural feature.

The uppermost layer excavated inside the western building yielded an abundance of ceramics, including many finely glazed sherds of splash- and green wares, alkaline glazed wares and two sherds of non-figurative lustre ware. These are generally consistent with an Abbasid to Fatimid ceramic horizon. Another stamped (but illegible) glass weight of a late Abbasid or Tulunid style was found here as well. Overall, we speculate that this fill corresponds to Phase 1 but may have contained discarded materials from elsewhere on site and thus contain traces from previous phases. Unfortunately, this layer has been severely disturbed by a buried concrete installation, possibly the cellar of an early 20th century house.³⁶ This is situated in the south-west corner of the excavated area and remains a problem to be dealt with in coming seasons.

To the immediate north of the corner of Walls 1 and 2 is Wall 3, which is constructed atop a fill covering the lower phase of Wall 2 and butting its upper phase. This stratigraphic sequence, along with our general understanding of the urban evolution of Aylah, would place Wall 3's construction at a relatively late date (11th century). Wall 3 was initially thought to be a late addition blocking of the western continuation of the east - west street, but excavations in 2011 revealed that it contained multiple phases and thus seems to have been continually reinforced over an extended period of time. If IM1's street continues into IM 4, then Wall 3 might represent a blocking or narrowing of this street. However, more excavation is needed to corroborate this. It is also possible that Wall 3 was constructed to buttress the corner of Walls 1 and 2 as a means of securing structural stability - perhaps even as a post-earthquake (1068 AD) reinforcement.

IM 5

This excavation unit was opened in 2011 and has not been explored to the same degree as the other units. Here too the upper strata were highly contaminated by modern depositions, including

walls (#1 - #3) and several large and deep cement installations. A number of walls seemingly belonging to Phase 1 were identified and partly excavated. Located centrally in the unit, two walls (#4 & #6) continue north-east into IM4. Consequently, IM5's Wall 6 appears to correspond to IM4's Wall 6, though the odd angling may suggest that it is later. It will be necessary in coming seasons to expose the walls completely and excavate around them before any relations can be unequivocally confirmed. As mentioned above, in IM5 the street veers south-west, seemingly heading towards the corner tower (22), but this also requires further exploration to verify.

Site Preservation

The geological and climatic conditions of Aqaba are unfavourable for preservation once archaeological remains have been exposed. The climate is one of intense heat and sunlight for most of the year, but there are strong prevailing winds from the north-west. Combined with sudden bursts of rain and hail in winter, Aqaba's climate has a devastating effect on the exposed archaeological landscapes unless certain preservation measures are taken. At Aylah, most of the architecture consists of cobbled walls held together by a mud-slurry. Originally, these would have been protected by a plaster coating and superstructures of plastered mud-brick, but these are largely gone. However, for the sake of temporary preservation (*i.e.* while the project is still running), all features and standing architecture are covered with a loosely fastened hessian cover that protects against wind and precipitation. Furthermore, the excavation area has been temporarily cordoned off by a 2.5 metre fence meant as a protective barrier to both visitors and the archaeological remains.

Paperless Archaeology

The AAP has implemented a paperless excavation and registration procedure. All in-field recording is conducted on iPads (**Fig. 24**), including scaled profile and plan drawings, as well as most non-publication photography. For

36. This is presumably part of a 20th century domestic complex known as the 'Sheikh's House' (pers. comm. Whitcomb), which was at least partly removed during the OI excavations at the site. Aylah generally has an interesting site morphology during the 19th and 20th centuries, which would be worth exploring

ethnographically – especially considering Aqaba's extensive development over the last 30 years. Nevertheless, this is not the venue to elaborate upon this. Some preliminary notes, references and images are provided in *Modelling Mercantilism* (pp. 42-52).



24. The use of iPads for in-field registration of all excavation data (© AAP/Henrik Brahe).

important contexts, overview shots, and images intended for publication, high-resolution photographs were taken and subsequently entered into our database. At the end of a season, all data has been systematically recorded directly into a comprehensive database. The use of iPads for recording, drawing and photography saved a lot of time in the field. However, by using a database system with a compatible app (in our case Filemaker Pro and Filemaker Go) an even larger amount of time was saved in post-excavation processing.

The AAP's standard practice of registering finds during the field season is conducted within the same database system as in-field excavation registration. The database currently subdivides finds into field objects, samples (i.e. non-diagnostic glass, faunal remains, metal, stone and architectural fragments) and science samples (everything taken for further testing, e.g. charcoal, soil, plaster etc.). All finds were processed according to find context and find category, allowing for easy cross-referencing. Similarly, all finds and sample bags were allocated a unique catalogue number.

In regard to ceramics, the AAP applies a rigorous procedure of processing that provides statistical information related to a given locus, but which also continually expands our general ceramic typology. During the course of the

first season, 234 individual types were identified, and in 2011 another 358 new types were added, bringing the current typology to 592 types in total.³⁷ Owing to the contexts currently under excavation, these are primarily Fatimid, Tulunid and Late Abbasid (10th- 12th centuries AD) in date, but work in the deep probes of IM1 have caused a significant number of early Abbasid and Umayyad types to be included as well. Rather than using form as the primary sorting criteria, the AAP typology is built first on variations in fabric and the identification of ware types, and secondly on chronological context. The current typology distinguishes between 24 different groups, with local products such as 'cream-surface wares' or 'grey - green wares' being the most frequent. Nevertheless, significant variations of imported glazed and non-glazed wares also occur.

Concluding Remarks

Three excavation seasons – in 2008 under the IAP and 2010 and 2011 under the AAP – constitute a renewed archaeological investigation of the urban history of Aylah. This investigation has targeted the south-west quadrant of the city, an area purposely left untouched for future research by the Oriental Institute excavations under Donald Whitcomb. The main goals of the AAP are to assess the possibility that this part of the city contained structures related to the processing and storage of trade goods, to further our understanding of the site's stratigraphic (depositional and architectural) sequences and to better understand the town plan, including its street networks. Ultimately, it is the ambition to bring the corpuses of archaeological data from both this project and the Oriental Institute excavations together in a joint publication of Jordan's port on the China Sea.

Acknowledgements

The *Islamic Aqaba Project* (21st January – 6th March 2008; study season: 20th November – 17th December 2009) was funded by the University of Ghent (70%), the *UMR 5648 du CNRS* (16%), the *Archaeologia Medivalis* association

37. Owing to the incompatibility of the typological criteria, the AAP established an independent type-series of ceramics, which is the one in which currently 592

types have been identified. The typology from the diagnostic IAP season in 2008 (processed in 2009) is available in Appendix 3 of *Modelling Mercantilism*.

(12%) and *Christian og Otilia Brorsons Rejselegat for yngre videnskabsmænd og -kvinder* (2%). The funding to conduct the 2009 study season of the IAP was acquired independently by the authors and came from the generous support of *The Danish Institute in Damascus* and *Julie von Müllens Fond*. Permission to excavate and logistical support was provided by the Department of Antiquities of Jordan, with Sawsan al-Fakhry functioning as DoA representative in 2008 and Manal Basyouni in 2009.

The *Aylah Archaeological Project* wishes to thank the Institute for Cross-Cultural and Regional Studies at the University of Copenhagen, in particular the Head of Institute, Ingolf Thuesen, and Director of the *Materiality in Islam Research Initiative*, Alan Walmsley. While *Elisabeth Munksgaard Fonden* covered Damgaard's travel expenses in 2010, the University of Copenhagen provides the bulk of the AAP's funding. This support has been crucial to the AAP's success and we are grateful for the trust vested in us.

Permission to excavate and professional logistical assistance is provided on multiple levels by the Department of Antiquities of Jordan. On a national level, we wish to acknowledge the late

Fawwaz al-Khraysheh and, more recently, Jehad Haroun, who has been a strong supporter of our work. To them both we wish to express our appreciation and gratitude. On a local level, the project is indebted to Manal Basyouni, recently appointed Director of the Aqaba Antiquities Office. Mrs Basyouni functioned as the DoA representative in 2011 and has generally provided professional and warm assistance in all matters since the project's beginning. Mohammad al-Donibat served diligently as our representative in 2010 and again during a short mapping season in 2011.

A special note of appreciation is extended to two parties for their support and encouragement. The first is the *C. L. David Foundation*, which in 2011 provided funding to convert the AAP into a paperless dig. Despite our small size and limited budget, this has put the AAP at the forefront of in-field recording methodologies. Last but not least, the authors extend heartfelt thanks and appreciation to Donald Whitcomb, who has supported and encouraged our work every step of the way, and on numerous occasions has provided us with data, knowledge and ideas to improve our understanding and results.

JARASH, SPRING 2013

Rafe' Harahshah and Jacques Seigne

The administrative deep changes intervened at Jarash at the end of the year 2012 allowed a redeployment of the field activities on the site. From February 2013, Dr Rafe' Harahshah, representing the General Director of D.o.A. at Jarash, could manage technical and human staffs of the department and use them on the site to implement, with the help of the others competent Jordanian departments and that of the members of the French team, a policy too long impeded. In particular, from this date and during three months, it was possible to clean the different monuments from a big part of the abandoned materials and equipments which defaced them for years.

The iron broken pieces forgotten by the various festivals, the out-of-service installations for more than 20 years of former Sound and Light and, more generally, the garbage left by the tourists and the pupils were unsettled, gathered and removed from the site. Also, the out-of-service equipment of D.o.A., dating more than half a century, as broken wheelbarrows, broken pickaxes and others rusty fences, accumulated in the storerooms - or even outdoor in front of the antique monuments - were able to be finally displaced and evacuated thanks to the competent administrative committees. A noria of trucks was necessary to bring this task to a successful conclusion. Due to lack of sufficient financial support, that task was not completely led, but it is now possible to photograph *Gerasa* monuments without a group of broken loudspeakers, the oxidized iron structure of a forgotten festi-

val tent, rolls of old iron barbed wire, nor others broken dumper, Land Rover or forklift from the British mandate on Transjordan to appear on the corner of the picture.

At the same time, the crane and the workmen of the D.o.A., then in standby on the working area of the sanctuary of Zeus, were employed to arrange blocks and restore walls and structures in different points of the site:

1- The Thorough Clean-up of the Oval Plaza

The various blocks which had been stored there¹ - and forgotten - during years on the paved floor and/or in front of columns were systematically tidied up behind porticoes, after construction of a low wall of dry stones intended to retain lands at the level of the old excavation fronts. During this work, blocks were grouped by types, as much as it was possible. Several discoveries also came to reward this work of cleaning and arrangement, of which that of the second Corinthian half-capital of the Zeus sanctuary main entrance (unfortunately in a very bad state of preservation). In the main time, the fluted column and the block of frieze of the naos of Zeus, lying in the North side of the Plaza since...? decades, or, maybe, since the excavation of the entrance of the Cardo in 1931 by the Anglo-American mission, were transported on the sanctuary of Zeus.

2- The Center of the Oval Plaza

Was cleared of the south theater seats blocks reused in this place in Umayyad / Abbassid

1. Blocks left after former Anglo-Americans excavations done at the entrance of the Cardo, and the ones found during clearances led by H. Kalayan in 1980/1982 at the level of the oriental propylon of the sanctuary of Zeus. Beyond, it should be reminded that the area of the Oval Plaza served for a long time as store area for

antique blocks collected in and around Jerash by the members of the DoA. during rescue operations. This is, as example, the place where several milestones coming from the road Gerasa / Philadelphia were "discovered" (Seigne and Agusta-Boularot 1998, note 34, p. 275).

times. They were transported up to their monument of origin and grouped with the other seats discovered with the aim of a possible work of restoration (see under 4- the South Theater).

Conversely, the decorated blocks with molding profile, the three engraved ones with the large dedicatory inscription² (among which an unpublished one), as well as the blocks of the crowning found all around (even in the *Cardo*) but at present known as coming from the monument of the center of the Plaza designated as “the priestesses base”, were collected and grouped in the center of the paved area. With them, a partial restauration/anastylosis³ was done to allowed the protection of the inscription and the visitors a better comprehension of the structure of the Plaza.(**Fig. 1**)



1. Oval Piazza, the monument to the priestesses partially restored (before and after).

2. A block of this inscription was known for a long time (Welles 111). A second block had been found during the excavations led by Madam Iman Oweis in 1987 to the east side of the southern part of the *Cardo*, (unpublished, it was only mentioned in PL Gatier, 1988 p. 151). The third block, with the very subdued but still readable unknown text, stayed next to the foundation. Apparently it was never mentioned before. The whole reconstituted monument and the hypotheses of its destination were presented during the colloquium of Ber-

3- The 31st Column of the Oriental Portico of the Oval Plaza

Threatened ruin. The column presented a strong out of plumb (more than 25 cm) towards the Oval Plaza and thus towards the tourists but, more important, one of the architraves that it supported, was badly broken in its “*lit de pose*” and rested on the capital only by some few square centimeters. Having supported the column, and both architraves, a scaffold allowed to reach the various blocks and to notice the extreme fragility of the group as well as the impossibility to strengthen and restore elements in situ. It was thus decided to replace the broken architrave by another one, intact, kept on the ground and coming from the western destroyed extremity of the portico. This replacement being essential, it was also decided to take advantage of the imperative dismantling of architraves to proceed to the dismantling and complete reconstruction of the column. After registration of the existing state, the marking of blocks and relative positioning of each of them, both architraves were unsettled without any problem as well as the drums of the column (thanks to the usual dexterity of Raeiq Rihani, crane driver and to the technical team of DoA⁴). The removing of the base revealed that foundation blocks support accused a grave defect of horizontality and that years had pulled them to dislocation. The restoration of the column thus began with the rebuilding of the foundation support, stones of which being put back to the horizontal and reconnected together. The reconstruction of the column itself (and its return to verticality) raised no problem, nor the setting of both architraves, the original one to the East, a “new” antique, identical, healthy one on the West (**Fig. 2**).

4- The South Theater

After the Oval Plaza, it was decided to proceed to the partial arrangement of the blocks of

lin (*ICHAJ* 2013) by one of us (J.S).

3. The various blocks were simply “presented”. The anastylosis is only partial, limited to a part of the molded decorated base, the three inscribed blocks and part of the crowning molding. Due to lack of time and money, the first row of stones, over the molded base, was not restored. The monument thus has not, in its current presentation, its initial height.

4. Supervised by Dr Rafe Harahshah, and Ali Oweissi, Adnan Mujally. Najeh Abu Hamdan, Khuder Al- Absi.



2. Oval Plaza: the disassembled and anastylosis of column 31.

the South Theater and in the clearance of the area situated in to the North of the stage building. After evacuation of the numerous various modern fragments (wood, scraps, broken furniture and diverse vestiges of twenty years of festivals) for which several trucks were necessary, blocks situated in front of the current main entrance of the theater were tidied up by types (columns, capitals, architraves,...) on one of the terraces existing in the North, at the foot of the hill. During these arrangements several interesting blocks were discovered (or rediscovered):

- Many blocks richly decorated from the *scaenae frons*;
- Many seats with back⁵, coming from the 15th rank of seats of the *cavea*, row completely forgotten at the time of the former restorations. The found blocks are sufficiently numerous to ensure 70% of the restoration of this line. Moreover they carry, engraved, the indications of the number of place for those pertaining to both side *cunei*. The places, in these two lower *cunei* were well planned there for 300 people in each one⁶. All the accessible seats discovered were gathered in the north-western angle of the theatre for a possible restoration.
- A large fragment of the base of a white marble statue,
- Another fragment of white marble statue (the

same one?) carrying some letters of an inscription in three lines at least, undoubtedly corresponding to the “signature” of the sculptor (Fig. 3).

.....H.....

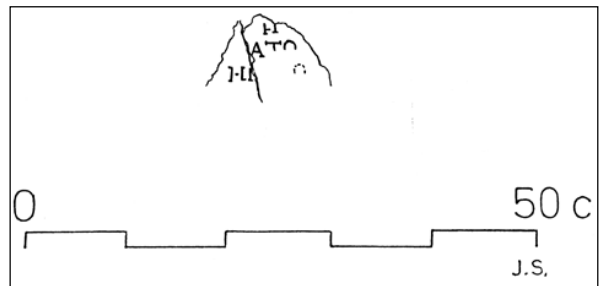
....ATO...

...HI.....

The inscription to which these few preserved letters belonged will undoubtedly remain forever incomprehensible. It is mentioned here only as a new testimony of the “signatures” of sculptor discovered on the site⁷.

These fragments of sculpture were gathered, in an especially arranged reserve, with the other marble parts found on the site. They will be studied soon by Dr. Thomas Weber, within the framework of the inventory of the ancient statues of *Gerasa*. Let us recall simply here that the inscriptions discovered reveal that several statues decorated the South Theatre, of which a representation of Justice (see for example Welles 53 in Kraeling 1938 p. 399/400). One of the statues was disengaged from the debris during the first work of consolidation and of restoration carried out there is nearly one century. It would have been transported in Jerusalem (Kraeling, 1938, p. 20, note 37).

The base of a small red hard limestone altar, very badly broken. Originally equipped with four independent feet, square sections, it carries three more or less fragmentary lines of a text written in Greek (Fig. 4) :



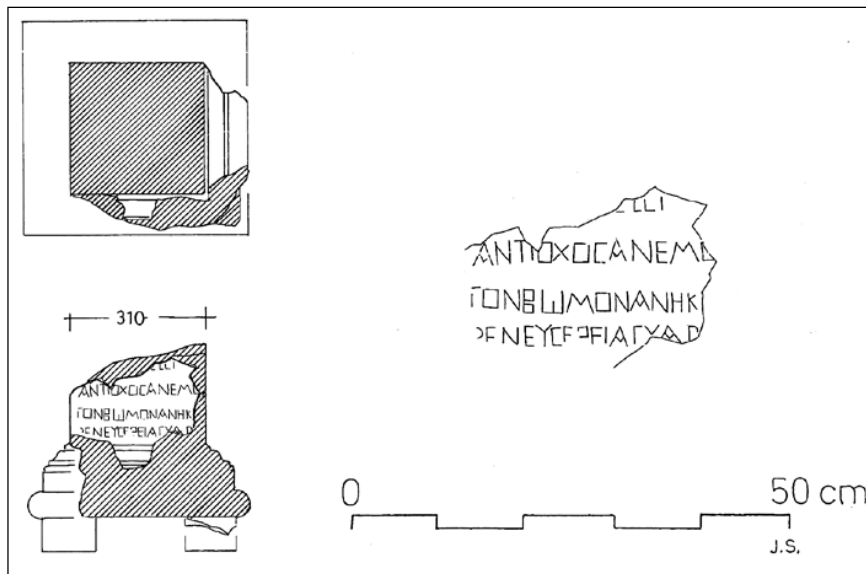
3. South Theatre area: copy of the inscription on marble discovered during cleaning. (survey and drawing J. S.).

5. In the theatres of the Eastern Province the seats with backs, often compared to the seats of *proëdrie* with good reasons in much of theatres, correspond in fact to the last higher line of seats of the *ima cavea* where they seem to have constituted a parapet along the *praecinctio*, generally very narrow. After numbering and measuring all the seats found, Lorraine Abou-Azizeh, process with a first restitution on paper for a possible project of reconstitution of this functional element of

the southern theatre. A first study shows that 70 to 80 % of the seats are preserved.

6. The characteristics raised on the various seats and raised during years will be presented soon in a note devoted to the South Theatre.

7. Several other signatures of artists, on marble statues, are known on the site. They will be published soon by Thomas Weber.



4. South Theatre area: drawing of the fragment inscribed altar found during cleaning. (survey and drawing J. S.).

ANTIOXOΣNEMO.....
TONBΩMONANHΚ...
...ENEYΣEBEIAΣXAP..

This altar was transported to the module of the “camp of the archaeologists” that Doctor Harahshah made reserved with the fragments inscribed.

5- The Sanctuary of Artémis

The legibility of the largest sanctuary of the site was badly reduced by several parks of blocks distributed on all over the surface of the court. In particular, the tourists could not understand the organization of the Eastern side of the *téménos*, nor to even see the large water tank arranged along the southernmost face of the temple. Initially, the parks of blocks were reorganized. As possible, the majority of the architectural elements were gathered out of the court, in the back of the southern portico. As far as possible also, the bases of pilasters, columns, the drums of columns, ... were laid out so as to suggest the various structures, porticos and their annexes of the southern side. The contribution of fill made it possible to level the over excavated parts of the court, in particular on the level of the various cavities cut in the rock which presented a real danger to the public (falls). In addition, the water tank was released of the blocks which encumbered it, and cleaned on all its surface previously excavated. Lastly, the molded blocks marking its edge and found in various points of the site (see in particular Church of St Theodore), were col-

lected and then repositioned on its edges, getting back its legibility to this essential element of the Artemis courtyard installations. Among the water tank molded blocks found during the clearance, several belonged to a small hemicycle. Perhaps they formed the Western end (not excavated) of the basin and could correspond to the point of arrival of water.

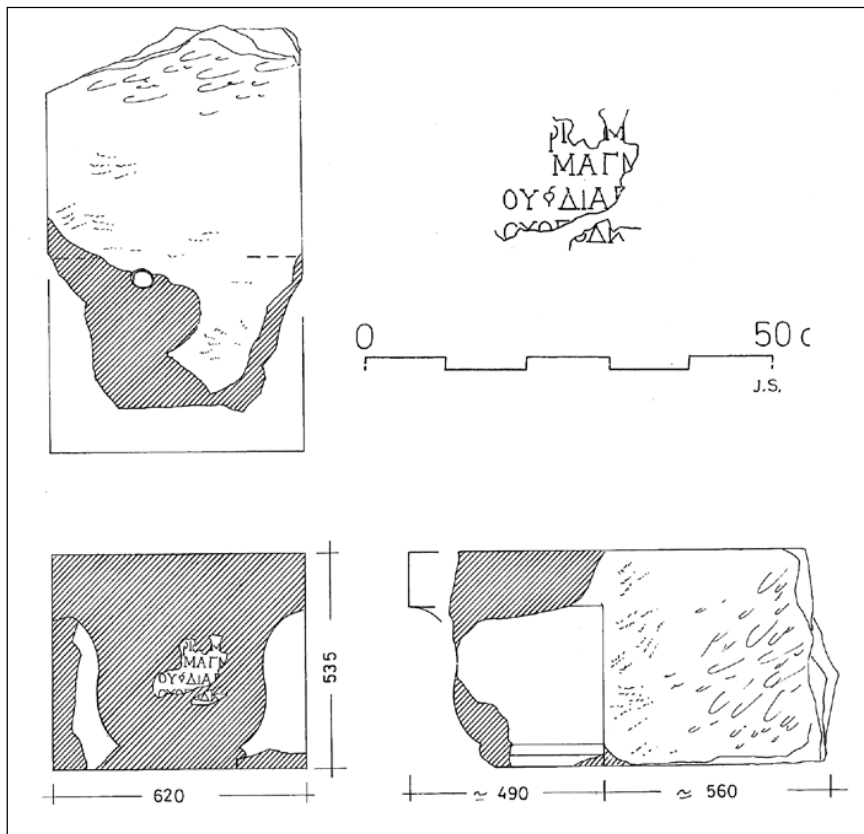
Lastly, several drums of columns were placed so as to suggest the ancient structure and organization of the Eastern portico of the court, completely disappeared today.

During this work of cleaning and arrangement, six inscribed blocks were found.

- **The first** corresponds to a white hard limestone console, of a well attested type at *Gerasa*, in particular along the western side of *Cardo*. Originally embedded in a wall it was used as support with a statue, in that case probably out of bronze. The main face suffered unfortunately a lot and the inscription is very fragmentary but seems unpublished (**Fig. 5**).

.....
.....ΦΙ...Μ.....
.....ΜΑΓΝ.....
.....ΟΥ*ΔΙΑ.....
.....ΟΥΟΠΟΔΩ..
.....

- **The second** block, out of pink hard limestone, corresponds to a profiled base of pilaster (?) or of anta (?) of a small structure (walls of 0,29 m width). Visible on three sides, it received,



5. Sanctuary of Artemis: the inscribed console. (survey and drawing J. S.).

embedded to its principal face, a relief, in the front shape type stele, probably in marble (or of bronze?), today missing. The upper part of crowning carries an inscription in Greek, quite readable but broken on the left. The text is apparently new, unpublished (Fig. 6).

.....ΑΣΟΣΤΗΝΑΕΤΟΝ

That block was left on the site, with the console

- **The third** corresponds to the profiled crowning of a pink hard limestone pilaster (Fig. 7) and carries the simple words:

ΑΓΑΘΗΤΥΧΗ

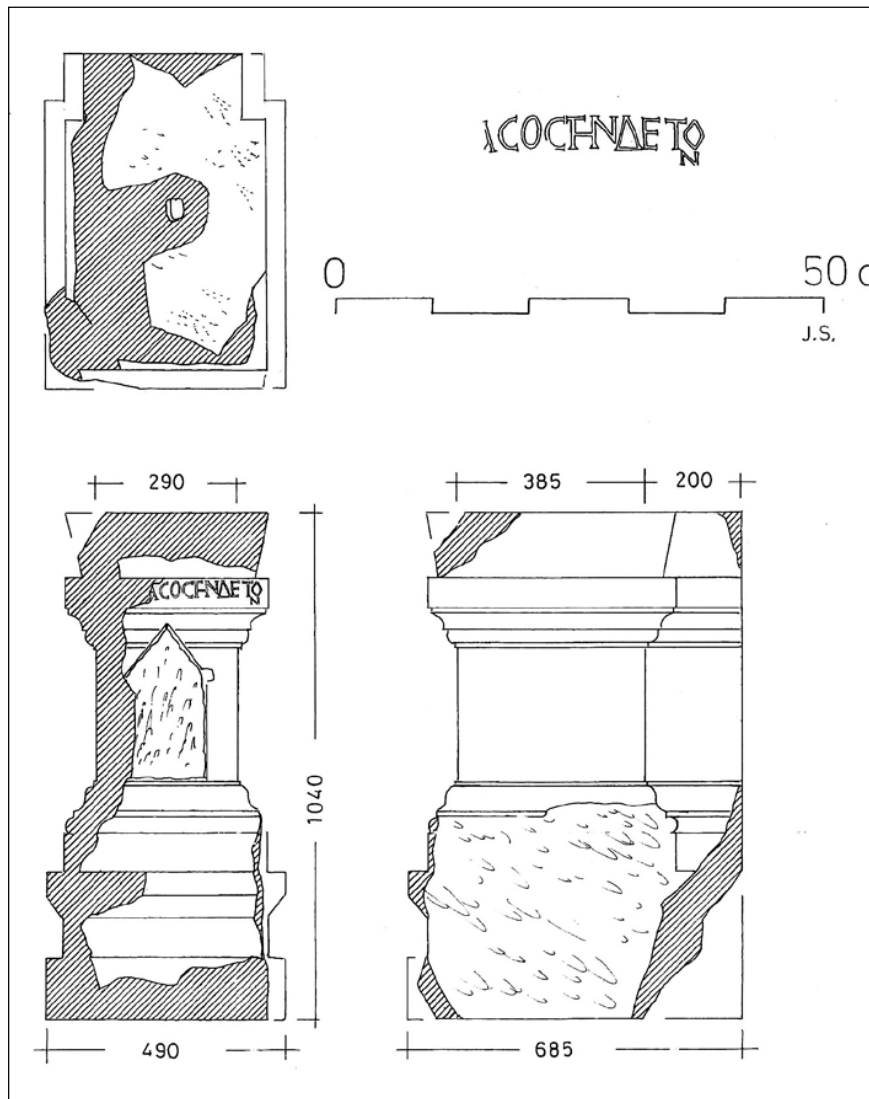
The block is partly broken on the left and the molding of crowning was chiseled and taken away (probably during its re-use in a building of Byzantine time or later. In spite of the absence of any trace of sealing on the waiting bed, this block of crowning probably corresponded to the top of a base of statue, probably made up of three blocks. It is possible to estimate at 0,65m approximately the width of the die (deep of 0,34m) on which was to be engraved the con-

tinuation of the inscription.

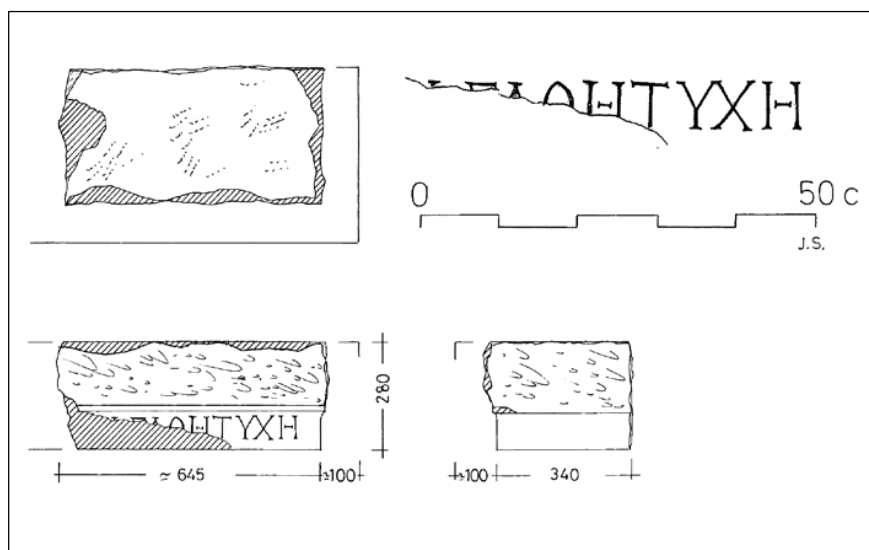
- **The fourth** is a base of column, octagonal, out of white hard limestone, probably coming from a building demolished in the modern city. It was deposited in the courtyard of the sanctuary of Artémis at the same time as other blocks recovered during modern work, the *téménos* of the goddess having been used a long time as temporary place of storage for the ancient elements recovered by the members of D.o.A. during rescue operations. This base carries an inscription, like more than ten of its similar, most of the time of funerary character (see for example Welles 86, 102, 139, 238, 239, ... in Kraeling 1938). This one is apparently new and the inscription unpublished (Fig. 8):

ΔΗΜΗΤΡΙΟΥ ΑΠΟΛ
ΛΟΦΑΝΟΥΣ ΒΥΛ

- **The fifth** is also another base of octagonal column, out of white hard limestone, coming, probably and like the preceding one, of the modern city. Deposited at another place than the preceding one, with other blocks (including one Tra-



6. Sanctuary of Artemis: inscribed wall anta base. (survey and drawing J. S.).



7. Sanctuary of Artemis: inscribed coronation block. (survey and drawing J. S.).



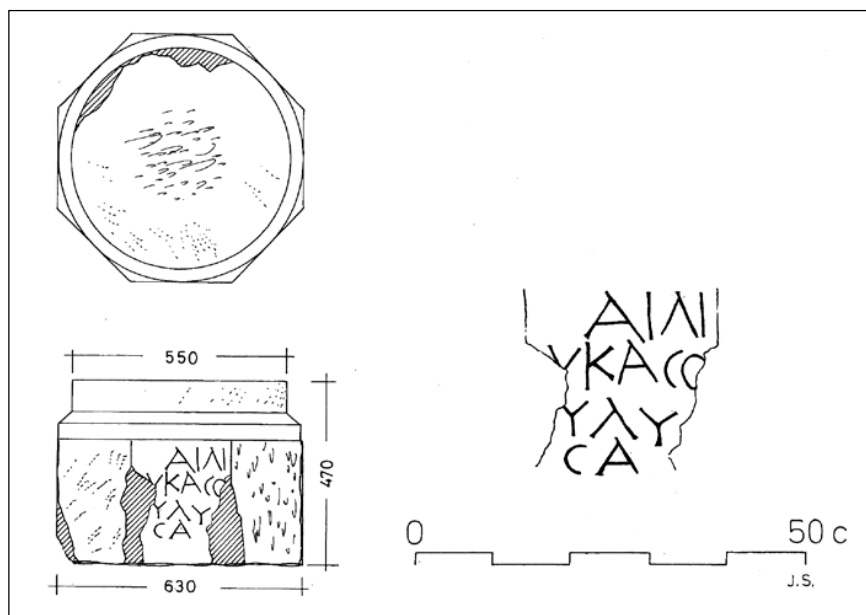
8. Sanctuary of Artemis: inscribed octagonal base. (survey and drawing J. S.).

jan milestone⁸), it was probably not found at the same place nor at the same time as the preceding one. Like the preceding one, it carries an inscription, apparently also new (Fig. 9):

ΑΙΛΙ
ΥΚΑΣΟ
ΥΛΥ
ΣΑ

- **The sixth** block corresponds to a broad fragment (right) of the lintel in soft limestone of the main door of the church of the Prophets, Apostles and Martyrs (Welles 298, inscription gone back to 464/465 AD). This block had been seen only by Wetzstein in 1863. The members of the

great Anglo-American mission of the beginning of the XX^o century mention it like “disappeared” in 1928 (Kraeling, 1938, p. 256). Its sudden rediscovery on top of the hill (the church was near Ain Karawan spring) can appear surprising but confirms the interest of the surveys carried out on the demolition sites of the Circassian houses by the members of D.o.A. It is possible to think that, at the beginning of XXth century, this fragment of lintel had been re-used in the masonry of the house that a “circassian notable, ... Ibrahim BEY “ made build about 1920 exactly on the site of the ruins of the church. The recent construction of a small market building on the same site - and thus after the demolition



9. Sanctuary of Artemis: inscribed octagonal base. (survey and drawing J. S.).

8. That milestone, as well as some others ones found recently on the site of Jerash was published in 1998 (Sei-

gne et Agusta-Boularot, 1998, miliaire 3, p.275/277

of the circassian installations, probably involve its reappearance “ (when? this block had been seen in 2008 by one of us, at the edge of the water tank of the sanctuary of Artémis, mixed with other blocks coming from the modern city).

This block corresponds to the right fragment of the lintel of the church⁹. It is broken on the left and presents a face worked on the right but which to be only the consequence of the re-employment in the modern house (Fig. 10), but it is also possible that the lintel was broken in three fragments for a very long time, the right part of the text seen by Wetzstein in 1863 being restored (see Kraeling 1938 p: 476).

....ΟΥΚΑ....ΔΙΟΥΕΓΕΝΕΤΟ.....
...ΤΩΝΑΠΟΣΤΟΛΩΝΜΑΡΤΥΡΩ..
...ΤΩΖΚΦΕΤΕΙΧΡΓΙΝΔΙΚ.....

The block is now stored in front of the entry of the museum of the site.

6- The Lane to the Bath of Placcus

After the arrangement of the various blocks which encumbered it, the south-eastern corner of the Artemis *téménos* became accessible to the D.o.A. crane. From there, it became possible to reach the street skirting the southernmost limit of the sanctuary and part of the thermal Baths of Placcus. This possibility was used to release the lane of the many blocks which encumbered it and to return it all its width and accessibility.

At the time of the great excavation of 1931¹⁰, many blocks of the sanctuary of Zeus (blocks of frieze, pediment of door, coffered ceilings, columns, architraves,...), had been found in the ruins of the Baths of Placcus. Brought in this place at the Byzantine time they had been integrated in the various buildings raised by the bishop Plac-

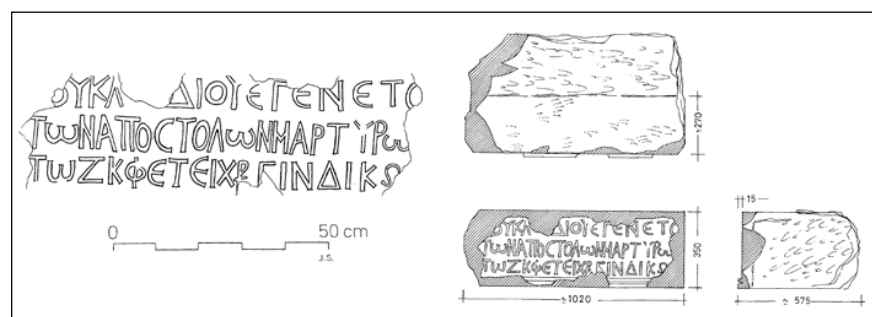
cus. After their discovery, from 1927 to 1933, they were stored “ temporarily “ in the street and its vicinities. Several of them could be recovered and transferred onto the sanctuary of Zeus, in preparation for their future partial *anastylosis*.

During these releases, a great circular base of statue (Fig. 11), out of white hard limestone, was also found, between the lane and the old museum. It carries an apparently new dedication to Geminius Marcianus. This legate of Arabia is well attested at Gerasa like on the milestones of the area¹¹. The original location of the base is unknown. It seems to be brought in the angle of the sanctuary of Artémis “ about 1980 “ (?) with other elements recovered “ in the modern city “ (possibly from the area of the Great East Baths) and would have rolled to the foot of the southern Artemis *peribolos* wall during years. It was transported and gathered with the other inscribed blocks deposited beside the Ottoman building.

The inscription, in five lines of Greek, can be read without difficulties:

ΓΕΜΙΝΙΟΝΜΑΡΚΙ
ΑΝΟΝΥΠΙΑΤΙΚΟΝ
ΗΠΙΟΛΙΣΑΜΟΙΡΑ
ΑΦΗΝΙΩΝΟΥΕΠΙ
ΜΕΛΗΤΟΥ

Lastly, the old project of partial *anastylosis* of the entry portico of the Baths of Placcus that one of us (J.S.) had proposed several years ago, was done; in 1931, the Anglo-American diggers found all the drums and capitals of the six columns having formed the entry on street of the balneal complex. They stored the columns drums at the east of the baths in the not excavated part of the lane. They were found at the same place in 1983. The six capitals ap-

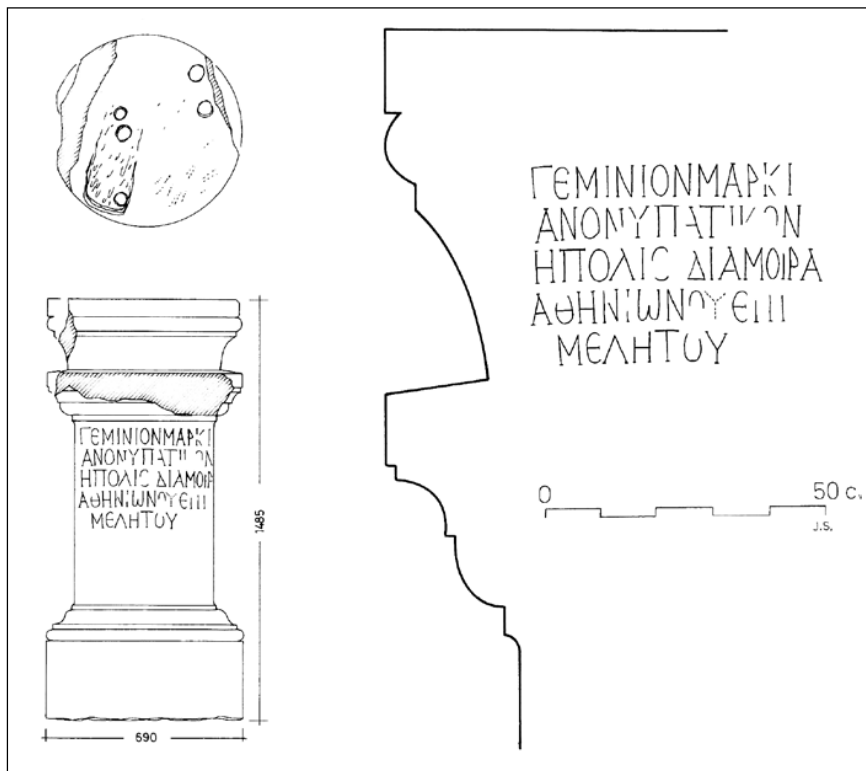


10. Sanctuary of Artemis: lintel of the Church of the Prophets, Apostles and Martyrs. (survey and drawing J. S.).

9. Welles 298, p. 476 in Kraeling 1938.

10. Kraeling 1938, C.S. Fisher C.S. The Baths of Placcus, p. 265, See also Fisher C.S. 1931.

11. See, for example, Welles 258 in Kraeling 1938, p. 463, Seigne J. et Augusta-Boularot S. 1998, p. 278 ...



11. Placcus lane: *Geminus Marcianus base* (survey and drawing J. S.).

pear gathered in the street, in front of the entry of the baths, on a series of photographs taken at the time of the excavations. The architraves and the majority of the frieze blocks, discovered in 1927/1928 during the restoration work of old Artemis south *cryptoporticus* into a museum for the site, could be seen today in the front wall of entry of the museum. All these blocks, coming from the sanctuary of Zeus, had been inventoried, drawn and photographed at the time of our researchs undertaken between 1982 and 1996. If this preliminary work, in connection with the graphic restitutions of the sanctuary of Zeus, had made it possible to find all the drums of the six columns and the two bases found in 1931, four of the six capitals found in 1931 as well as a dozen blocks of the frieze of the naos (however stored inside the museum as several 1950 photographs show it) could not be found today on the site. In 1992, thanks to the ancient marks engraved on the waiting beds and the visible faces of the various drums, the graphic reconstitution of the six columns had been carried out. Each of it was made up of a base, three drums

and a capital,. The *anastylosis* of these columns could be done without any problem and it was decided to rebuilt four of them on the entry of the baths, holding two complete supports for future restaurations/anastylosis of the sanctuary of Zeus. Curiously in 2013 only 15 of the 18 drums were found. A base of column also was untraceable. We thus should admit that between 1996 and 2013 a complete column disappeared from the site (unfortunately made up of drums of several different columns, “the borrower” not having noticed that each element carried an ancient construction marks). As the ones “lost” between 1950 and 1982, these blocks, at the present time, were not found, even in USA or in Egypt¹². Despite that situation, four columns could be rebuilt. They decorate and mark again the entry of the Baths of Placcus (**Fig. 12**)

7- Saint-Théodore Church.

The large church dedicated to St Theodore was excavated in 1928 by the members of the Anglo-Saxon teams at the time of the great excavations former to the second world war. Al-

12. Some columns from Gerasa were given, officially, to USA and Egypt, at different occasions (international

exhibition, memorial to His Majesty King Hussein,).



12. Placcus main entrance, before and after.

though partially restored in 1977¹³ the building and its atrium had remained encumbered with various vestiges (blocks and dump). Once more,

with the help of the crane of the D.o.A., the whole of the monument could be cleaned, the scattered blocks take out and store properly outside the nave. The southern wall of the church, and its various doors, partly ploughed up was restored, the jambs of the doors rebuilt (Fig. 13, a, b, c, d, e, f). The principal apse, threatening ruin, also was partially dismantled and re-built.

During this work, the blocks of the naos of Zeus, re-used like bases of the triumphal arch, were released, cleaned, photographed and drawn (from these documents modern stone copies could be done to reconstitute on the Zeus sanctuary the room where oracle was held, ... the day when financial means will make it possible). Parallel to this consolidation/restoration work, the wandering blocks pertaining either to the sanctuary of Zeus (profiled bases of the podium of the naos) or to the sanctuary of Artémis (more than ten profiled blocks of the crowning of the water tank) and found in the various stone deposits, were gathered and transferred onto the respective sanctuaries. Only the north side of the church, out of the crane reach, could only be very partially cleaned.

During these works, the block carrying the inscription Welles 136, re-used as base of the church altar¹⁴ (?), was released and drawn. It is



13a, b, c, d, e, f. St Théodore: South wall, before and after.

13. The columns of the nave and of the atrium were restored, as well as the main façade of the church in 1977/1979 under Kalayan H. supervision.

14. Welles C.B. wrote "...block re-used as the south-west base of the baldachino in the chancel..."(p.422),

which is not true. That block is *in situ*, at the center of the apse. There is a symmetric stone, without inscription, and the two stones were more probably parts of supports for the main altar of the church.

about the upper part of a square section pink hard limestone altar of Roman time, seen on its four sides, and whose crowning molding was completely cut away. The block is thus complete in width, and, in spite of the bindings, the letters of reduced sizes and the breaks, the inscription cannot seem to be restored as proposed by C.B. Welles¹⁵, unless imagining strange abbreviations (**Fig. 14**):

ΥΠΕΡΘΗΣΤΩΝΣΕΝ.....
ΣΩΤΗΡΙΑΣΝΑΤ.....
ΡΑΣ*ΣΑΜΣΑΙΟΝ.....
ΦΑΝΟΝΤΟΝΑΙΘΙ.....
...ΥΣΕΒΩΝΑΝΕ.....

Among the blocks left in the nave by the Anglo-Saxon diggers the top of another altar of hard white limestone was found. Inscribed, it was published by C.B. Welles under number 138 (**Fig. 15**):

ΑΓΑΘΕ.....
Υ.....Η
.....

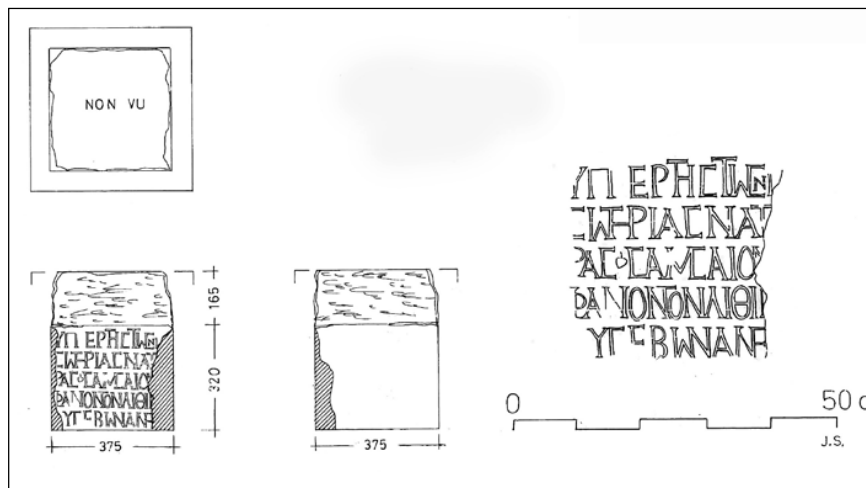
In addition, the fragment carrying the beginning of the famous inscription Welles 300¹⁶, found during cleanings, was fixed with the restored lintel.

In the east, the wall of the church annexes, south of the three church main doors, was partially rebuilt, after dismantling/rebuilding of the collapsed parts. The found blocks of the two niches framing the entrance door of the baptis-

try, were partly re-installed. The baptistery itself was completely disengaged from the fallen blocks which encumbered it, its walls cleaned and consolidated. The room located at its northern outlet, adjacent to the church, was also disengaged from the fallen blocks, its northern door threatening ruin, was dismantled and rebuilt, the two niches of the Eastern face reconstituted with their blocks of origin. Lastly, the large chapel, located at the south of the complex was entirely cleaned, the blocks of its apse repositioned, the door jambs blocks of the north and west openings on the atrium, found among the broken elements deposits, re-installed on the thresholds of their respective bays.

The same work of cleaning/storage was undertaken in the atrium where three of the columns of the northern portico and two of the southern one were partially rebuilt (**Fig. 16**). Western side, at the edge of the street, the release of the ploughed up blocks which encumbered the main entry made it possible to clean and show to the tourists the two fountains flanking the central passage. The stairway giving on the court was restored, steps rebuilt and the passage largely embanked and leveled. A layer of gravel came to supplement the general presentation and as protection of the few remaining pieces of mosaics.

At the base of the northern jamb of the main eastern door, on the interior side, was found the

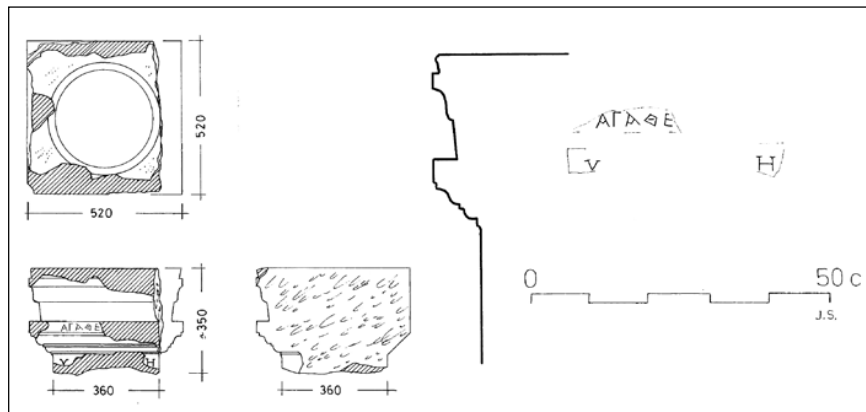


14. Block with inscription Welles 136 (survey and drawing J. S.).

15. See Welles C.B. in Kraeling C.H., 1938, p. 423.

16. The lintel, broken in three pieces, with the inscription Welles 300, was correctly re-erected on top of the main entrance of the church during the 1977/1979

restoration works, but with the inscription wrongly turned to the exterior and not to the interior of the church, as it was mentioned by all the travelers.



15. Block with inscription Welles 138 (survey and drawing J. S.).



16. St Théodore: atrium, before and after.

block carrying the Latin inscription Welles 209, considered as funerary¹⁷.

.....XIOΓAIANOPINX

In fact it is a block of crowning out of white hard limestone, of a great non monolithic (probably three pieces) base of statue - probably out of bronze as the two holes of sealing visible with its waiting bed testify -, originally leaned with a monument (or a wall) (Fig. 17). Its funerary character is not thus proven, the more so as a

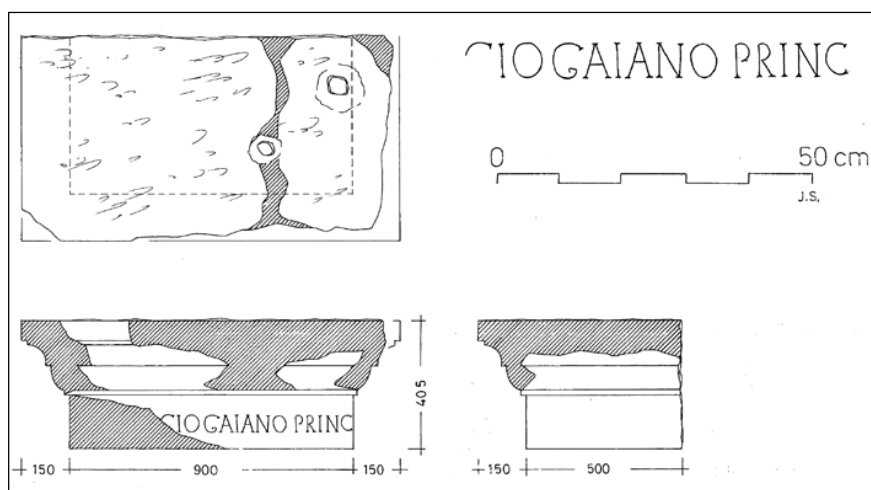
similar crowning block, having also carried a statue, was found on Northern *Decumanus*¹⁸ (we give here copy of the inscription and the drawing of the block (Fig. 18).

ΘMAPXIOΓAIANO

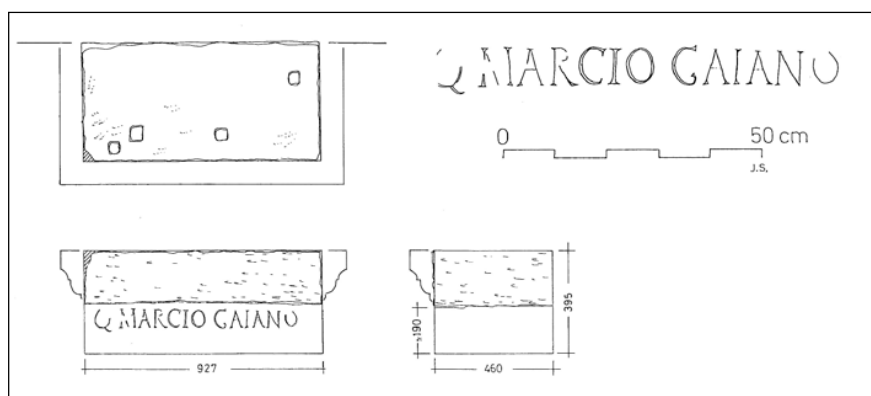
To the south of the entry, a hammered block of the great dedication of the sanctuary of Artémis (?) was found (Fig. 19), re-used like facing of a cross wall of the structures leaned with the Western limit wall. Like the majority of its simi-

17. Welles C.B. published it as a "funerary inscription".

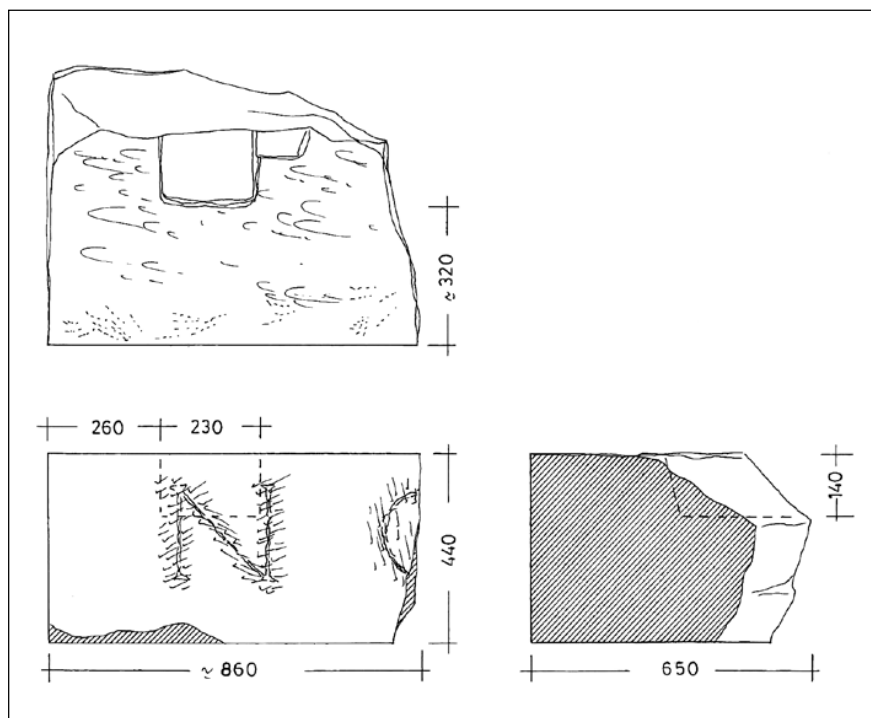
18. See Bowsher J. 1986, p. 384-385.



17. Block with inscription Welles 209 (survey and drawing J. S.).



18. Inscription from North Decumanus (survey and drawing J. S.).



19. St Theodore atrium. Inscribed block (survey and drawing J. S.).

lar¹⁹, it carries simply two letters and its waiting bed presents a housing for a beam:

.....NO.....

The two fragments of the right half of the lintel of the western main door of access to the atrium and carrying the inscription Welles 299, also found during cleanings, were presented in front of the entry, at the base of the right jamb of the door. The left fragment of the famous inscription, formerly re-used as lintel of a door of house of the circassian village, is deposited today in the garden of the museum of the site. It would be possible - and desirable - that the three pieces of this important inscription can be presented correctly close to the monument to which the lintel belonged. This operation is considered within the framework of a second phase of work on the site which could also include:

- the reconstitution on the ground, but vertically and out of reach of the tourists of the great dedicatory inscription of the Hadrian Arch (forgotten during recent work of restoration)
- the reconstitution of the 15th row of seats of the South Theatre and re-installation of the "back seats".
- adjustment of the accesses to the ottoman building with the creation of a "lapidarium" where would be gathered part of the inscribed and carved blocks of the site.... all that while

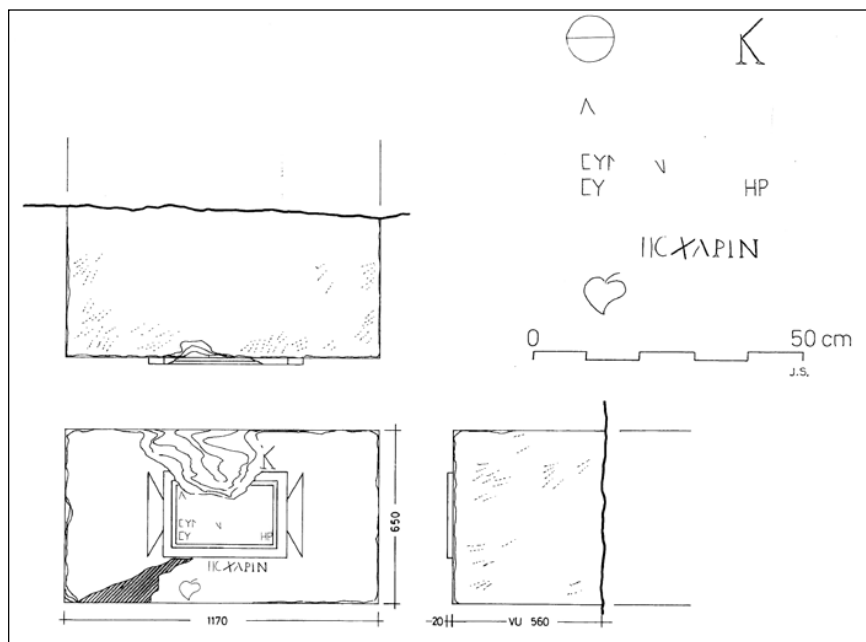
waiting for the creation of a real archaeological museum for *Gerasa*, with adapted structures for work and storage.

Jarash 12 -2013

Complement:

Work was also going on in the modern town. Near the South Gate, under the modern road Amman Irbid, the excavation done along the city wall for the construction of a new restaurant, allowed the clearance of the lower courses of the fortification. In that area, the wall was rebuilt during Byzantine time and a lot of stones coming from the hippodrome, the South necropolis, were reused in the wall. One of these stones, a hard yellowish limestone block, with an inscribed *tabula ansata* was put back to light. It was first seen by Jones 80 years ago and published by C.B. Welles under n° 237 in Gerasa, city of the Decapolis (Kraeling 1938). Unfortunately the block was partially broken by the bulldozer, but it was still possible to draw it. The text inside the tabula was quite totally cut away (Fig. 20).

That block is well dressed on at least three faces (the fourth one, inside the wall, is totally invisible). It belonged most probably to a funerary monument from the Southern necropolis



20. City Wall, east of South Gate: Block with inscription Welles 237 (survey and drawing J. S.).

19. See Seigne J. 2012

Bibliography

Bowsher, J.

- 1986 Inscriptions dans The North Decumanus and North Tetrapylon at Jarash, *JAP I*: 351-410.

Bowsher, J.

- 1938 *Gerasa city of the Decapolis*. New Haven.

Fisher, C.S.

- 1931 The campaign at Jarash in September and October. *AASOR XI*: 131-148.

Seigne, J. et Agusta-Boularot S.,

- 1998 Milliaires anciens et nouveaux de Gerasa, *M.E.F.R.A. tome 110*: 261-295.

Seigne, J.

- 2012 Inscription de dédicace (?) du sanctuaire d'Artémis de Gerasa de la Décapole, compléments. *TOPOI 17*: 469-478.

Welles, C.B.

- 1938 The Inscriptions in Kraeling C.H., *Gerasa City of the Decapolis*: 354-616 et pl. XCV-CXXXVIII.

THE IRON I POTTERY OF KHIRBAT AL-LĀHŪN

Margreet L. Steiner

Introduction¹

The site of al-Lāhūn / Lahun or Khirbat al-Lāhūn is located in Jordan, on the northern plateau of the Wādī al-Mūjib. The area between the Wādī al-Mūjib (biblical Arnon) in the south and the Wādī al-Wālā/ Wādī ath-Thamad in the north is considered to be the heartland of ancient Moab.

Al-Lāhūn was excavated during seventeen seasons between 1978 and 2000, by the Belgian Committee of Excavations in Jordan in close collaboration with the Department of Antiquities of Jordan. The excavations were directed by P. Naster (1978 - 1984) and D. Homès-Fredericq (1978 - 2000). Al-Lāhūn is a large site of 1100 by 600 m (66 ha), and is divided into different natural sectors (excavation areas

A - D). Brought to light were an Early Bronze Age fortified town in area C and a walled Iron Age I village with a later square fortress in area D. Traces were also found of Nabataean and Roman occupation (areas A and B), as well as remains from the Islamic period (area A).

The pottery discussed here comes from the Iron I village in area D and from Iron I levels inside the later square fortress (**Fig. 1**).²

The Iron I village was surrounded by a case-mate wall with a total width of *c.* 4.00 m. The

outer wall was *c.* 0.7-0.8 m wide, the inner wall 0.75 m and the space between the walls was 2.2 m. There are no joints visible in the wall (see Homès-Fredericq 1997: fig. 32), and according to the excavator the wall was built in one stretch. The total length of the wall is *ca.* 700m, of which 500 m was clearly traceable. About 350 m of wall was exposed. The wall encloses an area of 17.000 square meters (1.7 ha) and was clearly visible at the north, west and south sides of the village. At the eastern side the terrain slopes down and the wall was found to be severely eroded there.

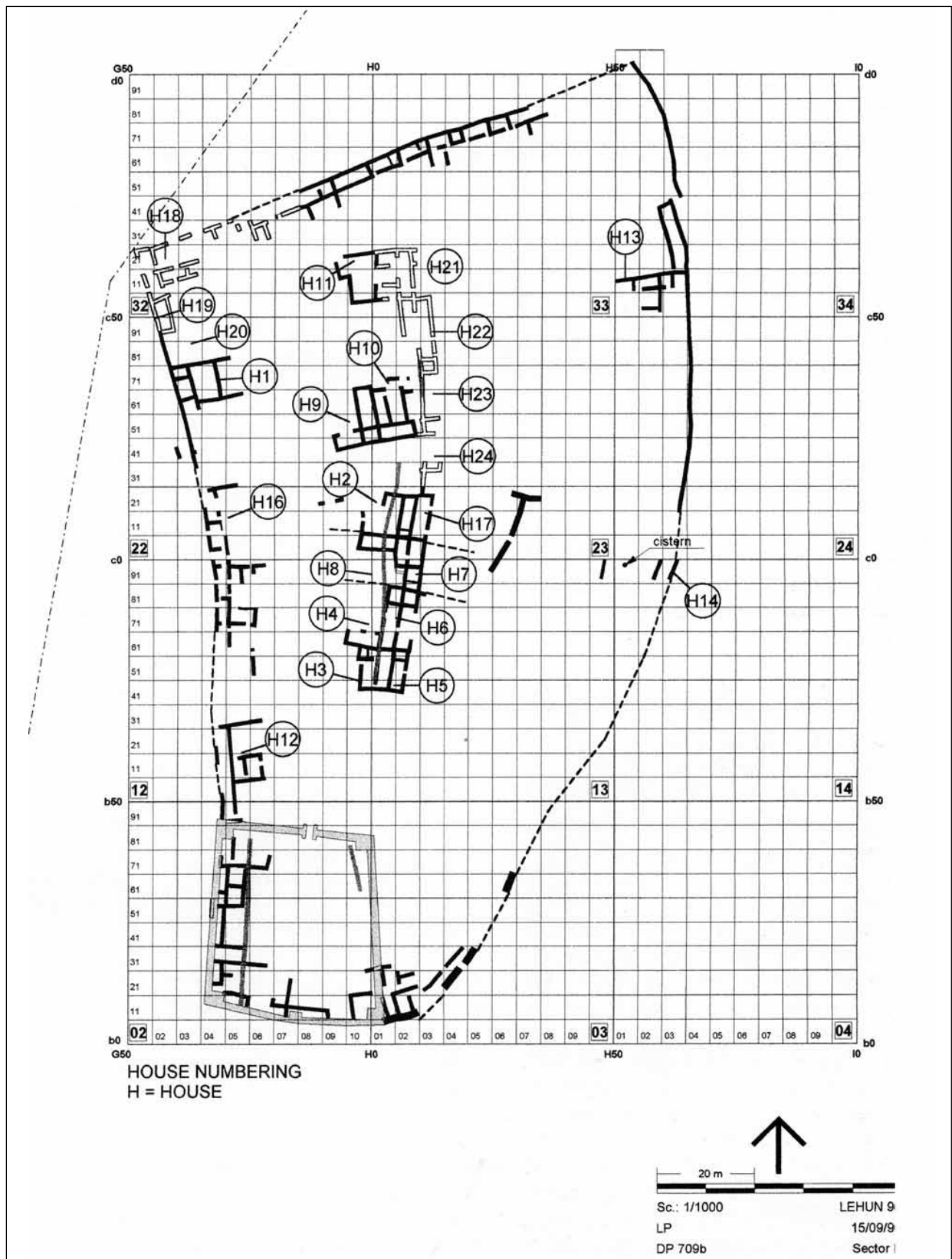
A total of twenty-four structures was completely or partly excavated. Additional structures were located below the square fortress but these could not be adequately examined. Only four houses were excavated down to bedrock: Houses 1, 2, 11 and 12. Of the others only the outlines were uncovered and some rooms excavated. At the east side of the village a stone-lined silo with a paved floor was found. No diagnostic sherds were found inside the silo, and it is not clear if it belongs to the Iron I village or to a later period.

At the southern side of area D a square fortress had been built over the remains of the Iron I village, possibly in the Iron II period. The size

1. This study was made possible through a generous grant of the Shelby White-Leon Levy Program for Archaeological Publication. Prof. Denyse Homès-Fredericq, Director of the Belgian Excavations in Jordan, kindly made the pottery available to me and provided me with information on the excavations. The pottery was stored at the Royal Museums of Art and History in Brussels, and its curator, Dr. Eric Guebel, gave us access to the store rooms and provided us with workspace. Ms. Ingrid Swinnen, who is publishing the Early Bronze Age pottery of Khirbat al-Lāhūn, was helpful in many ways. The Laboratory for Ceramic Studies of Leiden University did the technological analysis of the material

and provided much appreciated work space. Jeannette Boertien helped with the selection and analysis of the pottery, and Ellis Grootveld and Eveline van der Steen made the drawings. In Jordan Ali Khayyat, antiquities inspector, went with us through the store rooms of the Archaeological Museum in Madaba. Larry Herr kindly provided me with the unpublished pottery plates of Tall al-Umayrī and Hisbān.

2. For a survey of the results of the excavations see Homès-Fredericq 1997. Special finds were described in Homès-Fredericq 1982, 1987 and 1995. The architecture of the Iron I village has been published in Swinnen 2009.



1. Plan of Khirbat al-Lahūn, area D (courtesy of Homès-Fredericq 1997, fig. 41).

of the fortress was 33/37 x 43 m. with an open courtyard inside. The main entrance was at the northern side and consisted of a gate, 1,5 m wide, with a stone threshold. A smaller opening was found at the southwestern side of the fort.³ The walls of the fortress were ca 1.30 m wide and still stood to a height of 1.50 m. The outside of the walls was covered with a 3 cm thick plaster layer. At the south and west sides, the walls were built on top of an older wall that protruded some 10-16 cm (see Homès-Fredericq 1997: fig. 48). These earlier walls are the remains of the casemate system of the Iron I period discussed above.

The stratigraphy of the trenches and squares excavated in 1980 and 1983-1985 has been analyzed by Yvo van Hemelryk in his unpublished Ph. D. thesis (1987). Further information can be found in Homès-Fredericq 1997 and 2009.

Van Hemelryk's analysis shows that within the area of the fortress four surfaces or floors could be distinguished. The lowest floor belongs to the Early Bronze Age. Some EB occupation is to be expected as a fortified EB town was located nearby in area C. A higher floor and debris on top of it belongs to the Iron I village. On top of that a plastered surface, a partial pavement and some small silo's were found, which may belong to the period in which the fortress was built. Still later occupation layers include a floor, debris and a wall from the Islamic period.

Method of Excavation and Registration of the Sherds

The excavation of Area D started in 1980 with the opening of four excavation trenches inside the square fortress. From 1983-1987 excavations continued in that area. The fortress was provisionally dated to the Iron II period because of the sherds found in its upper layers (see also Homès-Fredericq 2009). Underneath the southern and western walls of the fortress remains of an earlier casemate wall were discovered. From 1992 - 1997 research focused on the casemate wall and houses north of the fortress, dating to Iron I.

The four original excavation trenches were called DI - IV in 1980. With the resumption of the work in area D in 1983, these trenches were

extended and a new numbering system was introduced. Now excavation took place in squares of 5 x 5 m which were consecutively numbered as work went along. In 1984 the area of the fortress was divided into a hundred 5 x 5 m. squares, and the old squares were renumbered. When in 1986 several squares were opened north of the fortress to trace the casemate wall, this new area was called DN(orth).

In 1987 a new topographical system was introduced and the whole area of al-Lāhūn was divided into squares of 100 x 100 meter. These squares were subdivided into four 50 x 50 m squares (called D1 - D64 in area D) and each of these squares subdivided again into a hundred 5 x 5 m. squares (for instance D1.1-100). The squares already excavated received a new number once again - see **Fig. 1**.

Thus from 1983 onwards the excavation took place in 5 x 5 m squares with baulks of one meter wide at the southern and eastern sides. The soil layers (and floors) excavated within a square did not receive a separate context number. So for much of the pottery only the square in which it was found was recorded, but not the exact layer it belongs to, nor its exact location inside the square (and thus house and room number). To overcome these handicaps I have in general assumed that large sherds and (almost) complete pots were found on the floors of the village houses (as is also shown on some photographs made during the excavation). Smaller fragments are assumed to have come from the destruction and wash layers covering the ruins, and very small sherds from the mixed top layers; often is it impossible to date them reliably because of their small size.

According to the excavator all pottery from area D was sent to the store rooms in Brussels. Together with my colleague Jeannette Boertien I have checked 176 boxes (large and small) that according to their label contained the Iron Age (I and II) pottery from Area D. We registered the diagnostic sherds, that is: all rim sherds, a selection of bases, some handles, mendable body sherds of large jars and most decorated wares. All in all this amounted to 269 sherds that could be assigned to the Iron I period. The sherds were taken to Leiden for further study.

3. On most plans this opening is not shown, but see

Homès-Fredericq 1997, fig. 50.

Not included in this number are four restored Iron Age vessels.⁴ One was a complete strainer-spouted jug (jug A), which came from square D12.60 (House 3). The bodies of three other vessels (storage jar B, painted jar C and biconical jug D) could be reconstructed, but the rims were missing. The stratigraphic context of these vessels is unknown – all four will be discussed below.

In Leiden a first classification of the Iron I material was made based on shape, size, function and finish of the sherds. The following classes were distinguished in the Iron I material:

<i>Classes</i>	<i>Number of diagnostic sherds</i>
Storage jars (StJ)	6
Smaller jars and jugs (JJ)	36
Kraters (Kr)	19
Small and medium bowls (B)	132
Cooking pots (Cp)	8
<i>Total number of rim sherds</i>	<i>201</i>
Body sherds	42
Handles	3
Bases	23
<i>Total number of Iron I sherds studied</i>	<i>269</i>

The amount of pottery found in the Iron I village of al-Lāhūn is surprisingly small. Only 201 Iron I rim sherds as well as four more or less complete pots were found during the twelve seasons of excavations in area D. Compare this number for instance with the more than 6000 Iron I rim sherds excavated at Dayr ‘Allā in an area of only 30 x 30 meters during four excavation seasons (Franken 1969: 242).

Because very little pottery was retrieved from area D, and very few data on the context of the excavated pottery was available, the conclusions in this report are restricted to the typology and technology of the vessels and a general dating of the repertoire.

Technological Analysis of the Pottery

The sherds were then studied by Mr. Loe Jacobs, potter of the Laboratory for Ceramic Studies⁵ of Leiden University (see also Steiner and Jacobs 2008). He could distinguish three basic forming techniques:⁶

a) Turning on a slow wheel

Large storage jars and large open vessels were made in parts on a rather heavy slow wheel.

Storage jars were made of coils and turned at low speed (less than 20 rotations per minute), possibly alternated with phases of higher rotation speed. After drying, a new coil of clay was added and fixed. From this quantity of surplus clay the wall was raised five to ten centimeters. The rim was thickened by pushing the clay up and down again, combined with slightly folding.

Kraters and medium bowls were turned (less than 30 rpm.) in an upright position. During turning twice a coil of clay was added at the top, to have enough clay to form the upper part of the body. After some drying two or more handles were pulled from pieces of clay which were stuck to the rim. The lower attachment of a handle was reinforced with some extra clay.

b) Throwing on a fast wheel

Smaller jars, jugs and smaller bowls were thrown on a faster potter's wheel (more than 30 rotations per minute), with normal rotation speed. Traces of this method were clearly recognizable on the inside of the vessels (see **Figs. 2a and 2b**). The small bowls were made in an upright position after which their bases were scraped upside-down.

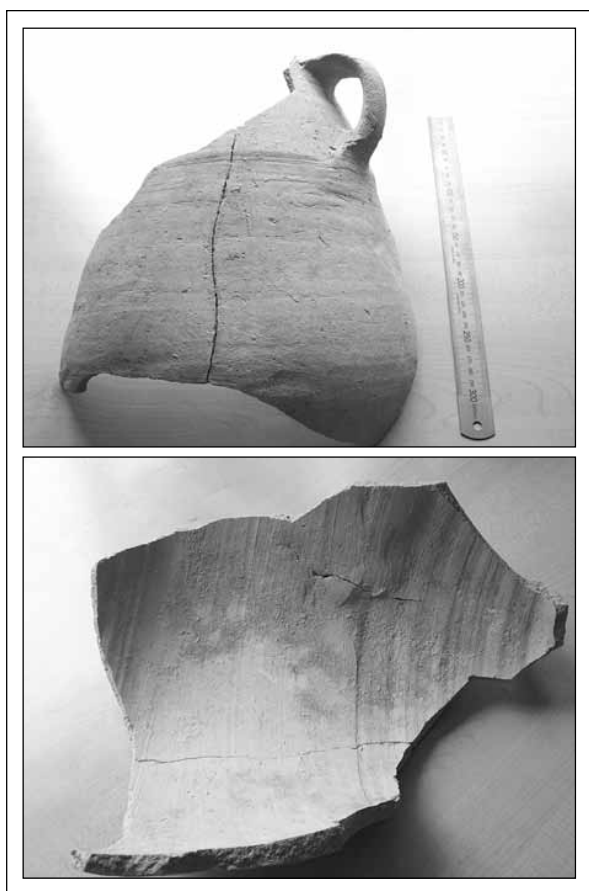
c) Mould-making and throwing

Cooking pots were made in the following way. The convex base was made by pressing a clay slab into a mould, probably a porous saucer made of baked clay. Then the mould was placed on the head of a potter's wheel. One or two coils of clay were fixed around the edge of the clay slab that was still in the mould. From the extra clay of these coils the upper part of the cooking vessels was thrown and eventually handles

4. As far as I am aware of, these jugs have no registration number. For convenience sake I identify them as vessels A-D.

5. Formerly the Department of Pottery Technology.

6. It is important to note that only the rims and some bases of the vessels could be studied, not the whole vessels.



2. Photo showing body fragment of large jar (2a) and the ribbing inside the sherd (2b) indicating the jar was thrown on a fast wheel.

were fixed. Still inside the mould the vessel was set aside to dry for a while. Then the vessel was removed from the mould, reworked where necessary and left to dry in an upside-down position. Making use of a mould allowed the potters to apply very 'short' clay-sand mixtures. Thus a good heat-shock resistance and a better durability could be obtained.

A sample of 27 sherds was then selected for a low-tech fabric analysis executed by Loe Jacobs. The sherds were cut by hand to get a first impression of their hardness. They were then re-fired under oxidizing conditions at a temperature of 800 degrees Celsius. The color was noted, and the fabric of the sherd was analyzed under a binocular microscope up to 50x. It was not always possible to distinguish between the clay matrix and the added temper as some mineral inclusions may have been part of the clay matrix.

Several fabrics could thus be distinguished, all kiln-fired under neutral to oxidizing conditions:

Fabric A

This fabric contained ferruginous basaltic rock fragments and iron oxide concretions as the main ingredients. These grains are likely to have been part of the clay matrix. Mudstone grains and limestone grains are present in lower quantities. Sporadically some flint, quartz grains, siltstone grains, hematite or shale occurred, and very seldom small amphibole and pyroxene grains. About half the samples contained some fibers, not more than 2% by volume and very small in size. This organic material was probably added as dung, to improve the plasticity of the clay for throwing. After re-firing the colors vary from pink and pinkish gray to reddish yellow, and most of the black cores, if present, were burned away. This fabric was used for large storage jars, most smaller jars and jugs, and for medium and small bowls.

Fabric B

Fabric B contained no basaltic rock fragments as the main ingredient but mudstones, limestone, calcite and shale. Less frequently several types of siltstone and grains with iron oxide do occur. If organic fibers are present, they are less than 2% by volume. Colors after re-firing vary between pink and light reddish brown. This fabric was used solely for kraters.

Fabric C

The dominant grain type in fabric C is crystalline calcite. Ferruginous rock fragments are present in lower quantities. Mudstone and or siltstone and some small quartz grains are present in relatively small amounts or sporadically. The re-fired colors vary from light reddish brown to reddish brown. Only cooking pots were made in fabric C.

Fabric D

A fourth fabric was identified during the technological analysis and is included here only for completeness as it occurred exclusively in Iron II sherds. The dominant grains in this particular fabric are microfossils of the ostracoda type, combined with some calcite and siltstone

grains. Sometimes organic fibers were added to the clay, probably to improve the coherence of the substance. This fabric also occurs in the pottery repertoire of Khirbat al-Mudayna ath-Thamad ca 1 km to the north (see Steiner 2006; 2009) and the vessels may have been imported from that region.

Clay Sources

In October 1992, during the Lāhūn excavation campaign, Abraham van As and Loe Jacobs, then director and potter of the Laboratory for Ceramic Studies, took about thirty clay samples in the Wādī al-Lāhūn, on top of the plateau, and three clay samples in the Wādī al-Mūjib, situated under the plateau. Some results of the analysis of this clay have since been published (As van, and Jacobs 1995). These clays from the Wādī al-Lāhūn and the Wādī al-Mūjib have now been compared with the fabric of the pottery samples described above and with pottery samples from the Early Bronze Age town in area C1.⁷

It seems that the EBA potters used clays from the Wādī al-Lāhūn to produce their vessels. However, these clays lack the necessary plasticity for throwing, and thus the Iron Age potters collected their clays from the Wādī al-Mūjib or from some deposits further away.⁸

The technological analysis discussed above showed that the large vessels (storage jars, kraters and medium bowls) were coil-made and turned on a slowly-rotating potter's wheel, while jars, jugs and small bowls were thrown on a faster wheel. The bases of cooking pots were mould-made, while the upper parts were thrown. The potters producing for Lāhūn thus used both a slow, heavy wheel for turning and a lighter, faster wheel for throwing.

Most vessels were made of a plastic clay, tempered with some sand and dung (fabric A), serviceable for both the slow and the faster wheel, and fired in a kiln at a temperature of 750-800 degree Celsius. Kraters, however, were made of a slightly different fabric (fabric B) that may have served some special purpose, although it is not quite clear what that purpose is.

Ethnological and ethno-archaeological research has shown that potters or pottery workshops usually use only one kind of fabric. Potters may mix clays to suit their needs, but they do not use different fabrics to produce different vessels in one workshop (see for instance London 1991: 403-5). We may thus suggest that large kraters were made in a specialized workshop or by a specialized potter who used his/her own fabric to work with. This potter used a slowly-rotating wheel, just as the potters who made the storage jars and medium bowls in fabric A.

Cooking pots were made of a clay tempered with crystalline calcite (fabric C). Calcite was used to temper cooking pots for millennia. These potter(s) used a different technique (a combination of mould-making and throwing), so we may postulate a third pottery workshop in the region producing only cooking pots.

Thus the small village of Lāhūn, with 300-500 inhabitants (Swinnen 2009), may have retrieved pottery from three different potters / pottery workshops. All potters used clays from deposits in the Wādī al-Mūjib.

Typological and Comparative Discussion of the Iron I Pottery

The pottery repertoire as described above is quite limited: two types of storage jars (and of each type only a few specimens were found), four different types of smaller jars and jugs, two types of large kraters, six types of small and medium-sized bowls and only one type of cooking pot. Small juglets and lamps have not been found at Lāhūn.

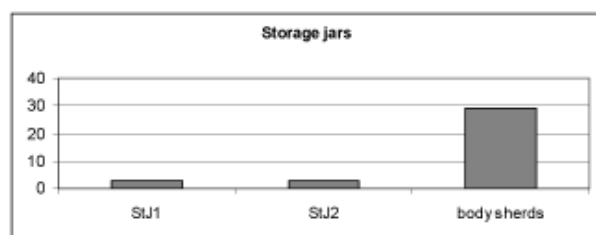
White slip occurred only rarely (7x): one krater, two jug fragments and four small bowl rims were white-slipped. Three of these bowl rim fragments had a red painted line around the rim and they may have belonged to the same vessel. Only six other sherds had painted decorations of bands and stripes: four jar fragments and two body sherds (possibly also of jars). None of the 269 Iron I sherds was burnished.

To put the Lāhūn pottery in its regional context and to date it, parallels are mainly taken for well-dated sites in Central Jordan.

7. The Early Bronze Age pottery is currently being studied by Ingrid Swinnen.

8. Several Iron Age I sherds have also been analyzed by

Benjamin Porter, who conducted an INAA analysis of sherds from four Iron I sites (see further Porter 2007).



Many fragments of storage jars (large, heavy jars with flat, rounded or pointed bases and two or more handles) have been excavated, but only six of these were rim sherds. The other sherds were all body sherds; it is not clear which type of rim belongs to the bodies. I have counted 29 large sherds or collections of mendable sherds found together. Four sherds had a flat base, one had a pointed base and one had a round base.

These storage jars were made of coils using a slow wheel, and the three analyzed sherds were made in fabric A.

StJ1 (**Fig. 3: 1-2**) is a jar with a short straight or inverted rim and a collar. The edge of collar is vague. Diameter of the mouth is 14 cm. Two specimens were found; of one jar several rim and body sherds were found as well as a pointed base; of the other jar only a rim sherd was retrieved. Collared rim jars have been found widely east and west of the river Jordan, and are generally dated from the end of the 13th to the 9th centuries B.C.

At Tall al-‘Umayrī the earliest Iron I collared rim jars have flaring thick rims and longer necks, while the neck tends to become shorter over time - see for instance the pottery from Field B (Clark, nyp: Fig. 4-29). At Khirbat al-Mudayna

al-‘Aliyā, one collared rim fragment was found as well as several body fragment with a collar. These sherds are very similar to the Lāhūn specimens (Routledge 2000: fig. 7.1, 2008: 3). From Iron Age Dayr ‘Allā only one collared rim jar was published (Franken 1969: fig. 47:1). This one has a short rim and a noticeable collar.

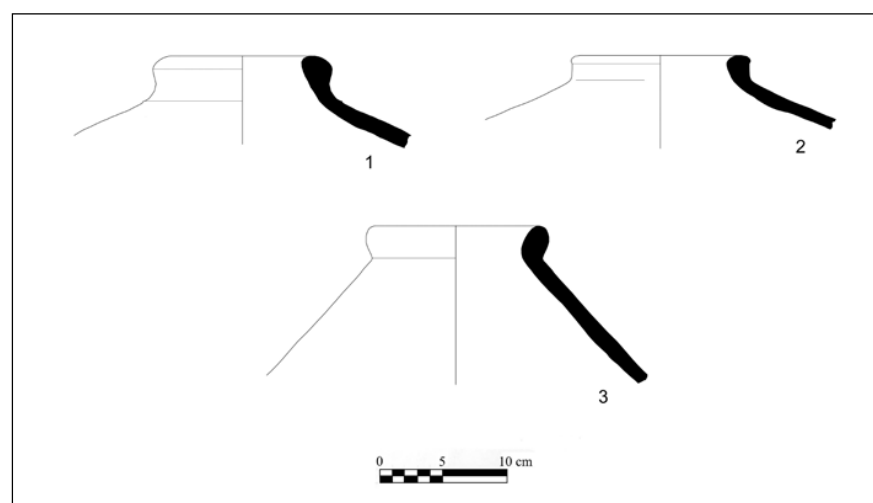
Swinnen (2009) stated (on my advice) that the collared rim jars found at Lāhūn were to be dated to the Iron II period. This conclusion was based on their find spot. Two mendable rim fragments were found in different squares, *ca.* 15 m. apart. This makes it unlikely that they were found on the floors of the buildings. On the other hand, from one jar several rim and body fragments were retrieved, and as stated above I have in general assumed that large fragments came from the Iron I buildings. So I have revised my opinion and assigned these collared jars to the Iron I village layers.

That only two collared rim jar have been found is worth noting. While in some sites in Ammon (‘Umayrī, Saḥāb) collared rim jars from Iron I are quite ubiquitous, they seem to be very rare in contemporary sites in the Jordan Valley (Dayr ‘Allā) and Moab.

StJ2 (**Fig. 3:3**) is a neck less jar with flattened or rolled rim. Diameter of the mouth is 14-15 cm. I have yet to find any parallels.

One storage jar (jar B) has been (partially) restored in Brussels. The original rim was missing and the jar was given a new heavy rolled rim, which may or may not have been the original type of rim - see **Fig. 4**.

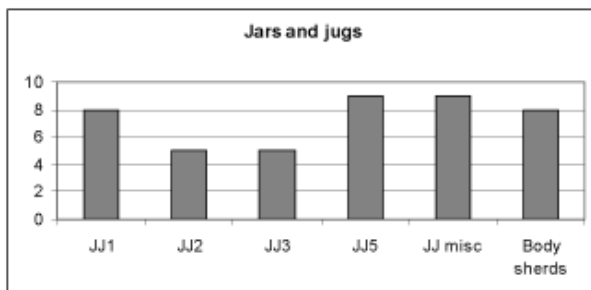
Rim fragments of thin-walled jars and jugs



3. Storage jars (1-2: StJ1, 3: StJ2).



4. Storage jar B, with reconstructed rim.



occur more frequently (36 x) than those of the large storage jars discussed above (6x). No distinction could be made between the rim fragments of jars and jugs; the eight (collections of) body sherds, however, all belonged to thin-walled jars. They were thrown and the four analyzed JJ sherds were all made in fabric A. Most sherds were undecorated.

JJ1 (**Fig. 5: 1**) is a jar or jug with a simple rounded or slightly thickened rim. Diameter of the mouth is *ca.* 14 cm. One jar had a flat base. Jars with a simple rim were also found at Khirbat al-Mudayna al-‘Aliya (Routledge 2008:

fig.6: 9) as well as at Hesban Stratum 20 (Ray 2001: fig. 3.2: 10).

JJ2 (**Fig. 5: 2**) is a balloon-shaped or biconical jar or jug with straight or everted folded rims. One sherd had a handle, one jar had a flat base. Diameter of the mouth is 10-13 cm. One restored jar in Brussels (jar D) may be of this type – see **Fig. 12**.⁹ Balloon-shaped or biconical jars are commonly found in tombs from the 12th century in central Jordan, such as Mādabā tombs A (Harding and Isserlin 1953) and B (Piccirillo 1975; H.O. Thompson 1986), some Saḥāb tombs ((Dajani 1970: 55,76, 205) and the tomb in Jabal Nuzha (Dajani 1966).

JJ3 (**Fig. 5: 3**) is a vessel with a high neck and folded triangular rim. Diameter of the mouth is *ca.* 9 cm. One rim was decorated with three red painted lines on an unslipped surface. Jars with triangular rims have many parallels at Dayr ‘Allā in Iron Age phases A and B, both the plain variant type 1a-b (Franken 1969: fig. 43) and the painted variety (Franken 1969: fig. 46: 68-70; fig. 47: 5-8).

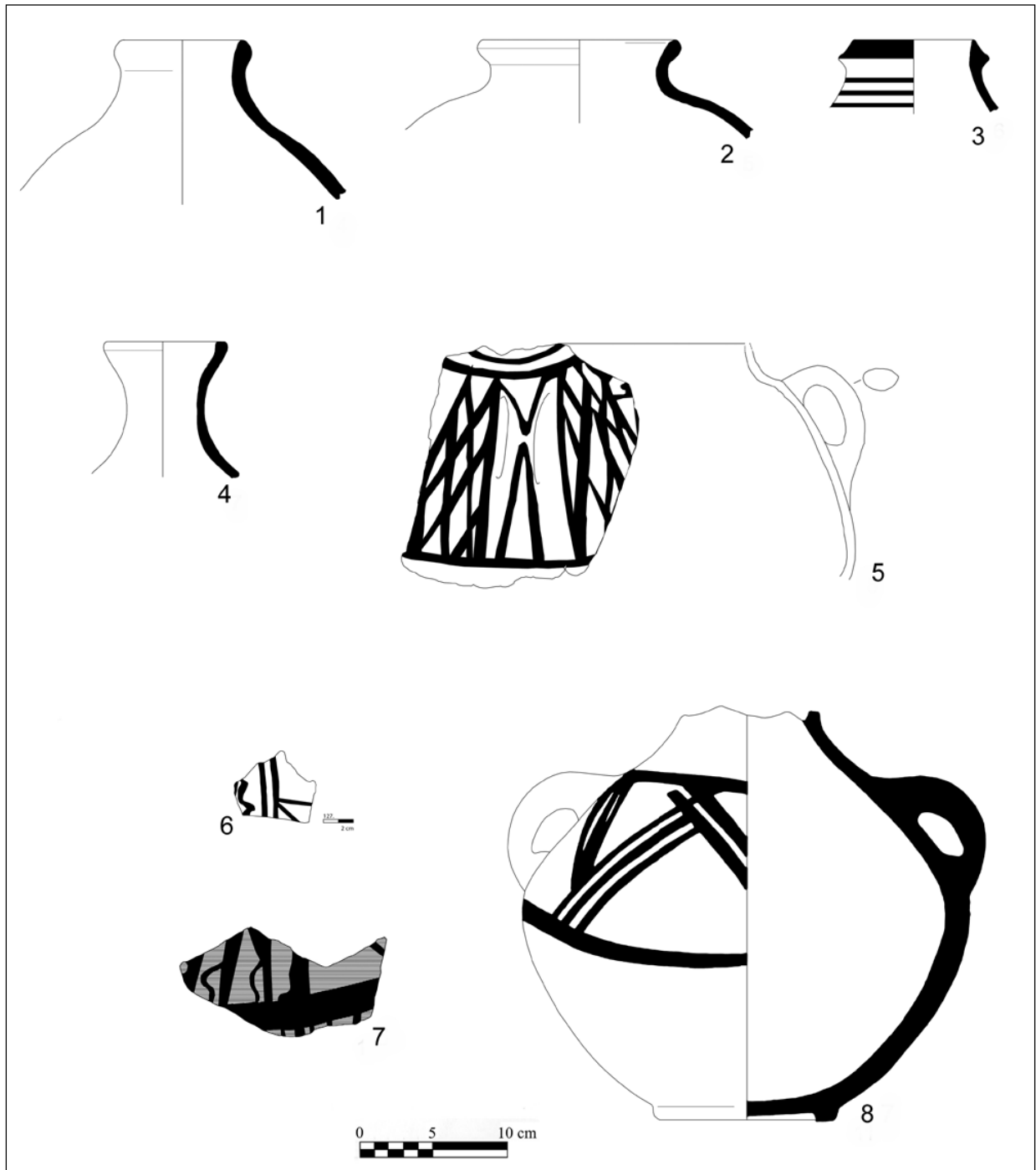
JJ5 (**Fig. 5: 4**) is a jar or jug with long neck and very simple rim. Most fragments were too small to determine the diameter of the mouth. Parallels for this type come from Dayr ‘Allā (jar types 2d and e, occurring in all Iron I phases, although more so in the later phases G-L - Franken 1969: 168).

Seven other jar/jug rim fragments (JJmisc) could not be assigned to one of the types above, among which a rim with trefoil mouth. The collection in Brussels also housed a complete jar met strainer spout (jar A). Some decorated sherds of jars and jugs were found as well, including an almost complete jar decorated with red paint (jar C) (**Figs. 5:8 and 13**) and a fragment of a red painted jug (**Fig. 5: 5**). In both cases the red paint was applied directly onto the unslipped and roughly finished surface of the vessel. Other decorated jug sherds included one body sherd with red paint in a different pattern on unslipped clay (**Fig. 5: 6**), one body sherd with red paint on a white slip (**Fig. 5: 7**) and the decorated JJ3 rim sherd described above (**Fig. 5: 3**).

Three painted sherds (from the same vessel) came from underneath the western fortress wall

9. Please note that the original rim was completely missing

and has been reconstructed.



5. Jars and jugs (1: JJ1, 2: JJ2, 3: JJ3, 4: JJ5, 5: fragment of decorated jug, red paint on unslipped surface, 6: fragment of body sherd, red paint on unslipped surface, 7: painted body sherd, red paint on white slip, 8: jar C, decorated with red paint on unslipped surface).

in 1980 (Homès-Fredericq 1997: 58) – see **Fig. 8**. The decoration of dark brown paint was applied on a white / light brown surface. The excavator dated these sherds to the Late Bronze Age and even compared them to Mycenaean wares

(Homès-Fredericq and Franken 1984: 152). However, an Iron I date is more likely, given parallels from Tall Dayr ‘Allā Iron Age phases A and B (Franken 1969: figs. 47:5, 51:62-64) and Hisbān Str. 20 (Ray 2001: Fig. 3.3:17-18).



6. Jar D, biconical jug, with reconstructed rim



7. Jar C.

The indication of the find spot of these sherds ('westelijke omwalling' = western wall) has suggested to some researchers that these sherds were found underneath the casemate wall and

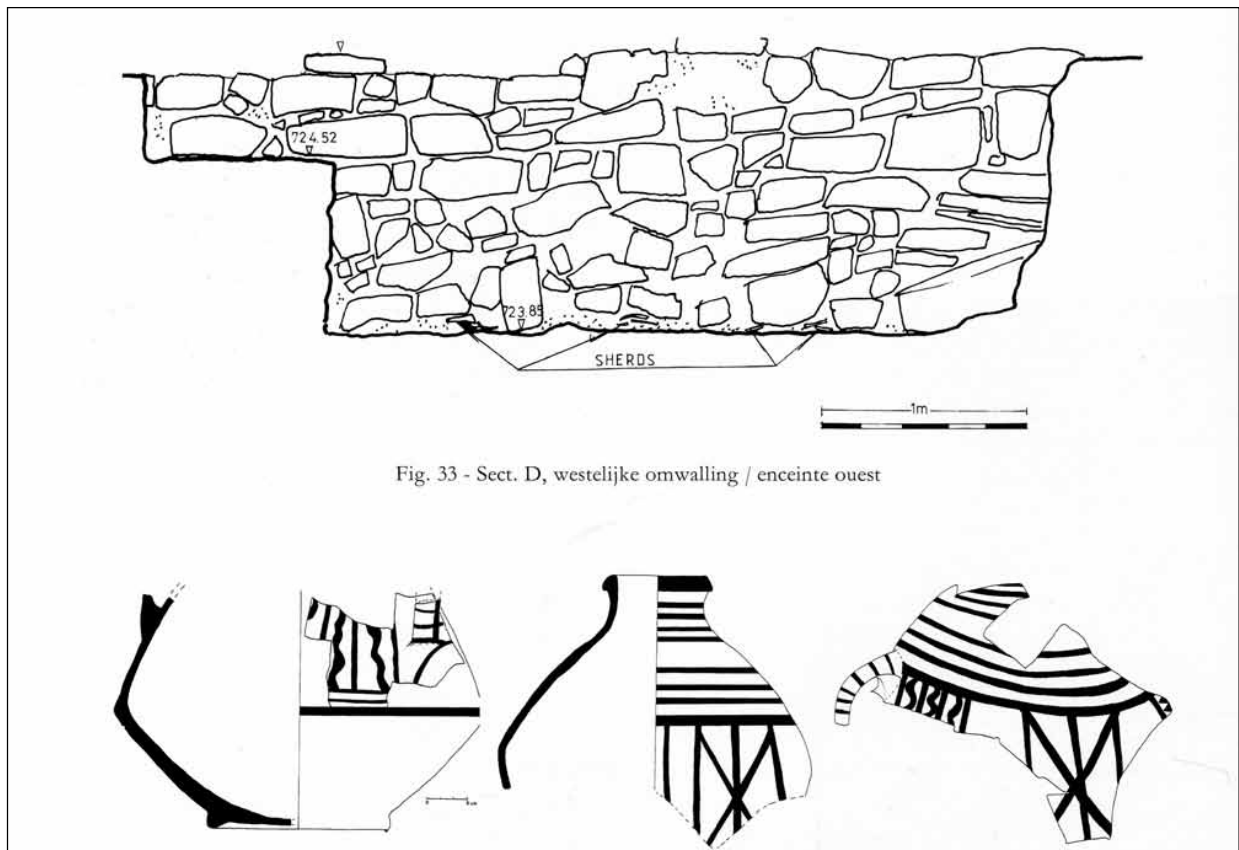
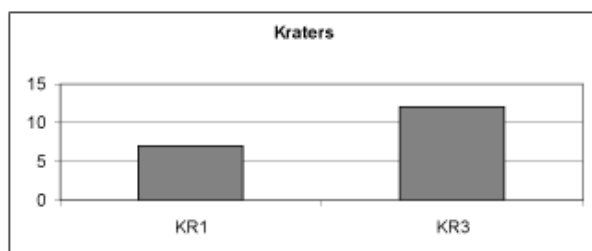


Fig. 33 - Sect. D, westelijke omwalling / enceinte ouest

8. The decorated jar and its findspot (courtesy Homès-Fredericq 1997: 58, fig 33).



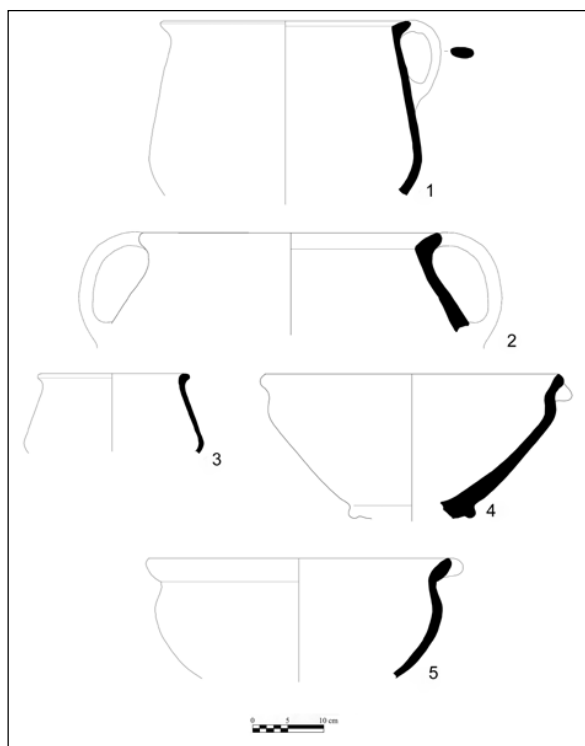
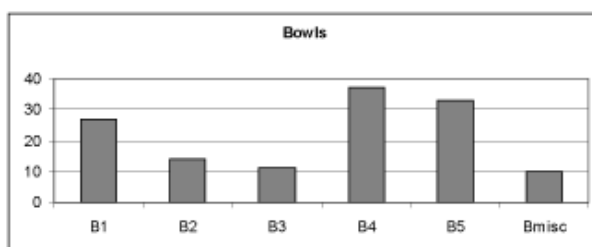
thus represent an earlier occupation phase. However, in 1980, when these sherds were found, the casemate wall had not yet been discovered; the sherds were retrieved from under the (later) fortress wall which was excavated in that year, and they thus belong to the Iron I village.

Nineteen rim fragments of kraters (thick-walled deep bowls with a mouth diameter over 35 cm) have been retrieved. The kraters were coil-made on a slow wheel. The three analyzed sherds (one of KR1 and two of KR3) were all made of fabric B; no other vessel types were made of this fabric in the Iron I period.

KR1 (**Fig. 9: 1-3**) is a biconical vessel with everted rim and large handles. One was white-slipped. The rim is mostly intentionally flattened. Five rims have a handle. Diameter of the mouth is 38-40 cm. Biconical shapes are a tradition of the Late Bronze Age. At Khirbat al-Mudayna al-‘Aliyā ‘biconical vessels are wholly absent’ (Routledge 2000: 43). From Dayr ‘Allā they are not reported from the Iron Age phases.

KR3 (**Fig. 9: 4-5**) is a large deep carinated vessel with everted folded rim and ledge handles. Diameter of the mouth is 41-43 cm. It is a very large, very roughly made vessel. Six fragments had one or two ledge handles attached to the rim. Ledge handles on Iron I deep bowls are also reported from Bālu‘ (Worschech 1990: 85) and Khirbat al-Mudayna al-‘Aliyā (Routledge 2000: 45). At Dayr ‘Allā they are only found on so-called ‘mensef’ bowls (large platters – see Franken 1969: 157-60).

Of all 201 Iron I rim sherds, 132 (or 65%) were of small and medium-sized bowls, all



9. *Kraters (1-3: KR1, 4-5: KR3).*

thrown of a rather fast wheel. The ten analyzed sherds were all made of fabric A.

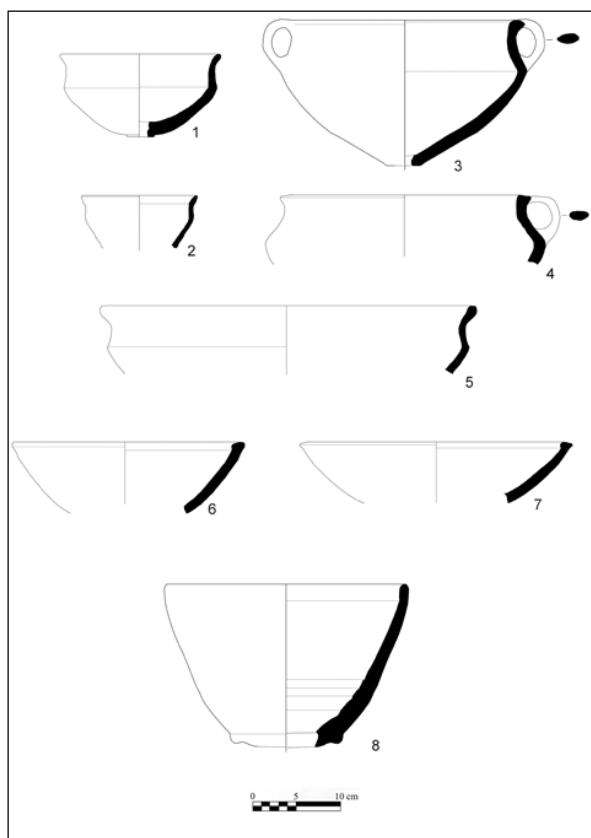
B1 (**Fig. 10: 1 and 3**) is a carinated bowl with simple rounded rim. No handles are present. One sherd has a flat base. Diameter of the mouth is *ca.* 20 cm.

B2 (**Fig. 10: 2 and 4**) is a carinated bowl with intentionally flattened rim and small round handles. One fragment has a flat base. Diameter of the mouth is *ca.* 21 cm.

B3 (**Fig. 10: 5**) is a carinated bowl with rounded rim and ledge handles set close to the rim. Diameter of the mouth is 31-42 cm.

B4 (**Fig. 10: 6-7**) is a rounded bowl with flattened inverted rim. One sherd has white slip outside. Diameter of the mouth is 24-32 cm. This type has parallels at Dayr ‘Allā Iron Age phase B - L (types 7, 10 and 11, Franken 1969: 187) and Hisbān Stratum 20 (Ray 2001: Fig. 3.3:2).

B5 (**Fig. 10: 8**) is a wide rounded or straight-sided bowl with rounded rim. One fragment has a decoration of vague red lines. Diameter of the mouth is 30 cm. This type of bowl may be related to the Manasse bowl found west of the Jordan. At Khirbat al-Mudayna al-‘Aliyā the most common pottery vessel was a rounded bowl with a simple or internally thickened rim



10. Small and medium bowls (1-2: B1, 3-4: B2, 5: B3, 6-7: B4, 8: B5).

(Routledge 2008: 157).

Most bowls are of the carinated variety (B1-3). Small carinated bowls (B1) have simple rounded rims and no handles. Larger carinated bowls have either a flattened rim and small round handles (B2) or a rounded rim and ledge handles (B3). Parallels for carinated bowls abound east and west of the river Jordan, but not many carinated bowls with ledge handles have been published so far. The pottery of WT-13 in Moab features several carinated bowls with ledge handles. So does Tall Mādabā: two carinated deep bowls from Field Phase 9 (Iron I-Iron IIA) had a very short carination and small ledge handles¹⁰. The Lāhūn sherds have higher carinations and the handles are more prominent, which could be an earlier trait. Routledge published a carinated bowl with a ledge handle from Khirbat al-Mudayna al-‘Aliyā (2000: fig. 5:6).

10. The pottery of WT-13 is currently under study by the author. It is dated to the Iron I or the beginning of Iron II period. Debra Foran and Stanley Klassen kindly

Several bowl rims excavated in the Iron I village did not fall into one of these types (Bmisc). Three sherds of a small straight-sided bowl were white-slipped and had a red band painted around the top of the rim. One bowl rim was not slipped but had a red band around the top of the rim as well.

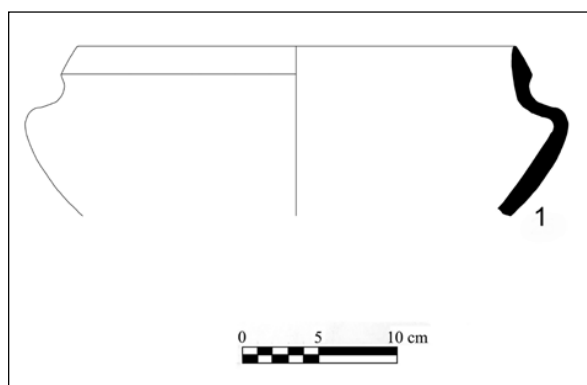
Cooking Pots

Only one type of cooking pot was found, CP1, a carinated cooking pot with elongated triangular rim (Fig. 11: 1). The stance is upright, not everted or inverted. The diameter of the mouth ranges from 28-33 cm. Six rim sherds were retrieved as well as one almost complete rim and one partly restored vessel. The pots were mould-made and thrown; the two sherds analyzed were made of a special fabric (C) containing dominant calcite grains.

This type of cooking pot conforms best to the Iron Age cooking pot type 1 at Dayr ‘Allā, where it is the dominant cooking pot in Iron Age phases A-E (Franken 1969: 120-121). At Khirbat al-Mudayna al-‘Aliyā this type has not been found.

Dating of the Pottery

Dating the Lāhūn repertoire is surrounded by difficulties. First of all the number of diagnostic sherds is very small and therefore cannot be subjected to statistical analysis; even an analysis of the absence or presence of certain types is not very reliable (but will be presented here anyway). The second obstacle is the paucity of



11. 1. Cooking pot.

showed me some of the unpublished pottery from Tall Mādabā.

well-dated material from other sites in the region. From only a few sites in Central Jordan the pottery has been published: Tall Dayr ‘Allā in the Jordan Valley, Tall al-‘Umayrī and Hisbān in the land of Ammon, Khirbat al-Mudayna al-‘Aliyā south of the Wādī al-Mūjib and several tombs at Ammān, Mādabā, Saḥāb, Mt. Nebo and Dhībān. As these tombs may have been in use for several centuries, they do not constitute a ‘closed context’ and the dating of their material is dependent on other well-dated contexts (which are scarce).

Several characteristics of the Lāhūn repertoire could be used for a general dating of the material. These are:

- The relatively large number of ledge handles (eleven rim sherds and two body sherds). Ledge handles are reported from Dayr ‘Allā Iron Age phases K and L, generally dated to the 11th century B.C., but these belong to ‘mensef’ bowls (large platters), not to deep bowls (Franken 1969: 157-60) and from Khirbat al-Mudayna al-‘Aliyā, dated by to the Iron IB, *ca.* 1050-950 B.C. (Routledge 2000: 43). At Bālū’ they are present but not dated (Worschech 1990). Mādabā tomb A, dated to the 12th century B.C., features several ledge handles (Hardin and Isserlin 1953). Smaller ledge handles on bowls are reported from Tall Mādabā and site WT-13, both provisionally dated to Iron I/IIA (see above). The parallels thus have dates ranging from the 12th century BC to the end of Iron Age I. The least one can say it that they point to a date securely in the Iron I period.
- The occurrence of carinated kraters and bowls (KR3, B1-3). Carinated bowls are known from the LBA and the Iron I period. They become progressively more s-shaped as the Iron I period continues. The Lāhūn bowls are more carinated than s-shaped and thus would fit early in the sequence.
- The presence of biconical vessels in the LBA tradition. Biconical shapes abound in the LBA and continue into the Iron Age. Seven rims fragments of biconical kraters (KR1) were found. These kraters are absent at Khirbat al-Mudayna al-‘Aliyā. Decorated jar C, the five JJ2 rim sherds and jar D were also biconical.
- The absolute dominance of cooking pot type 1 with triangular rim. All rim fragments and the

almost complete cooking pot are of this type. At Khirbat al-Mudayna al-Mu‘arraja and Khirbat al-Mudayna al-‘Aliyā, both dated by the excavator to the 11th-early 10th centuries B.C., cooking vessels consist mostly of the (later) ridged-rimmed cooking jugs (Routledge 2008). This would place the Lāhūn cooking pots earlier. At Dayr ‘Allā the parallel is the Iron Age cooking pot type 1, which is the dominant cooking pot in Iron Age phases A-E, dated to the 12th century B.C. (Franken 1969: 120-121).

- The only sporadic occurrence of white slip. Only seven sherds were white-slipped, among them three small straight-sided bowls with a simple rim and a red painted line on top of the rim, which may all belong to the same vessel. Red slip and burnishing are absent.
- The absence of vessels that are generally dated to 11th -10th centuries B.C. contexts in Central Transjordan (Dayr ‘Allā Iron Age Phases E-L, Khirbat al-Mudayna al-‘Aliyā), such as T-rimmed kraters, ‘mensef’ bowls and rim-ridged cooking jugs.

Given these characteristics the pottery repertoire as a whole can best be assigned to the beginning of the Iron I period, roughly the 12th century B.C., when Late Bronze Age traditions such as white slip, biconical shapes and sharply carinated bowls still occurred, and typically Iron Age characteristics such as ledge handles and cooking pots with triangular rim made their appearance. The best parallels come from Dayr ‘Allā Iron Age Phases A and B, Hisbān Stratum 20 and Mādabā Tomb A.

Some Conclusions

The pottery excavated in the Iron I village is a mixed collection and consists of some (restored) pots, large vessel fragments, smaller fragments and very small pieces. One should not assume, however, that all pottery in use during the occupation of the settlement has been retrieved. Most of the restorable pottery found inside the houses was very heavy: large kraters, jars and medium-sized bowls. It is worth noting that very few small finds were found in the village: some stone pounders, a bronze needle, a bronze arrowhead, a bronze dagger and a scarab seal dated to the end of the second millennium BC (see Swinnen 2009: 39 and note

12).¹¹ The presence of mostly very large vessels combined with the virtual absence of small finds seems to indicate that the inhabitants have left the settlement peacefully. They took most of their belongings with them and left behind only what was too heavy to carry: large and heavy vessels, together with heavy stone tools as grinders and pestles, and unmovable objects such as bread ovens and troughs. No traces were found of a sudden destruction by enemies or earthquakes. Some door openings were found to have been blocked with heavy stones; the inhabitants may have expected to come back one day.

The pottery shows that the Iron I inhabitants of Lāhūn retrieved their vessels from several workshops, all using different fabrics and techniques. The forms are comparable to those found at Dayr ‘Allā, Hisbān and ‘Umayrī in the Jordan Valley, Ammon and northern Moab, and the inhabitants of Lāhūn may have been in contact with those regions. Imported wares, however, were not found in the pottery repertoire.

It has repeatedly been pointed out that the layout of the settlement of Lāhūn is remarkably similar to the settlements of Khirbat al-Mudayna al-‘Aliyā, Khirbat al-Mudayna al-Mu‘arraja and Khirbat al-Mu‘amariyya, all situated south of the Wādī al-Mūjib. In his study of these Iron I communities in Central Jordan, Porter argues that the four villages near the Wādī al-Mūjib, among which Lāhūn, used the same resources to produce their pottery (2007, 2013). Note, however, that the other villages date to the 11th and the beginning of the 10th centuries (Routledge 2008). If Lāhūn was indeed occupied during (part of) the 12th century B.C., as I have concluded, there would be a considerable chronological gap between Lāhūn and the villages south of the Wādī al-Mūjib. Lāhūn would already have been deserted when the other villages were built.

Margreet L. Steiner
Independent scholar
Leiden, The Netherlands
msteiner@freeler.nl

Bibliography

As, van A. and Jacobs, L.

- 1995 An Examination of the Clays Probably used by the Ancient Potters of Lehun. (Jordan). *Newsletter of the Department of Pottery Technology* 13: 14-25.

Clark, Douglas R.

- Nyp Field B: The Western Defense System and Northwestern Domestic Area. Pp. xx-xx in Larry G. Herr; Douglas R. Clark; Lawrence T. Geraty; Randall W. Younker and Oystein S. LaBianca (eds.), *Madaba Plains Project 6: The 1996-1998 Seasons at Tall al-‘Umayri and Subsequent Studies*. Berrien Springs, MI: Andrews University Institute of Archaeology.

Franken, H.J.

- 1969 *Excavations at Tell Deir ‘Allā I: A stratigraphical and analytical study of the Early Iron Age pottery*. Leiden: Brill.

Harding, G. L. and Isserlin, B.

- 1953 An Early Iron Age Tomb at Madaba. *Palestine Exploration Fund Annual* 6: 27-47.

Hemelrijk, van Y.

- 1987 Een technologische studie van aardewerk uit Lehun, Jordanie / A technological study of pottery from Lehun, Jordan (in Dutch). Ph.D thesis, unpublished.

Herr, L.

- 2007 The Late Iron Age I Ceramic Assemblage from Tall al-‘Umayri, Jordan. Pp. 135-45 in S. White-Crawford, A. Ben-Tor, J.P. Dessel, W.G. Dever, A. Mazar and J. Aviram (eds.), *‘Up to the Gates of Ekron’, Essays on the Archaeology and History of the Eastern Mediterranean in Honour of Seymour Gitin*, Jerusalem.

Homès-Fredericq, D.

- 1982 Un goulot de bouteille de Nouvel An, trouvé à Lehun (en Jordanie). *Studia Paulo Naster Oblata*: 79-90. Leuven.
- 1987 Possible Phoenician Influences in Jordan in the Iron Age. *Studies in the History and Archaeology of Jordan* 3: 89-96.
- 1995 A cosmetic palette found in Lehun, Jordan. Pp. 265-71 in S. Bourke and J.-P. Descoedres (eds.), *Trade, Contact, and the Movement of Peoples in the Eastern Mediterranean. Studies in Honour of J. Basil Hennessy*.
- 1997 *Découvrez Lehun et la Voie Royale. Les fouilles Belges en Jordanie / Ontdek Lehun en de Koningsweg. De Belgische opgravingen in Jordanië*. Bruxelles / Brussel: Koninklijk Museum.

11. A fragment of a cosmetic palette (Homès-Fredericq 1995) and of a faience New Years bottle (Homès-Fredericq 1982) are to be dated to the Iron II period.

Seven spindle whorls made of pottery and stone were retrieved from the upper levels and also date to Iron II (Jeannette Boertien, personal communication).

- 2009 The Iron Age Fortress at Lehun. Pp. 165-82 in P. Bienkowski (ed.), *Studies on Iron Age Moab and Neighbouring Areas in Honour of Michèle Daviau.*, P. Leuven: Peeters.
- Homès-Fredericq, D. and Franken, H.J. (eds.)
1984 *Klei, bron van leven. Zevenduizend jaar pottenbakkerskunst in Jordanië.* Brussel: Koninklijk Museum.
- London, G. A.
1991 Aspect of Early Bronze and Late Iron Age Ceramic Technology at Tell el-Umeiri. Pp. 383-419 in Lawrence T. Geraty, Larry G. Herr, Øystein S. LaBianca, and Randall W. Younker (eds.), *The 1984 Season at Tell el-'Umeiri and Vicinity and Subsequent Studies.* Madaba Plain Projects 2. Berrien Springs (MI): Andrews University Press.
- Piccirillo M.
1975 Una Tomba del Ferro a Madaba (Madaba B, Moab). *Liber Annus* 25:199-224.
- Porter, B. W.
2007 *The Archaeology of Community in Iron I Central Jordan.* Unpublished PH.D. dissertation in Anthropology, Presented to the Faculties of the University of Pennsylvania.
2013 Complex Communities. *The Archaeology of Early Iron Age West-Centra Jordan.* The University of Arizona Press.
- Ray, P.
2001 *Tell Hesban and Vicinity in the Iron Age.* Hesban 6. Berrien Springs: Andrews University Press.
- Routledge, B.
2000 Seeing Through Walls: Interpreting Iron Age I Architecture at Khirbat al-Mudayna al-'Aliya. *Bulletin of the American School of Oriental Research* 319: 37-70.
2008 Thinking 'Globally' and Analysing 'Locally'. Pp. 144-76 in L. Grabbe (ed.), *Israel in Transition. From Late Bronze Age to Iron Age IIA (c. 1250 – 850 B.C.E.). Vol. 1. The Archaeology.* New York / London: t&t Clarck.
- Steen, van der, E.
2004 Tribes and Territories in Transition The Central East Jordan Valley in the Late Bronze and Early Iron Ages: A Study of the Sources. Peeteres, Leuven.
- Steiner, M. L.
2006 The Iron Age Pottery of Khirbet Al-Mudayna and Site Wt-13 in Jordan. *Leiden Journal of Pottery Studies* 22: 101-11.
2009 Khirbet al-Mudayna and Moabite pottery production. Pp. 145-164 in P. Bienkowski.(ed.), *Studies on Iron Age Moab and Neighbouring Areas in Honour of Michèle Daviau.* Peeters: Leuven.
- Steiner , M. L. and Jacobs, L.
2008 The Iron Age Pottery of al-Lehun, Jordan: Fabrics and Technology. *Leiden Journal of Pottery Studies* 24: 133-41.
- Swinnen, I. M.
2009 The Iron Age I Settlement and its Residential Houses at al-Lāhūn in Moab, Jordan. *Bulletin of the American School of Oriental Research* 354: 29-53.
- Thompson, H.O.
1986 An Iron Age Tomb at Madaba. Pp. 331-63 in L. T. Geraty and L. G. Herr (eds.), *The Archaeology of Jordan and Other Studies Presented to Siegfried H. Horn.* Berrien Springs, MI: Andrews University Press.
- Worschech, U.
1990 *Die Beziehungen Moabs zu Israel und Ägypten in der Eisenzeit.* Wiesbaden: Harrassowitz .

THERE IS NO MIDDLE BRONZE GLACIS AT TALL ŞĀFŪṬ: AN EXAMINATION OF THE MIDDLE BRONZE III REMAINS

Owen Chesnut

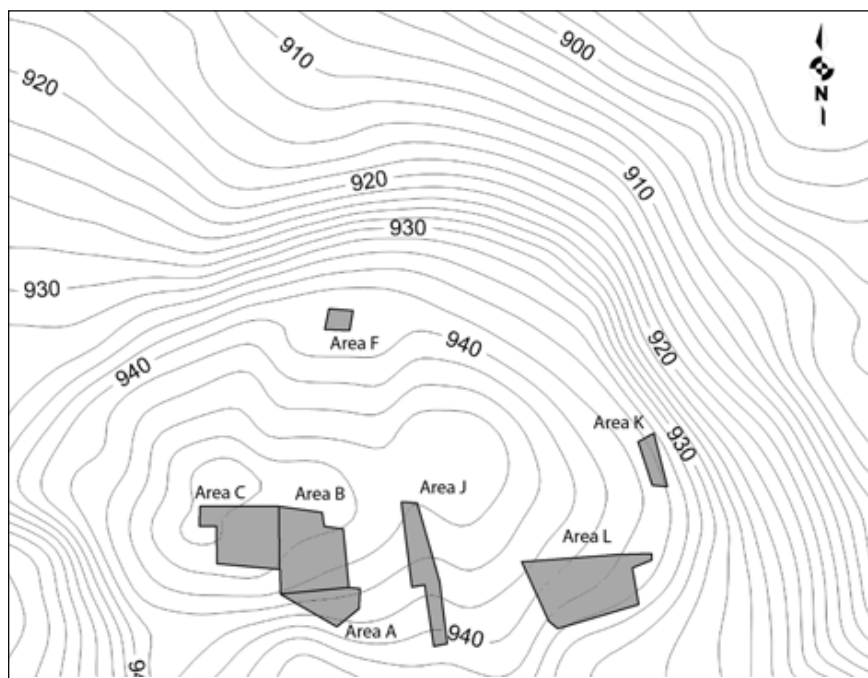
Introduction

The site of Tall Şāfūṭ is located 12 km. north of Amman in Jordan. It was excavated by Donald Wimmer over the course of 10 seasons between 1982 and 2001 (Wimmer 1985, 1987a, 1987b, 1989, 1991, 1992, 1994, and 1997a). Wimmer was Professor of Religious Studies at Seton Hall University, and was studying at the American Center for Oriental Research in Amman when he was asked to lead a salvage excavation at Şāfūṭ under the auspices of the Department of Antiquities of Jordan. In the first season of 1982, Wimmer excavated in Areas A, B, C, D, and E. Throughout the course of 10 seasons Areas A-L (omitting I) were excavated (**Fig. 1**). He discovered enough significant remains that the site was saved and he continued digging over the course of 10 total seasons.

The main periods represented at the site are the MB III, the LB II, Iron Age I, Iron Age II B, Iron Age IIC/Persian period, and Roman/Byzantine periods. Significant amounts of pottery and artifacts were found at the site, as well as large architectural structures, making Şāfūṭ one of the most important Bronze and Iron Age sites in Jordan. Şāfūṭ is mentioned most frequently because of its Middle Bronze Age “glacis” (see below). This article will examine the legitimacy of that claim and discuss other possible Middle Bronze Age remains that were discovered at the site.

Prior Research

Roland De Vaux (1938: 418) was one of the first archaeologists to report sherds from the site dating to the “Bronze I and Bronze II” periods



1. New Topographic Site Map of Tall Şāfūṭ.

(although, he would later rethink this position after discussing it with Glueck). Rudolph Dornemann visited the site in 1969 and noted finding “Middle Bronze II sherds, mostly of the hard grey ware with orange-pink slip” (1983: 19). After sherding the site, James Sauer, reported that the slopes “were dripping with” Middle Bronze Age and Late Bronze Age sherds (personal communication Wimmer; see Sauer 1986: 6).

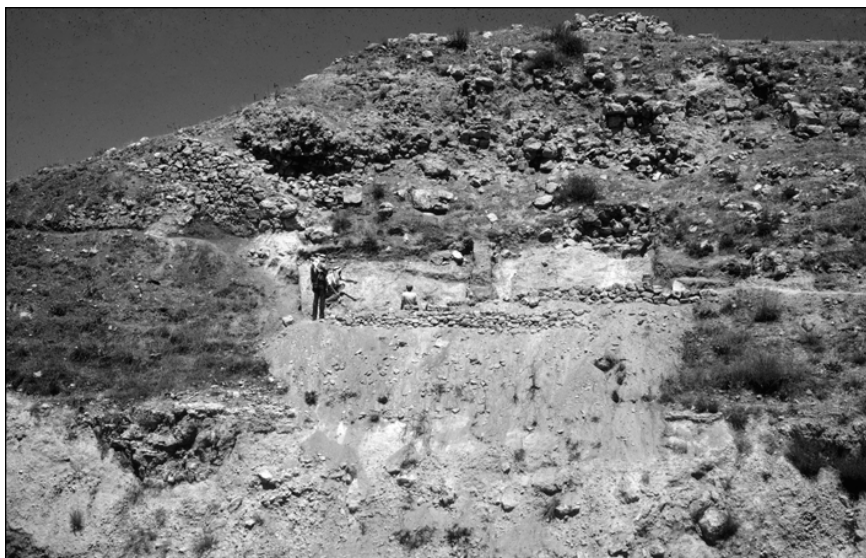
Professor Wimmer (1987b) also reported on the discovery of Middle Bronze Age sherds at Şāfūt in his preliminary report on the 1982–1985 excavation seasons. In his discussion of the glacis, he mentioned that only Middle Bronze Age and Late Bronze Age pottery was found in the layers immediately above the glacis (Wimmer 1987b: 165). He surmised that Middle Bronze Age remains might underlie much of the later Late Bronze Age and Iron Age remains. Wimmer would later attempt to find these remains in 2001 by digging below the late Iron Age buildings in Squares B4, C3, and C7 (per the season report written for the DoA).

The Discovery and Excavation of the Glacis

As mentioned above, the majority of Middle Bronze Age sherds were discovered in Area D. It is in this area that a “glacis” was reported and it is this feature that has been most widely reported in connection with Şāfūt. In 1953, construction of a new road from Jarash to Na’ur destroyed part of the northern slope of Şāfūt. In this destroyed section, Ma’ayeh (1960a) re-

ported that the bulldozers revealed “a sloping plastered ‘glacis’ revetment, resting on natural rock, and crowned by a wall. The glacis was constructed of different layers of sand, *huwwar*, and earth, beaten into a kind of *terre pisée*.” This report is a textbook description of a typical MB III rampart (Burke 2008: 51 notes that the term “*terre pisée*” was often misused in the literature describing rampart construction). In subsequent years, this information was cited by various scholars as evidence for Middle Bronze Age occupation at Şāfūt (Ottoson 1969; Zayadin 1973; Weippert 1979; Dornemann 1983; Sauer 1986 and Mazar 1990). In 1982, Wimmer laid out Squares D1 and D2 in the middle of what remained of the supposed glacis on the south side of the tall (Figs. 2 and 3). These squares were placed in a saddle slightly below the remains of a wall emerging out of the tall and curving towards the east. Unfortunately, these squares were not placed directly against the wall, for fear of destabilizing it. Had they done so the relationship between the glacis and the fortification might have been better understood.

Five loci were excavated in Square D1, including Locus D1.5, which was bedrock. Locus D1.1 was topsoil and revealed Middle Bronze Age, Late Bronze Age, and Iron Age II sherds. Beneath this locus, a 1.0 m wide test trench (Fig. 4) was excavated along the west balk in order to reach the purported glacis; however, no loci were designated for the dirt removed, causing the putative glacis itself to be desig-



2. View of Area D and the Top of Şāfūt.



3. Squares D1 and D2.



4. Test Trench in Square D1.

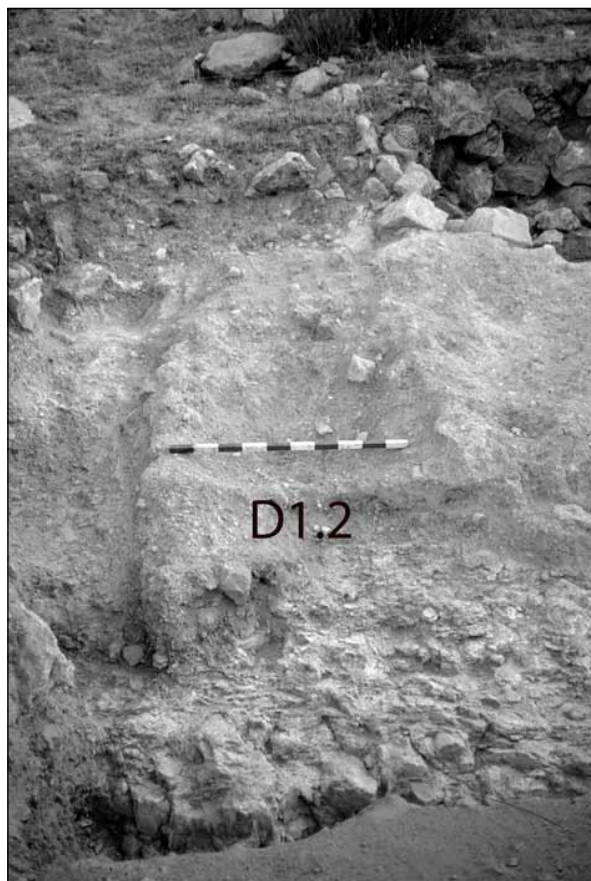
nated as Locus D1.2. Locus D1.3 was located in the northern part of the square and consisted of compact soil and limestone wall stones, collapsed from the perimeter wall directly north of the square. Locus D1.4 was made up of loose gray soil and was located throughout the square

directly above the glaxis. Four Middle Bronze Age sherds were found without locus numbers (only pail and sherd numbers), but most likely come from this locus based on the excavators' mention of the large amount of Middle Bronze Age and Late Age Bronze sherds recovered here. Square D2 was located directly to the east of Square D1. In Square D2, five loci were excavated, the contents of which corresponded nicely with what was found in Square D1: Locus D2.1 corresponds with Locus D1.1 in that it contained topsoil; two Middle Bronze Age sherds were found in this locus. Locus D2.2 corresponds with Locus D1.4 in that it contained loose gray soil and was located above the "glaxis"; the majority of Middle Bronze Age sherds found come from this locus. Locus D2.3 corresponds with Locus D1.2, which is the glaxis. Locus D2.4 corresponds with Locus D1.3, which contained the perimeter wall collapse. Finally, Locus D2.5 corresponds with Locus D1.5, which was bedrock.

To Glaxis, or Not Glaxis: That is the Question

The loci designated as the "glaxis" are D1.2 (Munsell Reading 2.5Y 7/4 pale yellow – 10YR 8.2 white) and D2.3. In Squares D1 and D2, this supposed glaxis was exposed over both squares, except in the southwestern corner of Square D2, where bedrock was exposed below the gray soil and along the northern balk of both squares where wall collapse had accumulated. The glaxis was purportedly 45 degrees, which is well above the average of a manmade glaxis (Burke

2008: 50, Table 5). The square supervisors and area supervisor all described the makeup of the “glacis” differently, making it difficult to determine the actual material. In Locus D1.2 it was described as “[a] very compact clay layer,” “a limestone cap” and “a natural structure” (Safut Area D Notebook 1982). The square supervisors also noted that this locus was naturally slippery, was somewhat “stepped,” and was embedded with large rocks (Fig. 5). In Locus D2.3 the glacis was described as “a limestone matrix deposit. It is compacted clay (*huwwar*) and pebbles (approx. pea sized)” (Safut Area D Notebook 1982). The supervisors also mentioned that the glacis appeared to be natural because there was no evidence of occupation above or beneath it (i.e. flat lying sherds), and that under the wall



5. Bedrock with Natural Accumulation on Top.

tumble (Locus D2.4) there was soft, fine soil and the bedrock, a fact which seems to confirm that the glacis is natural.

It should also be noted that the Area D supervisor Jennifer Groot (1983: 2) understood this “glacis” to be artificial, a plaster coat to keep the bedrock from eroding (although at times she called it a “compacted gravel and *huwwar* surface” and “sterile *huwwar*”). Groot dated the glacis to the Middle Bronze Age based on the similarities between this “plaster” layer and similar features of the glacis found at Jericho, Taanach, and Tell Dan (Groot 1983: 3; cf. Pennells 1983: 58). However, these three glacis are each made from different materials: the Jericho glacis out of mudbrick and *huwwar* plaster (Kenyon 1981; Marchetti 1998), the Ta’anach glacis out of clay and *huwwar* limestone (Lapp 1964, 1967), and the Tell Dan glacis out of crushed travertine (Biran 1994: 59-63). Also, the glacis at all three sites were constructed on earthen ramparts, making the parallels to Šafūt even less accurate. The presence of a glacis, as noted by Burke (2008: 11), is not sufficient to date fortifications to the MB III.

From the excavations carried out in Area D, it is clear that the “glacis revetment” that Ma’ayeh wrote did not exist. He mistook the natural bedrock stratigraphy along with the layers of deposition and crowning wall for a traditional Middle Bronze Age fortification. However, the excavations did reveal some kind of material on the bedrock, considered natural by Wimmer and the square supervisors, but artificial by the area supervisor. Several factors indicate that this formation of *huwwar*/compact clay/plaster is most likely natural. The strongest clues are the rocks that were protruding out of the layer, the stepped nature of the material, and the seeming disconnect between this formation and the fortification wall since the wall collapse in both squares was on top of fine soil and covering bedrock. As a whole, these factors indicate that this material is in fact a natural accumulation of friable limestone above the bedrock.¹

1. It should be noted that this theory was essentially Wimmer’s interpretation as well: “There is no question that the bedrock was cut in antiquity as a foundation for the crowning wall, and that the composition of the inclined place agreed with the earlier description, except that no certain signs of plaster appeared. It could have weathered away, or have been removed by the 1950s

construction...It should be noted that the crowning wall, as it was called, is curved, and that the segment on the west has its counterpart on the east as is evident in a pre-excavation slide. Excavation produces only Middle/Late Bronze Age pottery in the layers immediately above the glacis itself which proved to be sterile.” (Wimmer 1987a: 279).

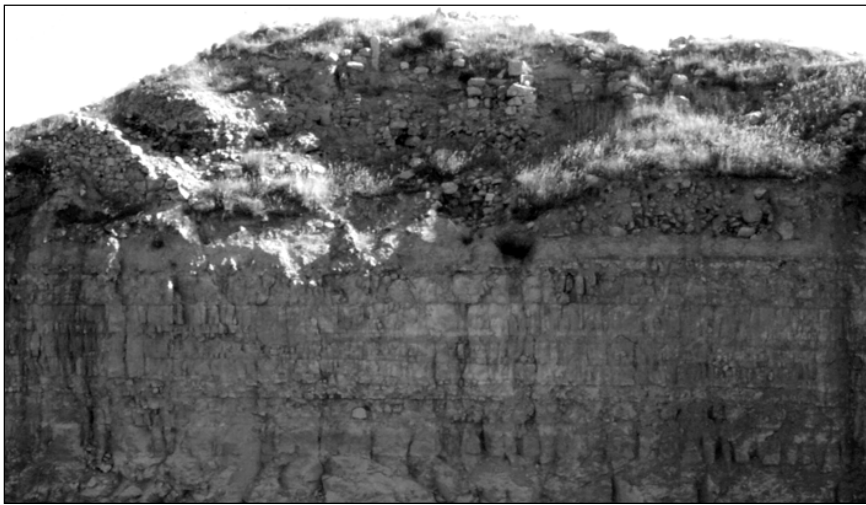
Although what was called the “glacis” in Area D was a natural formation, there remains a small possibility for a man-made glacis at Şāfūt. Nelson Glueck (1939: 191) observed that the western and southern slopes of Şāfūt were more gradual in descent, and it is these two sides of the tall that would require a glacis for added protection. Unfortunately, the construction and expansion of the Amman-Jarash highway has eliminated the possibility for further research on the southern side (**Fig. 6**), but it would still be possible to excavate on the western side of the tall. It is now clear that what has been cited time and again in the literature as a Middle Bronze

Age glacis is in fact a natural formation however the question of a glacis at Şāfūt will not be completely answered until this excavation can be carried out.

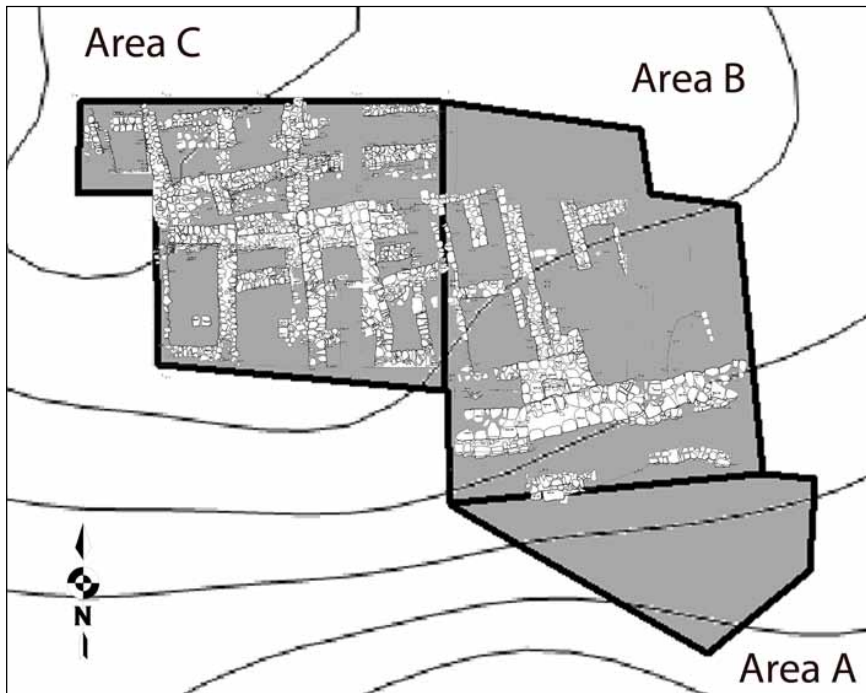
Possible Middle Bronze Age Architectural Features

City Wall

In the 1982 season, Middle Bronze Age remains were also found in Square B2. Middle Bronze Age sherds were reported by Wimmer in the loci contiguous to the “foundation trench” outside the city wall in Square B2 (**Fig. 7**), although he dated the wall to the Late Bronze



6. View of Where Area D Used to be After Road Construction.



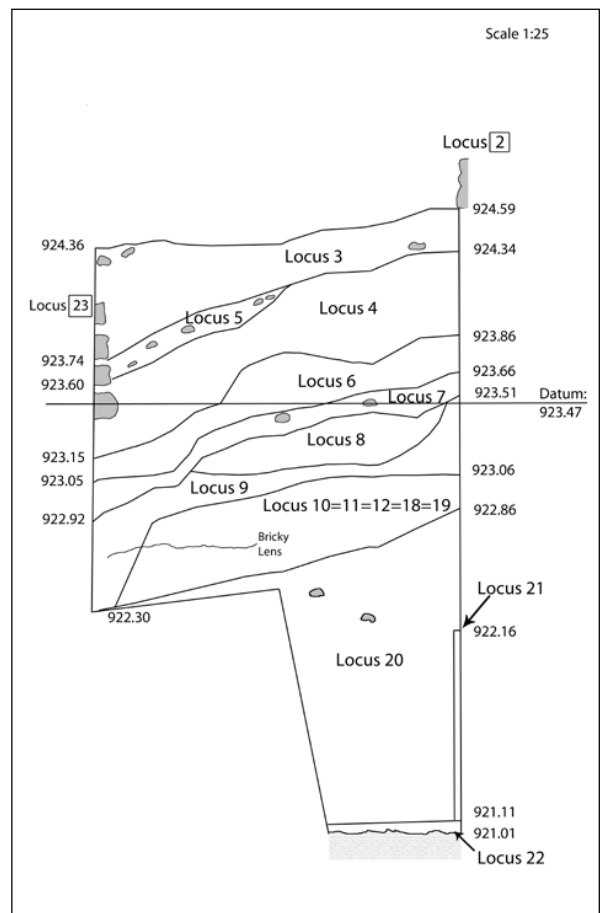
7. Area B With Possible MB III City Wall and Tower.

Age (1987b: 165). Several sherds were drawn, but they are forms that could date either to the Middle Bronze Age or to the Late Bronze Age.

A more thorough discussion of the construction of the wall and the loci located outside of it in Square B2 must be carried out to assess Wimmer's Late Bronze Age date of this structure.² As is well known, it is not proper procedure to date a wall based on material excavated on its exterior. It can be assumed that this area in Squares B1-3 was located outside of the city in all time periods prior to the Iron Age IIB, as Bronze Age and Iron Age I sherds have been found, but no architectural features. Architectural remains in Area A date to the Iron IIB and later. However, since Wimmer (1987a: 280) did not excavate to a sufficient depth inside of this wall, his assessment of its construction date to the Late Bronze Age, based on the sherds in the lowest levels of Square B2 located above virgin soil and bedrock must be closely examined.

It might be true that there are more Late Bronze Age sherds in the deepest loci in Square B2 (**Fig. 8**). However, a quantitative analysis cannot be carried out since not all sherds from these loci could be located, and there are still Iron Age II sherds mixed in with these loci. Iron Age II sherds are located in Loci 18, 19, 20, 21, and 22.³ These loci are the deepest strata reached in this square, located on top of bedrock. Loci 18 and 19 (and perhaps Loci 12 and 17, see previous footnote) all consist of occupational debris, perhaps discarded over the city wall (Safut Area B Notebook 1982). These loci consist of patches of ash, charred material, and different color soil all intermingled together. According to the excavators, these loci are the last to be found above virgin soil or, a "non-occupational level. No sherds. No bones." (Safut Area B Notebook 1982).

There is, however, at least one Iron Age II sherd from Locus 20, a locus which was supposed by the excavators to be sterile.⁴ This locus is essentially made up of topsoil and consisted of thick, dark brown, clayey soil, as can clearly



8. B2 Loci Next to City Wall.

be seen in the picture of the west balk. If Loci 21 and 22 do not actually refer to Loci 12 and 17, then the Iron Age sherds from these loci as well as that from Locus 20 are located in sterile strata—a "foundation trench" and a "bedrock cap," respectively. Locus 21, the "foundation trench," consisted of "bright yellow, white limestone-like material adhering to the face of N wall... extending outward from the wall to a width of .07m and a deepness [sic] of circa 0.50 m" (Safut Area B Notebook 1982).

It should be noted that a foundation trench, by definition, should not be sterile unless it is dug into virgin soil, and even then should consist of soil and remains from the time period of construction, not of the limestone-like mate-

2. The perimeter wall continues from Squares B1 through B3; however, excavations carried out in these two squares did not approach the depth that was excavated in Square B2 and so cannot speak to its founding date.
3. It is possible that Loci 21 and 22 are actually the pail numbers of Loci 12 and 17, since sherds have been la-

beled with locus numbers 25 and 26, which do not exist and probably refer to the pail numbers.

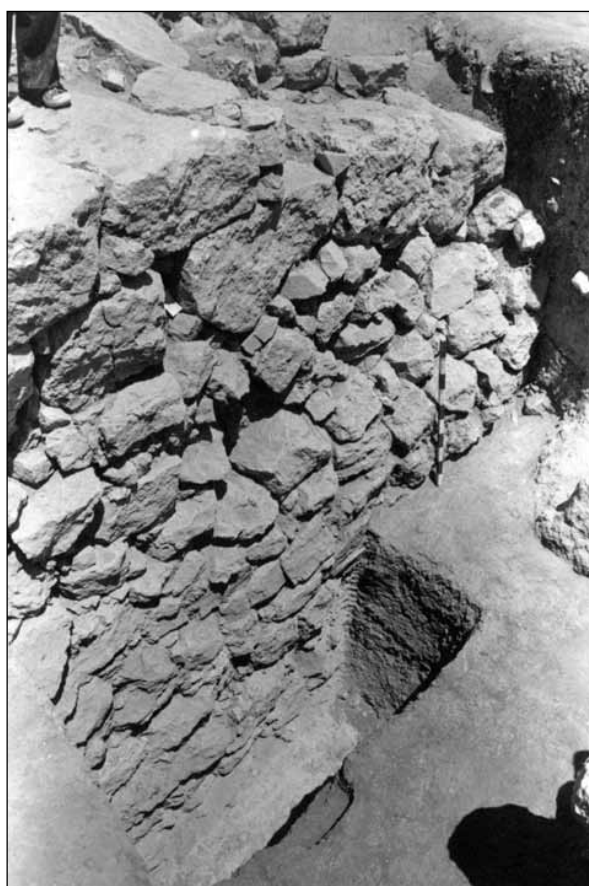
4. This locus number is not the product of a discrepancy with the pail number because pail number 20 never existed, according to the excavation notebook.



9. Western Balk in Square B2, Showing Lack of Foundation Trench.

rial described above.⁵ The 1982 pictures (**Fig. 9**) of the western balk reveal no evidence of a foundation trench. However, it is probable that this limestone-like material was some kind of mortar applied to the first four rows of the wall. This difference in treatment could indicate not a foundation trench but the foundation levels of the wall. These Iron Age II sherds were most likely mislabeled with the pail numbers and are actually from Loci 12 and 17. However, this probability does not detract from the fact that Iron Age II sherds were found in the lowest levels above virgin soil abutting the perimeter wall in Locus B2.2.

Now the discussion will turn from the pottery associated with the wall to the wall itself. The perimeter wall was exposed in Squares B1-B3 over an extent of 15 m in length. The wall is approximately 2.0 m wide, and in Square B2 a probe showed that it stood approximately 4.0 m in height (**Fig. 10**). The upper two courses of the wall consist of large, rough-hewn, rectangular stones, as large as 1.08 m x 0.60 m x 0.40 m. The course directly below the large stones of the top two rows consists of haphazardly arranged, irregularly-sized stones. The remainder of the wall down to bedrock consists of stones which are approximately 0.35 m x 0.25 m in size and



10. Extent of City Wall in Square B2.

5. Since this wall was apparently constructed on bedrock in virgin soil, there is really no need for a foundation

trench (Netzer 1992: 18).

are arranged in a more orderly fashion. There are 12 total courses of the wall exposed in Square B2. In Squares B1 and B3, it is unclear how many courses there are because a stone “skin” wall was laid against the actual perimeter wall (**Fig. 11**), beginning at the third (haphazard) course of stones and sloping slightly outward as it continues down. It is unclear if this “skin” wall continues down to bedrock or if it stops at a certain point, indicating the surface in the period in which it was constructed.

The wall evidences three (and possibly four) building phases, but, unfortunately, none can be accurately dated. Phase 1 consists of the first nine rows of stones, making up the foundation (four rows) and subsequent structure (five rows)



11. Skin Wall in Square B1.

of the wall. It is likely that this phase dates to the Middle Bronze Age: The latest sherds found in the fill outside the wall date to this period, and even though only a couple such sherds exist, the construction of this wall is of high enough quality to tip the scale in this direction instead of to the LB II.

Phase 2 consists of the wall “skin” (Locus B1.11) located in Squares B1 and B3, but strangely absent in Square B2. It begins just below the tenth row of stones and continues down over several courses. However, it is not certain whether the skin wall contained more courses and has simply eroded or was never constructed that high. Also, it is unclear how far the skin wall continues, because Squares B1 and B3 were not excavated to the base of the wall.⁶ This phase possibly dates to the LB II and coincides with the occupation levels located within the wall. Alternatively it might date to another period. There is insufficient data to be able to state its date confidently, but a date in the Late Bronze Age is most probable given the quality of the construction and the lack of this style earlier in the Middle Bronze Age or later in the Iron Age II.

Phase 3 consists of the top two courses of Wall B2.2 and the terrace wall (Locus B2.23) (**Fig. 12**) to the south of the main wall and located in Squares B1-B3.⁷ The terrace wall is built on top of Locus B2.7, which runs up and abuts the perimeter wall at the tenth course. The only pottery from this locus was drawn by William Glanzman (head archaeologist for the first five season of the project), but, unfortunately, a date cannot be determined from the drawings and his notes do not include dates. However, based on the high quality of the stones making up the top two courses and their similarity to stones found in perimeter walls in Areas F and L, it is likely that this phase should be dated to the late Iron Age.

6. A Middle Bronze Age sherd was found in Locus B1.13, which is located approximately halfway down the perimeter wall, consisting of fill.

7. There is also a tenth row that has not been mentioned. The excavators considered this course a separate phase that was constructed “hurriedly by persons not skilled...thrown up from the ruins of the original wall” (Safut Area B Notebook 1982). They thought that this course and the terrace wall were constructed from the

same fallen stones from the original wall, fallen perhaps due to an earthquake. It is possible that this tenth course should be designated a separate phase; however, after looking at pictures of the wall, a clear phase could not be distinguished. Perhaps, at the very least, this row could be designated as Phase 2.5 since it was most likely added at some point between the construction of the skin wall and the last two courses of the perimeter wall.



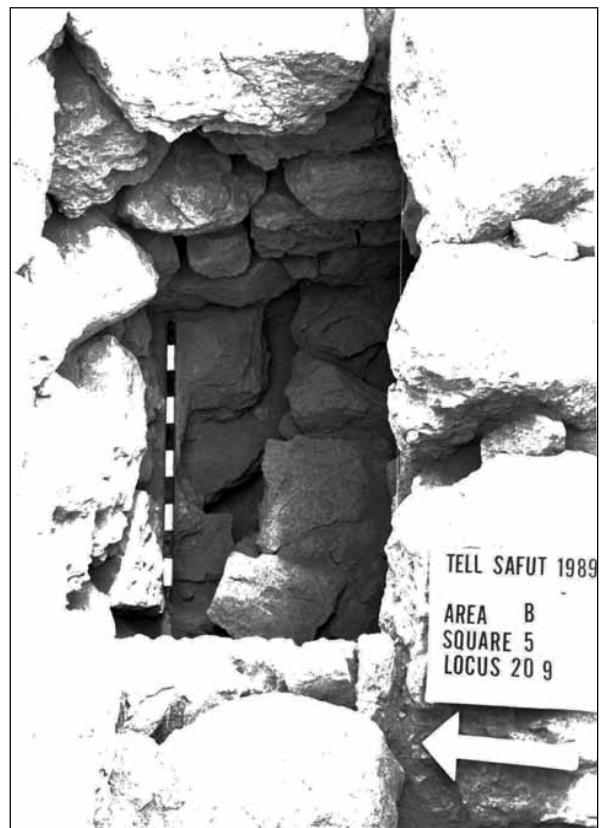
12. Terrace Wall in Square B2.

Perimeter Fortification Tower

In 1989, the south and west balks of Square B5 were excavated and what was previously called “the western stone structure” in 1983 (Safut Area B Notebook 1983) was further examined and was revealed to be a tower (see **Fig. 7**) abutting the perimeter wall (Locus B2.2). The first several loci consisted of balk removal and included one Middle Bronze Age sherd (in Locus 203), along with sherds from the Late Bronze Age and Iron Age. Unfortunately, excavation of these loci was very poorly recorded. It is clear that the excavation team was excavating the tower, but at least one of the loci called a wall (Locus 206) appears to not actually be a wall. Apparently, Locus 205 consisted of soil excavated from the south balk. It then became clear that there was a hole in the center of this stone structure, making it a tower.

Locus 206 was next excavated and is called a stone and mudbrick “wall,” although it appears to be only two or three rows of stones/mudbricks. The excavation notes at times refer to this locus as “stone wall and mudbrick wall,” as well as “hard soil with rocks and mudbricks” (Safut Area B Notebook 1989). Two Middle Bronze Age sherds and several Late Bronze Age sherds were found in these loci. Under the mudbrick “wall” is a wall made of stone--again, just three stones in a row with soil underneath. However, in the season summary, these “walls” are no longer on top of each other, but the mudbrick “wall” (Locus 206) is to the north of the stone

“wall” (Locus 207) and they are separated by soil horizontally rather than vertically. It seems, however, that both of these “walls” are under the walls of the tower (**Fig. 13**). The excavator suggests that these walls are from an earlier Middle Bronze Age or Late Bronze Age layer,



13. Lower Walls Running Under the Tower in Square B5.

and pottery from these loci date to these periods.

It is hard to say when this tower was built. The tower appears to have been in use during the Late Bronze Age II period, because the bronze seated deity figurine and Late Bronze Age chalice were found on a floor running up against it. However, the tower likely dates to the Middle Bronze Age because, in seasons subsequent to 1989, it was revealed that Wall 10 of the Late Bronze Age sanctuary actually abuts the walls of the tower (**Fig. 14**), indicating that the tower had to have been built earlier than the walls of the sanctuary. Another factor in favor of a MB III date is the construction-style of the tower. According to Burke (2008: 64) rectilinear towers were occasionally attached secondarily to the interior of the town wall instead of to the exterior, such as at Megiddo Stratum XIII.

Pottery Discussion

There are 24 Middle Bronze Age sherds from Šāfūt housed at Andrews University, and 31 that were found in storage in Jordan. Many more were documented in pottery readings, and some were reported as having been drawn, but no other drawings could be definitively dated to this time period. 33 of these Middle Bronze Age sherds were recovered from the 1982 season, five from 1983, three from 1989, and fourteen from 2001. 10 sherds were recovered in Area C, 15 from Area B, and 30 from Area D. Following is a discussion of the Middle Bronze Age pottery from Šāfūt with an accompanying plate

(**Fig. 15**) of representative forms taken from the loci discussed in this article.

Rim Forms

Overall, the Middle Bronze sherds represent 18 platter bowls (and one bowl base), 12 carinated bowls, nine jugs, six juglets, three jars, two storage jars, two cooking pots, and one krater. Even though the amount of pottery is small, there is a wide representation of forms.

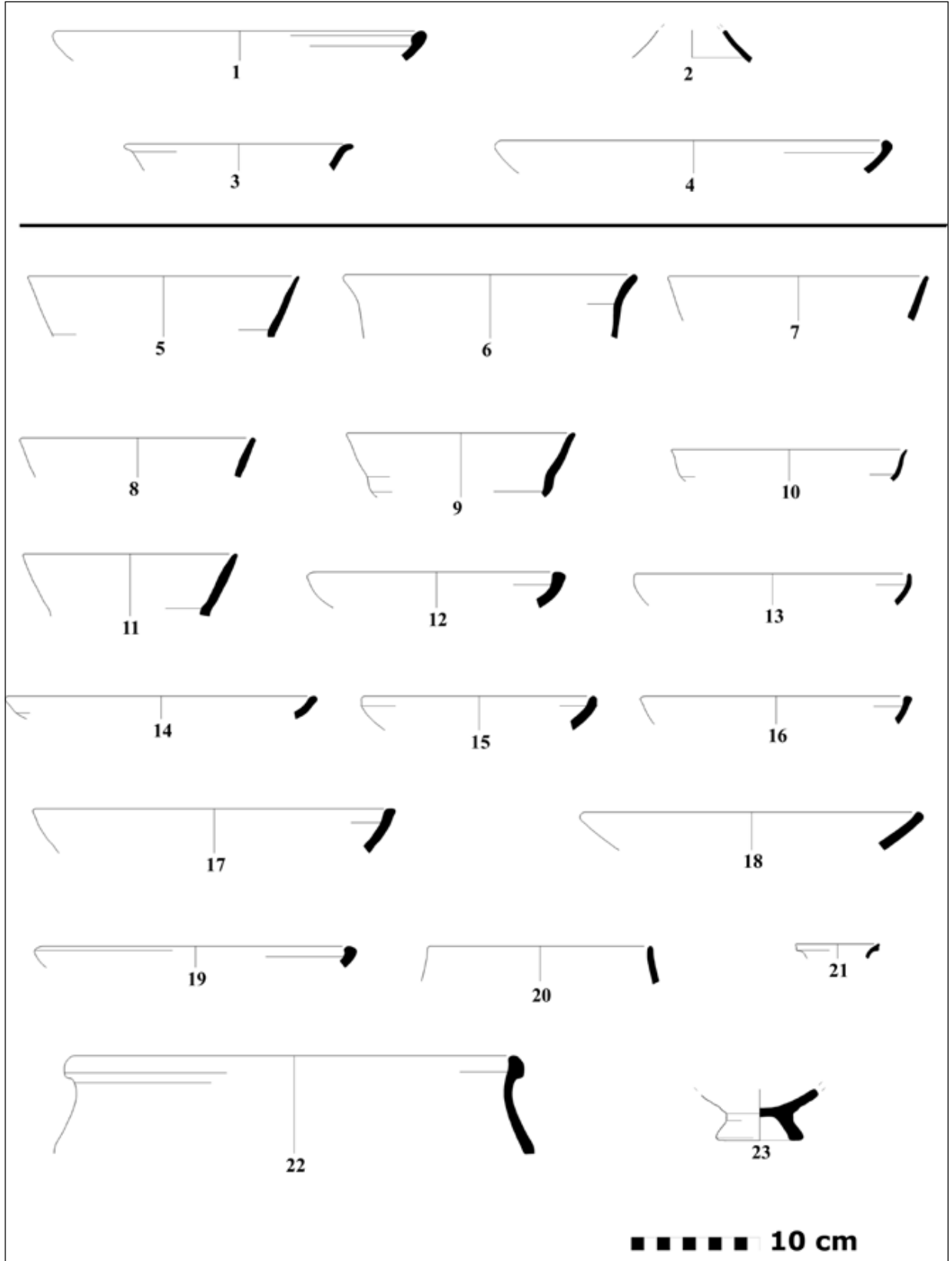
Bowls: The 18 platter bowls fit into three general rim types. Eight were variations of the simple, slightly upturned or squared rims (see **Fig. 15.17**). The other two forms are very similar; the first can be described as slightly inverted and triangular (see **Fig. 15.4**), and the second as thickened and rounded (see **Fig. 15.13**). The bowl base found (**Fig. 15.23**) is a high ring base. The twelve carinated bowls all have open, diagonally everted rims (see **Fig. 15.9**).

Jugs, Juglets, and Jars: The six jug rims belong to four different types--three are different variations of everted, thickened rims, with one being everted, triangular, one being upturned, and the other being flaring, simple. Two of the juglet sherds have rims, the first (see **Fig. 15.21**) having an everted, triangular rim and the other form being upright and slightly turned in. The three jar sherds are all body sherds with the same painted decoration on them (wavy lines between straight lines, see **Fig. 16**), but are from different loci and squares.

Kraters and Cooking Pots: The krater (**Fig.**



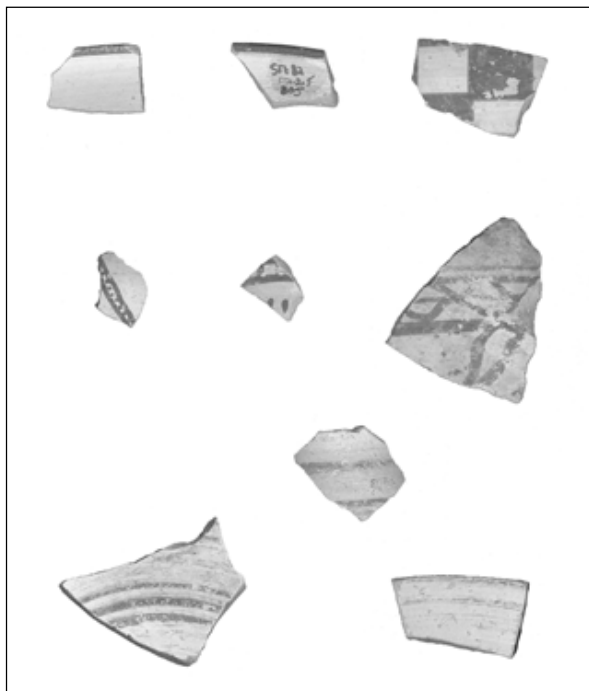
14. MB III Tower with LB IIB Wall Abutting It.



15. MB III Pottery from Tall SS.

No	Type	Sq	Loc	Pail	Reg	Exterior	Core	Interior	Manu	Ext	Color	Int
1	Platter Bowl	B1	13	3		7.5YR 7/4 Pink	7.5YR 6/0 Gray	7.5YR 7/4 Pink	W	SL	7.5YR 8/2 Pinkish White	SH
2	Jug	B2	25	1	84	10YR 8/4 Yellow	7.5YR 8/3 Pink	7.5YR 8/3 Pink	W			
3	Carinated Bowl	B5	203	9	7	10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	W	WBH	10YR 8/3 Very Pale Brown	WBH SH
4	Platter Bowl	B5	206	11	1	10YR 8/4 Very Pale Brown	10YR 8/4 Very Pale Brown	10YR 8/4 Very Pale Brown	W			
5	Carinated Bowl	D1	1	6	427	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	W	WBL SH	10YR 8/2 White	WBL SH
6	Carinated Bowl	D1	2	26		10YR 6/2 Light Brownish Gray	10YR 6/2 Light Brownish Gray	10YR 6/2 Light Brownish Gray	W	SH	10YR 7/3 Very Pale Brown	SH
7	Carinated Bowl	D2	2	5	771	7.5YR 7/4 Pink	7.5YR 6/3 Light Brown	7.5YR 7/4 Pink	W	SL	10YR 8/1 White	
8	Carinated Bowl	D2	2	5	799	10YR 7/3 Very Pale Brown	10YR 5/1 Gray	10YR 7/2 Light Gray	W			
9	Carinated Bowl	D2	2	5	749	7.5YR 7/4 Pink	7.5YR 7/4 Pink	7.5YR 7/4 Pink	W	SL	10YR 8/2 White	SL
10	Carinated Bowl	D2	2	5	311	10YR 7/2 Light Gray	10YR 7/2 Light Gray	10YR 7/2 Light Gray	W	WBH SH	10YR 8/2 White	WBH SH
12	Carinated Bowl	D2	2	6	393	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	W	WBH SH	10YR 8/2 White	WBH SH
13	Platter Bowl	D2	1	2	549	10YR 7/1 Light Gray	10YR 7/1 Light Gray	10YR 7/1 Light Gray	W	WBH	10YR 7/1 Light Gray	WBM
14	Platter Bowl	D2	2	5	805		5YR 7/4 Pink		W	SM	7.5YR 8/1 White	SM
15	Platter Bowl	D2	2	5	742	5YR 7/6 Reddish Yellow	2.5YR 6/8 Light Red	2.5YR 6/6 Light Red	W	S	5YR 8/3 Pink	
16	Platter Bowl	D2	2	5	304	7.5YR 7/3 Pink	7.5YR 7/3 Pink	7.5YR 7/3 Pink	W	WBM SM	7.5YR 8/3 Pink	WBM SM
17	Platter Bowl	D2	2	5	755	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	10YR 7/3 Very Pale Brown	W	WBH SH	10YR 8/2 White	WBH SH
18	Platter Bowl	D2	2	3	621	5YR 8/4 Pink	7.5YR 7/0 Light Gray	5YR 8/4 Pink	W	WBM SH	7.5YR 8/2 Pinkish White	WBH SM
19	Platter Bowl	D2	2	5	768	10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	W	WBH SH	10YR 8/2 White	WBH SH
20	Biconical Jug	D2	2	5	765	7.5YR 7/4 Pink	7.5YR 7/4 Pink	7.5YR 7/4 Pink	W	SL	10YR 8/2 White	SL
21	Juglet	D1	3	30		10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	10YR 8/3 Very Pale Brown	W			
22	Krater	D2	2	7	916	10YR 8/3 Very Pale Brown	10YR 6/2 Light Brownish Gray	10YR 8/3 Very Pale Brown	W			
23	Bowl (Base)	D2	2	3	625	7.5YR 8/3 Pink	7.5YR 8/3 Pink	7.5YR 8/3 Pink	W			

Color	Decor	Fire	Parallels	Time Period
7.5YR 8/2 Pinkish White		U	Abu al-Kharaz V: Fischer 2006: Fig 121.7; Jericho Tomb A/D: Kenyon and Holland 1982: Fig. 154.2,3; Shechem MBIIC: Seger 1974: Fig 5.4	MBIII-LBIA
	Pa 2.5YR 4/4 Reddish Brown	O	CWIII: Fischer 2006: decoration similar	MBIII-LBIB
10YR 8/2 White		O	Abu al-Kharaz V: Fischer 2006: Fig. 121.4; Pella Tomb 20: McNicoll et al 1982: Plate 114.9; Umayri 15: MPP2 1991: Fig. 5.12.5	MBIII
		O	Dothan XII: Master <i>et al.</i> 2005: Fig. 7.12.1; Megiddo XI: Loud 1948: Pl. 37.26; Shiloh VIII: Finkelstein <i>et al.</i> 1993: Fig. 6.10.2, 3	MBII-III
10YR 8/2 White		O	Umayri 15: MPP5 2002: Fig. 4.9.26; Shechem XVIIIIs: Cole 1984: Plate 14 BnB.1d; Deir Alla IV: Fischer ed. 2006: Chap. 3 Fig. 9.3	MBII-III
10YR 7/3 Very Pale Brown		O	Abu al-Kharaz IV/2: Fischer 2006: Fig. 42.6; Umayri 15: MPP2 1991: Fig. 5.12.15	MBIII
		U	Umayri 15: MPP5 2002: Fig. 4.9.26; Shechem XVIIIIs: Cole 1984: Plate 14 BnB.1d; Deir Alla IV: Fischer ed. 2006: Chap. 3 Fig. 9.3	MBII-III
	Pa 7.5YR 6/2 Pinkish Gray	O	Deir Alla IV: Fischer ed. 2006: Chap. 3 Fig. 9.3; Umayri 15: MPP5 2002: Fig. 4.9.26; Megiddo XII-IX: Loud 1948: Pl. 36.21	MBII-III
10YR 8/2 White		O	Abu al-Kharaz V: Fischer 2006: Fig. 112. 4, 6, 7; Umayri 15: MPP5 2002: Fig. 4.9.22	MBIII-LBIA
10YR 8/2 White		O	Pella Tomb 20: McNicoll et al 1982: Plate 114.1; Abu al-Kharaz IV/1: Fischer 2006: Fig. 29.7	MBIII
10YR 8/2 White		O	Umayri 15: MPP5 2002: Fig. 4.9.26; Shechem XVIIIIs: Cole 1984: Plate 14 BnB.1d; Deir Alla IV: Fischer ed. 2006: Chap. 3 Fig. 9.3	MBII-III
10YR 7/1 Light Gray		R	Abu al-Kharaz V: Fischer 2006: Fig 121.7; Jericho Tomb A/D: Kenyon and Holland 1982: Fig. 154.2,3; Shechem MBIIC: Seger 1974: Fig 5.4	MBIII-LBIA
7.5YR 8/1 White	PaR 10R 4/4 Weak Red	O	CW: Hazor XVI: Yadin 1960: Pl. CIX.8; Jericho H.xxxii-xxxiii: Kenyon and Holland 1982: Fig. 105.23	MBIII
	Pa 2.5YR 5/6 Red	O	Tananir: Boling 1975: Plate 1.6; Jericho H.xlvia: Kenyon and Holland 1982: Fig. 107.19	MBIII
7.5YR 8/3 Pink	PaR 5YR 5/3 Reddish Brown	U	Abu al-Kharaz VII: Fischer 2006: Fig. 156.1; Amman Citadel MB Tomb: Najjar 1991: Fig. 8.2; Megiddo XIII-XI: Loud 1948: Pl. 37.18	MBIII-LBIB
10YR 8/2 White		O	Amman Citadel MB Tomb: Najjar 1991: Fig. 7.4; Amman MB Tomb: Harding and Isserlin 1953: Fig. 6.14; Pella IV: McNicoll et al 1982: Pl. 119.13	MBIII
7.5YR 8/2 Pinkish White		U	Amman Citadel Tomb: Najjar 1991: Fig. 7.1; Abu al-Kharaz V: Fischer 2006: Fig. 111.3, 4	MBIII-LBIA
10YR 8/2 White		O	Abu al-Kharaz V: Fischer 2006: Fig 121.7; Jericho Tomb A/D: Kenyon and Holland 1982: Fig. 154.2,3; Shechem MBIIC: Seger 1974: Fig 5.4	MBIII-LBIA
10YR 8/2 White		O	Abu al-Kharaz V: Fischer 2006: Fig 249.1; Amman Citadel MB Tomb: Najjar 1991: Fig. 9.9	MBIII-LBIA
		O	Umayri 15: MPP2 1991: Figure 5.12.5; Baqah Valley Cave A2: McGovern 1986: Fig. 18.6	MBIII-LBIA
		U	Abu al-Kharaz V: Fischer 2006: Figure 54.5 similar form to MBIII cooking pots but not ware	LBIA
		U	Abu al-Kharaz IV/2: Fischer 2006: Fig. 101.1; Amman Citadel MB Tomb: Najjar 1991: Fig. 10.12; Amman Tomb: Harding and Isserlin 1953: Fig. 6.10	MBIII



16. Chocolate on White Pottery from Tall Šāfūt.

15.22 rim is very similar to a Middle Bronze Age cooking pot rim, being everted and almost triangular; however, the ware is much different than a typical Middle Bronze Age cooking pot. The two cooking pot rims were everted, triangular and out-turned, simple.

Decoration Analysis

16 of the sherds (29%) can be classified as some version of Chocolate-on-White ware (CW) (**Fig. 16**), and another nine sherds have paint on them but do not fit the classification requirements for CW (Fischer 1999). These numbers indicate that 45% of the Middle Bronze Age assemblage from Šāfūt is decorated and can be considered fine ware. However, since sherds from the earlier seasons were only kept selectively, no definitive statements can be made on the frequency of decorated wares in the overall assemblage.

Parallels and Time Period

The ceramic assemblage described here best fits in the MB III. Based on parallels, some of the sherds can date from the MB II through the LB IA. Since all sherds were found in fill layers or layers that cannot be associated with any architecture, it is difficult to narrow the chrono-

logical range. However, the majority of sherds do have parallels in the MB III. The ceramic assemblage, especially the painted wares, is best compared to Phases IV/1 - V at Tall Abū al-Kharaz (Fischer 2006), which date to the MB III-LB IA (17th - mid-16th centuries BC).

There are several sherds from Šāfūt that fit in Fischer's Chocolate-on-White typological groups (Fischer 1999, 2006): 13 sherds fit Fischer's Chocolate-on-White I and/or II (CWI/II) (Fischer 2006: 264-6). Chocolate-on-White I and II is characterized by monochrome decorations with a white slip and burnish, and by popularity of the chequer and ladder pattern (SFT01. B4.313.31 is a good example of the chequer design, see **Fig. 16**). Three sherds belong to Fischer's Chocolate-on-White Bichrome (CWB) (Fischer 2006: 264). Chocolate-on-White Bichrome is characterized by chocolate-brown and black decorations and wheel burnishing (see **Fig. 16**). However, no bowls were found in the Tall Abū al-Kharaz assembly, bringing the designation of these two bowl sherds as CWB into question. There is also one sherd that could be Chocolate-on-White III (CWIII) (Fischer 2006: 266). Chocolate-on-White III has a much thinner slip than the earlier CWI and CWII, but it is still burnished, unlike other Late Bronze painted forms. Other sites in Jordan with numerous parallels to the Šāfūt assemblage include Tall al-'Umayrī (phases dating to the MB III, see Herr *et al.* 2002), Dayr 'Allā (Stratum IV dating to the late MB III; see Fischer, Bourke, and Van der Kooij 2006), and Amman (tombs found in the city dating to the MB III; see Harding and Isserlin 1953, Najjar 1991). Sites in Israel and Palestine where a number of parallels were found include Dothan (Master *et al.* 2008), Jericho (Kenyon and Holland 1982), Megiddo (Loud 1948), and Shechem (Seger 1974; Cole 1984).

Summary

Šāfūt is most often cited in the archaeological literature due to its Middle Bronze Age "glacis", however what was thought to be a Middle Bronze Age "glacis" was actually a natural formation. Despite the fact that there is no "glacis revetment" at Šāfūt, there are other remains from the Middle Bronze Age. The acropolis perimeter wall and associated tower in Square B4 most

likely date to the Middle Bronze Age. During four seasons of excavation, sherds were found dating approximately to Middle Bronze Age III. Over 45% of the sherds were Chocolate-on-White and painted wares. Unfortunately, the loci in which they were found consisted of fill that were not associated with any architectural features. Nevertheless, the quality of these sherds hints at the potential occupation levels yet to be discovered. These remains indicate that despite its lack of a Middle Bronze Age glacis Tall Šāfūt should still be included in the discussion of the Middle Bronze Age III in Jordan.

Owen Chesnut
6878 Fox Road
Marcy, NY 13403

Bibliography

Area Notebooks

- 1982 Area B: Benson, Perretti; Area D: Boutsikaris, Gajary, Wilson, R. Wimmer
- 1983 Area B: Ditchfield
- 1989 Area B: Antoni

Area Reports

- 1983 Area D: Jennifer Groot

Biran, A.

- 1994 *Biblical Dan*. Jerusalem: Israel Exploration Society.

Boling, R.

- 1975 Excavations at Tananir. *Bulletin of the American Schools of Oriental Research Supplemental Studies* No. 21. Missoula MT: Scholars Press.

Burke, A.

- 2008 *Walled up to Heaven: The Evolution of Middle Bronze Age Fortification Strategies in the Levant*. Winona Lake, IN: Eisenbrauns.

Cole, D.

- 1984 *Shechem I: The Middle Bronze IIB Pottery*. Ann Arbor: ASOR.

De Vaux, R.

- 1938 Chronique: Exploration de la Region de Salt. *Revue Biblique* 47: 398-425.

Dornemann, R. H.

- 1983 *The Archaeology of the Transjordan in the Bronze and Iron Ages*. Milwaukee: Milwaukee Public Museum.

Finkelstein, I. (ed.)

- 1993 *Shiloh: The Archaeology of a Biblical Site*. Monograph Series of the Institute of Archaeology, Tel Aviv University No. 10. Tel Aviv.

Fischer, P. M.

- 1999 Chocolate-on-White Ware: Typology, Chronology and Provenance. The Evidence from Tell

Abu al-Kharaz, Jordan Valley. *Bulletin of the American Schools of Oriental Research* 313: 1-29.

- 2006 *Tell Abu Al-Kharaz in the Jordan Valley Volume II: The Middle and Late Bronze Ages*. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.

Fischer, P. M., Bourke, S. and Van der Kooij, G.

- 2006 *The Chronology of the Jordan Valley during the Middle and Late Bronze Ages: Pella, Tell Abu Al-Kharaz, and Tell Deir 'Alla*. Vienna: Verlag der Österreichischen Akademie der Wissenschaften.

Glueck, N.

- 1939 Explorations in Eastern Palestine, III. *Annual of the American Schools of Oriental Research* 28-29: 191-192, 197.

Harding, G. L. and Isserlin, B. S. J.

- 1953 A Middle Bronze Age Tomb at Amman. *Palestine Exploration Fund Annual* 6: 14-26.

Herr, L. et al.

- 1991 *Madaba Plains Project II: The 1987 Season at Tell el-'Umeiri and Vicinity and Subsequent Studies*. Berrien Springs, MI: Andrews University Press.

- 2002 *Madaba Plains Project V: The 1994 Season at Tall al-'Umayri and Subsequent Studies*. Berrien Springs, MI: Andrews University Press.

Kenyon, K.

- 1981 *Excavations at Jericho, Vol. III: The Architecture and Stratigraphy of the Tell*. London: British School of Archaeology.

Kenyon, K., and Holland, J.

- 1982 *Excavations at Jericho, Vol. IV: The Pottery Type Series and Other Finds*. London: British School of Archaeology.

Lapp, P.

- 1964 The 1963 Excavation at Tell Ta'annek. *Bulletin for the American Schools of Oriental Research* 173: 4-44.

- 1967 The 1966 Excavation at Tell Ta'annek. *Bulletin for the American Schools of Oriental Research* 185: 2-39.

Loud, G.

- 1948 *Megiddo II. Seasons of 1935-1939*. Chicago: University of Chicago Press.

Ma'ayeh, F. S.

- 1960a Recent Discoveries in Jordan. *Annual of the Department of the Antiquities Jordan* 4-5: 114-116.
- 1960b Chronique Archeologique: Amman, Safout, Jerash, Um Qeis, Quailbe (ancienne Abila). *Revue Biblique* 67: 226-229.

Master, D., Monson, J., Lass, E., and Pierce, G.

- 2008 *Tell Dothan I: Remains from the Tell (1953-1964)*. Winona Lake, IN: Eisenbrauns.

- Marchetti, N.
1998 *Preliminary Report on the First Season of Excavations of the Italian-Palestinian Expedition at Tell es-Sultan/Jericho*. April-May 1997. London: PEF.
- Mazar, A.
1990 *Archaeology of the Land of the Bible*. New York: Doubleday.
- McGovern, P. E.
1986 *The Late Bronze and Early Iron Ages of Central Transjordan: The Baq'ah Valley Project 1977-1981*. Philadelphia: University Museum.
- McNicol, A., Smith, R., and Hennessy, B.
1982 *Pella in Jordan I: An Interim Report on the Joint University of Sydney and the College of Wooster Excavations at Pella 1979-1981*. Canberra: Australian National Gallery.
- Najjar, M.
1991 A New Middle Bronze Age Tomb at the Citadel of Amman. *Annual of the Department of the Antiquities Jordan* 35: 105-134.
- Netzer, E.
1992 Massive Structures: Processes in Construction and Deterioration. Pp. 17-27 in A. Kempinski, and R. Reich (eds.), *The Architecture of Ancient Israel: From the Prehistoric to the Persian Periods*. Jerusalem: Israel Exploration Society.
- Ottoson, M.
1969 *Gilead: Tradition and History*. Lund, Sweden: CWK Gleerup.
- Pennells, E.
1983 Middle Bronze Age Earthworks: A Contemporary Engineering Evaluation. *Biblical Archaeologist* 46: 57-61.
- Sauer, J. A.
1986 Transjordan in the Bronze and Iron Ages: A Critique of Glueck's Synthesis. *Bulletin for the American Schools of Oriental Research* 263: 1-26.
- Seeger, J.
1974 The Middle Bronze IIC Date of the East Gate at Shechem. *Levant* 6: 117-130.
- Wimmer, D. H.
1983 *The Tell Safut Project*. Unpublished excavation season report.
1985 Third Archaeological Expedition to Tell Safut. *Liber Annuus XXXV*: 408-410.
1987a The Excavations at Tell Safut. *Studies in the Archaeology of Jordan* 3: 279-282.
1987b Tell Safut Excavations, 1982-1985 Preliminary Report. *Annual of the Department of the Antiquities Jordan* 31: 159-174.
1989 Safut (Tell). Pp. 512-515 in D. Homes-Fredericq and J. B. Hennessy (eds.), *Archaeology of Jordan II: Field Reports*.
1991 Tell Safut. *American Journal of Archaeology* 95: 268.
1992 Safut. *Anchor Bible Dictionary* 5: 896-897.
1994 Tell Safut. *American Journal of Archaeology* 98: 540-541.
1997a Safut, Tell. Pp. 448-450 in E. Meyers (ed.), *Oxford Encyclopedia of Archaeology in the Near East*.
1997b The Tell Safut Archaeological Project. Unpublished excavation season report.
- Yadin, Y.
1960 *Hazor II: The James A. Rothschild Expedition at Hazor: An Account of the Second Season of Excavations, 1956*. Jerusalem: Magnes Press, Hebrew University of Jerusalem.
- Zayadin, F.
1973 Middle Bronze Age. Pp. 18-19 in G. Barakat (ed.), *The Archaeological Heritage of Jordan: The Archaeological Periods and Sites (East Bank)*. Amman. Department of Antiquities.

THE 2012 SEASON OF EXCAVATIONS IN THE ANCIENT KHIRBAT AS-SAMRĀ CEMETERY

A. J. Nabulsi, A. Husan, P. Schönrock-Nabulsi

As the systematic excavations in the ancient cemetery in Khirbat as-Samrā are nearing their closing stages, the twelfth season, conducted between the 27th August and the 17th October 2012¹, aimed to conclude the remaining sections of the two adjacent sites A and A1. It was also intended to localise the 1993 test excavation area within Site A, i.e. to put it within the site's and project's grid. This report summarises the proceedings of this excavation and its results as well as suggesting some points related to the inscribed and an-epigraphic tombstones found during previous excavations.

A- The Excavation

Excavations in both sites were conducted according to pre-set grids and carried out in the same standards applied earlier (s. Nabulsi *et al.* 2007: 275, 2012). In site A, the 2011 grid of 5x5m was eastwards extended to the rows 2, 1 and Ø (12 squares). The positioning of five tombs dug in this area enabled the localization of the 1993 excavation within 6 squares (ØA to C3), whereby the first trench on the East extended into the balk of square F3 of site A1 (**Fig. 1**). In the remaining 6 squares (column D and row 2), only 12 disturbed tombs were found, nine of which were child burials. This low tomb frequency is mainly to be attributed to un-thorough excavation dictated by the limited time and workforce available. The yield from the twelve excavated tombs was poor in all aspects. Human remains were largely fragmentary and scanty. This is also true for the few objects (tomb furniture) found. These included some glass beads, incomplete fragment of iron and copper bracelets, anklets,

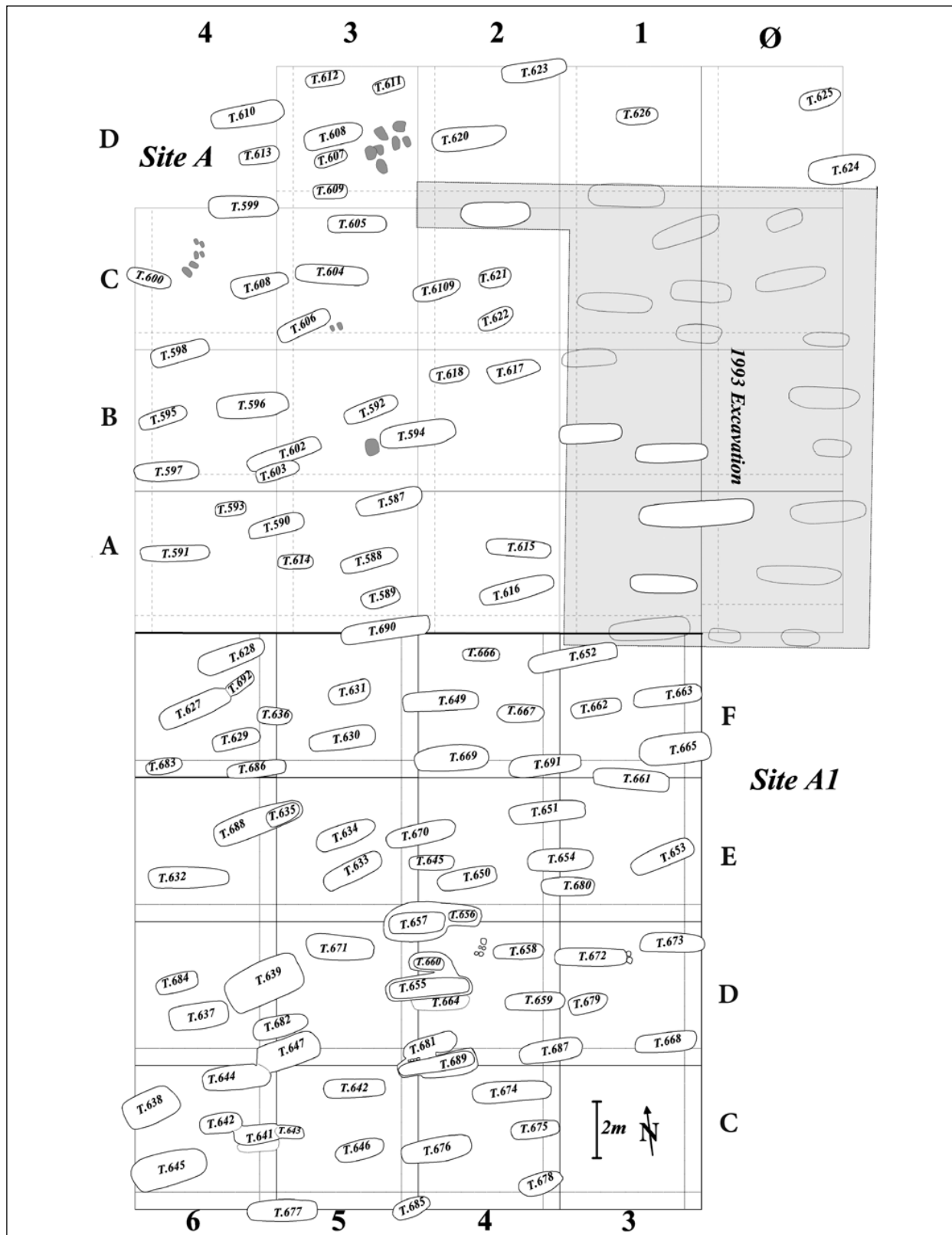
rings, pendants and one fragment of a bronze cross amulet (registered as KS-2107) that dates Tomb-622, and possibly the neighbouring ones, to the that in 1993 suggested 6th-7th AD century period (Nabulsi 1998: 271-274).

Site A1 was divided by a 5x5m grid of six (E-W) rows and 6 (S-N) columns. After the 1997, 2006 and 2008 excavations (Nabulsi *et al.* 2007: Fig 4), the remaining 15 squares were excavated during this season (**Fig. 1**). The site was probably one of the intensely used burial areas within this cemetery and indicated by 66 excavated tombs (4.4burials/25m²). Four other large tombs at the site's western margin were not excavated as they critically extended below the main South-North modern road. The excavated tombs included eight intact, at least 3 with multiple consecutive burials (two individuals), and 3 totally disintegrated infant burials. The total number of excavated tombs in the 900m² area of Site A1 increased to 157 tombs, 16 of which were intact. Overall, 692 tombs were excavated during 12 campaigns at Khirbat as-Samrā cemetery, 78 during the 2012 season.

Despite fragility, fragmentation, and surface erosion, a large sample of human material was retrieved; some partly or completely articulated. Other objects, tomb furniture, were scanty. These included four, low quality, golden earrings of simple ring-form found in previously disturbed tombs. A number of iron bracelets and anklets were found *in situ*, while other unrecognizable object was strongly rusty and fragmentary. Bronze and copper objects were generally deteriorated. These included 3 small bronze coins, fragmentary bracelets, earrings,

1. The excavating team included the students Charleen Gaunitz, Mareike Neumann, Nicola Silber, and Chris-

tina Wurst (all from JG University in Mainz, Germany) beside the authors listed above.



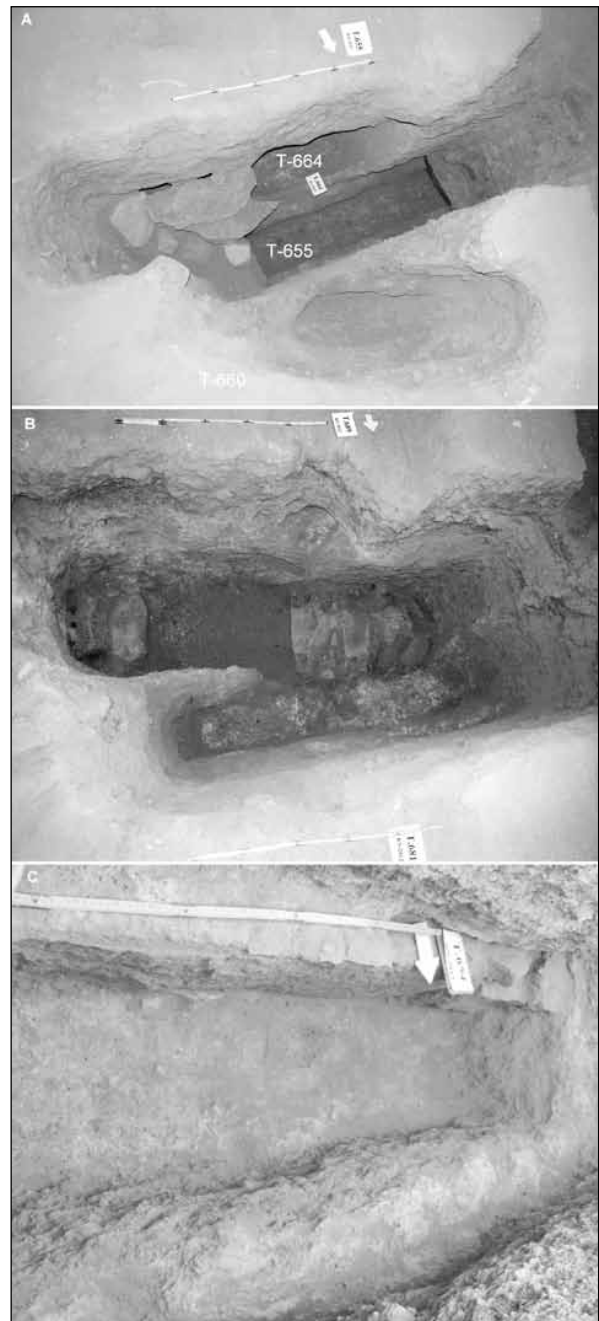
1. The excavated parts of Site A and A1 during the 2011 and 2012 seasons. The shaded area within Site A marks the 1993 excavation (comp. Nabulsi 1998).

and pendants. Also found were a number of diverse glass, stone, shell, and animal bone beads, though usual abundance. No glassware or plaster objects were found. Despite being adjacent to the 2011 excavated part of Site A (Nabulsi *et al.* 2012), no cloth or wood pieces were observed in any of the this season's Site A1 tombs.

The observed diversity within the Khirbat as-Samrā cemetery was not reported from any of the similar dated cemeteries in Jordan, e.g. Wādī Faynān (Findlater *et al.* 1998). It is interesting to observe that the ancient grave diggers never ran out of ideas to build simple or complex tomb structures, in adaptation to space, geology and very probable to the individual wishes of their local community. Site A1 revealed a wider diversity in tomb structure and arrangement than that documented in Site C (Nabulsi *et al.* 2009: 167-169).

Tomb-655, sized *ca.* 310x70x200cm, had a fine dug burial cist closed by almost similar sized (*ca.* 55x20x15cm), rectangular, fine cut, basalt slabs with smooth even surfaces. At about the slabs level, an oval opening, *ca.* 150x60cm was dug in the northern wall's virgin soil layer forming a side chamber, Tomb-664, with a 175x45cm burial bed. The tomb included a nearly intact single human burial, only the skull was displaced and damaged. The side chamber was closed by six flat and rough-cut basalt and limestone slabs, piled in two rows. The structure rested upon the covering stones of Tomb-655 and was fixed and sealed using variably small pebbles. When excavated, only the eastern row was intact and two of the displaced slabs had crude engraved cross on one side (see below). The complex was completed by the intact Tomb-660, a child burial, partly dug at the NE end, in the filling of Tomb-655 (**Fig. 2a**). Between Tomb-681 and Tomb-689 a short wall, 60x40cm, was built separating the western ends of both burials. The structure was constructed at the side Tomb-681 burial bed, and the covering slabs level of Tomb-689 (**Fig. 2b**). In the case of Tomb-654, its southern shoulder built using three rectangular basalt stones. The smaller one on the west was followed by two large, Greek inscribed basalt tomb stones, with their bases towards the middle. The shoulder was levelled by adjusting cuttings of the tombstones and the placement of small and flat stone (**Fig. 2c, 3**).

This observation reflects the attention and accuracy with which burial chambers were constructed in this cemetery. The burial cist contained the partially articulated lower limb parts of two individuals. Furthermore, there are structural indications that Tomb-654 and Tomb-664 were reused, i.e. earlier burials than those found in 2012.

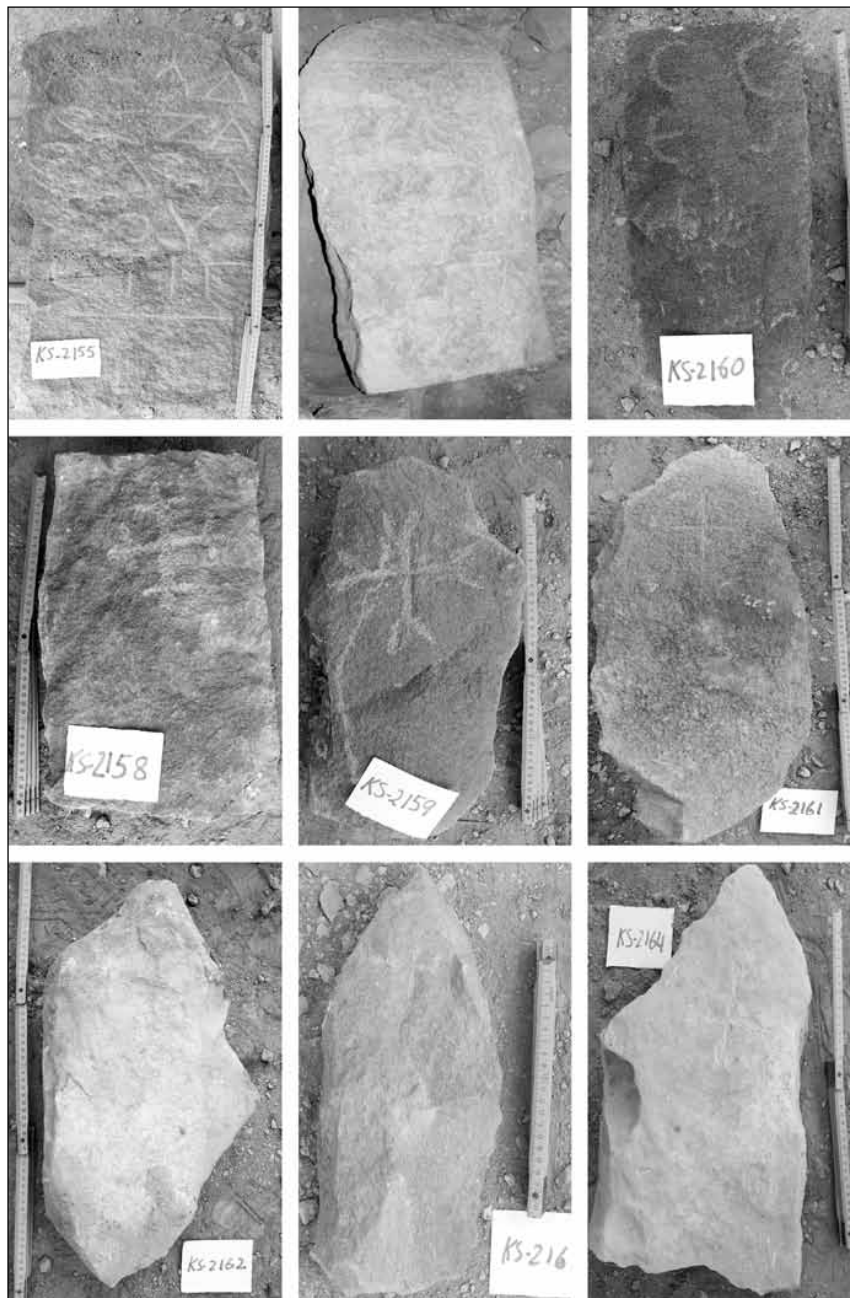


2. Tombs excavated in Site A1, 2012. A: complex of Tomb-655/644/660, B: the joint Tomb-681/689, C: Tomb-654 with levelled stone-built shoulder.

Earlier, it was suggested that a road or pathway (no tombs found within it) ran through the cemetery along the northern margin of Site C (Nabulsi *et al.* 2009: 167). During the 2009 season in Site E, a similar pathway that ran along through the southern squares was thought to be continuous with that in Site C. After the last two seasons, 2011 and 2012 in Site A and A1, it became evident that both must have been pathways leading to different burial areas within the cemetery, i.e. dead-end roads.

B- Inscribed and Anepigraphic Tombstones

Three Greek inscribed and eight cross-en-graved tombstones were found during the 2012 excavation from tombs in Site A1. The basalt tombstone, registered as KS-2160, was reused as a covering slab in the burial chamber of Tomb-682. The rectangular stone, 43x20x14cm, had roughly cut smooth surfaces. The inscribed face carried an unintelligible Greek text of 5-6 letters (**Fig. 3C**). The other two Greek inscribed tombstones reused in Tomb-654 (s. above and



3. Inscribed and an-epigraphic tombstones from the 2012 excavation season.

Fig. 3A, B) revealed similar features. Both were large oblong basalt stones with arched, dorsally wrapped top and thicker flat base, a flat inscribed face, rough back and partially dressed lateral sides. Originally, the stones had a broader upper part than their base but these were reduced, as evident by cut marks, to vertically level the tomb shoulder (**Fig. 2c**). The first tombstone found eastwards, KS-2155 (78x41x18cm), had a 5-line engraved Greek text followed by a vertical line. The text mentioned a man's name, his father's, and age at death. The Greek inscription on the second tombstone, KS-2156 (80x38x21cm), was engraved in 5 lines with similar information, whereby the part referring to personal names was separated between two vertical lines, and the age engraved below the lower line. Secure readings of the three inscriptions, including graphical details, are forthcoming.

Tombstones from Khirbat as-Samrā were differentiated in two distinct types. The First, Type 1, includes the “pagan” Greek inscribed stones dated to the 2nd-4th AD century. Type 2 represents the “Christian” tombstones dated to the 6th-7th AD century and includes Greek and “Melkite Aramaic” inscriptions (Savignac 1925: 118-119; Gatier 1998: 364-366).

While the “Christian” tombstones were considered to be characteristic of Khirbat as-Samrā (Gatier 1998: 366), those of Type 1 were the southernmost representatives of the Hauran material, similar to those from the surrounding sites, e.g. Umm al-Jimāl. This did not prevent the distinction between Rihāb and Khirbat as-Samrā tombstones, based on differences in décor and style (Gatier 1998: 364-366). Many of these stones have horizontal lines below and sometimes above the text. Among these was one single case, S.2257 (Gatier 1998: 367-380, no. 20) that was smaller in size but with features similar to KS-2155 and KS-2156. Curiously, the only other tombstone of similar size and style to these two was the Nabataean inscribed KS-1685 from Tomb-517 (Nabulsi and Macdonald, in press). Earlier, the Nabataean inscribed tombstones with arched or rounded topsides from in

Umm al-Jimāl were related, or even restricted, to female burials (Littmann 1914). This association was later extended to include Greek inscribed from other sites (e. g. Mac Adam and Graf 1985:187; Hübner and Weiss 2007:179). While KS-1804 could be such an example from Khirbat as-Samrā cemetery (Nabulsi and Macdonald, in press), KS-2155, KS-2156, KS-1685, as well as S.2257 were oblong gravestones with rounded tops, engraved vertical line below the inscription, and erected for deceased male individuals. With these features they can be considered as representatives of a local distinct tombstone style. The inclusion of the Nabataean inscribed stone also suggest dating not later than late 3rd AD century².

During the excavations carried out in Khirbat as-Samrā cemetery 52 an-epigraphic cross engraved and 18 inscribed “tombstones” were discovered. They are listed and classified in **Table 1** according to their type and location. Though only two were found *in situ*, KS-1261 and KS-1537 found in topsoil layer were probably collapsed headstones of Tomb-153 and 477 respectively (Nabulsi et al. 2007: 274; Nabulsi 2010: 217). The table show that more than half of the 52 cross engraved stones were reused as covering slabs, preferably on the western end rather than the lower eastern part. It appears that not all such stones were originally tombstones. This is definitely true in three cases, whilst possible in few others. The stones KS-2161 and KS-2162 found in Tomb-664 were thin on one oblong side and thicker on the other. Their *ca.* 8x7cm cross was applied by crudely “scratching” multiple perpendicular lines on the rough surface. The basalt covering stone KS-1383, Tomb-421, is fine-cut rectangular stone taken from a built structure. One side revealed irregularly engraved dotted lines and was partly covered with about 1cm thick plaster layer. The opposite side had a centrally rough engraved cross. It is improbable that these three were erected headstones.

The use of inscribed stones³ of type 1 as covering slabs was restricted to the tomb's eastern side. To four stones listed in **Table 1**, one can in-

2. The inscription was Nabataean and not “Hauran Aramaic” (Macdonald 2003:44-46,54-56) and no dating was suggested in the related publication (s. Nabulsi and Macdonald, in press). It has been suggested that Nabataean remained in use in the Hauran well into the

3rd AD century (e.g. Said and al-Ghul 2007:256).

3. The inscribed Hismaic text on KS-1331 and KS-1332 was a graffiti and not funerary (Nabulsi and Macdonald, in press) and therefore cannot be described as parts of a tombstone.

Table 1: The type and distribution of tombstones during excavations at Khirbat as-Samrā cemetery. Inscribed stones are given in singular registration numbers. See text for those marked (*).

	With Cross		Inscription Only		Total
	Anepigr.	and Greek or Syriac	Greek	Aramaic	
<i>In situ</i>	1	KS-2001			2
Topsoil	17	KS-1261*	KS-1863		22
		KS-1326, KS-2027	KS-2000		
Fill	8		KS-1205*	KS-1685*	10
Slabs					
W	17	KS-2009			18
M	3				3
E	5	KS-2010	KS-1325	KS-1331	10
			KS-1804	KS-1332	
Western half	19	1			20
Eastern half	6	1	2	2	11
n. d.	2		KS-1810		3
Chamber			KS-2155		2
			KS-2156		
Total	52	6	9	3	70

clude KS-1205 and KS-1685 which were found in the filling but fitted as one of the last, eastern, covering slabs in Tomb-310 and 517 respectively. Furthermore, it was observed that the inscribed and cross engraved stones were placed with their inscribed side facing the deceased. But in Tomb-34⁴, the covering slabs at both ends included the tombstones KS-2009 and KS-2010. Their inscribed faces carried an engraved cross and a text in Greek and Syriac was placed upwards.

Acknowledgement

The excavating team of the Khirbat as-Samrā ancient cemetery project appreciates the relentless support of Mr. Sameh Farhan Al-Mashagbeh. We are also thankful to the Mashaqbeh team members Osama Nayef Al-Nasser; Faisal Al-Sameh; Rashid S. Al-Azzam; and Fares R. Al-Farhan for their decent and enthusiastic efforts during many years of excavations, as well as Michael Macdonald (Oxford) for his valuable comments and suggestions on this report.

Corresponding author:

Dr. A. J. Nabulsi
Abt. Human biology- Allende Platz 2, 20146
Hamburg University-Germany
fbga023@uni-hamburg.de

Abdul Qader Husan
Department of Antiquities of Jordan
Mafraq Antiquities Office

P. Schönrock-Nabulsi
Ratzeburg, Germany

Bibliography

- Findlater, G., El-Najjar, M., Al-Shiyab, A.-H., O'Hea, M., Easthaugh, E.
1998 The Wadi Faynan Project: the South Cemetery Excavation, Jordan 1996: a Preliminary Report. *Levant*, 30: 69-83.
- Gatier, P.-L.,
1998 Les Inscriptions grecques et latines de Samra et de Rihab. Pp 358-413 in J.-B. Humbert und A. Desreumaux (eds.), *Khirbat as-Samra* 1. CNRS, Turnhout.

4. Wrongly referred to as "tombe 14" in Humbert (1998:

71, Fig. 71).

- Hübner, U. , Weiß, P.
 2007 Eine neue entdeckte griechische Grabinschrift aus At-Turra in Nordjordanien. *ZPE* 161: 177-180.
- Humbert, J.-B.
 1998 Le cimetière de Samra : Présentation Historique et Archéologique. Pp: 259-270 in: J.-B. Humbert und A. Desreumaux (eds.), *Khirbat as-Samra* 1. CNRS, Turnhout.
- Littmann, E.
 1914 *Nabataean Inscriptions from the Southern Haurân*. Publications of the Princeton University Archaeological Expeditions to Syria in 1904-1905 and 1909. Division IV. Section A. Leyden: Brill.
- Macdonald, M. C. A
 2003 Languages, Scripts, and the uses of writing among the Nabataeans. Pp.: 36–56, 264–266 (endnotes), 274–282 (references) in G. Markoe (ed.), *Petra, Rediscovered: Lost City of the Nabataeans*. New York, Abrams / Cincinnati, OH Cincinnati Art Museum.
- Nabulsi, A. J.
 2010 Khirbat as-Samra Cemetery: Site E, Season 2009. *ADAJ* 54: 217-219.
- Nabulsi, A. J., Abu-Shmais, A., Mosaeed, J., Eger, C.
 2007 The ancient cemetery in Khirbat as-Samrā: Of the sixth season of excavations 2006. *ADAJ* 51: 273-282.
- Nabulsi, A. J., Baraze, M., Husan, A.
 2012 The Khirbat as-Samrā Ancient Cemetery: The 2011 Excavation Season. *ADAJ* 56: 19-23.
- Nabulsi, A.J.
 1998 The Byzantine Cemetery in Khirbat As-Samra. Pp271-279 in J.-B. Humbert and A. Desreumaux (eds.), *Khirbat As-Samra Jordanie. Vol. I*. CNRS, Turnhout: Brepols publishers.
- Nabulsi, A.J., Abbadi, A., Shami, A., Askar, H.
 2009 Khirbat As-Samra Ancient Cemetery: Outline of Site C. *ADAJ* 53: 167-172.
- Nabulsi, A. J., Eger, Abu Shmeis, A, Khasawneh, N.
 2011 Khirbat as-Samrā Ancient Cemetery: The 2010 Excavation in Site A2. *ADAJ* 55: 25-31.
- Nabulsi, A. J . and Macdonald, M. C. A., with contributions by A. Desreumaux, P.-L. Gatier, and S. Timm
 In press Epigraphic diversity in the cemetery at Khirbat as-Samrā', Jordan. *Palestine Exploration Quarterly*.
- Said, S., al-Ghol, O.
 2007 New Nabataean inscriptions from Umm al-Jimal. *AAE* 18: 251-257.
- Savignac, R.
 1925 Excursion en transjordanie et au Kh. As-Samra. *RB* 34: 110-131, pl: II-III.



المملكة الأردنية الهاشمية

حولية دائرة الآثار العامة

المجلد (٥٧)

عمّان

٢٠١٣

حولية دائرة الآثار العامة

تصدر عن دائرة الآثار العامة، ص.ب. ٨٨، عمان ١١١٨ - المملكة الأردنية الهاشمية

رئيس التحرير
الدكتور منذر جمحاوي

هيئة التحرير

جهاد هارون
أروى مساعدة
هنادي الطاهر
أسامة عيد

قام بمراجعة النصوص الانجليزية

د. ألكسندر واس

الاشتراك السنوي:

٢٠ ديناراً أردنياً (داخل المملكة الأردنية الهاشمية).
٣٠ دولاراً أمريكياً (خارج المملكة) بالإضافة إلى أجور البريد.

الآراء المطروحة في المقالات لا تمثل رأي دائرة الآثار العامة بالضرورة

تقبل المقالات حتى ٣١ أيار (مايو) من كل عام حسب التعليمات الواردة في هذا المجلد وترسل على العنوان التالي:

حولية دائرة الآثار العامة

ص.ب: ٨٨

عمان ١١١٨ - الأردن

فاكس: ٤٦١٥٨٤٨ - ٦ - ٩٦٢ +

تعليمات نشر البحوث في حولية دائرة الآثار العامة

تعنى حولية دائرة الآثار العامة بالبحوث المختصة بالتراث الحضاري للأردن والمناطق المجاورة، بما في ذلك تقارير التنقيبات الأثرية ونتائجها.

ترسل البحوث في موعد أقصاه ٣١ أيار (مايو) من كل عام للنشر في مجلد العام نفسه إلى العنوان التالي: حولية دائرة الآثار العامة، ص.ب. ٨٨ عمان ١١١١٨ الأردن، هاتف (٤٦٤٤٣٣٦).

ويمكن الاستفسار عن طريق الفاكس رقم (٩٦٢٦ ٤٦٥١٥٨٤٨)، أو البريد الإلكتروني: (publication@doa.gov.jo).

لغة البحث

العربية أو الإنجليزية.

مسودات البحث

يجب ألا تتجاوز مسودة البحث ١٥,٠٠٠ كلمة (٣٠ صفحة تقريباً ولا يشمل هذا قائمة المراجع، والمواد التوضيحية (الأشكال)، ويرجى تضمين اسم الباحث (أو الباحثين) وعنوانه في نهاية المسودة، ويكون ترتيبها كالآتي:

١- عنوان البحث واسم الباحث (الباحثين).

٢- النص الكامل للبحث.

عنوان الباحث (الباحثين).

قائمة المراجع.

الهوامش إن وجدت.

قائمة شروحات الأشكال.

تسليم النصوص

يُسلم النص على قرص حاسوب، إضافة إلى نسخة مطبوعة يكون تباعد الأسطر فيها مزدوجاً، والرجاء إضافة نسخة محفوظة على شكل Rich Text Format على قرص الحاسوب. كما يجب أن تكون المسودة بشكلها النهائي دون إجراء تغييرات كبيرة لاحقاً.

الصور والرسومات والمخططات

يجب أن ترفق مع النسخة الأصلية عند التقديم. ويجب الإشارة إلى جميع المواد التوضيحية سواء كانت صوراً أم رسومات أم مخططات، باستخدام مصطلح (الشكل) في متن النص، وترقيمها حسب تسلسل ورودها في النص (الشكل ١، الشكل ٢، ... إلخ). ويجب ألا تزيد أبعاد الشكل عن ١٧ × ٢٢ سم، حيث تكون حجمها 250 pixels/in للصور الفوتوغرافية، و600 pixels/in للرسومات والمخططات، وبالإمكان تقديم الشكل إلكترونياً بصيغة (jpg)، ولا تقبل الأشكال المحملة على برنامج Word.

الهوامش

يفضل الابتعاد عن الهوامش قدر الإمكان، وتوضع مصادر البيبلوغرافيا بين قوسين ضمن المتن، مثلاً: (الفلاحات ٢٠٠١: ٦٥-٦٧) أو (Brown 1989: 32-35) للمراجع الأجنبية.

قائمة المراجع

يجب أن تكون ضمن جدول في نهاية البحث وحسب التسلسل الأبجدي، واتباع النموذج الآتي:

١- في حالة المقالات المنشورة في دوريات:

النوافلة، سامي

٢٠٠٠ تقرير عن حفرة الجي (جايا) في وادي موسى / ١٩٩١. حولية دائرة الآثار العامة ٤٤: ٤٢-٧١.

Zayadine, F. and Farés - Drappeau, S.

1998 Two North - Arabian inscriptions from the Temple of Lat at Wadi Iram. *ADAJ* 42: 255-258.

٢- في حالات المقالات المنشورة في مجلدات:

الدوري، عبد العزيز

٢٠٠١ فترات التاريخ العربي، نظرة شاملة. ص ٤٣-٥٩ في أبحاث ودراسات في التاريخ العربي، مهداة إلى ذكرى مصطفى الحياوي ١٩٣٦-١٩٩٨.

تحرير صالح الحمارة. عمان، الجامعة الأردنية.

Gabel, H.G.K. and Bienert, H.D

1997 Ba'ja: A LPPNB Regional Center Hidden in the Mountains North of Petra, Southern Jordan, Results from the 1997 Investigations. Pp. 221-262 in H.G.K. Gabel, Z. Kafafi and G. O. Rollefson (eds.) *The Prehistory of Jordan II. Perspectives from 1997*. Berlin: ex oriente.

٣- في حالة الكتب:

عباس، إحسان

١٩٩٠ تاريخ بلاد الشام من ما قبل الإسلام حتى بداية العصر الأموي، ٦٠٠-٦٦١. عمان: لجنة تاريخ بلاد الشام.

Peacock, D.P. S.

1988 *Pottery in the Roman World: An Ethnoarchaeological Approach*. London and New York: Longman.

الملكية الفكرية

من حق الباحث (الباحثين).

الفهرس

- ٧ مدفن ظهر السرو الروماني
رافع حراشنة
- ١٥ عمان البلقاء في نهاية الفترة المملوكية وبداية الفترة العثمانية، في ضوء أعمال التنقيب لموقع أم زويتينة
باسم المحاميد وهنادي الطاهر
- ٢١ الأنباط والبترا في المصادر العربية
أحمد لاش

مدفن ظهر السرو الروماني

د. رافع حراششة^١

جرش وتبين بعد الكشف على الفتحة التي ظهرت أثناء العمل أنها تقع في سقف كهف استعمل كمدفن يقع بابه في الجهة الشرقية من الفتحة (الشكل ١).

يقع المدفن في حي ظهر السرو إلى الغرب من سور جرش الأثري بحوالي ٥٠٠ م، وقد عثر عليه أثناء قيام أحد المواطنين بأعمال حفر وتجريف من أجل البناء حيث قام صاحب العمل بإبلاغ مديرية آثار



١. صورة جوية توضح موقع المدفن.

آثاري، خضر العبسي؛ فني صيانة وترميم، وفنيي الصيانة والترميم في مديرية آثار جرش.

١. تكون فريق التنقيب من كل من الدكتور رافع حراششة؛ مدير آثار جرش، عدنان مجلي؛ آثاري، علي العويصي؛ مهندس، ناجح أبو حمدان؛ آثاري، أكرم العتوم؛

(Fisher 1938: 554) ومدفن السلط (Hadidi 1979: 129-137) ومدفن ساكب البيزنطي (أبو عبيدة ٢٠٠٨: ٦٣-٧٩).

يفضي المدخل إلى حجرة الدفن المركزية وهي عبارة عن كهف مقطوع في الصخر، يبلغ ارتفاعه (٦,١ م) وقياسه شمال / جنوب (٧,٤ م) وشرق / غرب (٩,٤ م)، حفر على جوانبه الثلاثة الشمالية والغربية والجنوبية تجاويف في الصخر، استعمل بعضها للدفن المباشر وبعضها وضع فيه توابيت حجرية أغلقت بأغطية حجرية، وعثر في القاعة المركزية للمدفن على هيكل عظمي وضع مستلقياً على الظهر ورأسه باتجاه الغرب، وقد كانت العظام متآكلة بفعل الرطوبة العالية، كما عثر على جرتين صغيرتين وأمفورة من الفخار.

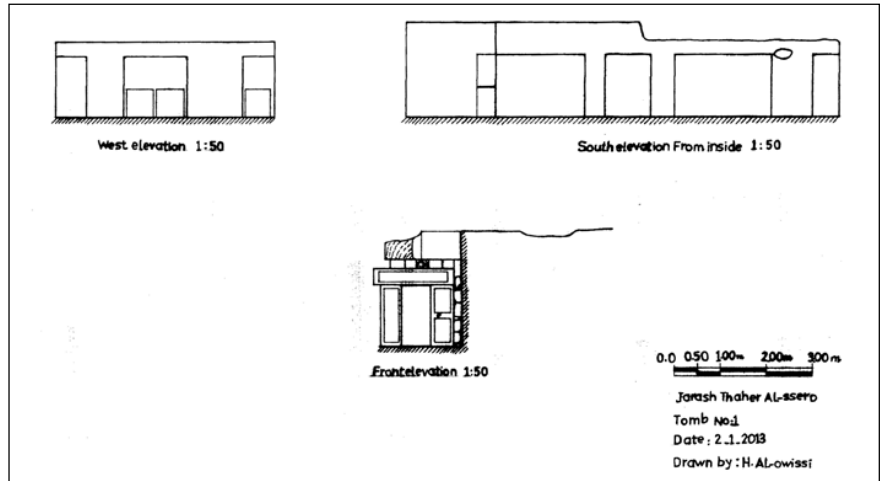
وصف المدافن (الشكل ٣)

بلغ عدد التجاويف الصخرية في الجهات الثلاث، ثلاثة عشر تجويفاً تحوي أربعة منها توابيت حجرية مجسمة، حيث وضع في التجويف

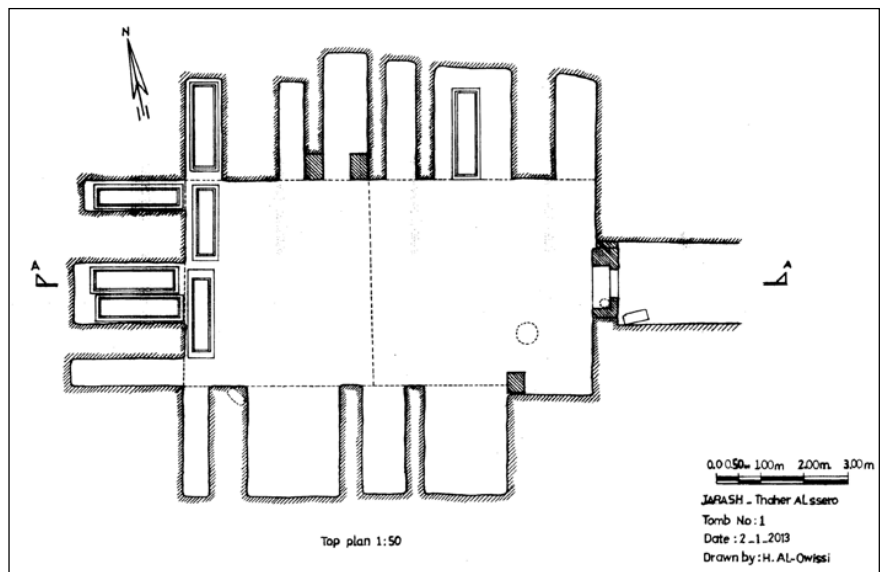
بدأت أعمال التنقيب بفتح مدخل الكهف من الخارج حيث ظهر على شكل قطع بالصخر بعرض (١,٨ م) وطول (٣ م) ويتم الوصول إلى الباب نزولاً بواسطة عدد من الدرجات التي نحتت بالصخر، وقد تكونت طبقة الطمم التي ملأت المدخل من أتربة وحجارة صغيرة وكسر فخارية ومعظمها أجزاء من أبدان جرار وأباريق فخارية وأجزاء من أسرجة بالإضافة إلى بعض الكؤوس والأسرجة عند باب المدفن من الخارج. كما ظهر عدد من الحجارة المشدبة يبدو أنها جزء من مدماك يعلو البوابة على شكل كرنيش هدم في الفترة اللاحقة.

يبلغ عرض المدخل (٦٥ سم) وارتفاعه (١٣٥ سم) ويتكون من عضادتين وعتبة علوية وأخرى سفلية فيها تجاويف من الأعلى ومن الأسفل لتثبيت محاور البوابة، وأغلق ببوابة حجرية متحركة وجدت مفتوحة وقد فقد جزء منها، ولها مفصل منحوت بالعضادة الشمالية كما نحت في منتصفها تجويف لوضع القفل الذي عثر على بقاياه (الشكل ٢)، مثل هذه الطريقة في الإغلاق معروفة في المدافن الرومانية فقد وجدت في مدفن جرش ٤

٢. مقطع عرضي للمدفن.



٣. مسقط رأسي للمدفن.



رافع حراحشة: مدفن ظهر السرو الروماني

حجري من الحجر الجيري وتم تثبيت بدن التابوت مع الغطاء بست وصلات ربط من الحديد، اثنتان في كل ضلع وواحد عند الطرفين، بلغ طول التابوت من الخارج (٢١٠سم) وعرضه (٦٥سم)، عثر بداخله على هيكل عظمي كامل في وضعية الاستلقاء على الظهر، ولم يعثر بداخل التابوت على مرفقات جنازية.

المدفن رقم ٧

تجوف نحت في الصخر الطبيعي يقع في الزاوية اليمنى من الجهة الغربية من قاعة الدفن عرضه (٧٠سم) وطوله (٢٣٠سم)، وضع بداخله تابوت حجري طوله (٢٠٥سم) وعرضه (٥٧سم) أغلق بغطاء من الحجر الجيري، وتم ربط بدن التابوت مع الغطاء بوصلات من الحديد، اثنتان عند كل جانب، وواحدة عند طرفي التابوت، عثر بداخله على هيكل عظمي لرجل في وضعية الاستلقاء على الظهر ولم يعثر على أية مرفقات جنازية.

المدفنان ٨ و ٩

تجوف نحت في الصخر الطبيعي في الجهة الغربية من قاعة الدفن، يبلغ عرضه (١٣٠سم) وعمقه (٢٥٠سم)، وضع بداخله تابوتان مجسمان من الحجر الجيري، على كل منهما غطاء من الحجر، يبلغ طول التابوت رقم ٨ (٢٠٥سم) وعرضه (٦٠سم) والتابوت رقم ٩ طوله (٢٠٠سم) وعرضه (٦٠سم)، عثر بداخل التابوت رقم ٨ على أجزاء من عظام بشرية يظهر عليها آثار حرق، كما عثر على رماد، حيث تم حرق جثة أو أكثر ووضع الرماد وأجزاء العظام المتبقية التي لم تحرق داخل التابوت، وعادة الدفن بالحرق كانت معروفة في الفترة الرومانية (انظر لاحقاً)، أما التابوت رقم ٩، فوضع على يسار التابوت رقم ٨، له غطاء حجري محكم الإغلاق عثر بداخله على رماد وأجزاء من عظام بشرية لشخص كبير السن، وأجزاء من عظام بشرية لطفل، وكما في التابوت رقم ٨، يبدو أنه تم حرق الجثث ثم وضع الرماد داخل التابوت. وفي المدفن رقم ٩ عثر على كسر من مرفقات جنازية، زجاجية وبرونزية، كما عثر بجانب التابوتين على ثلاثة أوانٍ من البرونز لحقها تلف بسبب الانبعاج، وتآكل بسبب الأكسدة.

المدفن رقم ١٠

يقع في الواجهة الغربية الجنوبية من قاعة الدفن يبلغ عمقه (٢٦٠سم) وعرضه (٦٠سم) قطع المدفن في الصخر الطبيعي، وأغلق مدخله بإحكام بحجارة صغيرة وطين من تربة حمراء، عثر بداخل المدفن على عظام بشرية بدون جمجمة، وقد وضعت بشكل عشوائي، كما عثر على كسر من الحديد المتأكسد.

المدفن رقم ١١

تجوف نحت في الصخر الطبيعي يبلغ عمقه (٢٥٠سم) وعرضه (٦٠سم)، أغلق مدخله بإحكام بواسطة حجارة كبيرة ومشذبة، واستعمل

الثاني والسادس والسابع تابوت حجري واحد لكل منهما، وفي التجويف الثامن تابوتان حجريان، كما وضع تابوتان حجريان بشكل طولي في الواجهة الغربية أمام التجاويف الصخرية.

المدفن رقم ١

يقع في الزاوية الشمالية الشرقية من قاعة الدفن قطع في الصخر الجيري عرضه (٩٠سم) وعمقه إلى الداخل (٢٤٥سم)، وارتفاعه (١١٠سم)، ظهر بداخله أجزاء من عظام بشرية مبعثرة بدون جمجمة، كما عثر على ثلاثة أوان زجاجية أحدها مكسور بالإضافة إلى كسر حديدية. أغلق المدفن بحجارة صغيرة ومتوسطة غير مشذبة واستعمل طين من تربة حمراء كرابط بين الحجارة، ولإغلاق الفتحات.

المدفن رقم ٢

تجوف صخري عرضه (١٨٠سم) وعمقه إلى الداخل (٢٥٥سم)، وضع في النصف الغربي منه تابوت مجسم مغلق بغطاء حجري وجد بداخله أجزاء من عظام بشرية، ويبدو أن نصف التجويف من الشرق قد خصص أيضاً للدفن أو تم العبث بمحتوياته لاحقاً، ولم يعثر سوى على قليل من أجزاء عظمية بشرية، وجد بجانب التابوت جرة (أمفورة) مكسورة إلى جزأين، جراء انهيار السقف.

المدفن رقم ٣

تجوف صخري يفصله الصخر الطبيعي عن المدفن الثاني، أغلق بابه بإحكام بحجارة مشذبة كبيرة وصغيرة، واستعمل طين من تربة حمراء كرابط ولإغلاق الفتحات بين الحجارة، يبلغ عمقه إلى الداخل (٢٧٠سم) وعرضه (٧٠سم)، عثر بداخله على جرة فخارية كاملة وحلق ذهبي وأجزاء قليلة من عظام بشرية.

المدفن رقم ٤

نحت بالصخر الطبيعي عمقه (٢٩٠سم) وعرضه (١م)، أغلق بإحكام بحجارة كبيرة ومشذبة، وفصل ما بينه وبين المدفن الخامس بجدار مصنوع من حجارة صغيرة وطين، عثر بداخله على أجزاء صغيرة من عظام بشرية فقط.

المدفن رقم ٥

تجوف نحت في الصخر الطبيعي، وفصل ما بينه وبين المدفن الرابع بجدار من الحجارة الصغيرة والطين، عمقه (٢٢٥سم)، وعرضه (٦٠سم)، لم يعثر بداخله على أي قطع أثرية أو عظام.

المدفن رقم ٦

يقع في الزاوية الشمالية الغربية من قاعة الدفن، عرضه (٨٠سم) وعمقه (٢٣٠سم)، وقد وضع بداخله تابوت حجري مجسم، أغلق بغطاء

وقطع في جدرانها الثلاثة، ويحوي أحد عشر تجويفاً للدفن، بعضها مفرد وبعضها مزدوج، وقد أُرُخَ المدفن إلى الفترة الرومانية المتأخرة «القرنين الثاني والثالث الميلاديين» (McNicoll 1992: 154). وكذلك في مدفن طبقة فحل ٥٤، فقد حفر في جدران الحجر المركزية ثلاثة عشر تجويفاً للدفن بشكل منتظم، كما وجد عند المدخل تابوت من الحجر الجيري عليه زخارف، وقد أُرُخَ المدفن إلى الفترة الرومانية المتأخرة (McNicoll 1992: 164). وفي مدفن جرش رقم ٧ الذي يتكون من حجرة مركزية قطع في جدرانها ثلاث حنايا قوسية وقد عثر على تابوت حجري وضع بمحاذاة الجدار الجنوبي وقد أُرُخَ المدفن من خلال اللقى الأثرية إلى القرنين الأول أو الثاني الميلاديين، وأعيد استخدامه في القرنين الرابع أو الخامس الميلاديين (Fisher 1938: 560-561). ويتكون مدفن قويلبة (Q: 2) من حجرة مركزية مستطيلة قطع في جدرانها الثلاثة تجاويف للدفن مستطيلة كما وجدت ثلاثة توابيت على أرضية الحجرة المركزية وتابوت حجري وضع في تجويف غير منتظم الشكل، وقد أُرُخَ المدفن لأواخر القرن الثاني وبداية القرن الثالث الميلادي. (Barbet and Guigue 1994: 102) ويحتوي مدفن السلط على حجرة مركزية مربعة الشكل بني على ثلاث واجهات منها غرف مقنطرة بالحجر، بداخل كل منها تابوت حجري بالإضافة إلى عدد من القبور في أرضية الحجرة بنيت بحجارة مشذبة في طابقين، وقد أُرُخَ المدفن إلى القرنين الثالث والرابع الميلاديين (Hadidi 1979: 129-137). ويتكون مدفن طبقة فحل ٦٤ من حجرة مركزية مستطيلة، قطع في جدرانها الثلاثة أحد عشر تجويفاً مستطيلاً للدفن، ووجد على أرضية الحجرة المركزية تابوتان من الحجر الجيري بجانب بعضهما، وقد عثر بداخله على عدد من الأسرجة والجرار الفخارية وجرار صغيرة وزبادي وأباريق وأواني زجاجية وخرز وبرونز وحديد وقطع نقدية، أُرُخَ المدفن لفترة طويلة تمتد من القرن الأول وحتى القرن الرابع الميلادي (McNicoll 1992: 170). واحتوى مدفن كهف جرش على سبعة توابيت حجرية وضعت على أرضية الكهف وتابوت صغير من الصلصال وصندوق رصاص صغير، ومن اللقى الأثرية التي عثر عليها في المدفن فقد أُرُخَ المدفن إلى نهاية القرن الثالث وبداية القرن الرابع الميلادي (Naghawi 1989: 201-218).

وهذه الأمثلة المقارنة تقودنا إلى أن المدافن التي تتكون من حجرة مركزية قُطع في ثلاث جهات منها تجاويف للدفن بأشكالها المختلفة وتجاويف دفنية بمختلف الأحجام (مفردة، ومزدوجة، وعريضة بشكل حجرات مقطوعة في جدران حجرة الدفن المركزية)، وتوابيت مجسمة وضعت في داخل تجاويف دفنية مقطوعة في جدران حجرة الدفن المركزية، وتوابيت مجسمة موضوعة على أرضية المدفن المركزية، تُؤرّخ إلى الفترة الرومانية المتأخرة.

عادات الدفن

ظهر في مدفن ظهر السرو أكثر من طريقة دفن فقد وجدت عظام

طين من تربة حمراء كرابط بين الحجارة، وإغلاق الفتحات الصغيرة. ظهر المدفن فارغاً تماماً ولم يعثر بداخله على أي عظام بشرية أو مرفقات جنائزية.

المدفن رقم ١٢

مدفن مزدوج يبلغ عمقه (٢٥٠سم) وعرضه (٢١٠سم)، فصل المدفن من الداخل بجدار من الحجر الصغير والطين، وأغلق الباب بحجارة كبيرة وصغيرة بعضها مشذب، وبعضها غشيم، واستعمل الطين الأحمر كرابط بين الحجارة، وإغلاق الفتحات، استعمل كل جزء من المدفن المزدوج كغرفة دفن منفصلة، وقد عثر في الغرفة الغربية على أجزاء من عظام بشرية، موضوعة بشكل عشوائي، وفي الغرفة الشرقية أيضاً على أجزاء من عظام بشرية مبعثرة ولا يوجد أي مرفقات جنائزية داخل المدفن.

المدفن رقم ١٣

قطع المدفن في الصخر الطبيعي يبلغ عمقه (٢٤٥سم) وعرضه (١٠٠سم)، وقد حدث انهيار في سقفه بسبب الرطوبة، وعند تنظيفه، عثر بداخله على أجزاء من عظام غير واضحة مع قليل من الرماد، مما يشير إلى أنه قد دفنت جثة محروقة فيه.

المدفن رقم ١٤

مدفن مزدوج، فصل بين غرفتي الدفن بجدار من الحجارة الصغيرة والطين، يبلغ عمقه (٢٥٠سم) وعرضه (١٩٠سم)، وقد أغلق المدخل بحجارة متوسطة وكبيرة، وطين من تربة حمراء كرابط بين الحجارة، تعرض سقف المدفن للتآكل ولسقوط أجزاء منه على أرض المدفن، وعند تنظيفها عثر على أجزاء من عظام بشرية وضعت بشكل عشوائي.

المدفن رقم ١٥

تابوت حجري وضع في الواجهة الغربية من قاعة المدفن الرئيسية، ويغلق باب المدفن رقم ٦، يبلغ طوله (٢٥٠سم) وعرضه من الخارج (١٠سم)، لوحظ وجود إزاحة للغطاء الحجري عن مكانه الأصلي، مما يشير إلى محاولة فتحه في فترات سابقة، ظهر بداخله عظام هيكل عظمي مكتمل جمع في طرفه؛ ربما لإعادة استخدامه. لم يعثر بداخله على أي مرفقات جنائزية.

المدفن رقم ١٦

تابوت حجري وضع بجانب التابوت رقم ١٥ من جهة الجنوب يبلغ طوله (١٧٥سم) وعرضه من الخارج (٦٠سم)، ويبدو أنه فتح سابقاً، لعدم إحكام الغطاء، عثر فيه على بقايا عظام بشرية، وكسر نحاسية وحديدية، وحلق ذهبي وعدد من الرقائق الذهبية الصغيرة.

المقارنة مع أمثلة مشابهة

وجد في مدفن طبقة فحل (١٣)، تابوتان حجريان على أرضية المدفن،

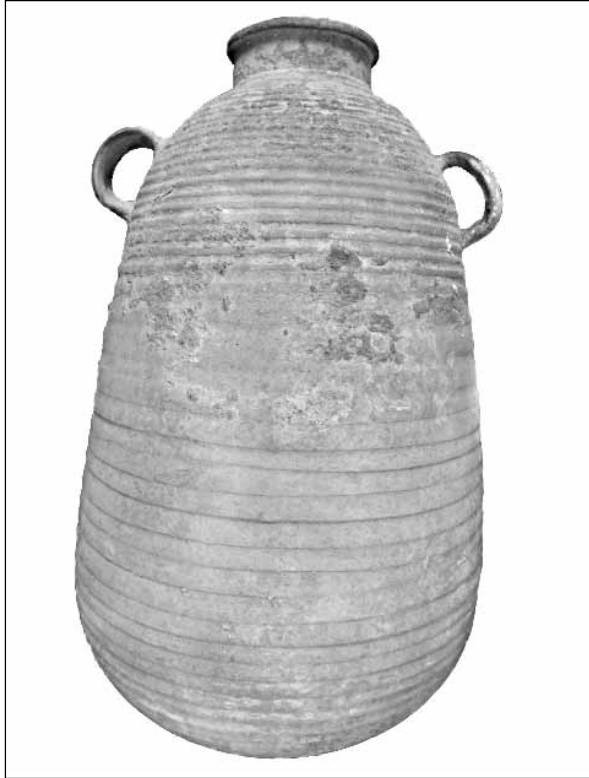
رافع حراحشة: مدفن ظهر السرو الروماني

الفوهة (١٠سم)، وارتفاع الجرة (٤٨سم)، ظهر مايشبه ذلك في المدفن رقم ٥ من جرش (Fisher 1938: 559. Fig, 37)، رقم التسجيل في مستودع التنقيبات (٢٢١٢) (الشكل ٤).

٢ - أمفورة كاملة، وجد العنق مع الأكتاف وجزء من البدن مفصلاً عن بقية البدن، مرممة، القاعدة مخروطية ومستوية من الأسفل، لها مقبضان سميكان يصلان ما بين طرف الفوهة من الأسفل وكتف الإمفورة من الأعلى، الفوهة حلقيّة وسميكة، الطول (١٠سم) وقطر الفوهة (١٢سم) اللون كريمي استعملت لحفظ السوائل، ظهر مايشبه ذلك في المدفن رقم ١١ من جرش (Fisher 1938: 567, fig. 45) رقم التسجيل في المستودع (٢٢١٥) (الشكل ٥).

٣ - أمفورة كاملة القاعدة مخروطية ومستوية من الأسفل، لها مقبضان سميكان يصلان ما بين أسفل الفوهة وكتف البدن من الأعلى، العنق طويل وتشكلت الفوهة من حلقتين دائريتين تعلوان بعضهما، الطول (٩سم) قطر الفوهة (١١سم) اللون كريمي رقم التسجيل في المستودع (٢٢١٣) (الشكل ٦).

٤ - جرة برميلية الشكل لها مقبضان سميكان يصلان ما بين أسفل الفوهة وكتف البدن من الأعلى كما تم إضافة طبقة على العنق لزيادة تماسكه ولربط المقبضين به. الفوهة مبرومة الشكل سميكة تبرز للخارج عن الرقبة، القاعدة دائرية مقعرة مساوية لحجم بدن الجرة من الأسفل، طول الجرة (٦٢سم) وقطر الفوهة (١٢سم) اللون كريمي. استعملت لحفظ السوائل ظهر مايشبه ذلك في المدفن رقم ١٢



٤. جرة من الفخار، متوسطة الحجم.

بشرية مبعثرة بدون جمجمة كما في المدافن ١، ٢، ٣، ١٠، ١٢، ١٤، وعظام بشرية عليها آثار حرق بالإضافة إلى رماد في أرضية المدفن، كما في المدافن ٨، ٩، ١٣. كما ظهر المدفنان ٥، ١١ فارغين تماماً على الرغم من أنه تم إغلاقهما بإحكام، ولم يعثر على جثث كاملة سوى في التوابيت المجسمة ٦، ٧، ١٥ وعظام جثة كاملة أيضاً في التابوت المجسم رقم ١٦، وقد جمعت العظام في طرف التابوت تمهيداً لاستعماله مرة ثانية. بالإضافة إلى هيكل عظمي كامل وضع مستلقياً على الظهر في منتصف أرضية الحجرة المركزية.

الدفن بالحرق

ظهرت في مدافن الفترة الرومانية التي عثر عليها في الأردن تحديداً دلائل قليلة على وجود عادة الحرق في الدفن فقد عثر في مدفن حسيبان (31F) على جرة فخارية بداخلها رماد جثث محروقة، وقد أُرِخَ المدفن للفترة الرومانية المبكرة وأعيد استخدامه في الفترة الرومانية المتأخرة، كما عثر على رماد في بعض التجاويف الدفنية الأخرى (Davis 1978: 129-148).

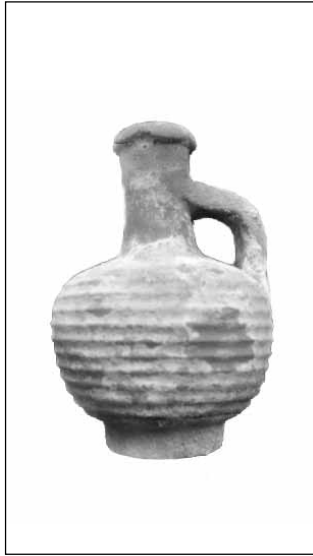
عُثر كذلك في أحد مدافن مطار الملكة علياء على صندوق من الرصاص فيه عظام إنسان حُرقت قبل وضعها في الصندوق وقد كان الحرق تاماً، وقد أُرِخت إلى بداية القرن الثالث ميلادي، وقد خلص الباحث إلى أن ذلك كان ممارسة غريبة على المجتمع (Ibrahim 1986: 38-39). وأضاف أن من قام بالدفن قد مارس عادات مألوفة لديه، وكأنه يشير إلى أنه من خارج المنطقة وأن ممارسة الدفن بالحرق كانت غير معروفة في الفترة الرومانية في الأردن. كما ظهر في مدفن الجوفة عظام عليها دلائل حرق، ووجدت أيضاً آثار إشعال نار في أرضية المدفن، وعثر بالإضافة إلى ذلك على هياكل عظمية غير محروقة وبهذا استخدم الدفن العادي للجنة ودفن ثانوي بحرق بعض الجثث في مكان آخر ومن ثم جلبت إلى المدفن وقد أُرِخَ المدفن إلى منتصف القرن الثالث الميلادي (Harding 1950: 81-95).

اللقى الأثرية

عثر على عدد من القطع الأثرية الفخارية والبرونزية الكاملة بعضها في قاعة المدفن الرئيسية وبعضها الآخر داخل المدافن منها أمفورتان، وجرة إسطوانية الشكل، وجرة أخرى، وإبريقان بدون مصب، وخمسة أكواب وثمانية أسرجة وإناء فخاري رسم على بدنه من الخارج قطف عنب وثلاثة مدامع زجاجية كاملة وحلقان ذهبيان.

وصف اللقى

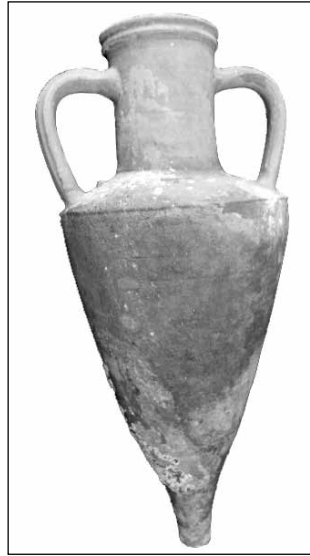
١ - جرة من الفخار، متوسطة الحجم، البدن من الخارج ذات حوز نافرة، العنق قصير، والفوهة مشطوفة إلى الخارج، لها مقبضان على أكتاف البدن من الأعلى، القطر عند القاعدة أكثر من أعلى البدن، وهناك كسر في بعض أجزاء من البدن، اللون كريمي، قطر



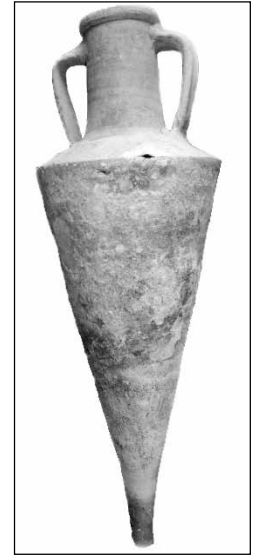
٨. جرة برميلية الشكل.



٧. أمفورة كاملة، القاعدة مخروطية.



٦. أمفورة كاملة، القاعدة مخروطية.



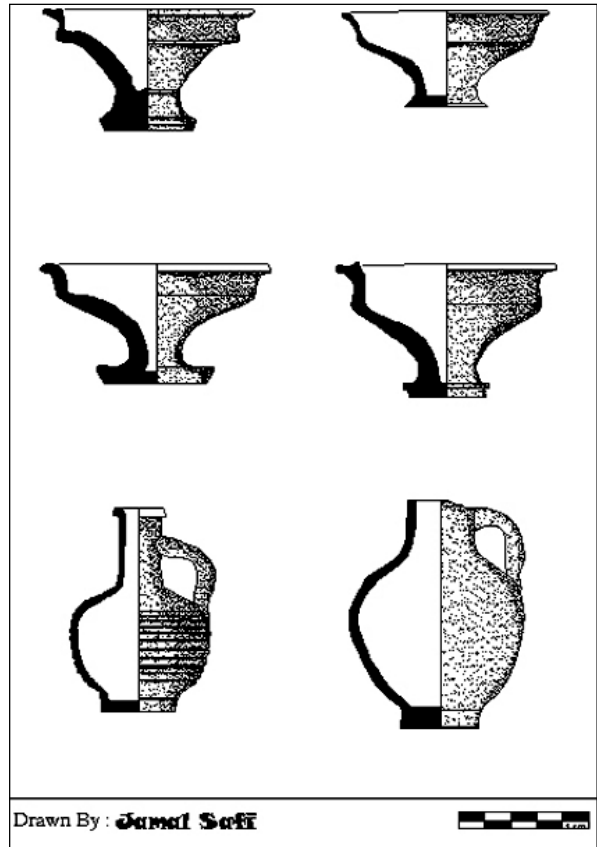
٥. أمفورة كاملة.

البدن بحوالي (١سم)، ظهر البدن من الخارج محزراً على شكل حلقات دائرية، العنق طويل، والفوهة سميكة مشطوفة إلى الخارج، الطول مع القاعدة (٨,٥ سم) وقطر الفوهة (١,٥ سم)، اللون بني ضارب إلى الحمرة، ورقم التسجيل في المستودع (٢٢٢٢).
(الشكلين ٨ و ٩)

٦ - إبريق فخاري صغير الحجم، كروي الشكل، بدون مصب، فاقده الفوهة، وجزء من العنق له مقبض يصل ما بين العنق والبدن، القاعدة حلقية صغيرة، اللون بني فاتح واستعمل بطانة خارجية ذات لون بني غامق، الطول (٨,٥ سم) ظهر ما يشبه ذلك في المدفن رقم ٨ من جرش (Fisher 1938: 563, Fig. 4) رقم التسجيل في المستودع (٢٢٣٤) (الشكلين ٩ و ١٠).

٧ - إناء فخاري أسطواني على شكل إبريق، بدون مقبض، مع تشكيل مصب قصير بارز للخارج من جدار الفوهة من الأعلى، والعنق قصير، وقد شطفت الفوهة بزيادة اتساعها عن الأطراف للخارج، القاعدة مستديرة، زخرف البدن بقطف من العنب، اللون من الداخل بني ضارب للحمرة، وقد وضع على البدن من الخارج بطانة ذات لون بني ترابي الطول (٢٤سم) وقطر الفوهة (٧سم) ظهر ما يشبه ذلك في المدفن رقم ٨ من جرش (Fisher 1938: 563, Fig. 4) رقم التسجيل ٢٢١٦ (الشكل ١١).

٨ - أكواب صغيرة، عددها خمسة، ظهرت في أماكن مختلفة من المدفن، ويوجد في القعر من الداخل تجويف نحو القاعدة، حافة الكأس مستقيمة إلى الأعلى بارتفاع (١سم) ومشطوفة قليلاً إلى الخارج، القاعدة حلقية ومقعرة من الخارج طول العنق (٢سم)، يبلغ الارتفاع ما بين (٥-٧ سم) وقطر حافة الكأس ما بين (٧,٥ - ٨,٥ سم) اللون كريمي وبعضها كريمي ضارب إلى الحمرة. ظهر ما يشبه ذلك في المدفن رقم ٨ من جرش (Fisher 1938: 558, Fig. 36) (الشكلان ٩ و ١٢).



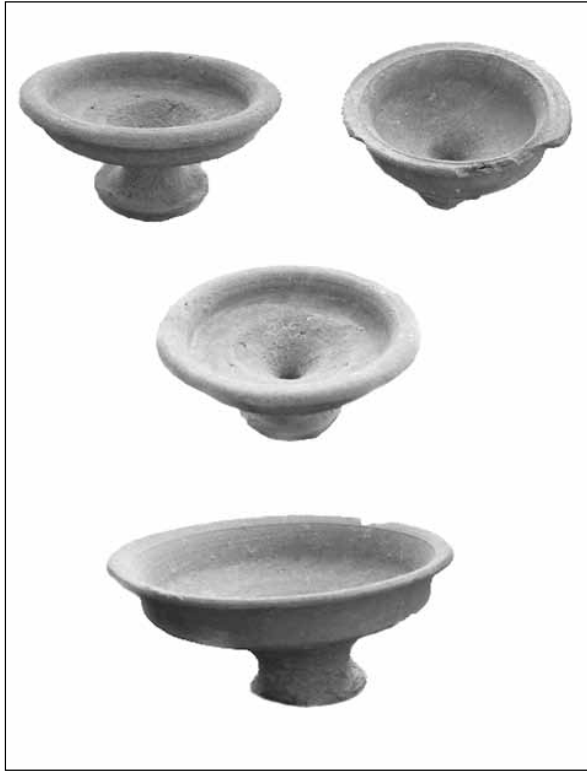
Drawn By : Jamal Saki

٩. رسم توضيحي لأكواب فخارية وجرار.

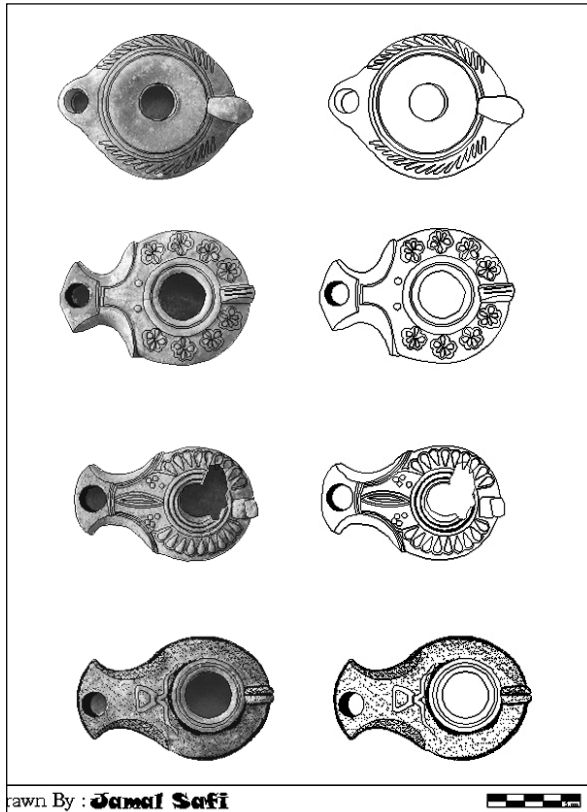
من جرش (Fisher 1938: 570, Fig. 47)، (رقم التسجيل ٢٢١٤) (الشكل ٧).

٥ - إبريق فخاري بدون مصب، له مقبض يصل ما بين منتصف العنق وأعلى كتف البدن، والقاعدة حلقية، مقعرة من الخارج، تبرز عن

رافع حراشنة: مدفن ظهر السرو الروماني

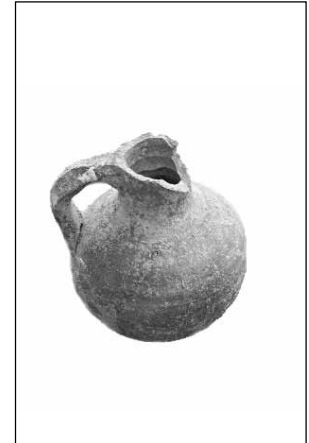


١٢. مجموعة من الأكواب الفخارية.



Drawn By : **Jamal Safi**

١٤. رسم توضيحي لمجموعة من الأبرجة الفخارية.



١٠. إبريق فخاري صغير الحجم بدون ١١. إناء فخاري أسطواني على شكل مصب.

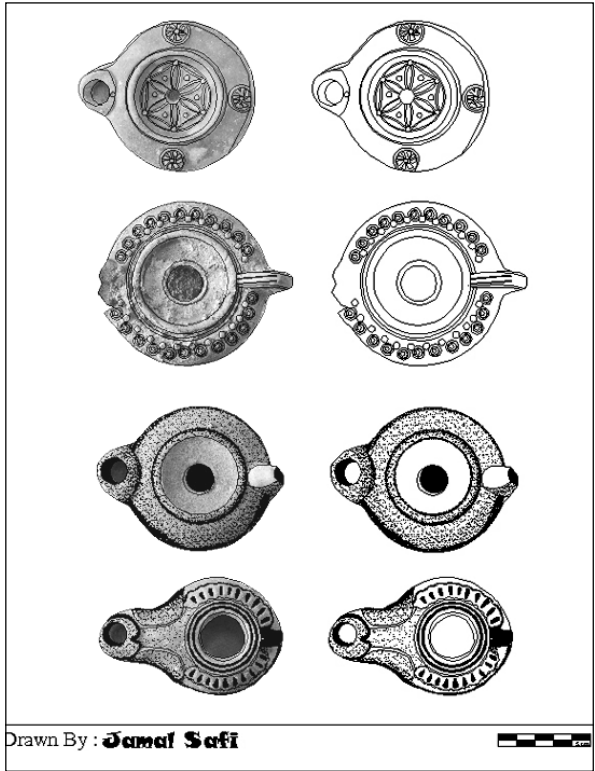
٩ - قرط ذهبي صغير، هلالتي الشكل، مفرغ من الداخل، متآكل من الجانب، ومفقود جزء من البدن.

١٠ - قرط ذهبي، صغير ومجدول، عليه طبعة وخرزة صغيرة، بنية اللون ومثبتة على البدن.

١١ - حلقة صغيرة، دائرية، بداخلها خرزة لونها أخضر، ولها عروة صغيرة ربما حلية توضع في الأنف.

١٢ - ثمانية أسرجة من الفخار، مختلفة الأشكال، زخرف سطحها الخارجي بزخارف هندسية ونباتية (الشكلان ١٣ و ١٤).

١٣ - أربعة قوارير زجاجية (الشكل ١٥).



Drawn By : **Jamal Safi**

١٣. رسم توضيحي لمجموعة من الأبرجة الفخارية.



١٥. قواريير زجاجية.

- 129-137.
- Harding, G. L.
1950 A Roman Family Valut on Jebel Jofah, Amman. *QDAP 14*: 81-95.
- Ibrahim, M., Gordon, R.
1986 A Cemetery at Queen Alia International Airport. *Yarmouk University Publications*.
- McNicol, A. W. et al.
1992 Pella in Jordan 2, *the university of Sydney College of Wooster Excavation at Pella 1982-1988*. Sydney.
- Naghawi, A.
1989 A new Rock-Cut Tomb in Jarash. Pp 201-218 in *Jarash Archaeological Project 1984 – 1988. Vol II*, Paris.
- المراجع
أبو عبيدة، محمد
٢٠٠٨ مدفن بيزنطي في بلدة ساكب، حولية دائرة الآثار العامة ٥٢: ٦٣-٧٩.
- Barbet, A. and Guigue, C. V.
1994 Le Peintures des Necropoles Romaines d, *Archaeologie du Proche – Orient*. Beyrouth.
- Davis, J. J.
1978 Hashbon 1976, Area Fond, *KAUSS XVI, no. 1*: 120-148.
- Fisher, C. S.
1938 Gerasa City of the Decapolis. Edited By Kraeling. *C.H. ASSOR*, New Haven.
- Hadidi, A.
1979 Roman Family Tomb at Es- Salt. *ADAJ 23*:

عمان البلقاء في نهاية الفترة المملوكية وبداية الفترة العثمانية، في ضوء أعمال التنقيب لموقع أم زويتينة

باسم المحاميد وهنادي الطاهر

توطئة

يتناول هذا البحث دراسة أولية للملامح الاجتماعية والاقتصادية والسياسية لمنطقة شرق الأردن عموماً ومنطقة عمان البلقاء خصوصاً ما بين نهاية الفترة المملوكية وبداية العصر العثماني في محاولة للتعرف على الأسباب التي أدت إلى ازدهار المنطقة في الفترة المملوكية ومن ثم تراجعها في الفترة العثمانية وذلك في ضوء نتائج الحفريات الأثرية وتحليل الشواهد المعمارية التي عثر عليها في موقع أم زويتينة الأثري في منطقة الجبيهة شمال عمان.

ومعرفة هل كان هذا التراجع في الاستيطان وليد الأحداث جرت بداية القرن السادس عشر مع سيطرة العثمانيين على المنطقة بعد انتصارهم في معركة مرج دابق عام (١٥١٦م) التي جرت أحداثها بين السلطان العثماني سليم الأول وبين السلطان المملوكي قنصوه الغوري وهل كان لهذه السيطرة العثمانية دور في تراجع الاستيطان في المنطقة أم أن هذا التراجع في الاستيطان حدث نتيجة لسلسلة من الأحداث السياسية والاقتصادية سبقت دخول العثمانيين إلى المنطقة وذلك من خلال الشواهد المعمارية التي عثر عليها أثناء أعمال التنقيب.

الموقع

تقع خربة أم زويتينة ضمن أراضي قرية أم زويتينة حوض ٣ ظهر العين، من أراضي منطقة الجبيهة إلى الشمال من وزارة التعليم العالي، وعلى بعد حوالي ٧٠٠م إلى الشمال الغربي من دوار المنهل على الطريق الجديد الذي يربط منطقة الجبيهة بمنطقة أبو نصير، وضمن الإحداثيات N 32.03484 E 35.88378 وترتفع حوالي ١٠٠٠م عن مستوى سطح البحر. ومن الملاحظ أن منطقة أم زويتينة ذات موقع متوسط بين عمان وجرش على مسافة ليست ببعيدة عن الطريق الروماني الذي كان يربط فيلادلفيا (عمان) بجرش (الشكل ١).

التسمية: دلالات ومعاني

اسم الموقع «أم زويتينة»، وزويتينة تصغير زيتونة وهي «شجرة مثمرة وثمرها يستخرج منه الزيت» (نصير ٢٠١٠: ٣٧١).
ظهر العين وهو اسم الحوض الذي تتبع له أراضي أم زويتينة «ما غلظ من الأرض، والعين ينبوع الماء» (نصير ٢٠١٠: ٣٧١)، أما منطقة الجبيهة فقد جاءت من الجبهة «ما بين الحاجبين إلى الناصية،



١. موقع أم زويتينة، صورة جوية.

وجبهة القوم سيدهم» (نصير ٢٠١٠: ٣٧٢).

من خلال دراسة تحليلية بسيطة لدلالة التسمية وطبيعة المنطقة الجغرافية نلاحظ أن الموقع قد اكتسب التسمية من خلال الطبيعة الجغرافية للمنطقة، حيث تنتشر فيها مصادر مياه غزيرة ومتعددة، ويذكر بعض السكان المحليين أنه كان يوجد حوالي أربعة ينابيع في هذه المنطقة. ويمكن ملاحظة شجيرات الطيون الكثيفة وهذه الشجيرات تكثر عند مصادر المياه.

كما يمكن ملاحظة الطبيعة الجبلية الوعرة والتي ترتفع حوالي ١٠٠٠م عن سطح البحر وهي ذات أمطار غزيرة تصلح لزراعة الأشجار المثمرة، ومن المعتقد أن التسمية أم زويتينة جاءت لكثافة زراعة أشجار الزيتون في المنطقة.

وهنا يمكن ملاحظة دلالة الاسم الجغرافي في تفسير الموقع وما يدل عليه من طبيعة الاستخدام.

الدراسة المعمارية الأولية لموقع أم زويتينة

من خلال أعمال التنقيب في الموقع ظهرت ثلاث طبقات أثرية تمثل ثلاث مراحل من الاستيطان تعود إلى العصر المملوكي وبداية العثماني (الشكل ٢)، من الأقدم إلى الأحدث:

المرحلة الأولى - بداية القرن الرابع عشر الميلادي

وهي المرحلة الأقدم من الاستيطان المملوكي، فقد كشفت أعمال التنقيبات الأثرية عن وجود مبني مكون من غرفتين مشتركتين بجدار بسماكة حوالي (١م) يحمل سقفاً نصف برميلي ويستند على الجدار الأوسط ويغطي الغرفتين مشكلاً قبوين متجاورين (الشكل ٣).

حيث أن هذا النظام المعماري وهو ما يعرف بنظام الأقبية شائع بشكل كبير في منطقة الأردن في فترة القرن الرابع عشر ويمكن مشاهدة هذا النظام المعماري في ذيبان وحسبان وجلول والدير في الفحيص والسلط والبحاث.

إن النمط المعماري المتبع في البناء الذي يشكل مجموعة من البيوت ذات تقسيمات هندسية منظمة يدل على استقرار ساكني البيوت ويعكس حالة الاستقرار السياسي والأمني التي تعيشها المنطقة في تلك الفترة، ومن خلال البحث في المصادر التاريخية نلاحظ أن منطقة عمان في هذه المرحلة شهدت ازدهاراً معمارياً ونشاطاً سكانياً كثيفاً.

تعتبر الفترة المملوكية من الفترات التاريخية التي تناولها بالدراسة الكثير من المؤرخين المعاصرين للفترة المملوكية إضافة إلى المؤرخين المحدثين من كافة نواحي الحياة السياسية والاجتماعية والاقتصادية لما شهدته هذه الفترة من أحداث هامة وفرت للباحثين والمؤرخين مادة تاريخية غنية، وذلك لكثرة التفاصيل التي يمكن الحديث عنها، كالصراعات والحروب مثل الحروب الصليبية ودخول المغول إلى المنطقة وحالة عدم الاستقرار السياسي في منطقة بلاد الشام، والذي أدى إلى هجرة عدد كبير من السكان من مناطق الصراع في سوريا والعراق والساحل الفلسطيني والاستيطان في منطقة شرق الأردن عموماً ومنطقة عمان بالقاء خصوصاً، والدليل على ذلك كثرة المواقع الأثرية التي تؤرخ إلى هذه الفترة، أو إعادة استخدام بعض المواقع الأثرية التي تعود إلى فترات أقدم، وخاصة مناطق الاستطلاع العسكري كمواقع العصر الحديدي الثاني حيث أن الظروف السياسية



٢. منظر عام لأعمال التنقيب في الموقع.

باسم المحاميد و هنادي الطاهر: عمان البقاء في نهاية الفترة المملوكية وبداية الفترة العثمانية، في ضوء أعمال التنقيب لموقع أم زويتينة



٣. نظام الأقبية المتبع في الفترة المملوكية.

غور الأردن وصناعة النيل في غور الصافي وصناعة الحديد في عجلون وخربة الدير في منطقة الفحيص، والكبريت الأبيض والقار من البحر الميت وأصبحت مناطق الأردن كذلك المصدر الأكبر لتزويد الدولة المملوكية بالغلل (غوانمة ١٩٧٩).

٤- النشاط الفكري والثقافي، الذي نتج عن الاستقرار السياسي والأمني لهذه المنطقة خلال العصر المملوكي، وليس أدل على ذلك من انتشار المدارس مثل مدرسة حسيان المملوكية، والمدرسة الشافعية في الكرك، والمدرسة اليعقينية في عجلون، ومدرسة صرغتمش في عمان والتي تؤرخ إلى مرحلة متأخرة من حكم الدولة المملوكية ١٣٥٦م. وكذلك انتشار بعض المنشآت المدنية ذات المنافع العامة مثل البيمارستانات (غوانمة ١٩٧٩).

المرحلة الثانية - بداية القرن الخامس عشر الميلادي

تمثلت هذه المرحلة بإعادة استخدام المباني التي تؤرخ إلى القرن الرابع عشر الميلادي، فقد دلت أعمال التنقيب في هذه المرحلة على أن هنالك تراجعاً واضحاً في الأنماط المعمارية من حيث صغر مساحات الغرف، وتغيراً في نظام التسقيف المتبع في المرحلة الأولى ليتحول من نظام الأقبية إلى نظام الأقواس وكذلك عدم استخدام المادة الرابطة، مما أدى إلى تراجع في متانة البناء، حيث من الصعوبة تحديد مبنى واحد بمنهج معماري نستطيع التعرف عليه، وعثر على الكثير من الحجارة المتساقطة التي أعيد استخدامها لبناء غرف جديدة ولكن بشكل مختصر. ويبدو من تقسيمات الغرف أن حظائر الحيوانات أصبحت جزءاً من هذه الغرف (الشكل ٤) مما يدعو إلى الاعتقاد أن السكان غير أمنين على ترك الماشية خارج حدود المنزل، وهذا يشكل بداية الانهيار في النظام الأمني.

تقريباً متشابهه بين العصرين المملوكي والحديدي الثاني. فقد دلت المسوحات الأثرية التي جرت في منطقة عمان البقاء على اتساع الاستيطان في العصر المملوكي وتطور بعض الصناعات والحركة التجارية، وكذلك كشفت الحفريات الأثرية عن وجود مبانٍ إدارية ودينية منتشرة في المنطقة تدل على هذا النشاط واهتمام الممالك بالمنطقة، ففي حسيان عثر على قصر يعرف باسم قصر الحاكم المملوكي وحمام ومدرسة، وفي منطقة البحات غرب عمان عثر على قصر يؤرخ إلى هذه الفترة وهذا دليل على وجود نظام اجتماعي وسياسي وإداري خلال حكم الممالك في القرن الرابع عشر في منطقة شرق الأردن.

وهنا بعض الأسباب التي أدت إلى ازدهار منطقة شرق الأردن خلال حكم الممالك :

١- العمق الجغرافي الاستراتيجي، أدى إلى بناء القلاع والتحصينات العسكرية، وتطور البريد وطرق المواصلات وطرق الحج لأن المنطقة بقيت تحت سيطرة الدولة المملوكية، ولم يتم السيطرة عليها بشكل كامل من قبل الصليبيين أو المغول، وحرصاً من الدولة المملوكية على الاستقرار السياسي في المنطقة التي أصبحت تشكل العمق الاستراتيجي، ونقطة وصل بين مصر والشام، عمدت الدولة المملوكية إلى الدخول في أحلاف عسكرية مع القوى المحلية والعشائر البدوية.

٢- الهجرات السكانية باتجاه منطقة شرق الأردن التي أصبحت ملاذاً آمناً لكافة المهاجرين والفارين من الحروب من مناطق العراق والشام وفلسطين.

٣- شكلت منطقة شرق الأردن سلة غذاء للدولة المملوكية والجيش، فتطورت بعض الصناعات مثل صناعة السكر والصابون في



٤. حظائر الحيوانات داخل البيوت التي تعود إلى المرحلة الثانية من الاستيطان.

المرحلة الثالثة- القرن السادس عشر الميلادي (بداية الفترة العثمانية)

من خلال أعمال التنقيب في الطبقة السطحية لوحظ وجود نمطين معماريين:

- النمط الأول عبارة عن جدران طولية ليس لها أية صفة معمارية واضحة، تتكون من مدماكين وصفين من الحجارة وبأطوال مختلفة وجدت في الطبقة السطحية (top soil).
- النمط الثاني عبارة عن غرف دائرية الشكل مكونة جدرانها من حجارة كبيرة نسبياً مبنية من صف واحد ومدماك واحد من الحجارة (الشكل ٥).

ومن هنا كان لا بد من التوقف عند النمط المعماري الدائري وهو نمط بسيط جداً ولكن وجوده في هذه الطبقة وطريقة البناء في هذه الفترة يعتبر غريباً نوعاً ما، ويمكننا هنا إبراز مجموعة من

الملاحظات على هذه المرحلة:

- ١- أن مثل هذه الجدران الدائرية التي لا تحوي أي مظاهر أو شواهد لوجود أبواب ومداخل يمكن الاستنتاج أن هذه الجدران لا تحمل سقفاً ثقيلاً بل وجدت لحمل سقف خفيف مثل القماش أو القش وهذا يدعم فكرة الاستيطان المؤقت قبل مرحلة هجران الموقع.
- ٢- من خلال دراسة هذه الأنماط المعمارية وطريقة البناء يمكن القول أن هذه الأنماط المعمارية جاءت بسبب أن الاستيطان في موقع أم زويتينة أصبح استيطاناً موسمياً أو استيطاناً مؤقتاً وعليه تكون هذه المرحلة هي الأخيرة من مراحل الاستيطان في الموقع.
- ٣- من خلال البحث في الفترات التراثية تبين أن مثل هذه الأنماط من البناء لا زال يستخدم إلى الآن أثناء فترات الحصاد وجمع

باسم المحاميد و هنادي الطاهر: عمان البقاء في نهاية الفترة المملوكية وبداية الفترة العثمانية، في ضوء أعمال التنقيب لموقع أم زويتينة



٥. النمط المعماري الدائري.

الأول أعلن الغزالي انفصال بلاد الشام عن الباب العالي وهنا أرسل العثمانيون جيشاً لم يكن للغزالي قدرة على مواجهته فاستسلم وأعدم، وبالتالي أصبحت بلاد الشام تحت إدارة الولاية العثمانية وتبعت مباشرة للباب العالي. بعد السيطرة العثمانية على بلاد الشام أعيد تقسيم بلاد الشام إلى مناطق ثلاث تعرف باسم السناجق أو الولايات؛ وهي ولاية دمشق وحلب وطرابلس، حيث تبعت شرقي الأردن لولاية دمشق وقد حكم العثمانيون شرقي الأردن اسماً ولم يكن لهم اهتمام إلا بقافلة الحج الشامي التي كانت تعبر الأراضي الأردنية حينها.

وهنا يمكن القول أن موقع أم زويتينة وغيرها من المواقع التي توجد في منطقة عمان الحالية وما يعرف بمنطقة البقاء تاريخياً قد هُجرت من السكان بشكل تدريجي بناءً على ظروف وأحداث سياسية جاءت مع نهاية الفترة المملوكية وبداية العصر العثماني، أدت هذه الأحداث إلى تراجع في عدد السكان ثم إلى هجر للمنطقة بأكملها، ومن المعتقد أيضاً حدوث تغير ديموغرافي للسكان أدى إلى الاستغناء عن حياة الاستقرار والتحول إلى حياة البداوة وذلك بسبب انهيار النظام الأمني، ولجأ السكان حينها إلى التنظيم القبلي

الثمار وأن البناء الدائري الذي يحمل السقف الخفيف يعرف إلى الآن باسم القصر وهو يستخدم من قبل مالك الأرض عند إشرافه على الحصاد.

٤- من خلال الدراسة الأولية للفخار المكتشف في الطبقات الثلاث التي تمثل ثلاث مراحل من الاستيطان في الموقع والتي أُرُخَّت جميعها في البداية إلى العصر المملوكي وذلك لأن جميع الكسر الفخارية متشابهة من حيث الزخارف والشكل، إلا أنه لوحظ وجود كسر صغيرة من الغليون العثماني، والكثير من الفخار المعروف باسم (Elephant handle) في الطبقة الأحدث وهي الطبقة السطحية وهذا يدل على أن تقنية صناعة الفخار في العصر المملوكي وبداية العصر العثماني كانت تقريباً متشابهة. وهنا لا بد من الحديث عن دخول العثمانيين إلى منطقة بلاد الشام ثم منطقة مصر وإنهاء حكم المماليك كلياً عام ١٥١٧م بعد هزيمة آخر سلاطين المماليك طومان باي الذي أدى بدوره إلى وضع البلاد العربية تحت الحكم العثماني المباشر ولكن منطقة سوريا الجغرافية تمتعت بحكم ذاتي من خلال تعيين السلطان العثماني والياً عليها وهو والي جان بردي الغزالي ولكن بعد وفاة السلطان سليم

والذي هو في الحقيقة تنظيم عسكري يساعد على توفير حماية أكبر لأفراد القبيلة وكذلك يوفر قدرة وسهولة في التنقل أي قدرة على الكر والفر. وهنا نتساءل هل كان لتلك الفترة تأثير على تكوينات المجتمع العشائري الأردني الحالي؟

كذلك التراجع الذي شهدته منطقة عمان البلقاء مع نهاية العصر المملوكي ودخول الدولة المملوكية في صراع مع الدولة العثمانية الناشئة في بداية القرن السادس عشر كان له أكبر الأثر على هجر السكان للمنطقة. هنا يجب أن نتساءل كيف حدثت هذه الهجرة؟ وإلى أين؟ وهل كان لهذه الظروف السياسية دور في سيطرة العشائر البدوية على المنطقة وتحول السكان إلى النمط غير المستقر (البدوة) للحفاظ على التكوينات الاجتماعية التي كانت سائدة قبل الانهيار الأمني والصراعات السياسية؟

وبالعودة إلى بعض أسماء العائلات لبعض الدارسين والمنتسبين لمدرسة حسيان المملوكية يمكن القول أن هذه الأسماء تشكل عدداً كبيراً من أسماء العشائر الأردنية الحالية وهذا يدعم الاعتقاد بالتحول السكاني للنمط البدوي وهذا لا يمنع كذلك الحديث عن دخول بعض العشائر من شمال الجزيرة العربية والاستقرار في منطقة شرق الأردن خلال الفترة العثمانية (غوانمة ١٩٧٩).

كذلك إن هجر السكان لهذه المنطقة ليس الأول حيث شهدت المنطقة هجراً في الاستيطان خلال نهاية العصر العباسي.

المراجع

- البخيت، محمد عدنان
١٩٧٦ مملكة الكرك في العهد المملوكي. المملكة الأردنية الهاشمية.
البخيت، محمد عدنان ومرزوق، محمد يونس
١٩٩٢ بحوث في تاريخ بلاد الشام في العصر العثماني. عمان،
مطبعة الجامعة الأردنية
الحسو، أحمد عبدالله
٢٠٠٤ تاريخ الكرك عبر العصور الإسلامية. عمان، منشورات
وزارة الثقافة.
غوانمة، يوسف درويش
١٩٧٩ تاريخ شرقي الأردن في عصر دولة المماليك الأولى
(القسم الحضاري). عمان، وزارة الثقافة والشباب.
١٩٧٩ تاريخ شرقي الأردن في عصر دولة المماليك الأولى
(القسم السياسي). عمان، وزارة الثقافة والشباب.
المومني، سعد
١٩٨٨ القلاع الإسلامية في الأردن (الفترة الأيوبية المملوكية).
عمان، دار البشير للنشر والتوزيع.
نصير، ركاد
٢٠١٠ المعاني اللغوية لأسماء المدن والقرى وأحواضها في المملكة
الأردنية الهاشمية. عمان، دار ورد الأردنية للنشر والتوزيع.

الأنباط والبترا في المصادر العربية

أحمد أسعد لاش

Abstract

Most scholars agree that there is a lack of information about Petra and the Nabataeans in the Arabic sources, particularly in the early Islamic sources where Petra is not mentioned. However, this article shows that in the period between the diminishing of the Petra dominance in the region in the 4th, 5th and 6th centuries and the earliest Islamic historians in the 8th century, Petra had no ruler worthy of mention in the major battles of the Islamic conquests in the second quarter of the 7th century. However, Nabataeans were well known in many of Arabic sources by the name Nabat and Annbat. The Greek name for Petra was not used but its Nabataean name, Raqmu or ar-Raqeem was well known to the Arabs as a small city carved in rock as one unit, located not so far from Palestine and close to Ayla (Aqaba). The Holy Qur'an mentions many places in the Arabic peninsula, Mesopotamia, Egypt and in the Levant including ar-Raqeem in surat al-Kahf as a place where the miracle of the seven sleepers took place.

أكثر على الجانب الزراعي على حساب النشاط التجاري (Amr 2011: 305-313) فشهدت تلك الفترة توسعاً سكانياً خارج حدود مدينة البترا بحثاً عن مساحات أكثر ملائمة للنشاط الزراعي.

وخلال القرنين السابقين عمل الباحثون والمؤرخون على توثيق كل ما يتعلق بالبترا والأنباط من ذكر أو إشارة في المصادر التاريخية سواء المصادر الآشورية أو الفارسية أو اليونانية أو الرومانية، وقد نُشرت العديد من الأبحاث و الكتب في هذا المجال، وكان الإستفسار الدائم هو لماذا لم يتوفر في المصادر العربية الإسلامية المبكرة ذكر عن البترا؟ علماً أن الاكتشافات الأثرية المتأخرة «كما أشرنا سابقاً» أثبتت استمرار الوجود السكاني في البترا حتى القرن السادس الميلادي كما في كنيسة البترا (Amr 2011: 305-313)، أي في الفترة التي شهدت بها قريش أوج نشاطها التجاري بين جنوب الجزيرة العربية وشمالها والتي ظهر بها ما يعرف بالإيلاف الذي أسسته قريش كنظام للتنقل الآمن للقوافل التجارية المارة بالجزيرة العربية، وتلك ليست بالفترة الزمنية الكبيرة التي تفصلها عن البعثة النبوية الشريفة في حوالي ٦١٠ ميلادي. فنجد في المصادر الإسلامية المبكرة ذكراً لتاريخ العرب وقبائلهم وأنسابهم وألتهم وعبادتهم ابتداءً من اليمن في جنوب الجزيرة العربية وصولاً إلى تدمر في البادية السورية، في حين يشير الباحثون إلى غياب ذكر البترا في تلك المصادر العربية وهي الملاصقة لبلادهم في شمال الجزيرة

بدايةً لابد لي أن أتقدم بجزيل الشكر والعرفان للأساتذة د. فوزي زيادين ود. غازي بيشه ود. خيرية عمرو لتفضلهم بقراءة مسودة هذا المقال وتقديم ملاحظاتهم القيمة التي استفدت منها استفادة جمّة في هذا البحث.

منذ أن قام الرحالة السويسري بيركهارت بإعادة اكتشاف البترا سنة ١٨١٢ وتقدمها للعالم، لم تتوقف أعمال البحث العلمي والتنقيب الأثري في تلك المدينة حتى يومنا هذا، فقد عمل الباحثون والمؤرخون العرب والأجانب جاهدين لسبر أغوار التاريخ والبحث بكل ما يختص بحضارة البترا والأنباط وتاريخهم وامتداد دولتهم التي غطت مساحة كبيرة من المشرق، امتدت في أوجها من دمشق وحتى شمال الجزيرة العربية وصولاً إلى سيناء غرباً، فكانوا أسياد التجارة في العالم القديم منذ القرن الأول قبل الميلاد وحتى بدايات القرن الثاني الميلادي، وبالرغم من خضوع دولتهم للسيطرة الرومانية سنة ١٠٦ للميلاد (Frösén et al. 2002) إلا أن حضارة البترا استمرت لقرون عديدة بعد ذلك، وقد كان للزلزال الذي ضرب المنطقة سنة ٣٦٣ للميلاد أثره المدمر على البترا (Frösén et al. 2002)، وإن كانت الشواهد الأثرية المكتشفة مؤخراً أثبتت وجود استمرار للاستيطان البشري في البترا بعد هذا الزلزال استمرت حتى القرن السادس الميلادي وإن كان بصورة أقل، وقد اتخذ شكلاً مختلفاً من النشاط السكاني الذي يبدو أنه أصبح يركز

العربية. وهذا ما سنحاول الإجابة عليه من خلال هذا البحث.

وقبل الخوض في غمار هذا البحث لابد أن نشير إلى أن المصادر العربية التاريخية التي أرخت لبدایات الفترة الإسلامية ولما سبقها من التاريخ العربي قد ابتدأت في القرن الثاني الهجري والذي يعتبر محمد بن إسحق أهم مؤرخيه والذي اختص (كغيره من المؤرخين) في توثيق السيرة النبوية الشريفة وما تلاها من أحداث إلى أن يصل للزمان الذي عاش فيه، ويعتبر ابن اسحق صاحب كتاب (سيرة رسول الله) هو شيخ المؤرخين العرب وأقدمهم، وإن سبقه بعض من كتب في التاريخ في القرن الأول الهجري كسليم بن قيس الهلالي وعبيد بن شربه وعلاقة بن كرشم، إلا أن ابن إسحق يعتبر المرجع الرئيسي لمن عاصره ولمن جاء بعده من المؤرخين، وهو الذي ولد سنة ٨٥ للهجرة ٧٠٣م وتوفي سنة ١٥١ للهجرة ٧٦٨م، إلا أن كتابه هذا قد فقد ولم يصلنا منه إلا ما هذبه ولخصه عبد الملك بن هشام والمعروف بابن هشام المتوفى سنة ٢١٨ هجري ٨٣٣م صاحب ما يعرف بسيرة ابن هشام، وباستعراض بسيط لأبرز المؤرخين الأوائل للتاريخ العربي الإسلامي نذكر:

هشام بن محمد الكلبي والمعروف بالكلبي والمولود سنة ١١٠ هجري ٧٢٨م والمتوفى سنة ٢٠٤ هجري ٨١٩م، كذلك محمد بن عمر الواقدي المولود سنة ١٣٠ هجري ٧٤٧م والمتوفى سنة ٢٠٧ هجري ٨٢٣م، ومحمد بن علي المدائني المولود سنة ١٣٥ هجري ٧٥٢م والمتوفى سنة ٢٢٥ هجري ٨٤٠م، ومحمد بن سعد صاحب كتاب الطبقات الكبرى والمتوفى سنة ٢٣٠ هجري ٨٤٥م، وخليفة بن خياط المتوفى سنة ٢٤٠ هجري ٨٥٤م، واحمد بن اسحق اليعقوبي المتوفى سنة ٢٨٤ هجري ٨٩٧م واحمد بن يحيى البلاذري المتوفى سنة ٢٩٧ هجري ٩١٠م، ومحمد بن جرير الطبري المؤرخ الأشهر في التاريخ العربي الإسلامي والمولود سنة ٢٢٤ هجري ٨٣٩م والمتوفى سنة ٣١٠ هجري ٩٢٣م.

هؤلاء بشكل موجز أهم من كتب ووثق التاريخ العربي الإسلامي في بداياته، ومن جاء منهم لاحقاً أخذ ممن سبقه وأضاف عليه ولكل منهم طريقته في تحرير الدقة وتحقيق الرواية والسند حسب المعايير الخاصة به والتي كانت تختلف من شخص لآخر، فكان لتوثيق ما ورد من أخبار السيرة النبوية النصيب الأكبر من كتابات أوائل المؤرخين، حيث كان علم نقل الحديث في بداياته ومحاوله تتبع سند الرواية التي تخص السيرة النبوية قدر الإمكان وإن كانت الكثير من الأسانيد قد تم مراجعتها وتدقيقها في وقت لاحق عندما توسع علم الحديث وعلم الجرح والتعديل، أما فيما يختص بالتاريخ العربي قبل الإسلام فقد تناقلته الرواية الشفهية، والتي أخذت الطابع القصصي في بعض الأحيان وشابها بعض من عدم الدقة التي قد تصل إلى مرحلة الأساطير أحياناً أخرى (الحوت ١٩٥٥).

وبمتابعة بسيطة لأهم التواريخ الخاصة بالسيرة النبوية الشريفة نلاحظ أن مولد الرسول صلى الله عليه وسلم كان بمكة المكرمة في حدود سنة ٥٧١م وكانت بعثته في حدود سنة ٦١٠م، وهجرته سنة ٦٢٢م، ووفاته صلى الله عليه وسلم سنة ٦٣٢م، في حين أن أهم وأوائل الكتابات التاريخية التي تناولت التاريخ العربي الإسلامي قد ابتدأت كما

أشرنا سابقاً في القرن الأول والثاني للهجرة أي بفترة قريبة نوعاً ما من الأحداث الرئيسية في التاريخ الإسلامي وهي بعثة الرسول الكريم وهجرته ووفاته ومرحلة الفتوحات الإسلامية المبكرة.

وبالعودة إلى المحور الرئيسي في بحثنا هذا وهو البترا والأنباط فنجد أن هذه الدولة العربية التي بلغت أوجها في القرن الأول قبل الميلاد والقرن الأول الميلادي قد مرت كما هو حال الكثير من الدول بمرحلة النشوء ثم القوة والتمدد ثم الضعف والإضمحلال فالتلاشي، فكان خضوعها للسيطرة الرومانية سنة ١٠٦م من الأحداث الهامة على هذه الدولة العربية، إضافة إلى بروز دولة تدمر كقوة تجارية في المنطقة على حساب النفوذ النبطي، إلا أن الزلزال الذي ضرب المنطقة سنة ٣٦٣م كان له الأثر الأكبر فيما يبدو على حضارة البترا ليس فقط بتدمير بعض المنشآت المعمارية بل بتأثيره على النظام المائي الذي اشتهرت به البترا وكان اعتمادها عليه في تلك الصحراء القاحلة وتدميره للقنوات المائية في أجزاء واسعة من المدينة، إلا أن الدلائل الأثرية تشير إلى استمرار الوجود السكاني في المدينة حتى منتصف القرن السادس الميلادي ولو بصورة أقل إلا أن ما تبقى من الحضارة النبطية في البترا لم يستطع الصمود أمام ضربة زلزالية أخرى ضربت المنطقة سنة ٥٥١م (Niemi 2009) والتي يبدو أنها قد أنهت ما تبقى من وجود مدني في مدينة البترا. وعند العودة إلى المصادر العربية الإسلامية من كتب السير والمغازي والتي رصدت الأحداث الهامة في التاريخ الإسلامي وخاصة ذكر المواقع والأماكن الجغرافية خلال الغزوات لا نجد ذكراً لمدينة البترا، فهذا هو الجيش الإسلامي يتحرك في السنة الثامنة للهجرة/٦٢٩م في غزوة مؤتة منطلقاً من المدينة المنورة نحو بلاد مؤاب متوقفاً في معان التي لا تبعد أكثر من ٤٠ كم عن البترا دون أن يكون هناك أي ذكر لمدينة البترا في كل كتب السيرة التي تناولت تلك الغزوة، وفي السنة التاسعة للهجرة/٦٣٠م ينطلق الرسول صلى الله عليه وسلم في غزوة تبوك ويتوقف هو وأصحابه في منطقة الحجر (الطبري ٣: ١٠٥) قبل أن يبلغ تبوك «وهي المدينة النبطية المعروفة بمداين صالح» ثم يكمل الجيش الإسلامي طريقه نحو تبوك تاركاً تلك البقعة الخالية من السكان، ولدى وصوله تبوك في شمال الجزيرة العربية يقيم بها بضع عشرة ليلة، حيث جاء يحنة بن رؤبة صاحب أيلة إلى رسول الله وصالحه وأعطاه الجزية وكذلك صالح أهل جرباء وأذرح وأعطوا الجزية وكتب رسول الله لكل كتاب، كما صالحه أكيدر دومة الجندل على الجزية (الطبري ٣: ١٠٩) وبالرغم من وقوع هذه الأحداث ضمن مناطق جغرافية قريبة من البترا إلا أن كل كتاب التاريخ الذين تحدثوا عن هذه الغزوة لم يوردوا بها أي ذكر للبترا، مما يرجح فرضية أن البترا في تلك الفترة كانت خالية أو شبه خالية من التواجد السكاني بصفته المدنية على الأقل. أما بالنسبة للفتوحات الإسلامية التي أعقبت وفاة الرسول الكريم في السنة ١١ للهجرة/٦٣٢م والتي انطلقت في بدايتها من المدينة المنورة باتجاه العراق وبلاد الشام، والتي أسهبت كتب السير في الحديث عنها من حيث التواريخ وقادة الجيوش والفِرَق وتحركاتها والأماكن التي مرت

أحمد لاش: الأنباط والبترا في المصادر العربية

من مصادر التاريخ الفارسي، ولعل احتضان الدولة العربية الإسلامية للكثير من العناصر الفارسية في جسمها ونشاط أعمال الترجمة من الفارسية إلى العربية قد أتاح الفرصة للتعرف على ما ورد في التاريخ الفارسي المكتوب والذي كانت أخبار تدمر جزءاً منه بشكل أو بآخر وإن خالطها شيء من عدم الدقة، وهذا ما قد لا يكون قد توفّر عند الإشارة إلى البترا أو الأنباط، ولكن ألا يوجد ذكر للأنباط في المصادر العربية؟ لقد تناول الكثير من الباحثين البحث في مسمى (النبط) وتاريخه وجذوره وما يعرف بنبط العراق أو نبط السواد ونبط الشام (زيدان ١٩٢٢) وهذا موضوع لا يتسع مجال بحثنا في الخوض فيه، أما لفظ (النبط) في اللغة العربية فيورده ابن منظور في كتابه لسان العرب انه «الماء الذي ينبط من قعر البئر إذا حفرت» «والنبط إنما سُمي نبطاً لاستنباطهم ما يخرج من الأرضين»، ومما لاشك فيه أن النظام المائي الذي استخدمه الأنباط هو من السمات المميزة في حضارتهم، كما يورد ابن منظور قولاً لعمر بن الخطاب «تمعدوا ولا تستنبطوا أي تشبهوا بمعد ولا تشبهوا بالنبط» (ابن منظور ٢٠٠٣)، أما جورج زيدان فيورد ما ذكره الأصفهاني أن «الأرمانيون نبط الشام والأردوانيون نبط العراق» (زيدان ١٩٢٢)، في حين يصف القريري النبط بأنهم «بقايا الصابئة» (القريري ١٠٥: ١)، أما محمد بن سعد صاحب كتاب الطبقات الكبرى والمتوفى سنة ٢٣٠ للهجرة/٨٤٥م فيذكر في الجزء الأول من كتابه الطبقات الكبرى، صفحة ٣١ أن هاشم والد جد الرسول محمد صلى الله عليه وسلم التقى بزوجه سلمى بنت عمرو من بني النجار في سوق النبط وهو في طريقه إلى المدينة فتزوجها وأنجب منها ابنه شيبه والمعروف بعبد المطلب، وهو جد الرسول الكريم الذي كفل الرسول صلى الله عليه وسلم وهو طفل بعد وفاة والده عبدالله. وإذا حاولنا تتبع تاريخ هذه الحادثة فإننا نكون أقرب للعقد الأول من القرن السادس الميلادي، أي الفترة التي كانت ما تزال تشهد تواجداً نبطياً في البترا حسب ما دلت عليه مكتشفات كنيسة البترا الأثرية (Frösén et al. 2002)، فهل كان الأنباط في تلك الفترة ما زالوا يمارسون أصناف التجارة ليكون لهم سوق بالقرب من المدينة يعرف بسوق النبط.

ولكن بالإضافة إلى كلمة «النبط» هل وردت كلمة «الأنباط» بالشكل الصريح في المصادر التاريخية العربية؟ يذكر ابن خلكان في الجزء السادس من كتابه «وفيات الأعيان»، في الصفحة رقم ٣٠٤ ما يرويه على لسان الحسن البصري عندما عاب خروج يزيد بن المهلب على بني أمية فاتهمه الناس أنه يناصر بني أمية فكان أن نفى ذلك وأنه لا يمكن أن يناصر بني أمية على حد قوله وهم الذين استحلوا المدينة المنورة «حتى أن الأقباط والأنباط ليدخلوا على نساء قريش فينزعون خمورهن عن رؤوسهن وخالخلهن من أرجلهن وسيفهم على عواتقهم»، وهذه الرواية ذكرها الطبري أيضاً على لسان الحسن البصري في الجزء السادس من تاريخه بما نصّه «أليس هم الذين أحلوا حرم رسول الله صلى الله عليه وسلم يقتلون أهلها ثلاثة أيام وثلاث ليالي، قد أباحوها لأنباطهم وأقباطهم يدخلوا على نساء قريش فينزعون خمورهن.....» (الطبري ١٩٦١: ٥٨٨).

بها، وبالأخذ بعين الاعتبار أن شرق الأردن كان مسرحاً لأهم المعارك في الفتوحات الإسلامية وقد دُكرت الكثير من المناطق به إلا أن البترا لا يوجد لها ذكر في أي من تلك الأحداث.

فإذا كانت تلك المصادر قد صمتت عن ذكر البترا، فهل صمتت أيضاً عن ذكر الأنباط؟

لا شك أن الأنباط هم من القبائل العربية (زيدان ١٩٢٢) ووجودهم في شمال الجزيرة العربية يعني إشتراكهم مع سكان شبه الجزيرة العربية في الثقافة واللغة والديانة، فالإله الرئيسي للأنباط (ذو الشرى) كان من الآلهة ذات المكانة في شبه الجزيرة العربية وقد صنفه سليم الحوت تحت باب آلهة الأماكن (الحوت ١٩٥٥)، ويذكر هشام الكلي أنه كان لبني الحارث بن يشكر بن مبشر من الأزد صنم يُقال له ذو الشرى وله يقول أحد الغطاريف:

إذن لحللنا حول ما دون ذي الشرى وشجّ العدى منا خميس
عرمرم (الكلي ١٩٢٤). وقد ذكرت الآلهة المشهورة في شبه الجزيرة العربية مثل مناة واللات وهبل في نقوش مدائن صالح النبطية (جوسن وسفنيك ١٩٩٧)، كما ورد اسم (اللات) بكثرة في نقوش وادي رم (زيادين وفارس ١٩٩٨) وفي نقوش البترا ظهرت اللات والعزى بأسماء مختلفة (Starcky et al. 1976/68). فبالرغم من القرب الجغرافي والإشتراك الثقافي فإنه من الغريب أن يغيب ذكر البترا وملوك الأنباط في المصادر العربية المبكرة، في حين نجد بها ذكراً يكاد يكون تفصيلياً لتدمير وملوكها مثل أذينة وهوب اللات والملكة زنوبيا التي عرفت بالمصادر العربية بإسم (الزباء) وحكمت مملكة تدمر خلال النصف الثاني من القرن الثالث الميلادي، فكيف لا تُغفل المصادر العربية الحديث عن تاريخ تلك الدولة التدمرية التي تقع على ضفاف الفرات والتي تقرب الفترة الزمنية الفاصلة بينها وبين أوائل المؤرخين العرب من الخمسة قرون، في حين نجدها صامته عن البترا وتاريخها! قد يكون جواب ذلك هو ما نقله الطبري عن هشام الكلي «أنه استخرج أخبار العرب وأنساب آل نصر بن ربيعة ومبالغ أعمار من عمل منهم لآل كسرى وتاريخ نسبهم من بيع الحيرة وفيها ملكهم وأمورهم كلها» (الطبري ١: ٦٢٨)، فمعظم ما تناقلته العرب عن التاريخ وأحداثه قبل الإسلام يدخل تحت بند التاريخ الشفهي غير المكتوب والذي قد يخالطه عدم الدقة في بعض الأمور والتهويل في بعضها الآخر، وقد يسقط ذكر أقوام بانتهاء كياناتهم، وهذا ما قد يكون حدث بالنسبة لذكر البترا والأنباط، خاصة إذا أخذنا بعين الاعتبار أن بداية التوثيق التاريخي في الحضارة الإسلامية العربية قد بدأت في القرن الثامن الميلادي أي بعد بداية أفول نجم دولة الأنباط وما لحق ذلك من تدهور لمكانة دولة الأنباط عقب زلزال ٣٦٣م، وما قد تكون شهدته المدينة من شبه خلو للتواجد المدني عقب زلزال ٥٥١م، فإننا نتحدث عن فجوة زمنية تمتد ما يقرب من القرنين على بداية التوثيق التاريخي وآخر مراحل التواجد النبطي المدني، أما بالنسبة لتدمير فيبدو أنها قد شهدت نوعاً من الإستمرار في التواجد السكاني - ولو ليس بالشكل الذي كانت عليه - حتى الفترات الإسلامية المبكرة. وبما أن العرب قد ورثوا الكثير

حيث زارها الملك الظاهر بيبرس سنة ٦٧٤ للهجرة/١٢٧٦م وهو في طريقه إلى الكرك وممر بقر النبي هارون وأبدى إعجابه بها، وقد أورد شهاب الدين النويري هذا الخبر في الجزء الثامن والثلاثون من كتابه «نهاية الأرب في فنون الأدب» في الصفحة ٩، كما أوردتها يوسف غوانمة في كتابه «التاريخ السياسي لشرق الأردن في العصر المملوكي» (غوانمة ١٩٨٢: ٦٩). كما أورد هذه الزيارة بالتفصيل الدكتور فوزي زيادين في مقال له (Zayadin.1982)

ولكن هل ورد اسم البترا كاسم مكان أو مدينة في المصادر الإسلامية المبكرة؟

في الواقع يرد إسم البترا في المصادر العربية القديمة كإسم مكان، فيذكر عبدالله البكري في من كتابه «معجم ما استعجم من أسماء البلاد والمواضع» عند ذكر مساجد الرسول صلى الله عليه وسلم عن ابن اسحق ما نصه «ومسجد بطرف البترا من ذنب كواكب» (البكري ١٩٨٣: ٦٦)، كما يذكر الطبري في الجزء الثاني من تاريخه اسم (البتراء) كمكان ممر به الرسول الكريم سنة ست للهجرة في طريق غزوته لبني لحيان بالقرب من المدينة المنورة (الطبري ١٩٦١: ٥٩٥)، وهي نفس الرواية التي ذكرها ابن هشام في الجزء الثاني من سيرته (ابن هشام ١٨٧٨: ١٦٤)، إلا أن وصف المكان وجغرافيته لا ينطبق على مدينة البترا المعروفة لدينا والتي تبعد عن هذا المكان مئات الأميال.

ومن الغريب أن لا نجد ذكراً لمدينة البترا الأثرية في المصادر العربية المبكرة والتي تحدثت عن تاريخ العرب وأسبغت في الوصف وذكر الأخبار فهل من المعقول أنهم كانوا يجهلون وجود هذه المدينة المميزة المنحوتة في الصخر والواقعة على حدودهم الشمالية والتي كانوا تحت سيطرتها في زمن من الأزمان، هل فعلاً غابت عنهم أخبارها حتى بعد أن أصبحت أطلالاً، وهم الذين يعبرون البلدان طولاً وعرضاً بتجارهم ولا يخفى عليهم مكان في بلاد الروم وفارس والحبشة وإفريقيا، فكيف يخفى عليهم مدينة منحوتة بالصخر مجاورة لهم، وكيف تكون مدينة الحجر معروفة لديهم في حين تخفى عليهم مدينة مثل البترا والتي تعتبر الحجر جزءاً من حضارتها.

في الحقيقة قد يكون من الصعب جداً أن تجد اسم البترا في المصادر العربية الإسلامية المبكرة، فالبترا كما هو معروف مصطلح يوناني يعني الصخر (زيدان ١٩٢٢) وقد أطلقه اليونان على البترا بناءً على لغتهم اليونانية وأعاد إحياءه بيركهارت عندما أعاد إكتشاف البترا سنة ١٨١٢ بناءً على المصادر اليونانية واللاتينية التي اعتمد عليها، ونحن الآن نستخدم هذا الاسم بشكل عفوي، فهذا المصطلح إذن لم يطلقه الأنباط على مدينتهم وبالتالي لم يستخدموه، فهم كعرب سيستخدمون الاسم الذي أطلقوه هم على مدينتهم وحسب لغتهم وهو نفس الاسم الذي يستخدمه بني جلدتهم من القبائل العربية الأخرى وبالذات في شبه الجزيرة العربية، والأمثلة على ذلك كثيرة فعمان أو ربة عمون التي بقيت لمئات السنين تسمى بالاسم اليوناني فيلادلفيا لم يتقبل أهلها من العرب أو إخوانهم في المنطقة والجزيرة العربية ذلك الاسم وظلوا يطلقون عليها إسم عمان

كما يرد ذكر الأنباط في صحيح مسلم في الباب (٣٢) المعنون بالوعيد الشديد لمن عذب الناس بغير حق، في حديث عن هشام بن حكيم بن حزام يحمل الرقم (٢٦١٣) حسب تصنيف مسلم ونص الحديث (عن هشام بن حكيم بن حزام رضي الله عنهما أنه مرّ بالشام على أناس من الأنباط، قد أقيموا في الشمس، وصُبّ على رؤوسهم الزيت، فقال ما هذا؟ قيل: يعذبون في الخراج، وفي رواية حبسوا في الجزية. فقال هشام: أشهد لسمعت رسول الله صلى الله عليه وسلم يقول: «إن الله يعذب الذين يعذبون الناس في الدنيا» فدخل على الأمير، فحدثه، فأمر بهم فخلوا) (مسلم ١٢١٠: ٢٠٠٦). كما ويورد الإمام النووي المتوفى سنة ٦٧٦ هجرية، هذا الحديث في كتابه رياض الصالحين من كلام سيد المرسلين تحت الرقم (١٦٠٦) ويُتبعه بعد أن يشير إلى أن الحديث رواه مسلم بعبارة («الأنباط» فالأحون من العجم)، أمّا عند شرحه للحديث وتفصيله لكلمة الأنباط، فيقول: (ويقال فيهم النبط بفتح أوله، هم قوم من العرب، دخلوا في العجم والروم، واختلطت أنسابهم، وفسدت أسنتهم، سمواً بذلك لمعرفتهم بأنباط الماء واستخراجها، لكثرة معالجتهم الفلاحة). (النووي: ١٢١٠). وقد يكون هذا أفضل توصيف عن مفهوم الأنباط لدى المؤرخين العرب الأوائل، قد يوضح ما التبس في بعض الكتابات العربية المبكرة عند تعريف الأنباط. وقد أيدت ذلك الإكتشافات الأثرية التي أوضحت مدى تأثير الأنباط بالحضارة اليونانية والرومانية من حيث طرز البناء واستخدام الأسماء والأحرف وحتى في تحوير بعض أسماء الآلهة.

هذه بعض الأمثلة على ورود مصطلح النبط أو الأنباط في المصادر العربية التاريخية، مما يؤكد لنا أن الأنباط ليسوا بالأغراب أو المجهولين عن المجتمع العربي في شبه الجزيرة العربية بغض النظر عن الاختلافات والتشعبات بين المؤرخين على توصيف وتعريف كل من أطلق عليه لفظ النبط أو الأنباط، ولكن ماذا عن ذكر البترا كمدينة أو كموقع في المصادر العربية؟ لقد أثبتت التنقيبات الأثرية في منطقة البترا وجود دلائل استيطان سكاني في مواقع متعددة خلال معظم الفترات الإسلامية وإن كانت نسبة ذلك الإستيطان متفاوتة من فترة إلى أخرى والتي غلب عليها الطابع الزراعي في بعض الفترات مثل مواقع الطيبة والنوافلة والصدقة (Sinibaldi 2011: 305-313) وكذلك موقع البيضا (Amr 2011: 305-313)، ومما لا شك فيه أن البترا قد شهدت مرحلة نزاع للسيطرة عليها في العصور الإسلامية المتوسطة «الفترة الأيوبية والفترة المملوكية» حيث عمل الفرنجة على اتخاذ بعض المواقع الاستراتيجية بها كقلاع عسكرية لهم لإتمام السيطرة على جنوب الأردن وهي التي تبعد حوالي ٣٠ كم من قلعة الشوبك، فظهرت بها القلاع الصليبية مثل قلعة الوعيرة وقلعة الحبيس (Vannini 2011) والتي لم يمض وقت حتى حررتها منهم جيوش صلاح الدين الأيوبي، حيث يذكر المقرئ في الجزء الأول من كتابه «السلوك لمعرفة دول الملوك» (المقرئ ١٩٩٧: ٢١٤) عند حديثه عن أحداث سنة ٥٨٤ للهجرة أن صلاح الدين قد بعث الأمير سعد الدين كمشه الأسدي محاصراً الكرك والشوبك وسلع حتى تسلمها مع عدة حصون هناك في رمضان. كما كانت البترا معروفة في الفترة المملوكية

أحمد لاش: الأنباط والبترا في المصادر العربية

دين عيسى عليه السلام وقد فرّوا من بطش قومهم وإختبؤوا في أحد الكهوف، فكان أن ضرب الله على أذانهم وأنامهم ثلاثمائة وتسع سنين ثم أفاقهم ليكونوا آيةً لمن بعدهم، ليجدوا أن الأجيال التي كانت تحاربهم وتكفر بالله وتعبد آلهة غيره قد ذهبت وبادت وجاء من بعدهم قوم يؤمنون بالله، وقد نزلت بهم سورة كاملة في القرآن الكريم وهي سورة الكهف، التي حثّ الرسول صلى الله عليه وسلم المسلمين على قراءتها كل يوم جمعة. أما في البحث عن معنى الرقيم فيورد الطبري في تفسيره لسورة الكهف عن ابن عباس أن الرقيم «وَادِ بَيْنَ عَسْفَانَ وَأَيْلَةَ دُونَ فِلَسْطِينَ وَهُوَ قَرِيبٌ مِنْ أَيْلَةَ» (الطبري ٢٠٠٠)، وقد أورد هذا أيضاً ابن كثير في تفسيره (ابن كثير ١٩٨٢). وأيلة كما نعلم هو اسم مدينة العقبة الحالية والتي تبعد عن مدينة البترا حوالي ١٠٠ كم. كما يورد الطبري عدة أقوال في تفسير الرقيم فيذكر الطبري عن قتادة أن الرقيم هو «الوادي الذي به أصحاب الكهف» كما يذكر عن ابن عباس قوله عن الرقيم «يزعم كعب أنها القرية» ويذكر عن الضحّاك أيضاً قوله «أما الكهف فهو غار الوادي والرقيم اسم الوادي»، وهذه الأقوال هي ما ذهب إليها معظم المفسرون. وفي نهاية السرد القرآني لقصة أصحاب الكهف يذكر القرآن الكريم ما اجتمع عليه أهل ذلك الزمان بعد أن اكتشفوا مكان أصحاب أهل الكهف وعرفوا ما لهم من فضل وكرامة وبعد وفاة هؤلاء الفتية، فقد أجمع الذين غلبوا على أمرهم أن يتم بناء مسجد عليهم، وهذا ما أخبر به القرآن الكريم في الآية رقم (٢١) من سورة الكهف (قال الذين غلبوا على أمرهم لنتخذن عليهم مسجداً). ولفظ المسجد ليس بالغريب عن اللغة النبطية فقد ظهر في النقوش النبطية في منطقة الحجر أو ما يعرف بمداين صالح (جوسين وسفينياك ١٩٩٧: ٢١١، اللوحة ٣٩).

فهل تكون البترا أو ما كان يعرف بالرقيم في ذلك الوقت، هي المكان المقصود بالنص القرآني، وهل الكهف الذي حدثت به معجزة هؤلاء الفتية هو أحد الكهوف الموجودة في منطقة البترا أو القريبة منها؟ فحسب الوصف القرآني يبدو أنه ليس بالبعيد عن التجمعات السكنية حيث كان يوجد قوم هؤلاء الفتية، ولهذا فقد طلبوا من أحدهم عندما أفاقوا أن يذهب ليشترى لهم الطعام دون أن يلحظه أهل المدينة حتى لا يعيدوهم في ملتهم كما هو مذكور في الآيات ١٩ و ٢٠ من سورة الكهف، إذن هم لم يذهبوا إلى منطقة أخرى بعيدة عن مدينتهم، قد تكون هذه النقطة جديرة بمزيد من البحث والتقصي، فهذه المعجزة تحظى بالإهتمام من أتباع الديانة المسيحية كما هو حالها بالنسبة لأتباع الديانة الإسلامية، وإن كان هناك بعض الاختلاف في التفاصيل المتعلقة بهذه المعجزة، خاصة أن مكان حدوثها كان محل جدل واختلاف بين كتّاب التاريخ عبر العديد من القرون، مع الأخذ بعين الاعتبار أن أعمال التنقيب التي قامت بها دائرة الآثار العامة برئاسة الدكتور رفيق الدجاني في منطقة ابوعلندا في عمان والتي تم اعتماد كهف الرجيب بأنه هو الكهف الذي حدثت به تلك المعجزة، كانت سنة ١٩٦٣ (الدجاني ١٩٦٤) أي قبل عام من اكتشاف النقش النبطي عند مدخل السيق (Starcky 1965).

في النهاية أود أن أشير إلى أن هذا بحث موجز اجتهدت به ما

دون أن يكثرثوا لما يطلق الغريب عليها من أسماء، حتى أنها وردت بأحد الأحاديث النبوية الشريفة بإسم عَمَان. إذن ماذا كان الاسم الأصلي أو النبطي للبترا؟ لقد ذهب البعض للقول بأن الاسم الأصلي للبترا هو السلع بناءً على ما أورده ياقوت الحموي في الجزء الثاني من معجم البلدان بأن السلع تعني «شقوق في الجبال واحدها سَلْع وسَلْع، وسلع حصن بوادي موسى بقرب بيت المقدس» (الحموي ١٩٥٧: ١٥٢٢). في الحقيقة أن موقع السلع معروف لدينا وهو في محافظة الطفيلة ومن المواقع المميزة الذي يشتهر بقلعته التي تحتوي على المسلة البابلية، كما أنه يوجد الكثير من المواقع التي يطلق عليها السلع في شبه الجزيرة العربية نظراً لأن هذا الاسم هو وصف لطبيعة جغرافية. لكن الاسم النبطي الأصلي الذي عرف به الأنباط مدينتهم من الطبيعي أن يكون مشار إليه في نقوشهم النبطية في مدينتهم، فكما توجد نقوش تشير إلى أسماء أشخاصهم وملوكهم وألهتهم فمن الطبيعي أن يكون هنالك نقوش تذكر اسم مدينتهم، ولقد كانت الفرصة سانحة للكشف عن أحد هذه النقوش عندما تعرضت مدينة البترا في شتاء ١٩٦٤ لكمية كبيرة من الأمطار شكّلت سيلاً كبيراً عند مدخل السيق ليكشف عن أحد هذه النقوش النبطية والذي قام بقراءته عالم الآثار الفرنسي جون ستاركي وقام بنشره في حولية دائرة الآثار العامة (Starcky 1965: 43-49)، والذي يظهر نصّه بوضوح حيث تشير الكتابة إلى الاسم القديم للبترا وهو (رق م و) (رقمو) حيث يتحدث النقش عن شخص يدعى تيمو والذي كتب ذلك النقش تكريماً لابنه بالتبني (أو خادمه) بيترايوس من رقمو والذي مات ودفن في جرشو. ويؤرّخ ستاركي هذا النقش للفترة بين سنة ١٠٠-٥٠ م. وقد ساعدني في قراءة هذا النقش والمقالات المنشورة عنه باللغة الفرنسية الدكتور كريستيان أوجيه مشكوراً. وقد اتفق مع ستاركي في قراءته وترجمته لهذا النقش معظم علماء الآثار بما فيهم الدكتور فوزي زيادين وبالذات فيما يتعلق بالاسم النبطي للبترا وهو (رقمو) أما اسم المكان الثاني وهو (جرشو) فيرجّح ستاركي بأنه مدينة جرش في حين يرجّح فوزي زيادين بأنه في شمال الجزيرة العربية قرب الحدود الأردنية.

فهل ورد إسم (رقمو) أو ما يقابله في لهجات شبه الجزيرة العربية وهو (رقيم) في المصادر العربية الإسلامية؟ يورد الإصطخري في كتابه المسالك والممالك أن «الرقيم» مدينة بقرب البلقاء وهي صغيرة منحوتة بيوتها وجدرانها بالصخر كأنها حجر واحد» (الإصطخري ١٩٣٧: ٦٤). والقرآن الكريم الذي أنزله الله بلسان عربي مبين لهداية الناس وعبادة الله الواحد الأحد بدلاً عن الآلهة الكثيرة التي كانت تعبد من دونه وخاصة لدى العرب، عمل على ترويب العرب وترغيبهم ومخاطبتهم بلسانهم وتذكيرهم بأقوام معروفة لديهم وذكر ما أل إليه حالهم كقوم عاد وثمود وذكر لهم أسماء مناطق يعرفونها كالبحر ومدين وسبأ وبابل وسيناء وغيرها فهل ورد به اسم الرقيم؟ عند العودة إلى القرآن الكريم نجد أنه يرد اسم الرقيم في الآية رقم (٩) من سورة الكهف (أم حسبت أن أصحاب الكهف والرقيم كانوا من آياتنا عجباً) والتي تبدأ بها قصة أصحاب الكهف، هؤلاء الفتية المؤمنون والذين يجمع المفسرون أنهم كانوا على

استطعت لأتتبع فيما إذا ورد ذكر أو إشارة عن البترا أو الأنباط في المصادر العربية التاريخية بصورة أو بأخرى وقد يكون جانبي الصواب في جانب وحالفني في جانب، ولكنني أريد أن أشير إلى أنه إذا جانبي الصواب فهو من عند نفسي وإن أصبت فهو بتوفيق من الله عز وجل. وأترك الحكم على ما ورد في هذا البحث للقارئ الكريم.

المصادر والمراجع

- القرآن الكريم
الأزرق، محمد بن عبدالله
٢٠٠٣ أخبار مكة وما جاء فيها من الآثار. تحقيق عبد الملك بن عبدالله، مكتبة الأسد.
الإصطخري، إبراهيم بن محمد
١٩٣٧ المسالك الممالك. مطبعة بريل. ليدن.
الأفغاني، سعيد
١٩٩٣ أسواق العرب في الجاهلية والإسلام. الطبعة الرابعة، دمشق.
ابن خلكان، أحمد بن محمد
وفيات الأعيان وأنباء أبناء الزمان. تحقيق إحسان عباس. دار صادر، بيروت.

- ابن سعد، محمد
١٢٢١ هجري الطبقات الكبرى. تحقيق إدوارد سحو. مطبعة بريل، ليدن.
ابن كثير، عماد الدين
١٩٨٢ تفسير القرآن العظيم. دار المعرفة للطباعة والنشر، بيروت.
ابن منظور، محمد بن مكرم
٢٠٠٣ لسان العرب. دار صادر، لبنان.
ابن هشام، عبد الملك
١٨٧٨ السيرة النبوية. مطبعة بولاق، القاهرة.
البكري، عبدالله
١٩٨٣ معجم ما استعجم من أسماء البلاد والمواقع. تحقيق مصطفى السقا، عالم الكتب، بيروت.
الحموي، ياقوت
١٩٥٧ معجم البلدان، الجزء الثالث. دار صادر للطباعة والنشر، بيروت.
الحوت، محمود سليم
١٩٥٥ في طريق الميثولوجيا عند العرب.
الدجاني، رفيق
١٩٦٤ اكتشاف كهف أهل الكهف. مؤسسة المعارف، بيروت.
زيدان، جورج
١٩٢٢ العرب قبل الإسلام/ الطبعة الثانية، مطبعة الهلال، القاهرة.
الطبري، محمد بن جرير
٢٠٠٠ جامع البيان في تأويل القرآن. تحقيق أحمد محمد شاكر، مجمع الملك فهد لطباعة المصحف الشريف.
١٩٦١ تاريخ الرسل والملوك. تحقيق محمد أبو الفضل إبراهيم. دار المعارف، مصر.

- غوانمة، درويش
١٩٨٢ التاريخ السياسي لشرق الأردن في العصر المملوكي. دار الفكر للنشر والتوزيع، عمان.
الكلبي، هشام بن محمد
١٩٢٤ الأصنام. تحقيق أحمد زكي باشا، الطبعة الثانية. مطبعة دار الكتب المصرية، القاهرة.
المريزي، أحمد بن علي
١٩٩٧ السلوك لمعرفة دول الملوك. تحقيق محمد عبد القادر عطا. دار الكتب العلمية، بيروت.
النويري، شهاب الدين
نهاية الأرب في فنون الأدب. مكتبة المحاكم الشرعية السنية، لبنان.
النووي، يحيى
رياض الصالحين من كلام سيد المرسلين. المكتبة العصرية، بيروت.
النيسابوري، مسلم
٢٠٠٦ صحيح مسلم. تحقيق. نظر بن محمد الفاريابي. دار طبية.
الهمداني، الحسن بن أحمد
١٨٨١ صفة جزيرة العرب. مطبعة بريل، ليدن.

Bibliography

- Amr, K. and al-Momani, A
2011 Villages of the Early Islamic Periods in the Petra Region. Le Proche- Orient de Justinien aux Ab- bassides Bibliothèque de L'antiquité tradive 19. Paris.
Frosén, J. et al.
2002 The Petra Papyri. Vol (I). ACOR.
Niemi, T. et al.
2009 Evidence of Nabataean occupation at Qasr at- Tilah. ADAJ 53: 108-113.
Sinibaldi, M. and Tuttle, C.
2011 The Brown University Petra Archaeological Proj- ect: 2010 Excavation at Islamic Bayda. ADAJ 55: 431-450.
Starcky, J.
1965 Nouvelles Steles Funeraires A Petra. ADAJ 10: 43-49.
Starcky, J. et al.
1967/68 The Temenos Inscriptions. ADAJ 12/13: 30-49.
Zayadine, F. and Fares, S.
1998 Tow North-Arabian Inscriptions from the Temple of Lat at Wadi Iram. ADAJ 42: 255-258.
Zayadine, F.
1982 Caravan Routes Between Egypt and Nabataea and the Voyage of Sultan Baibars to Petra in 1276. SHAJ II: 159-174.