STUDEIS IN THE HISTORY
AND ARCHAEOLOGY
OF JORDAN
XIII

المملكة الأردنية الهاشمية
رقم الإيداع لدى دائرة المكتبة الوطنية
(٢٠٠٤/٥/١١١٩)

٥٦٥,٠٣٩

Jordan Department of Antiquities
Studies in the History and Archaeology of Jordan
Amman: The Department, 2019.
Vol. XIII.
Deposit No.: 1119/5/2004.
Descriptors:\Jordanian History \
Antiquities \\ Studies \\ Archaeology \
\ Conferences \

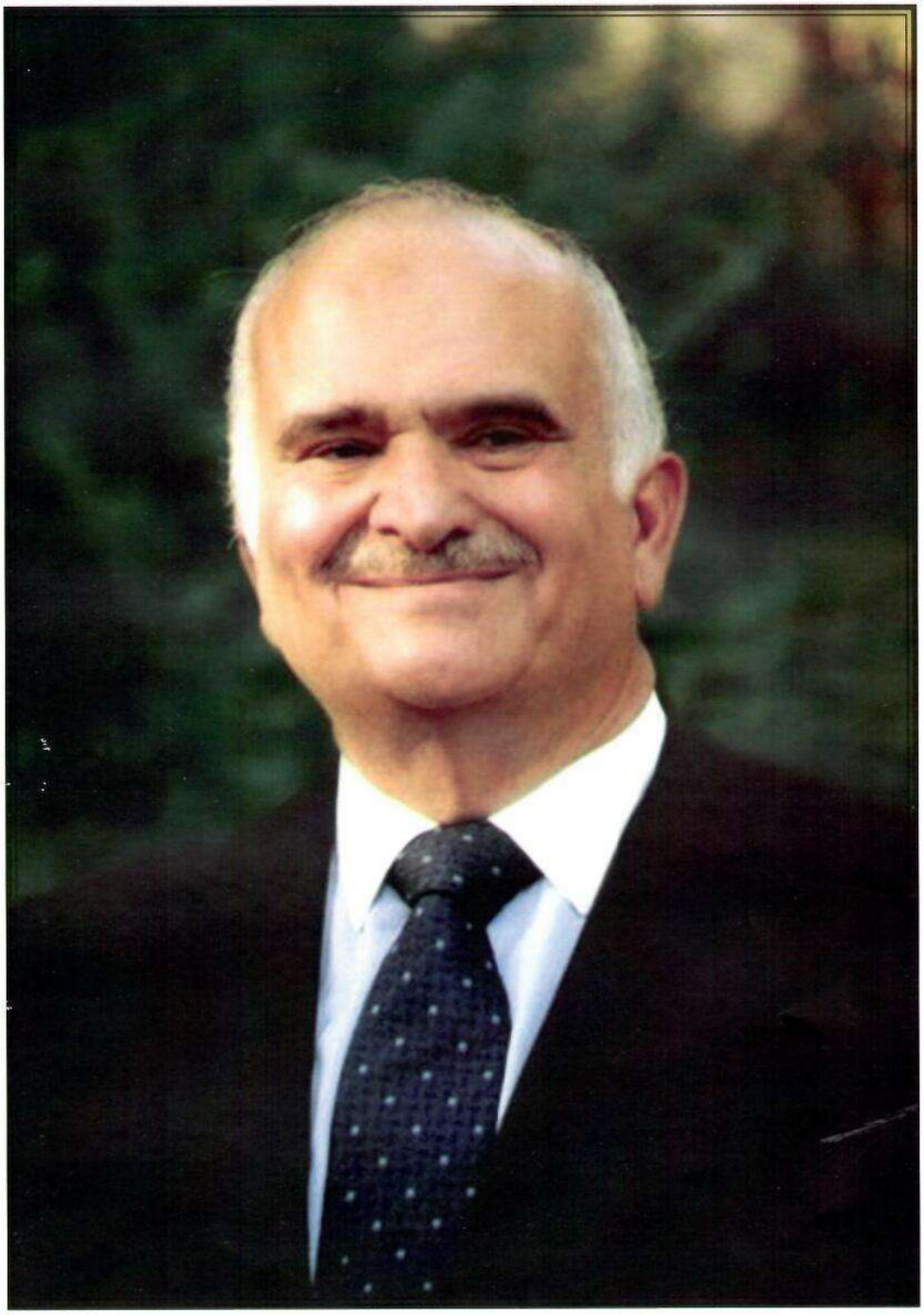
* تم إعداد بيانات الفهرسة والتصنيف الأولية من قبل دائرة المكتبات الوطنية

STUDEIS IN THE HISTORY AND ARCHAEOLOGY OF JORDAN
XIII

Department of Antiquities
Amman- Jordan

HIS MAJESTY KING ABDULLAH THE SECOND IBN AL-HUSSEIN
OF THE HASHEMITE KINGDOM OF JORDAN

HIS ROYAL HIGHNESS PRINCE
AL-HUSSEIN BIN ABDULLAH THE SECOND



HIS ROYAL HIGHNESS PRINCE
EL-HASSAN BIN TALAL

THE HASHEMITE KINGDOM OF JORDAN

STUDEIS IN THE HISTORY AND ARCHAEOLOGY OF JORDAN XIII

Studies in the History and Archaeology of Jordan
Published by the Department of Antiquities, P.O.Box 88, 'Amman 11118 Jordan

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STUDIES IN THE HISTORY AND ARCHAEOLOGY OF JORDAN XIII: ETHICS IN ARCHAEOLOGY

Contents

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

System of Transliteration from Arabic

Consonents

ء	' *(except where initial)*	ض	ḍ
ب	b	ط	ṭ
ت	t	ظ	dh
ث	th	ع	ʿ
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
ـة ة	a *or* at	ـه ه	a *or* ah

Long Vowels

ا، ى	ā
و	ū
ي	ī

Short Vowels

ـَ	a
ـُ	u
ـِ	i

Common Nouns

تَلّ	Tall	دَيْر	Dayr
جَبَل	Jabal	عَيْن	ʿAyn
خِرْبَة	Khirbat	وادي	Wādī
جُرْف	Jurf	غَوْر	Ghawr

THE INTERNATIONAL CONFERENCE ON THE HISTORY AND ARCHAEOLOGY OF JORDAN

Conference	*Theme*	*Venue*	*Dates*
I	The History and Archaeology of Jordan from the Earliest Prehistoric Times to the End of Ottoman Period	University of Oxford Oxford - UK	25-31 March 1980
II	Jordanian Environment: Geographical and Historical	Department of Antiquites Amra Hotel Amman - Jordan	4-16 April 1983
III	Trade, Communications and International Relations througout the Ages	University of Tubingen Tubingen - Germany	6-12 April 1986
IV	Sites and Settlement in Jordan	University of Lyons Lyons - France	30 May - 4 June 1989
V	Art and Technology throughout the Ages	University of Science and Techonology Irbid - Jordan	12-17 April 1992
VI	Landscape Resources and Human Occupation in Jordan throughout the Ages	University of Turin Turin - Italy	5-10 June 1995
VII	Jordan by the Millenia	University of Copenhagen Copenhagen - Denmark	12-19 June 1998
VIII	Archaeological and Historical Perspectives on Society, Culture and Identity	The University of Sydney Sydney - Australia	9-13 July 2001
IX	Cultural Interaction through the Ages	Al-Hussein Bin Talal University Petra - Jordan	23-27 May 2004
X	Crossing Jordan	George Washington University Washington, D.C. - U.S.A.	23-28 May 2007
XI	Changes and Challenges	Paris - France	7-12 June 2010
XII	Transparent Borders	Humboldt University Berlin - Germany	5-11 May 2013
XIII	Ethics in Archaeology	Princess Sumaya University for Technology Amman - Jordan	21-26 May 2016

HRH, Prince El-Hassan Bin Talal

Huge pleasure to welcome you all, those who have participated in our previous conferences, as well as those who are joining us for the first time, in this, the Centennial Year of the Arab Revolt in which we also honour the 70th year of Jordan's Independence; the Arab Renaissance and those moments in history when the giants of our shared human experience took up the torch of human dignity.

Today, particularly for the historians, archaeologists, conservation practitioners, policy-makers, researchers, and educators amongst you, the story may seem to be more of destruction, than creation or renaissance, yet our meeting itself is a reaffirmation of continuity, innovation and change. It is my hope that we shall emerge, somewhat wiser than we began; somewhat better equipped to learn from past experience and look for relevance to the present, and, however tentatively, to the future.

Your work is invaluable, the partnerships we have built over some 13 meetings and continued exchange outside of these, even more so. In the past we have spoken of many things, but today's theme: Archaeology and Ethics is indeed challenging.

Geopolitically, our position is pivotal to regional and international conflict, just as it is pivotal to conflict resolution as the middle ground in both geographical and political terms. And it is worth recalling that our underlying purpose, far from making archaeology the handmaiden of politics, or manipulating the truth for political gain, has always been the promotion of understanding between and within nations and states in the context of the promotion of human dignity within the mosaic of pluralism that characterises our region.

Some ten or so years ago, in the heady days of peace, we spoke of a new epoch, in which the assumptions and methods of the conflict era, were obsolete. Times have changed, as may have the major causes of conflict, but it remains clear that our region can have no future unless

the future is shared, and we have committed ourselves to facing this future in partnership. This means a commitment to bring to light, to explore and conserve our common heritage, for it is only through an understanding of common ground that true friendships can be forged.

Our shared heritage, tangible and intangible, is the symbol / repository of our collective memory; evidence of our evolving social identity and our inspiration for the future.

It gives back a voice to those now silenced, to tell of their achievements, of their disasters – natural or manmade, and of their beliefs and philosophies of life.

How often, contemplating some magnificent temple or simple landscape, littered with bumps and mounds that tell of possible dwellings or burial sites of previous ages, do we travel back in time and across the globe to see how different peoples have shaped our world and been moulded by it. Each of us, in our own different way, absorbs the intimations that speak of whole societies, of peoples, and their complex interactions; ways of life and thought that preceded our own, culminating through human adversity in a legacy that is the 21st century.

Some of this will be evidence-based, some pure imagination, yet ultimately our understanding of past cultures is essential to understanding ourselves, our homelands, past and present, and our common humanity.

Viewed in a humane light, far from being the afterthought in the "security basket", culture and cultural heritage acquire a power of their own.

Sadly, despite the UNESCO Convention for the Protection of Cultural Property in the Event of Armed Conflict (The Hague Convention of 1954) and the best efforts of the International Blue Shield Committee, we continue to see the terrifying scale of destruction of cultural and religious heritage, spiralling at times of conflict.

The images of the collapsing Bamiyan Buddhas in 2001 are emblematic of the high price of war and extremism on humankind's common cultural past. Whilst, for the current generation, that is witnessing one of the worst humanitarian disasters in history, no less than the destruction of Mesopotamia, the Levant and Arabia Felix.

When culture is an expression of creative diversity, it becomes the enemy of those who seek to impose a single world view, because culture is based on respect for the other. And diversity denies such intellectual terrorism.

It is vital therefore that the declarations of UNESCO and other global bodies reaffirm the point that the right to protect cultural diversity and heritage is a cultural and humanitarian right, a right of future generations and an important part of the panoply of human rights.

Our region, and the ancient city states of Mesopotamia, the Levant, Arabia Felix - the Fertile Crescent, are widely considered the 'cradle of civilisation'. This ancient world stands at the beginning of Western civilisation, behind the Ancient Greek and Roman worlds, behind the Abrahamic Faiths, and as such is central to the development of knowledge, its transmission further afield and to the history of civilisation.

It is here that man learned to live in cities, to develop a code of law, and to write epics, not to mention pioneering the invention of the 360 degree circle. Babylonian and Assyrian intellectual history, science, literature and religion likewise the creative, spiritual and cultural norms which flourished in the Levant / Ancient Mesopotamia influenced directly the 'enlightenment' in a direct expression of the route of ideas.

To date, too little emphasis has been given to the key role of culture for intercultural dialogue and sustainable development, or to the relationship between heritage and intercultural dialogue. Heritage, far from being solely a matter of ancient relics, is a dynamic vehicle, transferring knowledge across and within continents and inspiring respect and joy in past achievements and in human diversity.

We need to ensure that by designing international or regional projects dedicated to the promotion of heritage it regains not only its intrinsic value, but its stature as a tool for mutual understanding and appreciation, or in other words, for intercultural dialogue.

In this way, a continuum of the imagination can inspire, particularly younger generations, in the direct contacts that will give them insights into new realities, other than the customary stereotypes and imposed prejudices, particularly as regards man's inspirational and varied religious 'heritage'.

As conservation practitioners, policy-makers, researchers, and educators in the field, beyond the considerable practical challenges you face on a daily basis the ethical dilemmas facing archaeology today must be given priority.

The issues for consideration include relations with indigenous peoples; the professional standards and responsibilities of researchers; the role of ethical codes; the notion of value in archaeology; concepts of stewardship and custodianship; the meaning and moral implications of 'heritage'; the question of who 'owns' the past or its interpretation; the trade in antiquities; the repatriation of skeletal material; and the treatment of the dead – the list goes on.

These are complex questions, but perhaps a starting point is simply to recognise in a spirit of respect and humility, that no single definition of the truth is universally accepted. Whilst there may be different cultures in the world today, all have contributed to universalism and the values that we share today have a sound basis in many different traditions. Our common humanity must be our touchstone as we learn to live with multiple perceptions of the truth.

As inhabitants of this 'global village' to whom after all cultural heritage belongs, we all need to become involved in the process of the 'preservation' of cultural heritage through enriching experiential programs that safeguard heritage, preserve cultural identity and foster community sustainability.

In addition to the Silk routes, the Spice routes, and the Pilgrimage routes, the Routes of Creative Ideas are part of our cultural heritage. Only through positive engagement, dialogue and action can we realise our potential at all levels of responsibility.

The changing nature of the right to cultural heritage affects the forms of protection, access to and governance of cultural heritage. In this process, the focus is not only on positive law and jurisprudence, but also on soft-law rules, diplomacy and cultural cooperation as possible alternative devices for fostering inter-cultural dialogue and understanding.

On a different level, attention must be paid to producing innovative toolkits for the management and protection of our heritage, in particular

digitization processes with the development of databases, virtual museums, *etc.* In this way a contribution can be made towards the development of sustainable strategies for protecting and managing cultural heritage as a means to foster international and inter-cultural dialogue within the region.

Its outcomes will be twofold:

1. a ground breaking contribution to an interdisciplinary scholarship in this area, disseminated through various publications (articles, reports, workshops and monographs);
2. the elaboration of recommendations and guidelines – openly accessible via a new online platform – concerning best practice on the use of cultural heritage for the benefit of states and communities and individuals,

Cultural heritage can only be safeguarded in the long term if the right scientific, organizational and infrastructural conditions exist at national and international level.

Our shared heritage, tangible and intangible, cuts across boundaries and provides the basis of humanity's rich cultural diversity. Its preservation, the preservation of our human heritage, cannot be achieved by a handful of committed individuals, but is dependent on each and every one of us.

It is in this light that I renew my call for the creation of a regional heritage entity or a heritage commission for the region – an agency tasked with progressively mapping and preserving the historical treasures in our region. We need a qualitative involvement and a cross-regional approach to preserve our world's heritage.

The Brazilian lyricist and novelist Paulo Coelho, tells us that

> *"Culture makes people understand each other better. And if they understand each other better in their soul, it is easier to overcome the economic and political barriers. But first they have to understand that their neighbour is, in the end, just like them, with the same problems, the same questions."*

We in Jordan are honoured to act as custodians of sites dating from the Neolithic period (Faynan) through Nabatean Petra – (which teaches us much about water conservation) to sites which sit in the landscape of religious memory for Muslims and Christians alike.

These great remnants of other ages enable us to explore our common roots and to share our stories with pilgrims and travellers from the global human family.

Our cultural history and its protection should be elevated above politics and crisis.

Cultural heritage belongs to no-one. It belongs to all.

It is the long thread that connects us all the way back to the beginning of mankind - and educates us about ourselves.

Aristotle advised that everything about humans, at a fundamental level, is a question of ethics. If globalisation is about a world to be bettered for all human beings, global governance means nothing without global ethics and a global code of conduct which can be contributed to and willingly practised by all. Right action has to have its roots in right knowledge. Let the knowledge and wisdom made available to us by you, my friends, and others in the field, inspire not only individual contemplation, but also individual actions towards an age of sanity in which we may build not only a new world order, but a new world attitude.

Thank you.

Dr. Monther Jamhawi

Your Royal Highness Prince El-Hassan Talal,
Your Royal Highness Princess Sumaya Bint El-Hassan,
Your Excellency Dr. Nidal Qatamine – Minister of Labor, Acting Minister of Tourism and Antiquities
Your Excellencies Mr. Akel Biltaji – Mayor of Amman,
Excellencies and Distinguished Guests,
Ladies and Gentlemen,
Good Evening...
أسعد الله مساءكم

It is very great honor to Welcome you YRH and our distinguished guests and colleagues today in our celebration of the opening of 13the International Conference on the History and Archaeology of Jordan. We thank you very much YRH for patronizing this event.

YRH

I am proud to stand before you YRH, and the presence of Her Royal Highness Princess Sumaya Bint El Hassan , to speak on behalf of all my colleagues at the DoA, Where I feel Like student at your school, the school that has been always fully supported by your guidance to take care and handle our responsibilities while building up effective partnership to safeguarding and promoting our heritage and history of Jordan, and this ICHAJ was one of your babies and ideas since 1980, and with your full support, interest and follow up, it became notable conference among all scholars and archaeologists working in our region.

YRH
Excellencies, Ladies and Gentlemen

I Found it very interesting to mention that the contributions of the foreign expeditions to the history & archaeology of Jordan started very early in Jordan by many travelers & explorers such as cetezen, Burckhardt & others, as the first Archaeological project was conducted in the years 1883-1887, by the British mission called the Palestinian Quarterly Found. This project was the gate for other colleagues to seek for better understating of the history & archaeology of Jordan, and

followed by many projects led by different missions coming from Italy, Germany, USA, France, Switzerland, Netherland, Denmark, Belgium, Australia, Spain, Sweden, Hungary, and many other international organizations like UNESCO, USAID, JICA & European Commission.

We at the DoA strongly believe that this participatory work with the different foreign missions is of great importance to preserve our archaeological sites and to ensure its sustainability to embody the vision of His Majesty King Abdullah II by enhancing the role of the Department of Antiquities to continue its historic role in preserving and protecting all heritage sites in the Kingdom.

YRH
Excellencies, Ladies and Gentlemen

In the last conference in May 2013 in Berlin, in your speech you addressed the theme "Ethics in Archaeology" to be the title of this conference, and since the then it has been proven that such theme is very much needed to be reminded of and focused on. The dramatic destruction and demolition of heritage sites by terrorists, the illegal excavations and vandalism and the intensive illicit trafficking and illegal trading of antiquities has reached the point where we need to rethink how to adopt and reactivate ethical procedures in the field of Archaeology. Therefore, We designed the poster of this conference to promote the importance of enlightment and awareness to show the details and share the responsibilities in safeguarding our heritage.

YRH
Excellencies, Ladies and Gentlemen

As you can see from the booklet of this conference, about 190 participants from 23 countries are participating in this conference and will be presenting their research results and their discoveries over the coming 5 days in 39 sessions. Presentations will be running on 3 parallel sessions in 3 main halls at PSUT and the RSS. And here please allow me YRH, TO PASS OUR sincere gratitude and appreciation to HRH Princess Sumaya Bint EL Hassan for her great and full support given to the DoA and this conference. In addition, a running exhibition of some projects will be there at PSUT and 3 workshops will be conducted on 3 hot subjects beside this conference; the World Summit of Sciences and its application to Archaeology, the Illicit Trafficking of antiquities

and the educational role NGOs and Universities in the protection of Heritage of Jordan. Furthermore, the proceeding book of ICHAJ 12 That was held in Berlin in 2013 will be distributed to its participants and will be displayed for others.

YRH

Excellencies, Ladies and Gentlemen

The organizing of this conference was shared and jointly carried out by the DoA, PSUT, and the JM teams. The coordination between all was fantastic to ensure the best success of this conference and to meet the high expectations of our valued participants. Last but not least, I would like to thank all my colleagues from the DoA, the JM and PSUT for their great efforts in organizing this conference and the following up all details, really without them we could not have it completed. I really appreciate all of them and ask them to forgive me for not having enough time mention them by names. But I shall say to all of them Thank you. I am proud of you.

I would to thank also all participants who insisted to be with us in this conference regardless their busy schedules. And special thanks to the scientific committee who spent a lot of time in reading and giving comments towards having it in better quality.

Finally, thank you YRH for being with us today and we wish all the best of success for this conference.

THANK YOU...

والسلام عليكم ورحمة الله وبركاته،،،

Studies in the History and Archaeology of Jordan (SHAJ), vol. 13:31-43.

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Cremation Burials in Jordan: A Regional Perspective

Summary

This is a regional review on the practice of cremation from the Neolithic to the Roman era in the light of latest excavations reports and research, more from a biological aspect. It showed that regionally, cremation was not a funerary practice, before the LBA. Hygienic factors possibly played a role in the regional widespread of practice during the IA. Cremation burials did not appear in Jordan before the Roman period. They were more frequent than previously perceived and reflected Roman/Hellenistic cultural influence and very likely practiced among the well to do section of the local population.

Introduction

This is a review and an update on the practice of cremation in Jordan from the early periods to the Roman era, with a regional perspective; reflecting the archaeological evidence in the light of human biology. One has to differentiate between accidental or intentional, sometimes destructive, burning of human bones and cremation as part of the funerary customs of a given community. Cremation is thus one method to handle the corpse of deceased individuals by their related persons shortly after death by incinerating the body (Primary Cremation) or what remained after the decay of the soft tissue (Secondary Cremation).

A number of studies were carried out to determine changes that occur to the bones in the process of cremation (*e.g.* Herrmann 1976; Whyte 2001; also Großkopf 2004: 8-26 for overview). These included changes to the colour, size, and shape influences by the organic and inorganic bone contents. Beside oxygen supply, temperature and time, the type of "fuel", and the body constitution of the deceased affect the incineration process (Holck 1987: 131-163). Despite slight differences, the studies showed that the yellow-white bones attain a brown/dark grey colour by 300 C°. Between 400-500 C° they become dark grey or black and slightly deformed. By 700-800 C° the bones become increasingly whitish with deformations including coiling, grid patterns, vertical, horizontal and elliptical fissures. At this point, fragmentation is slight and shrinkage reaches about 20%. Above 1000 C° the bones become chalky and brittle with pronounced deformation. Heat induced changes are not homogenous as different bones burn

differently (Comp. Hermann 1988: 577-580; Holck 1987: 144). The extent of fragmentation increases when the process is abruptly stopped. The burning of dry bones causes vertical cracks but no elliptical fissures nor coiled fragments (Hermann 1988; Großkopf 2004: 24). There is no information on the effect of lengthy exposure to heat or "slow" burning on bones.

Regional Occurrence from the Neolithic to Iron Age

The earliest cremation case was suggested to be tens of thousands years old (Browler *et al*. 2003). It was during the Neolithic period that cremation became practiced in different cultures in different continents (*e.g.* Reinhart *et al*. 2002; Scarre 2002; Meacham 2004). Until recently, claims of Neolithic cremations in the Near East and Egypt were made while citing (Childe 1945: 14), who in turn cited allegation (Dunand 1939).

Regionally, that is from the Syro-Palestinian coast to the Euphrates and excluding Jordan for the time being[1], the earliest cremations were reported from the Neolithic Tall al-Kerkh site in Northwest Syria (Tsuneki 2011: 84). Yet, the provided graphics revealed stronger burning of the secondary burials in the upper concentrations C6 than in the lower C5. Furthermore and aside from coloration, the burnt pits and their contents did not differ from those of non-burnt bone concentrations like C1 (comp. Tsuneki 2011: Fig 3; Tsuneki and Haydar 2011: 12-15). The presented information does not verify whether the burning was intentional or accidental. They might have been "tertiary cremations", at best.

Most authors suggested that cremations appeared in this region as early as the Early Bronze Age (EBA) (*e.g.* Biankowski 1982; Rosik 2001; Ilan 2002; Polcaro 2014). From the EBA to the Middle Bronze Age (MBA) cremations were reported in about 10 different sites, mostly cave burials. In Palestine, the earliest case was from Tall Jazzari's EBA-I cave tomb 2I, the so called "Crematorium" (Macalister 1911: 58-9, 74-6, 285-9, fig. 20). Accordingly, the cave was used as a burial place in two distinct periods. The later phase was represented by inhumations on the upper layer and in enclosures built in the artificially enlarged eastern part of the cave. The earlier phase is represented in a pile of ash and burnt semi-articulate human bones of some 20 adults and an unknown number of subadults on the cave's floor. The pile was about 30cm thickest at the western end diminishing eastwards in the other cave half and consisted of alternating white earth and black ash strata. These observations suggest that the bones were subjected to multiple, limited, and subsequent fires that probably did not exceed 300 C°. Aside from being fragmentary, no heat induced bone deformations were reported. This was reflected in the osteological analyses and conclusions made (Macalister 1911: 58-9). It appears that the fires were started by a later community in preparation to use the cave as a burial place, as indicated by the upper layer inhumations. The fires might have been intended as a hygienic measure (Bienkowski 1982: 87) to eradicate bad smell or intruding animals, *e.g.* rodents and reptiles. It is also very likely that the fires were used to query the cave tomb's eastern enlargement as indicated by the 2 feet of soft rock debris piled on the western part (Macalister 1911: 75). This fire-query technique was in use until recently in this region. A similar dated EBA-I cremation site was reported in cave tomb 94 in Jericho (Kenyon 1960: 16-26; Gallaway 1962: 117). Disarticulate and rearranged human skeletal remains of multiple individuals were found partly burnt below a layer of earth, rock chips and stones intermingled with pottery fragments. Above this, alternating layers of ash and small rocks were just below a reddish earthy fill. In the absence of osteological data, the stratigraphy indicates that the human bones below were affected or indirectly burnt by small fires

1. For cremations in Mesopotamia see, among others, reviews in Akkermanns 1989; Kreppner 2008:267; and Polcaro 2014:140-1.

above. It is very likely that those who started the fires above were unaware of the burials below. Though of a later period, Soltysiak (2008) reported on a double jar sub-adult burial form Tall Barra in NE Syria. The articulate skeleton was nearly burnt but the outer jar surface revealed no traces of fire. The upper layer was ashy. This lead to conclude accidental burning caused by multiple campfires above, as probably the case in Jericho's tomb 94. While the supposed cremation in Yāzūr (Ben Tor 1975) represents another similar case of unintentional burning, two other finds in the vicinity of Jaffa (Kaplan 1993: 521, 1473), as well as the EBA-II case at Tall Beit Yara (Maisler 1942) remain very questionable if not doubtful.

In Syria, the first case of cremation was reported from Tall Chuera in the North East. This EBA-III burial of 4-6 adults found enclosed in Kammer 5 of Steinbau 1 was suggested to be secondary partial cremations (Moortgat 1962: 35-43). The presented evidence indicates limited fire in a limited space where the burials were deposited. The disarticulation and burning might have been unintentional or random. Given the building's condition and other inhumations found earlier (Moortgat 1960), accidental burning should not be excluded so that the case of Tall Chuera cremation remains doubtful. In the island of Ebla on the Syrian coast the MBA cave tomb P.8680 revealed burnt secondary burials re-deposited "against the pit corner" (Mogliazza and Polcaro 2010). The burnt bones revealed longitudinal cracks only (Mogliazza 2017: Personal Communication) and light coiling can be observed (comp. Polcaro 2014: 148, fig. 2) indicating that the bones maintained some organic material when burnt. Furthermore, the temperature required to reach such bone deformations (at least 300-500 C°) would have left a substantial ash layer. This couldn't have been possible given the pit's limited space with limited oxygen flow to reach and maintain such high temperatures (s. a.). Hence, the possibility of a hygienic act (Polcaro 2014: 142) is doubtful. Though it is difficult to ascertain whether the burnings were secondary or tertiary cremations (Polcaro 2016: Personal Communication), suggested that the case of Tomb P.8680 was not a cremation and that the burning took place outside the tomb. As to early cremation cases from Lebanon, there is great uncertainty about the reports from the EBA-IV sites of Al-Houriye Cave (Beayno *et al*. 2002) and Magharet ash-Shatawi (Copeland and Wescombe 1966).

So far, the indications are that the above cases were random burnings of human bones, intentional or none, regardless of the above narrow difinition of cremation. There is no substantial evidence that cremation was part of the funerary customs of any regional community until the emergence of the LBA period. From the LBA through the Iron Age (IA), 14th /13th-6th century BC, cremation burials became increasingly widespread, though inhumation remained generally the rule. This was attested in tens of sites in Palestine, Lebanon, and Syria (TABLE 1). Similarities between the sites were observed, alongside local variations (Bienkowski 1982: 87; Tenu 2009: 85). Some had single, *e.g.* Yazur (Dothan 1961), while others revealed more than hundred cremations, *e.g.* Hama (Riis 1948) and Al Bass (Aubet 2010). Few were intra-mural, *e.g.* Tall Sheikh Hamad (Kreppner 2008: 265) but most were extra-mural in specified burial places, *e.g.* Tall Shuikh Fuqani (Tenu 2009). Variations in the practice included depositing the incinerated human remains in single (Tenu 2009) or double pottery urns (Aubet 2010) or even in a vertical pit, *e.g.* Er-Ruqqeish (Culican 1973).

The strong appearance in the LBA and expansion during the IA of cremation burials in this region lead to different attempts to explain such occurrences (*e.g.* Bienkowski 1982: 87; Aubet 2013: 79-80). Yet, the greater majority of scholars considered migration to be the primary factor (*e.g.* Gilmour 1995: 167-9; Ilian 2002). Cremation might have had an Anatolian origin (Gilmour 1995: 167; Lewartowski 1998: 138;

Table 1. A Random Listing of the Regional Cremation Burial Sites Dated from LBA through IA. Sites with a Degree of Uncertainty are Marked by (?).

Palestine	Syria	Lebanon
Tall Bayt Mersim ? (Albright,1938)	Tall Shiukh Fuqani (Tenu, 2009)	Al Bass (Tyre) (Aubet, 2010)
Jericho ? (Garstang, 1932)	Tall Sabi Abyad (Akkermans and Smits, 2008)	Khaldi (Saidah, 1966)
Yazur (Dothan, 1961)	Rasm at-Tanjara (Athanassiou, 1977)	Tambourit (Sidon) (Saidah, 1977)
Ras an-Naqura (Prausnitz, 1982)	Tall Khanzourah (Athanassiou, 1977)	Byblos (Salles, 1994)
‘Atlit (Johns, 1938)	Tall Mohammad Diyab (Sauvage, 2005)	Tall Rashidiyah (Doumet, 1982)
ar-Ruqqaysh (Culican, 1973)	Hama (Riis, 1948)	Tall ‘Arqa (Thalman, 1978)
Tall al-‘Ajjul (Petrie, 1932)	Tall Harriri (Mari) (Parrot, 1935)	Juya (Chapman, 1972)
Tall-Bira (Akko) (Alexandre and Stern, 2001)	Yunis (Woolley, 1939)	Khirbat Silm (Chapman, 1972)
Tall Dan (Hartal, 2006)	Tall Shaykh Hamad (Kreppner 2008)	Tambourit, Tyre (Seeden, 1991)
Tall Far’a (Fara) (Petrie, 1930)	Ras al-Bassit (Courbin, 1993)	Qasmiyah (Chapman, 1972)
	Ras Shamra ? (Schaeffer, 1962)	
	Sukas (Riis, 1979)	

Polcaro 2014: 144). Since ideas and techniques are significantly faster than genes (Harrison and Boyce 1975: 130), the supposition that the Aramaeans might have played a role in transmitting the idea in the region (Tenu 2009: 88) becomes considerable. Migration or not, one has to explain why local populations accepted and employed the new practice in their funerary rituals. Hygienic considerations were of the factors considered (*e. g.* Biankowski 1982: 87; Polcaro 2014: 143). There are a number of points that might emphasize the hygienic role, at least as a catalyst, in the regional spread of cremation burials during the IA. First, cremation and the separation of cemeteries from residential areas became more evident from the beginning of the IA (Comp. Reports in TABLE 1, *e.g.* Culican 1973; Tenu 2009: 89), even if some were intramural (*e.g.* Kreppner 2008: 265). Secondly, textual evidence, *e.g.* Assyrian correspondence from Tall Fekheriye in North Syria (Bartl and Bonatz 2013: 268), spoke of famine and human calamities (Disease) between 12th and 10th BC century.

Beside variations in burial methods between sites, latest studies indicated similarities in burials between the East and West Phoenicians, especially the absence of infant burials in their cemeteries (Gras *et al*. 1991: 127, 171)[2]. The West Phoenician infant cremations were often referred to as male child sacrifices. Studies were carried out (Schwarz *et al*. 2010, 2012) on the remains of 540 children from 348 urns. The analyses were based on a number of established osteological methods, such as the presence of Neonatal line, dental, and pelvic traits to deter-

2. There was no indication of infant cremation burials to be found in the osteological report (Conheeney and Pipe 1991) to support the suggested “tophet in Tyre” (Seeden 1991).

mine age and sex. The result revealed that 22% were of premature aborts and 16% of stillbirths, 38 of 70 examined iliac bones were probably of females (Schwarz *et al*. 2010: 8). Child mortality rates were similar to those of modern Tunisia. Child mortality is often related to infectious disease (bacterial and viral), which mostly leave no trace on the bones (Roberts and Manchester 1995: 9). The arguments brought by opponents to this study (*e.g.* Smith *et al*. 2011; Xella *et al*. 2013: 4-5) could not undermine the presented hard scientific evidence. Infant urns were buried in a specified place, far from Punic towns, as in Carthage and Motya (Gras *et al*. 1991). Adult cemeteries, with cremation and inhumation burials, were also separated from residential areas (Gras *et al*. 1991: 173). These observations tend to indicate greater role for hygienic considerations in the practice of cremations, an idea that the West Phoenicians might have carried with them from their native land in the East to their settlements in North Africa and Southern Europe. The fact that infant cremation cemeteries were not yet discovered anywhere along the Syro-Palestinian coast and inwards might argue for as well as against this suggestion.

Cremation Burials in Jordan from the Bronze Age to the Iron Age

From Jordan, there were few reported cases of human cremation burials that extended between the EBA and IA. The earliest was from two EBA-I. Burnt human bones were found in six dolmens in Dāmiya in the Jordan Valley (Gilead 1968). The burning was probably indirect as a result of secondary usage of the dolmens, as also argued (Polcaro 2008: 35). Bones found in tomb UCV-20 and UCV-84 in Jābāl Nebo (Saller 1966) appear to be accidental, burnt by camp fire(s) above sites (also Bloch-Smith 1992: 38).

In the case of EBA-II and III site of Bāb adh-Dhirā‘ in the Jordan Valley, burnt human bones were found in 3 charnel houses (Rast and Schaub 1989: 325-396). According to the excavators, all bones and objects in charnel house A8 were “Embedded in Burn Layer”. In house A41, 2 bone groups of an earlier phase were covered by an earthy wall-wash layer while 2 other bone groups of the later phase were found in an ash layer. A massive ash layer that contained burnt human bones covered two thirds of charnel house A51’s floor, below the collapse of a mud brick wall. It was suggested that the fires were started from outside, near the doorways and were restricted to tombs that were still in use until EBA-III. Older charnels that went out of use were not affected by any fire. These observations lead the excavators to conclude that the burning resulted from an act of aggression and not cremations (Rast and Schaub 1989: 396). Also, only single ash layers were found and the human bone parts were anatomically recognizable, though disarticulate and variably fragmentary. This indicates that singular and limited fires were involved. These observations lead to exclude cremation as part of the funerary rites in Bāb adh-Dhirā‘ EBA-II to III population.

The case of the 13th BC century structure at the old ‘Ammān (Marka) Airport “Temple” is more complicated. There, small fragments of partly burnt human bones were found in the 3 layers of occupation within as well as outside the structure (Herr 1983: 23). They were suggested to be sacrificial (Hennesy 1985: 99), Hittite ceremonial cremations (Herr 1983: 129), or even resulted from three phases of destructive conflagrations (Mumford 2015: 109). According to the archaeological and osteological reports of the 1976 excavation outside the structure (Herr 1983; Little 1983: 47-66), fragments of human bones were collected from the topsoil and nearly all layers. At least 76% of the bone material was not burnt. The burning itself was suggestively slow. Fragmentation and wide dispersion of the bone material was estimated to belong to three individuals (Little 1983: 47-50). It appears that the bones were anatomically recognizable and there was no mention of heat

induced deformations. The "Burials" were thus in a state of dry bones when first subjected to heat, the source of which might be indicated by ash pits found (Herr 1983: 11-12). Also, there is the possibility that the bone fragments were washed in or out of the structure in different times as indicated by their deposition in the 3 layers. The source of the human bones remains uncertain and it would not be possible to have conclusive evidence given the extent of distortion to the site[3]. Furthermore, a similar structure at Umm ad-Danānīr (Baqa'a), also of the 13th BC century, yielded no human bones of any kind (MacGovern 1989: 128-134). Therefore, the evidence of human cremations, of any kind and purpose, in 'Ammān (Mārkā) Airport "temple" remains inadequate or even not available.

Also in Umm ad-Danānīr, the excavators found completely charred bones, among other inhumations in Cave B3. The burning proved to be caused by campfire as indicated by fire blackened cooking pot found in the same context. Cremation was thus excluded (MacGovern 1982: 50). At Tall al-'Umayrī, burnt remains of two individuals found in room B3 might indicate similarity with the IA cremations from Tall Sheikh Hamad in NE Syria (Kreppner 2008: 265), but the archaeological context clearly showed that this burning resulted from a destructive fire (Herr 1998: 50), as in a similar case from Ebla (Ferro *et al.* 2010). Another IA case that can be excluded is from Saḥāb, where the human remains were found in partly ashy earthen jar (Ibrahim 1972: 32).

Roman Cremation Burials

By the end of the IA, cremation burials disappeared from this region, almost as sudden as they appeared. Their re-emergence in the Hellenistic period (from the fourth century BC) was there where cremations were never practiced before, in Egypt. There, it continued during the Roman period, until the second AD century. This was evident in a number of cemeteries, mostly in Alexandria like Shatbi, Shuqafa (Nock 1932: 328), Jabbari (Venit 2002) and in al-Alamain (Daszewski 2008: 441) but the practice was limited to the Ptolemaic section of the population. Egyptian burials were restrictively inhumation (Nock 1932: 328; Daszewski 2008: 441). Roman cremation burials, between second BC to second AD century were less frequent in the NE provinces than elsewhere in the Empire. The only *bustum* cremation case was in Palestine in a cemetery of Roman soldiers in Nabataean Kurnub (Negev 1972). All other regional reports were *ustrina* cremations, though no *ustrinum* was ever found. Pottery cremation urns were found in Jerusalem and Tall al-Mutasallim (Barkay 1984; Hershkovitz 1989). A leaden "box" of bones or urn was found in a site on the Jenin-Nablus road (Zayadine 1966: 581). The only findings from Syria were an urn (Nock 1932: 327) and three cremations from Dura-Europos (Toll 1946: 5-6, Pl. LXIV no. 2 and 3). Only a single case was reported from Lebanon (Nasser 2014).

Roman cremation burials discovered in Jordan were considered to be odd or foreign, but the accumulating evidence suggests now otherwise (TABLE 2). Single pottery cremation urns were found in Tall al-'Umayrī (Boling 1989) and Ḥisbān (Mitchel 1994). One leaden urn (FIG. 1a) was discovered in Queen Alia Airport (Ibrahim and Gordon 1987), one in a cave tomb in Yaṣilah-Irbid (Al Muheissen and Tarrier 1996), and two in each of Umm as-Summāq al-Janūbī and Hijra cave tombs in Amman (Abu-Shmeis and Nabulsi 2009). Cremated human bones were found in different burial niches within three different cave tombs in al-Masarāt az-Zarqā' (FIG. 2c-e). Because of massive distortion, it was not possible to determine the kind and number of depositions but each tomb must have contained at least one cremation burial (Nabulsi *et al*. in preparation). Another case of disturbed cremation burial was

3. See also the archaeological discussion on the stratigraphy of this site in Mumford (2015).

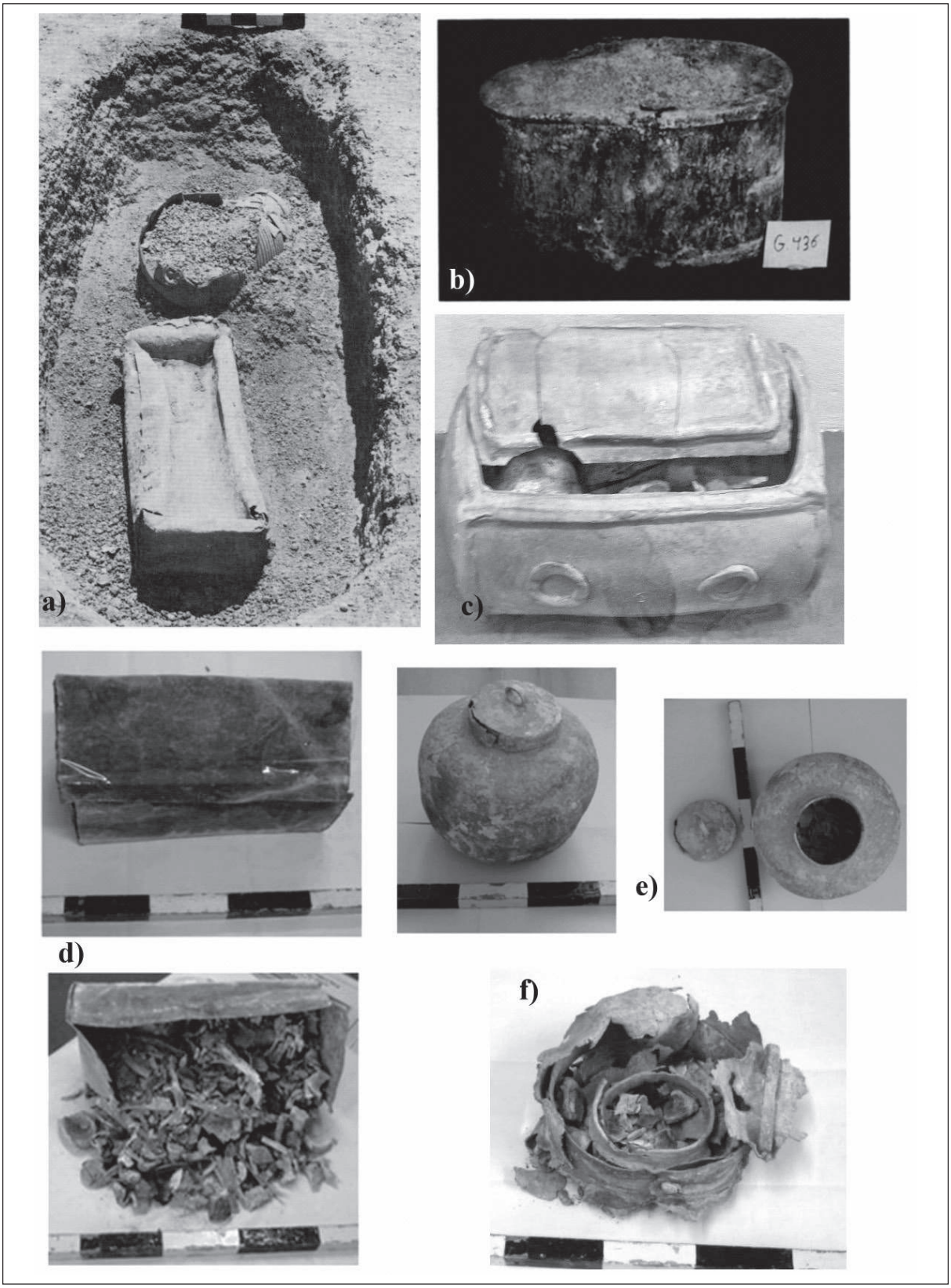
Table 2. The Roman cremation burial sites discovered in Jordan.

Site	Type	Source
Secure case		
Queen Alia Airport	1 Leaden urn	Ibrahim and Gordon, 1987*
Tall al-ʻUmayrī	1 Pottery urn	Boling, 1989
Ḥisbān	1 Pottery urn	Mitchel, 1994
Yaṣīlah - Irbid	1 Leaden urn	Al Muheissen and Tarrier, 1996
Umm as-Summāq al-Janūbī	2 Leaden urn	Abu Shmeis and Nabulsi, 2009
Ḥijra	2 Leaden urn	Abu Shmeis and Nabulsi, 2009
al-Masarrat (az-Zarqā')	At least 3, urn?	Nabulsi *et al.*, in preparation
ʻAbdūn, Cave tomb-2015	At least 1, urn?	Nabulsi and Shami, in preparation
Unrecognized case		
Jarash	1 Leaden urn	Naghawi,1989
	1 Pottery urn	Jarash Museum
Uncertain case		
al-Jawfah - Amman	Ash bone layer	Harding, 1950
Dhahr as-Sarū - Jarash	Sarcophagus	Harahsheh, 2013
Zamāl-Irbid	Columbarium	Milhem, 2004
al-Ḥabīs - Petra	Columbarium	
ʻAbdūn, Cave tomb-2013	Few burnt fragments?	Nabulsi and Shami, in preparation

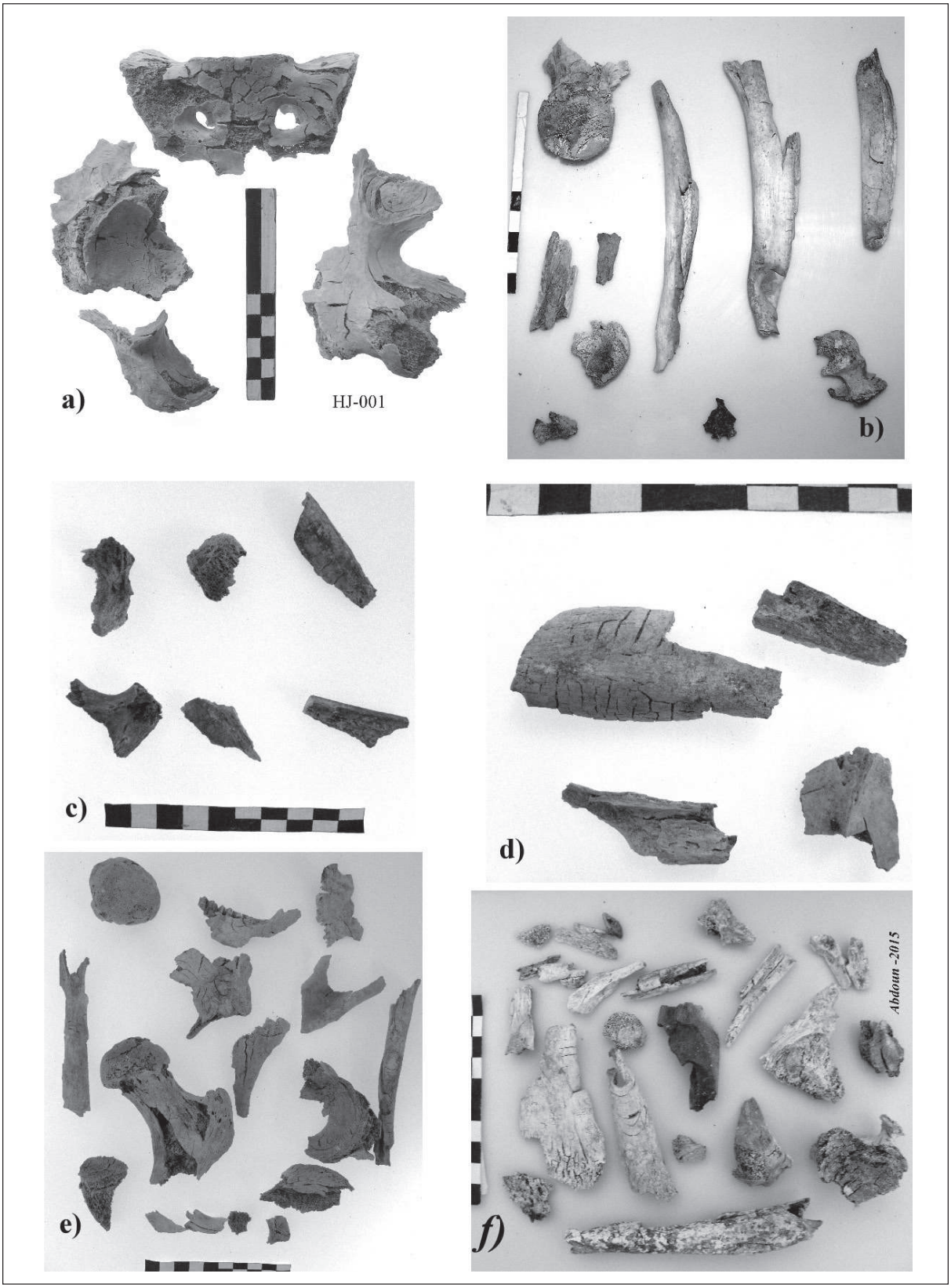
* It was confirmed that the pottery cooking pot found with the urn (FIG. 1a) was empty (Ibrahim, 2016: personal communication), but it might have been used to collect the cremated bones from the rogus.

found during the 2015 rescue excavation of a Roman cave tomb in ʻAbdūn ʻAmmān (Nabulsi and Shami, in preparation). Interestingly, two other cases from Jarash went unnoticed. A cylindrical leaden urn (FIG. 1b), similar to those found in Roman Britain (Comp, Toynbee 1971: 32, fig. 14) was found in a cave tomb (Naghawi 1989). The other case is a pottery urn on display in Jarash Museum (FIG. 1c). There were other reports of cremation burials, which closely observed are very uncertain. The reported ash and burnt bone layer in the al-Jufah cave tomb (Harding 1950: 81-3) was probably caused by a destructive fire, maybe started in preparation for the later burials found. This is also true for the burnt bones in two Dhahr as-Sarū Jarash sarcophagi (Harahsheh 2013: 9). The niches of the stone "Columbarium" found in Zmāl-Irbid (Milhem 2004: 9, figs. 11, 12) are too small to deposit urns of any sort (Compare the Scaled fig. 11). Another almost similar structure was found in Ṣaydūr-Irbid (Milhem 2012: 38, fig.18) but without any comment. These were most likely pigeons' columbaria as those found in Syria (*e.g.* Gatier and Vérilhac 1989: 343; Chehadeh and Griesheimer 1998: 179) and possibly the "Columbarim" tomb in al-Ḥabīs, Petra. Also uncertain were small burnt bone fragments found among human remains retrieved from a Abdoon cave tomb excavated in 2013 (Nabulsi and Shami, in preparation).

The available data show that 14 Roman cremation burials, 7 of which in leaden urns, were found in 10 different sites in Jordan. It became evident that Roman cremation burials were not rare in Jordan but more frequent than previously supposed with an estimated frequency of above 1% of all first and second AD century Roman burials found in the Eastern Heights area. The practice is known to have required huge material as well as financial resources (Toynbee 1971; Altjohan 2001). Most documented cases were agricultural sites. The two Greek inscriptions on one Hijra urn revealed the same linguistic



1. Roman cremation urns found in Jordan: a: Queen Alia Airport (Ibrahim and Gordon 1987), b: Jarash leaden urn (Naghawi 1989), c: Jarash museum urn, d and e: Hijra, f: Umm as-Summāq al-Janūbī (Abu Shmeis and Nabulsi 2009).



2. Roman cremation material from different sites in Jordan: a: Hijra, b: Umm as-Summāq al-Janūbī, c-e: al-Masarrāt az-Zarqā', f: 'Abdūn 2015 (Graphics by A. J. Nabulsi).

modifications evident in other local funerary inscriptions and suggest a strong Hellenization effect (Timm *et al.* 2011). Therefore, it appears that cremation burials were practiced by a small section of the local agricultural population with strong Roman/Hellenistic cultural influence and financially capable. Such burials, and others connected with, are not to be dated beyond the second AD century, a few decades after the practice disappeared from Rome (Nock 1932; Toynbee 1971).

Conclusion

This short and non-bibliographic review concentrated on the evidence associated with a nearly marginal subject of cremation in Jordan and its direct neighbours through time. It differentiated between cremation as a rite and burnt human bones. The combination of archaeological and biological evidence leads to conclude that cremations were not part of the regional funerary customs before the LBA period. Hygienic considerations might have played a role in the spread of the practice through the IA. There is no evidence of cremation burials in Jordan before the Roman period. Roman cremation burials were documented in 10 different sites in Jordan. The available data suggest that cremations were relatively frequent (*ca.* 1%) and not as rare as previously perceived. It was practiced by a minority of the local population with strong Roman/Hellenistic cultural influence, preferably using leaden urns. These burials are datable within the first two centuries AD.

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New Greek Inscriptions from Dafyāna in North-East Jordan

Introduction

This article is intended to be a contribution to the corpus of the Greek and Latin Inscriptions in Jordan ('Inscriptions de la Jordanie'). The project is coordinated by Dr. Pierre-Louis Gatier (CNRS Lyon) and Dr. Nabil Bader (Yarmouk University), under the auspices of the Department of Antiquities of Jordan (DoA). One of the main goals of the programme, which is shared by the academic team (Nabil Bader and Julien Aliquot) and by the Mafraq Branch of the DoA (Abdulqader Al-Husan), is to complete an epigraphical survey of North-East Jordan. The following study illustrates the first results of a fruitful cooperation in the region. The Greek inscriptions presented here were found in the village of Dafyāna by the Mafraq Branch of the DoA, and are currently preserved in Mafraq. All are simple epitaphs engraved on basalt stelae, similar to previously known inscriptions from the same region. These documents provide new information on settlement history and burial customs in the southern part of Ḥawrān during the Roman Empire (Sartre-Fauriat 2001; Bader 2009). One of them is particularly worthy of note; the inscription records the foundation of a collective tomb by a junior officer of the Roman army who died in the Black Sea region, but whose body was carried home for burial by his servant in AD 312/313. This inscription is an important addition to the very scant epigraphical evidence of the Tetrarchic province of Diospontus. It also confirms that Dafyāna belonged to the territory of Bostra, the capital of Roman Arabia. While emphasizing the role of this area as a recruitment pool for the Roman army and administration, it also increases the number of documents which provide evidence regarding transportation of dead soldiers' remains to their homeland.

Dafyāna: Current State of Research

Dafyāna (lat. 32.31198 N; long. 36.55995 E; alt. 879 m) is located in southern Ḥawrān, about twenty kilometres east of Umm al-Jimāl, seven kilometres west of Umm al-Quṭṭayn, and thirty kilometres south of Bostra, in neighbouring Syria, slightly away from the ancient Roman road leading from Azraq to Bostra. The archaeological site is integrated within the boundaries of the modern village. It has been explored by several travellers and scholars since

the end of the nineteenth century: H. C. Butler and the Princeton Expedition in 1904-1905 (Butler 1907: 116), N. Glueck (Glueck 1951: 24), G. King (King 1982: 93-94; King, Lenzen and Rollefson 1983: 424), D. Kennedy, H. I. MacAdam and the members of the Southern Ḥawrān Survey in the 1980s and the 1990s (Kennedy, MacAdam and Riley 1986: 150-151; MacAdam and Graf 1989: 177-178). Remains of ancient houses and funerary inscriptions from the Roman period have been found there. N. Bader, who has visited the place in 1991 and 1992, gathered the epigraphical material from Dafyāna in *I. Jordanie* 5.1 (Bader 2009: 307-311, nos. 684-694): eleven inscriptions, all funerary. More recently Dafyāna has become the object of investigation by the Mafraq Branch of the Department of Antiquities, which led to the discovery of previously unknown Roman tombstones in 1996, about 150 m to the west of the village.

Four New Greek Epitaphs

The first three epitaphs are very common. There is no indication of Christian symbols, so must therefore date between the second and the fourth century AD. The majority of the Semitic and Greek names which occur are known in the Ḥawrān, and on occasion also at Dafyāna. The fourth inscription is much more remarkable (see below for further details).

1. Epitaph of Abgaros, 2nd-4th *ca.* AD (FIG. 1). Mafraq, DoA Office, inv. no. GI 153. Basalt fragment. Dim.: 35 × 42 × 22 cm. Bibliography: unpublished.

Αβγαρ-
ος Σα-
[- - -]

Translation: "Abgaros son of Sa. . ."

Onomastic parallels: *I. Jordanie* 5.1, 383, 423, 530(?), 626, 635, 684 (the last one from Dafyāna).

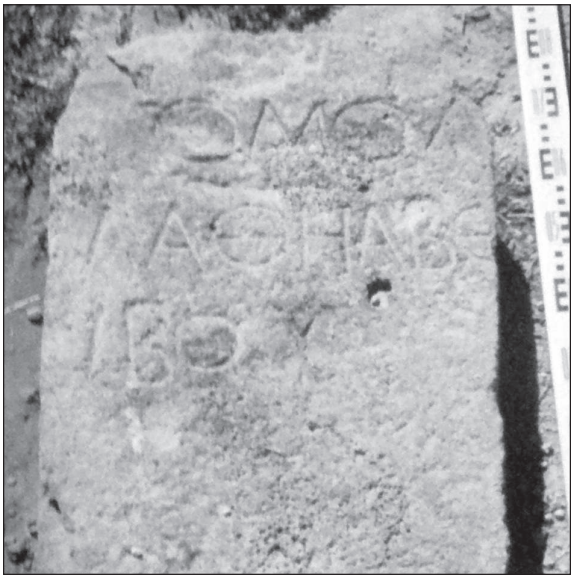
2. Epitaph of Gomollathe, daughter of Abeibos, 2nd-4th c. AD (FIG. 2). Mafraq, DoA Office. Basalt fragment. Unknown dimensions. Bibliography: unpublished.

Γομολ-
λαθη Αβε-
ιβου.

Translation: "Gomollathe, daughter of Abeibos."

Onomastic parallels: *I. Jordanie* 5.1, 628 (Αβιβος), 707 (Αβειβος); 6 (Γομολλαθη), 265-269 (Γομολαθη).

1. Epitaph of Abgaros (Photo Credit: Julien Aliquot).



2. Epitaph of Gomollathe, Daughter of Abeibos (Photo Credit: Abdulqader Al-Husan).

3. Epitaph of Theodoros, son of Somenos, 2nd-4th c. AD (FIG. 3). Mafraq, DoA Office. Basalt stele in two fragments. Dim.: 108 × 43 × 18. Height of the letters: 5-7.5 cm. Bibliography: unpublished.

Θεόδ-
ωρος
Σομε-
4 νου
ἐτ(ῶν) κδ΄.

Translation: "Theodoros, son of Somenos, 24 years old."

Onomastic parallels: *I. Jordanie* 5.1, 8, 308, 629 (Θεόδωρος); *PAES* 3A, 685 (Σομενος).

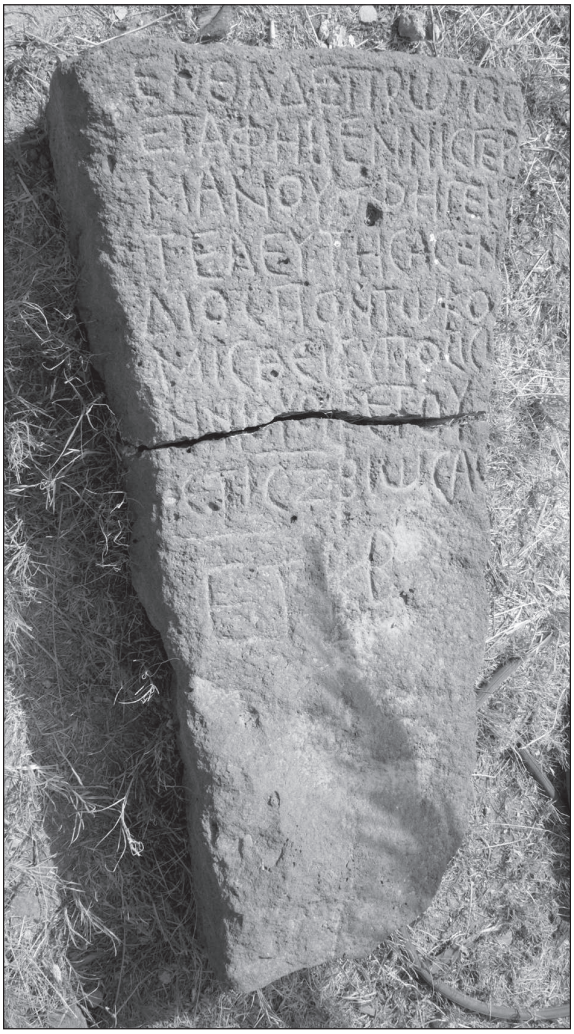
4. Epitaph of Bennios, son of Germanos, AD 312/313 (FIG. 4). Mafraq, DoA Office, inv. no. GI 159. Basalt stele in two fragments. Dim.: 130 × 70 × 20 cm. Height of the letters: 5-6 cm (lines 1-8); 10 cm (line 9). Bibliography: Al-Husan and Aliquot 2015; Tybout 2016: 420 (mention).

Ἐνθάδε πρῶτος
ἐτάφη Βέννις Γερ-
μανοῦ β(ενε)φ(ικιάριος) ἡγεμ(όνος)
4 τελευτήσας ἐν
Διοσπόντῳ κο-
μισθὲν ὑπὸ Σισι-
ννίου οἰκέτου
8 ἔτι σζ΄ βιώσας
ἔτ(η) κβ΄.

Line 3: The reading of β(ενε)φ(ικιάριος) is sure, since the first letter is a beta crossed by an oblique stroke; ὀφ(φικιάλιος) must be rejected, as well as Tybout's translation (*officialis*).

Translation: "Here first was buried Bennios, son of Germanos, *beneficiarius* of the governor, dead in Diospontus, who was carried home by Sisinnios his servant, in the year 207 (= AD 312/313), and who lived for 22 years."

3. Epitaph of Theodoros, son of Somenos (Photo Credit: Julien Aliquot).



4. Epitaph of Bennios, son of Germanos (Photo Credit: Julien Aliquot).

This inscription reminds of the foundation of the tomb. The use of the chronological era of Provincia Arabia (beginning on the 22nd of March, AD 106) confirms that Dafyāna belonged to the territory of Bostra, the capital of the province. Although he came from this area, Bennios died far away, in the Black Sea region, while serving the Roman governor of Diospontus, a province created between AD 305/306 and 309/310, with Amasia as its capital (Loriot 2006: 412-414, on the Roman province of Diospontus and its governors). As a *beneficiarius*, he was a junior officer in the Roman army, just below the rank of centurion, and owed his promotion to the favour (*beneficium*) of a commander for whom he performed administrative duties (Nelis-Clément 2000).

Onomastics indicates the places where Bennios died and was buried respectively, that is, on the one hand, Pontus, where he died, with his body then transferred by his servant, and, on the other hand, Dafyāna and the Roman province of Arabia, where he was obviously born. The name Βέννις (for Βέννιος) is a transliteration of the Latin *gentilicium Benius/Bennius* (Solin and Salomies 1988: 33), in this case a unique name, rather than the Phrygian name Βεννιος/Βενιος (Vassileva 1999: 175). His patronymic Γερμανός corresponds to the Latin *cognomen Germanus*, but it was also a very popular name in Arabia, where it is suspected of being a Greek transliteration of Semitic names (Sartre 2007: 211-214). The name of his servant, Σισίννιος, belongs to a series of Hellenized Iranian names which are well known in the East, chiefly in Asia Minor, and which are consistent with the trend for the *signa* in -ιος from the third century onwards (Justi 1895: 304; Zgusta 1964: 468-469; *LGPN*, *s.v.*). Sisinnios may have joined Bennios after his master's assignment in Diospontus.

Bennios' return to Dafyāna is a typical example of the so-called *translatio cadaveris* or *translatio corporum* (both modern terms), which refer to two kinds of operation; either the transportation of the remains of a deceased person to the grave, or transferance from one grave to another (Laubry 2007: review of legal sources and Latin inscriptions, with 21 texts from the Roman West, mostly epitaphs of soldiers and imperial freedmen; Tybout 2016, with a catalogue of Greek inscriptions recording or implying the repatriation of mortal remains). In Roman law, the transportation of bodies was considered an integral part of the funeral (*Funus*) and a legal obligation (*Necessitas*), whatever the distance and however many provinces will be crossed. This kind of operation was sometimes very expensive, especially because

of tolls. The cost was nevertheless included in the normal funerary expenses. In most cases, the deceased person will not have already received a permanent burial (*Perpetua Sepultura*) as their remains are going to be transferred. These costs and requirements partly explain the phenomenon of remote commemorations for dead soldiers (Hope 2003; *AE* 1993, 1572, for a remarkable example at Apamea in Syria; not far from Dafyāna, at Najran in southern Syria, see *IGLS* 15, 367, with Al-Husan and Aliquot 2015: 499: building inscription of the monumental tomb of a lady "who was deprived of her four sons Annius, Claudianus, Magnus, and Meilichos, taken at the camp"). Exceptions were envisaged under certain extraordinary and deemed as legitimate conditions which involved the executor (for example, in the case of natural disasters threatening the tomb of destruction of a tomb). In this case, the location of a temporary grave remained a *locus profanus*, as opposed to the *locus religiosus* of the final burial. Transfer required a prior consent from competent authorities, that is the pontifical colleges of Rome and Italy, governors in the provinces, and possibly the emperor himself as a *pontifex maximus*. As a servant of a *beneficiarius* assigned to a provincial governor (on soldiers' servants: Speidel 1989), Sisinnios was well placed to obtain permission to return his master's remains to his place of birth. The mention of such transfers in epigraphy not only has a commemorative value: "it shows to the community that the executor acted correctly within the legal framework, according to the law and before the gods" (Laubry 2007: 176, "elle certifie à la communauté que l'auteur du transfert a agi dans la légalité la plus complète, face au droit et face aux dieux").

Two Greek epitaphs from the Ḥawrān also refer to the return of dead bodies to their native land. The first was discovered at Eeitha, modern Hīt (Waddington 1870, no. 2121). After a lacuna, we learn that a rider, "back from Germany and dead in the *ala Agrippiana*, was returned to his children." (The *ala I Flavia Agripppiana sagittariorum* was in Syria from the time of Trajan's Parthian campaigns onwards, according to several military diplomas reported in *AE* 2006, 1845-1851. The same auxiliary unit must be recognized in the epitaph of a rider at Worms in Germania Superior, *CIL* 13, 6235, as well as in the epitaph of a *duplicarius* at Palmyra, *IGLS* 17, 484.) The second relevant document is a funerary epigram in two elegiac couplets for a man named Silvanus, from Adraha, modern Dar'ā (Wetzstein 1864: 293, no. 98 = *IGLS* 14, 177, with some corrections in Al-Husan and Aliquot 2015: 500-501): "Look at these ashes which came from a foreign land to this tomb, these remains of a funeral pyre are those of the unfortunate Silvanus; sea and earth shared me, then fire thirdly; heart water . . ." So, it appears that Silvanus had drowned at sea, and his body would have been either found on the shore or buried in a temporary grave, before his remains were incinerated, probably to facilitate their repatriation to Adraha. The association of a Latin name with cremation and the theme of returning ashes to an original homeland suggests that he was a Roman soldier who had joined the navy.

To sum up: While emphasizing the role of Bostra's territory and Ḥawrān as a whole as a recruitment pool for the Roman army and administration, Bennios' epitaph increases the number of documents from this area relating to the transportation of the remains of dead Roman soldiers or officers to their homeland. More generally, the study of these new Greek epitaphs from Dafyāna encourages us to pursue our fieldwork in North-East Jordan.

Abbreviations

AE: L'Année épigraphique. Paris.
CIL: Corpus inscriptionum latinarum. Berlin.
I: Jordanie: Inscriptions de la Jordanie (IGLS 21). Paris; Beirut.
IGLS: Inscriptions grecques et latines de la Syrie. Paris; Beirut.

LGPN: Lexicon of Greek Personal Names. Oxford.
PAES 3A: Littmann, Magie and Stuart 1921.
SEG: Supplementum epigraphicum graecum. Leiden.

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Achim Lichtenberger and Rubina Raja

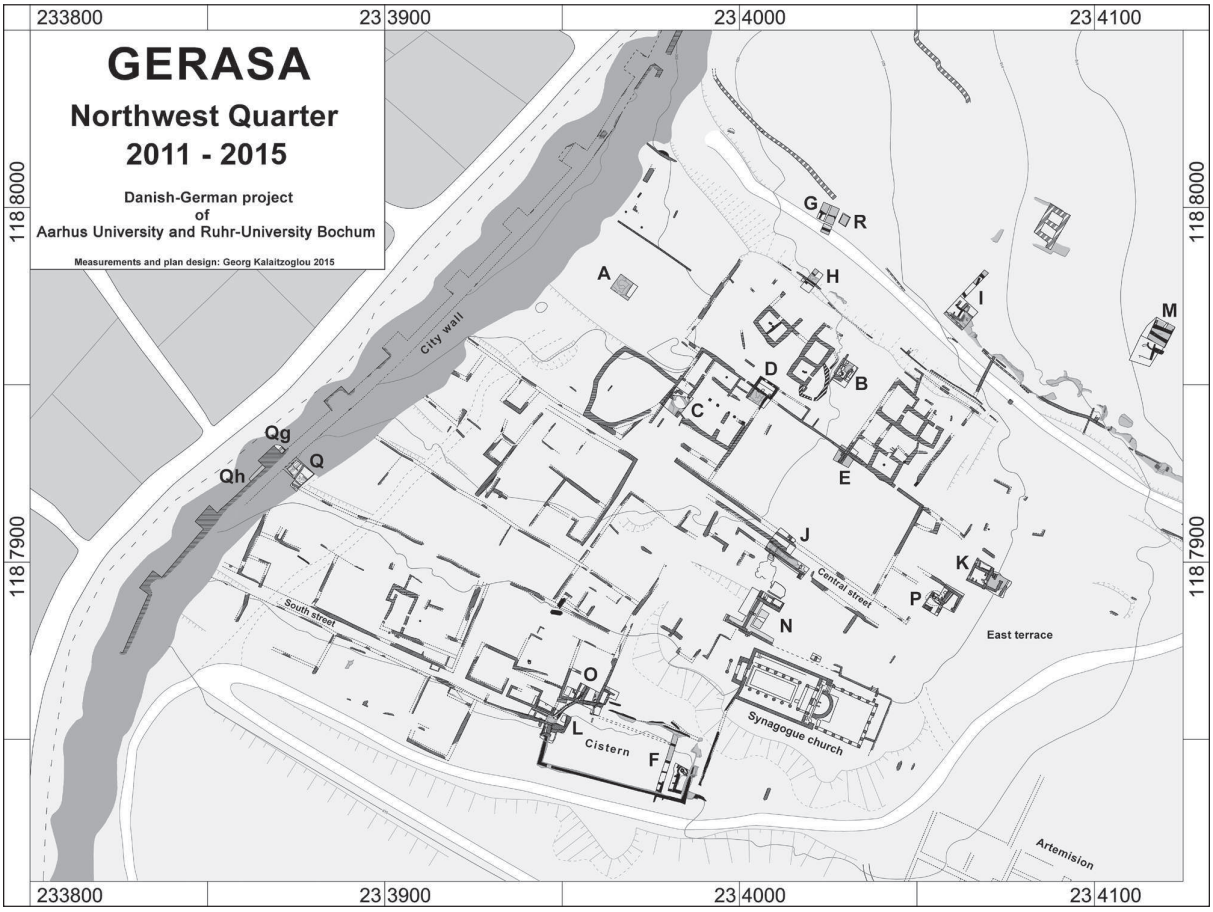
The Danish-German Jarash North-West Quarter Project: Results from the 2014-2015 Seasons

Introduction

Since 2011 a joint Danish-German archaeological project headed by the authors investigates the North-West Quarter of Jarash (Lichtenberger and Raja 2015a, 2016a) (FIG. 1). Within the ancient walled city of Jarash, the North-West Quarter lies at the highest point of the settlement and overlooks the Roman period Artemision. The project aims at investigating the settlement history of this approximately 4 hectare large area and relate it to the overall archaeology and history of the city. Whereas in the past mainly the city center with the public monuments has been the focus of archaeological research (Kraeling 1938), our project aims at looking at one of the prominent areas situated away from the monumental colonnaded streets and massive temple complexes. The project covers all periods of the urban history of the site and it has been possible to trace evidence from the Hellenistic to the Ottoman periods, as well as some scattered, ex-situ evidence for prehistoric periods.

During the Roman period, the city of Gerasa in Northwest Jordan belonged to the Decapolis. The city was founded in Hellenistic times and it thrived in the Roman, Byzantine and Early Islamic periods. Only a major earthquake in 749 AD, which shook large parts of the Southern Levant (Tsafrir and Foerster 1992; Sbeinati, Darawcheh and Mouty 2005: 362-364) brought a drastic decline to urban life at the site. A small resettlement dating to the Ayyubid-Mamluk period also exists (Tholbecq 1997-98) but a proper re-settlement of Jarash only took place in the 19th century with the advent of Circassian settlers.

The ancient city of Gerasa is located on both banks of a steep *wadi*, the ancient Chrysorrhoas, which divided the city into two parts (Lichtenberger and Raja 2016b). Walls enclosed the city. The Roman city had a north-south oriented cardo and two decumani. The eastern part of the ancient city is mostly covered by the modern city. But in the western half of the city including the colonnaded cardo most of the ancient remains are undisturbed by modern activities and extensive excavations have taken place for more than 100 years uncovering impressive urban structures. Research has mainly focused on the city center and the public buildings of the Roman city. Another focus has been the numer-



1. Plan of the North-West Quarter, showing 2012 – 2015 trenches.

ous Byzantine churches. Only in recent years more attention has been given to the early Islamic phases of the city.

Since 2011 a Danish-German project investigates a hitherto unexplored area of Jarash, the so-called North-West Quarter[1]. Work started with an intensive field survey in this approx. 3 ha large area documenting all evidence visible on surface and in addition a geomagnetic survey was done of the whole area (Lichtenberger and Raja 2012; Kalaitzoglou *et al.* 2012). Only after intense evaluation of the geophysical and survey data excavations were initiated. Between 2012 and 2015 in total 18 trenches have been excavated (2012-2013: Kalaitzoglou, Lichtenberger and Raja 2013, 2017; Lichtenberger, Raja and Sørensen 2013, 2017). The location of the trenches were selected strategically in order to as comprehensive as possible understand the settlement history. All trenches were backfilled after excavation. Our excavation strategy focused on understanding stratigraphies and undertaking a High Definition Archaeology sampling programme for a variety of evidences in contexts.

It became clear that the North-West Quarter – in contrast to other areas of the ancient city – was only little occupied during the Hellenistic and Roman periods. Until now water supply installations and stone quarries are the most prominent features dating to the Roman period, although there is at this point is more than circumstantial evidence for occupation also in this period. Most extensive and well

1. The only archaeological work that has taken place in the North-West Quarter prior to the beginning of our project were some trenches excavated by Clark and Bowsher 1986 and the excavation of the synagogue church in 1928 (Crowfoot and Hamilton 1929:211-219; Crowfoot 1938: 234-239 and Dvorjetski 2005).

preserved in the North-West Quarter, however, are the late Roman and Byzantine as well as the early Islamic periods, for which substantial occupation has been excavated. Especially on the so-called Eastern Terrace well-constructed houses of the early Islamic period have been excavated in 2014 and 2015 in trenches K and P. These houses give impressive evidence for the last phase of Umayyad Jarash. The houses were destroyed by the earthquake of 749AD and the area was never reoccupied, and therefore the complete inventory of these houses is preserved giving a glimpse into the very moment that the earthquake struck. After the earthquake the entire North-West Quarter of Jarash seems to have been abandoned until a Middle Islamic resettlement took place during the Ayyubid-Mamluk period. During this period, a considerable hamlet was constructed on the central top part of the North-West Quarter. This hamlet, of which parts were excavated during the 2012-2014 campaigns, is until now the most substantial Ayyubid-Mamluk settlement uncovered and published in Jarash (Lichtenberger and Raja 2016c).

The North-West Quarter was integrated into the urban layout of the Roman period city when the city walls were constructed and some structures were built. However, although being enclosed by these, the North-West Quarter entered into urban history of Jarash comparatively late, and we have to assume that during the Roman period, when it was already integrated into the city walls, this area was only little occupied in comparison to what was going on in the city centre.

2014 Season

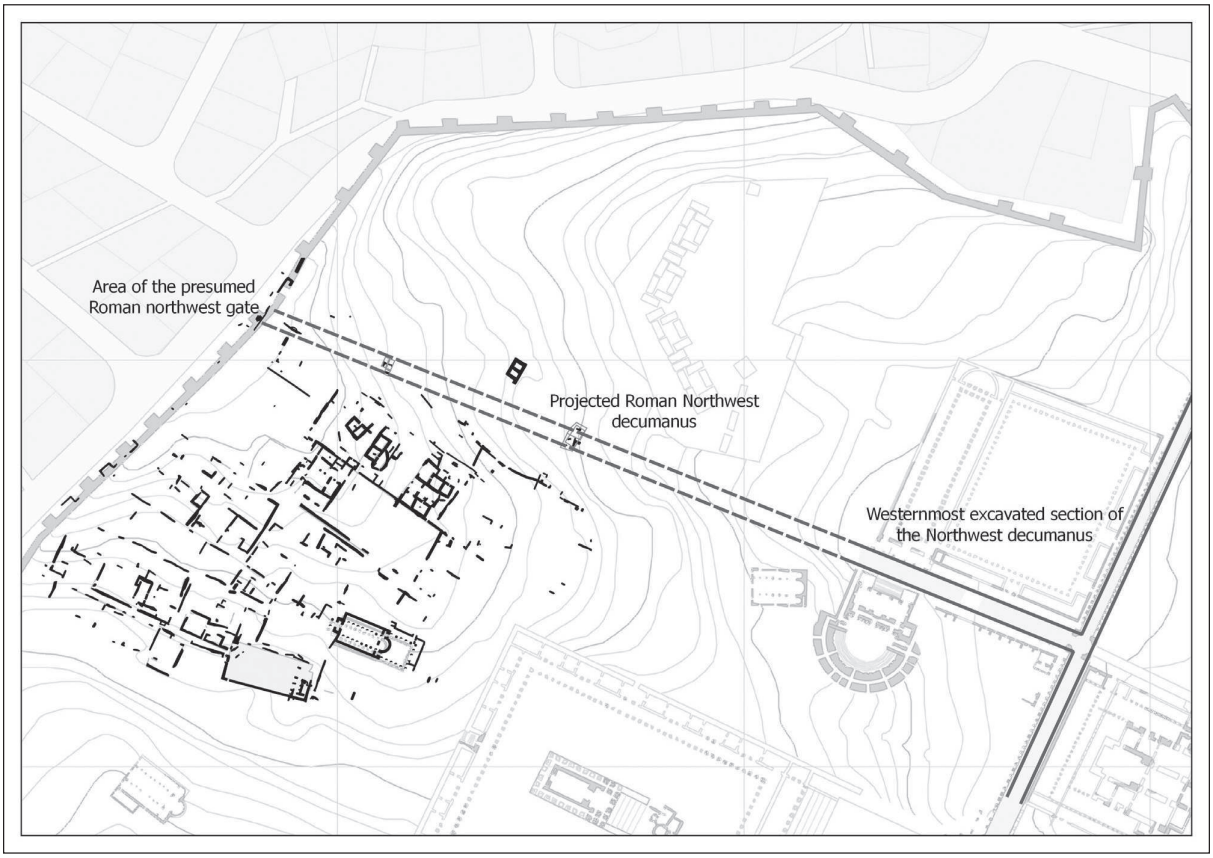
During the 2014 campaign five trenches were excavated (trenches I – M). The trenches were selected on the basis of our previous research undertaken in the area (Lichtenberger and Raja 2016a). Two trenches (I and M) were laid out on the northern slope of the hill in order to investigate this area and the possible course of the North Decumanus (FIG. 2). These trenches were continuations of the work carried out during the 2013 season (trench G). Another trench (J) was laid out on the southern side of the large terrace in front of the Ayyubid-Mamluk hamlet in order to investigate a possible street system in this area. Another trench (L) was excavated at the western end of the large cistern. This trench continued research from the 2013 season (trench F). One trench (K) initiated research on the so-called Eastern terrace, overlooking the Artemision, an area which had not been investigated earlier.

Already during the 2013 season it had become clear that it was highly doubious that the North Decumanus, which began at the Tetrapylon near the North Theatre, ever reached the city walls in the North-West Quarter in the shape of a colonnaded street[2]. No evidence had been found during the 2013 campaign, although we intentionally investigated this, and therefore one of the aims of the 2014 campaign was, to investigate this question further.

Trench I

The main objective for laying out trench I was to investigate the possible continuation of the North Decumanus, which is documented running in western direction from the Tetrapylon to the area of the North Theatre. Furthermore the trench also allowed examination of an area with a cave that was partly visible and the nature of which needed to be clarified. One of the aims was to check the hypothesis put forward by some scholars that the caves in this area might have been used as tombs (Seigne 1992: 340-341, ills. 7–9). The trench was located on the slope of the north side of the hill approx. 20 m from trench G excavated in 2013 and 40 m from trench M, an area already excavated by an American-British team in 1982 (Clark and

2. See for this is more detail (Lichtenberger and Raja 2015a). For a discussion of the layout and dating of the street grid (*cf.* Raja 2012: 140-143).



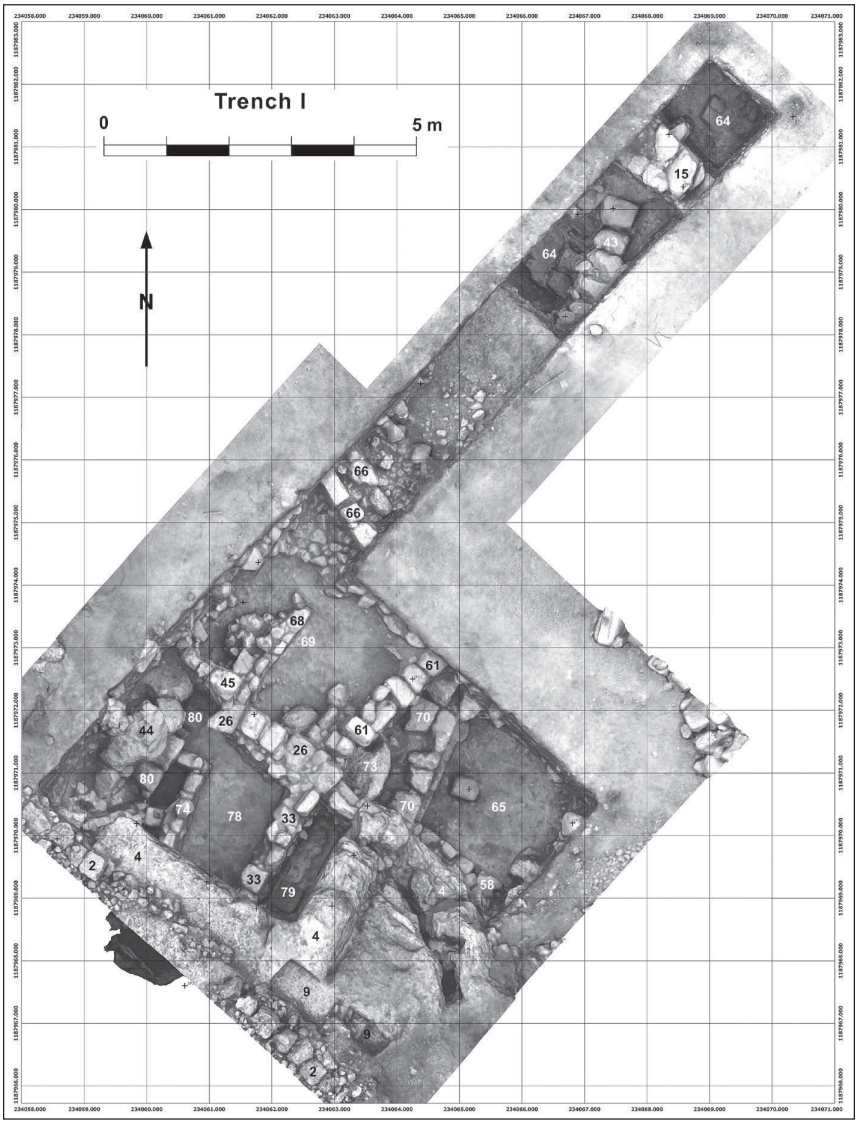
2. Plan showing projection of a possible "North Decumanus".

Bowsher 1986) (FIG. 3). The location of the trench was chosen because trench G had not yielded results pointing to a continuation of the North Decumanus in this area. Therefore it was deemed necessary to investigate whether a possible North Decumanus would have run until the projected turn in the bedrock towards the south. Furthermore the trench excavated in 1982 had not yielded conclusive results regarding the possible continuation of the North Decumanus either and therefore trench I was intended to clarify the question of the existence of a street in the Roman period in this area.

The trench was for most parts excavated to bedrock, virgin soil or structures of which there were few. The northern extension sectors were not excavated fully since the northernmost sectors already had yielded bedrock and virgin soil and therefore the conclusion could be drawn that there definitely was not a street running east-west in this area at any point in time.

The overall results gained from the finds in trench I showed several phases of use, the latest of which was of Ayyubid-Mamluk date (FIG. 4). The earliest phases of occupation, which until now cannot be securely dated, include substantial wall structures running north-south protruding from the worked bedrock and a cave. These give the clear impression of habitation structures set against and using the bedrock as a back wall and the small cave as a room. At a later point this complex fell out of use and re-occupation of the area took place on a much smaller level, but also using the cave as the back of another room. There was no evidence for the cave having been used as a tomb at any point in time. Neither rock cuttings nor fittings indicated such use.

Trench I yielded no evidence for the supposed North Decumanus and therefore it was decided to continue further east through the re-investigation of what we term trench M, earlier



3. Photogrammetric plan of trench I.

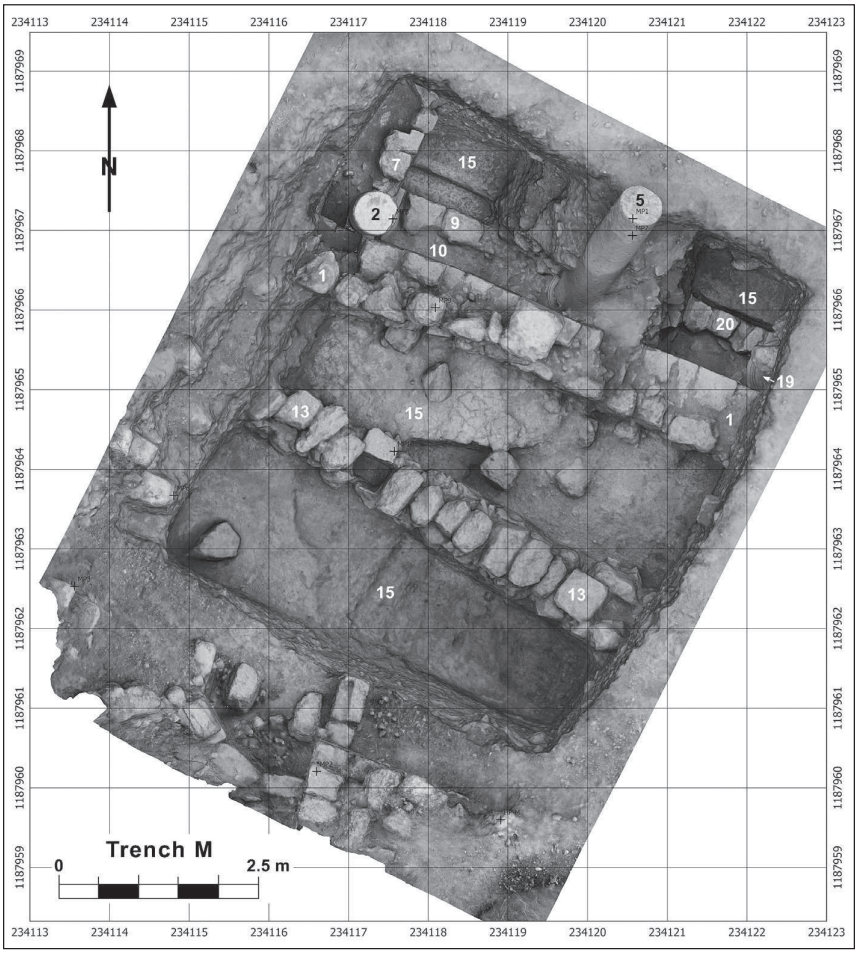
partly excavated by an American-British team, to find out whether the colonnaded street could be traced in this trench.

Trench M

The main objective for laying out trench M was to clarify whether the North Decumanus continued in this area. This trench, which partly had been excavated in 1982 by Clark and Bowsher (Clark and Bowsher 1986) needed to be reexamined as it was not excavated fully to bedrock or virgin soil in the original excavation leaving a number of crucial research questions open, since the area is important for the understanding of a potential extension of the North Decumanus towards the West.

The trench was located to the north of the north slope of the hill (FIGS. 5 and 6). Two in-situ columns were already partly visible when

4. Ayyubid- Mamluk jug from trench I.



5. Photogrammetric plan of trench M.

excavation was begun in 1982. Behind these columns a well-constructed wall ran in several courses. This wall is set on bedrock which stretches towards the south. Further to the south a line of stones ran in east-west direction through the trench. The southern side of the trench excavated by Clark and Bowsher was not the objective of reexamination in the 2014 campaign.

The re-excavation of trench M brought several new features to light. Firstly the line of stones running east-west through the trench turned out to be a stone constructed covered water channel which was mortared on the inside. Secondly a third column base came to light in the easternmost part of the trench confirming that the structure continues further towards the East. All three columns were standing on stylobates placed on the bedrock and in front of them a rock cut "channel" ran, which might have been a sort of fundament pit. Thirdly there was no evidence of a street in front of these columns ("North Decumanus"). The exact nature of the structure, which very well may have been a façade monument, remains to be further investigated.

After the 2014 season it became clear that the North Decumanus never could have ex-

6. Trench M from West.

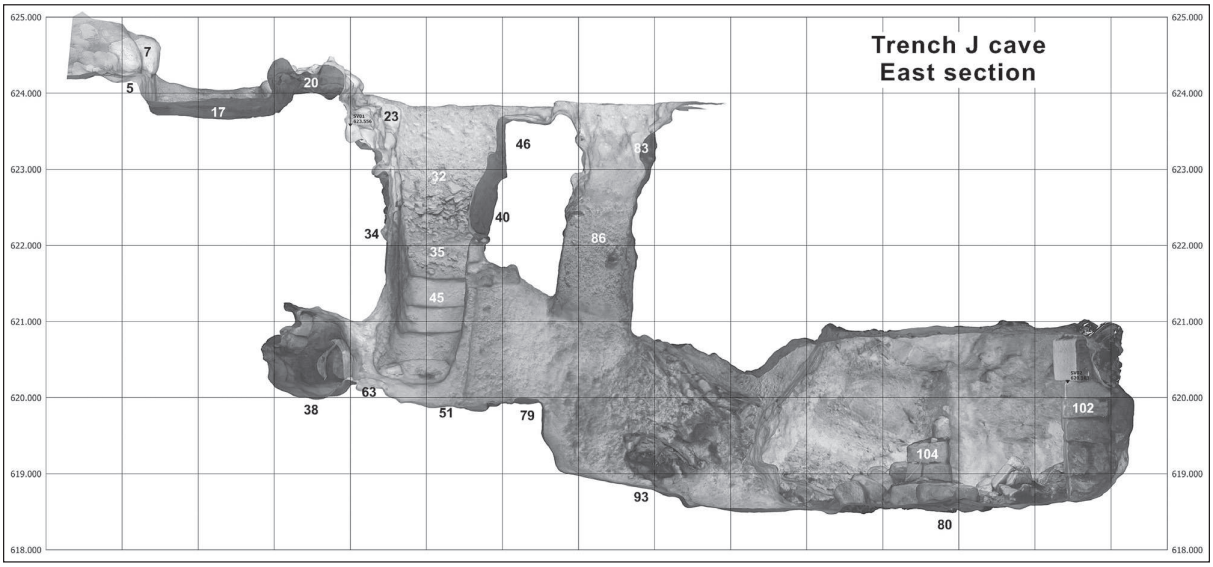
tended much further to the West than the North Theatre and that its projected course probably led through a partly unsettled area within the city walls, an area which remained open and used for gardening and agricultural purposes throughout Antiquity and the Middle Ages[3].

Trench J

Trench J was laid out on the southern side of the large terrace east of the Ayyubid-Mamluk hamlet. The most surprising result was the discovery of an underground chamber system (FIGS. 7-9). The trench was laid out catching the inside of the terrace, the terrace wall as well as the outside of the terrace to the south where another wall was running east-west. Between the wall located outside of the terrace and the remaining area to the south bedrock was soon reached. However, the bedrock turned out to be cut to a depth of 5 m. The fill from the surface to the bottom of the cut bedrock was full of pottery dating to mainly between the 3rd and 5th centuries AD. The fill was extremely dense and there was more pottery than soil in some of the layers. At the level of approx. 4 m three cave structures were encountered, which also had been intentionally filled. Towards the west a rock-cut staircase ascended. The full length to the surface of this staircase was not excavated due to the lack of time, but it is assumed that it led all the way to the surface. The cave structures to the north and the west were not very large and they were partly natural and partly artificially cut. In the area in front of the three caves two fire places came to light. An entrance to a larger cave complex was encountered at the south side where a door opening was situated. This door opened a short corridor leading

7. Photogrammetric plan of trench J.

3. Already with due caution (Lepaon 2011).



8. Photogrammetric section of trench J.

to a large open cave room on a lower level. In the ceiling of the corridor a shaft, which led to the surface, was located. The corridor had been blocked with walls and filled in from above through the shaft. This fill mainly contained material from the 6th/7th centuries AD. Behind this fill a large cave, partly natural and partly worked came to light. It measured approx. 7.5 m by 6.5 m. On the west side it had three roughly worked niches, on the east side it was vertically worked and on the south side it was blocked completely by an artificially constructed back wall. Within the back wall a blocked door was visible. This probably led to another room located to the south. Approx. in the middle of the back wall a support pier was located which was constructed by several well-worked blocks. It had been slightly moved out of place by a collapse in the bedrock which could be detected by a large piece of bedrock that partly had become loose and was pressing against the support. Another pier was standing in the center of the cave, but it had partly collapsed. One large mill stone made up the bottom of this central support. Another one was built into one of the courses of the artificially constructed back wall. The cave was not rich on finds belonging to the last phase of use; a few pottery sherds were found, but these may originally have belonged to the fill layers. It seems that the cave had been cleaned out before it was closed off. There were no traces of other than production usage of the cave in which remains of an oil press was found. The complex had two main phases of use. In one main phase, the staircase functioned as an entrance to the cave complex. Around the 5th century AD, it was backfilled and blocked. To this phase the tabuns, which were found in the staircase area, also belong. From then on the large cave was probably only accessible through the door in its southern wall and the shaft probably also would have given access to the cave. At a later point in time, possibly in the 7th century AD also this shaft was blocked and at this point in time, also the south

9. Inside of the cave in trench J.

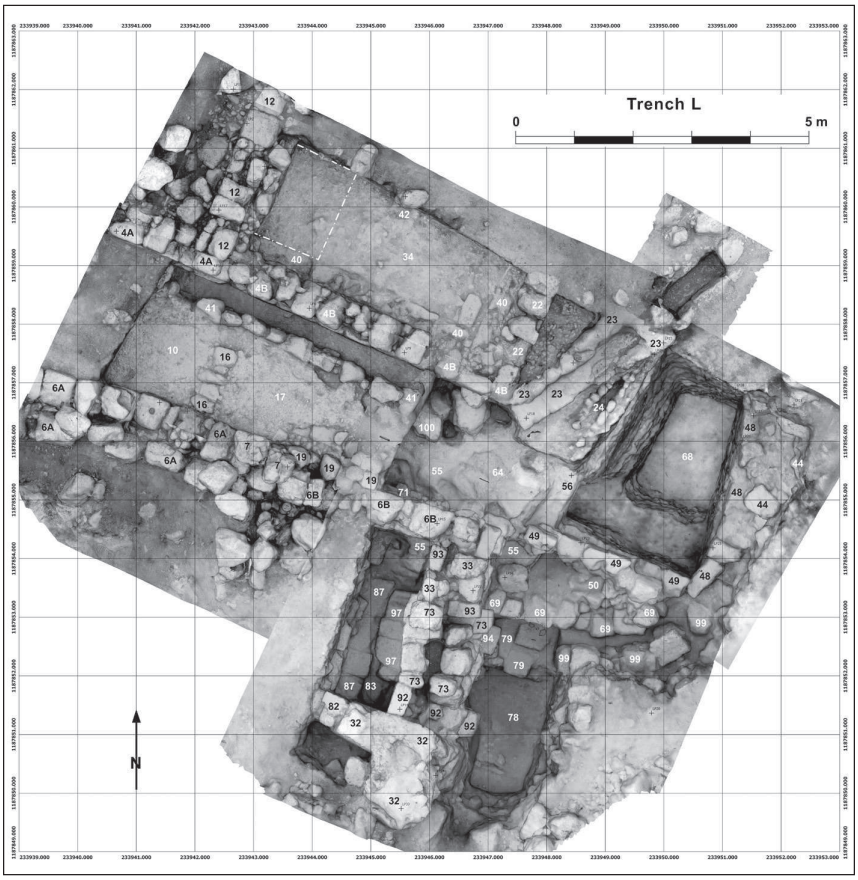
wall with the entrance was closed and the cave was completely sealed off. Since excavation of trench J could not be concluded in 2014, it was covered and protected to be further investigated in the 2015 season (see below).

Trench L

Trench L continued our examination of the large cistern on the southern slope of the North-West Quarter. It was laid out on and covered the part of the area at the west end of the large rectangular cistern, the street running towards the west and the corner of the easternmost building standing on the northernmost street corner (FIG. 10). The aim of the trench was to clarify the relationship between the cistern and the quarter on the south slope of the cistern in order to examine the chronological relationship between these features.

The trench gave important insight into the building history of the area. Already the analysis of trench F, excavated in 2013, proved that probably by the end of the 6th century AD the cistern fell out of use as a water reservoir and subsequently was filled with domestic/industrial structures inside. Such a chronology was also supported by AMS analysis of the mortar of the cistern (Lichtenberger, Lindroos, Raja and Heinemeier 2015).

Part of trench L was laid out in the cistern itself and in this area the western back wall of the cistern was traced. It was covered by a thick layer of mortar. In front of the mortar a dense fill layer was found which covered the cistern from the edge until approx. 3 m into the cistern, where a massive north-south running retaining wall was found (FIG. 11). The wall was standing directly on the floor of the cistern and was preserved up to eight courses; smaller stones were set between the large courses. A structure running east-west and binding into the retaining wall was found to the south at the end of the retaining wall. This latter wall was standing on a fill foundation. In the extension towards the



10. Photogrammetric plan of trench L.

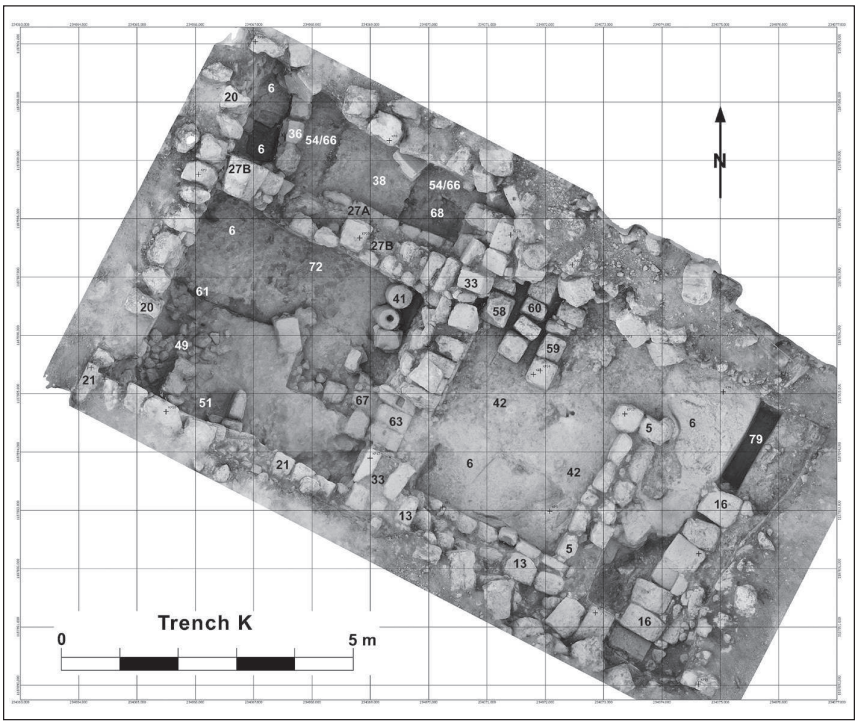
11. Wall in the cistern in trench L.

south the back wall of the cistern phases was also partly traced as was a massive structure, which was built into the bedrock, most likely as a post-cistern use. Later this structure had been closed off and turned into a wall. This area might have served as an entrance point to the cistern in the period in which it served as an area of housing and production. For now it is assumed that the walls formed part of a staircase construction leading down to the cistern when the cistern had fallen out of use as a water reservoir. At the same time this construction served as substructure of the street coming from the west, bending at this point to the north.

The street had several walk-on levels and probably belonged to the same planning phase as the houses north of it. The chronological relationship between the street, the houses north of it and the phase in which the cistern still served as a water reservoir could not yet be determined with certainty.

Trench K

Trench K was laid out on the Eastern Terrace of the North-West Quarter, to the west of the monumental Artemision and to the east of the east end of the terrace in front of the Ayyubid-Mamluk hamlet. It yielded an important Early Islamic domestic structure with rich finds which we called "House of the Scroll" (FIGS. 12 and 14). The house did not seem to have had pre-Islamic phases and the area seemed to have been uninhabited before the construction of the house. The aim of the trench was to investigate activity in this area, which seems to have been heavily disturbed by destruction as seen through numerous larger stone blocks which lay scattered across the complete area of the east terrace that covers approx. 3,000 square meters.



12. Photogrammetric plan of trench K.

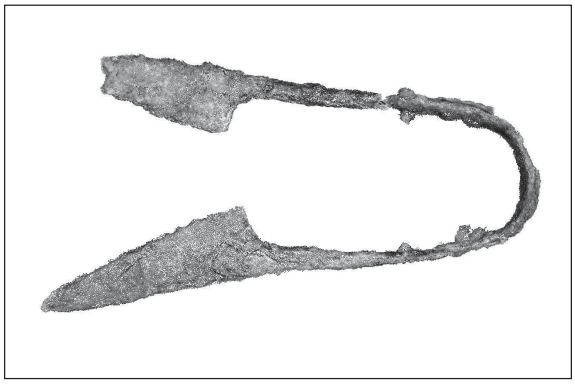
The excavated structures in trench K were comprised of two connected rooms whereof the easternmost room connected to yet another front room or courtyard in which a mortared rock-cut water channel covered by large stones running north-south through the easternmost part of the trench was discovered. To the north of the westernmost room part of another room was excavated. This room did not seem to bear any direct relation with the westernmost room of the trench. Bedrock was reached in many sectors. In the westernmost room a concentration of finds came to light. These included an Arab-Byzantine coin hoard. Among the coins was a rare specimen of a coin possibly minted in Jarash during the early Islamic period (FIG. 13) (Lichtenberger and Raja 2015b). Furthermore a number of iron and bronze items which seem to have belonged to an assemblage came to light. The items were almost all connected with textile production and sewing. They included needles for rough materials, Byzantine weights, spindle whorls and files. In the northeastern corner of the trench several larger metal objects were found, among these a flax heckle, which again underlined a connection to textile production and the working of raw materials (FIG. 15). Also a small silver scroll in a lead container, which gave the house its name, was found in the debris of the house. A digital unfolding of the scroll proved that it carried pseudo-Arabic script and probably was intended for magical purposes (FIG. 16) (Barfod *et al.* 2015). The concentration of Early Islamic period finds seem to have fallen down onto the first floor during the collapse of a second story. The associated pottery and glass finds without doubt point to an Early Islamic date. The collapse probably took place during the earthquake of 749 AD, a date which is confirmed by 14C dates from the collapse and by the find coins.

2015 Season

In the 2015 season five trenches (N – R) were excavated and trench J from 2014 was fin-

13. Obverse of a coin from trench K, Jarash (?).

14. View of trench K from West.



15. Scissors from trench K.

16. Silver scroll from trench K.

ished. The trenches mostly continued research foci started in previous years (trenches N, O, P, R) and one trench (Q) was laid out to investigate the city walls of Jarash.

Trench J

The main objective of work in trench J was to continue excavation of the cave complex which we had found in 2014 and to continue in a northern sector, north of an Ayyubid-Mamluk wall investigation of a possible street level of the so-called middle street.

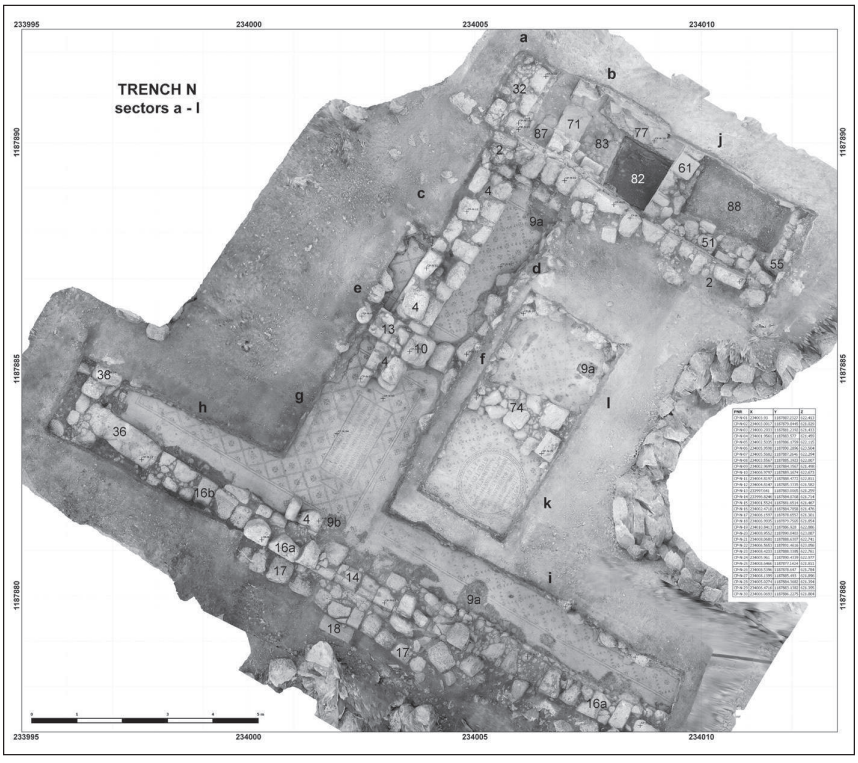
Unfortunately the protection roof which was built in 2014 did not prevent extensive illicit excavation in this trench. Several people must have excavated here during spring for approx. 2 weeks. They destroyed the entire inventory of the cave room and also destroyed the south wall of the cave. They continued excavation into the soil and found another cave room further southeast which was robbed. This heavy damage to the trench did not allow us to continue further investigation in the cave but it was clear that the cave had been used as an oil press before it was closed.

We excavated the staircase further to the east and reached its end. From the end of the staircase an opening to the north must have given access. In the northern sectors of the trench it became clear that a street indeed was running east-west and that this street was built of compact mortar floor. This street was termed "central street" by us.

Trench N

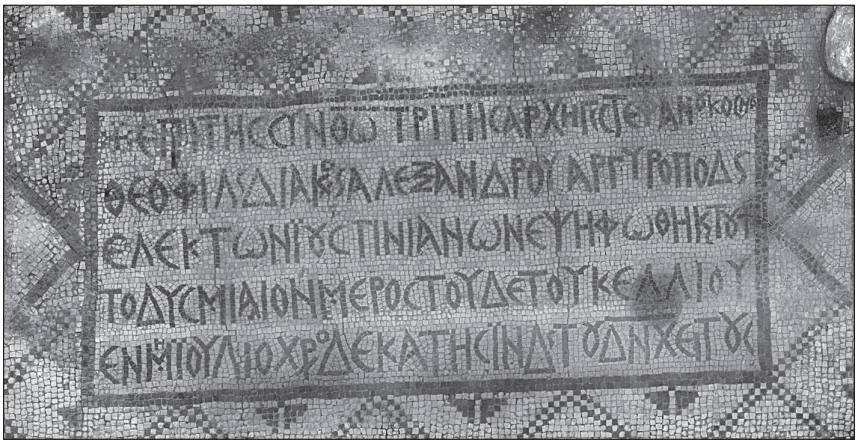
Trench N was a continuation of the work begun in trench J and the purpose was to investigate the southern side and the entrance to the cave complex (FIG. 17). The trench was laid out over the presumed rock edge and entrance and the rock cut entrance was found. The cave was accessible through a door from the west to enter a small anteroom from which the cave opened to the North. The anteroom was enclosed by two massive walls on the Eastern and on the Southern side. The cave was smaller than the cave found in 2014 but it was connected to it and it is probable that the cave was also part of the same olive oil press installation.

South of the massive east-west running wall



17. Photogrammetric plan of trench N.

a large room with mosaic floor was found. The floor was decorated in fields and had geometric patterns as well as two Christian inscriptions: One was set in a tabula ansata, the other in a medallion (Haensch *et al.* 2016) (FIGS. 18 and 19). The earlier mosaic inscription in the medallion dates to: 576AD and the younger one in the tabula ansata to 591AD. The room with the mosaic measured at least 9 × 15 m. However since the eastern border was not reached and the room was only partly excavated, it could have been considerably longer. It could be established that the room had an inner wall running along the center which would have allowed roofing of the complex. This ensemble which could be only partially excavated during this campaign probably belonged to the church-phase of the so-called synagogue church from the 6th century AD further to the south, since it was directly connected to the atrium of the church through a small staircase. The inscriptions attest to military staff being involved in the decoration of the mosaic hall and the preliminary study of the hall and its inscriptions



18. Mosaic inscription (576 AD) from trench N.

19. Mosaic inscription (591 AD) from trench N.

suggest that we are dealing with an ecclesiastical complex related to the Byzantine army.

Sometime before the earthquake of 749 AD the large room with the mosaic was transformed into a structure with several smaller rooms by the implementation of several division walls, which all respected and continued use of the mosaic floor. Pottery found on the floor dates to the early Islamic period. The whole evidence is of special significance since it attests to the transformation of ecclesiastical spaces after the Islamic conquest. Excavation in this area is planned for the summer campaign 2016.

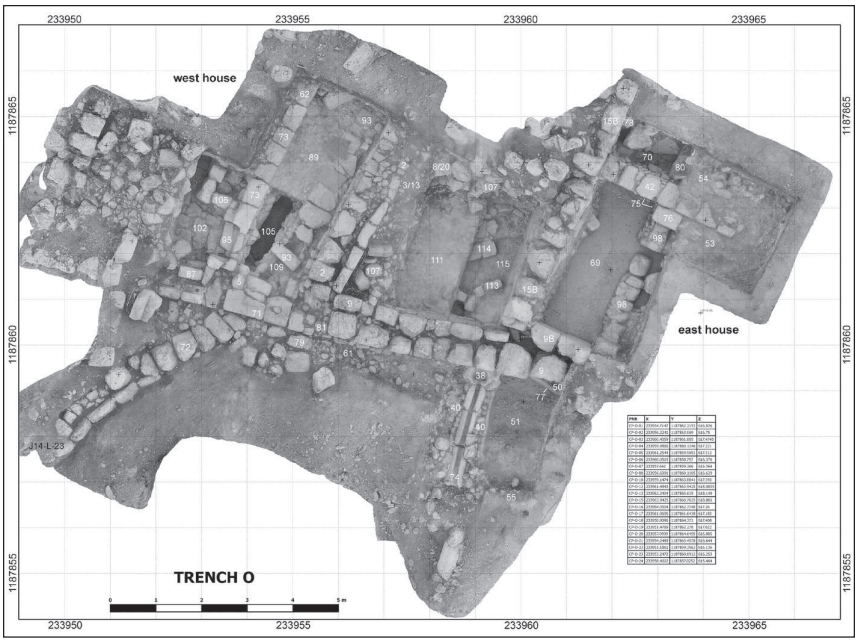
Trench O

Trench O was laid out at the Northwest corner of the large cistern on the south slope of the North-West Quarter (FIG. 20). This large cistern had been partly subject to excavation in 2013 and 2014 (trenches F and L). The aim of the new trench was to investigate the possible water inlet and a possible sediment basin of the large cistern. What was found in the trench was an Early Islamic alley (?) from south to north with one house to the West and a water channel running along this alley (?). The southern continuation of this channel had been found in trench L in 2014 (see above). East of this a densely packed podium was encountered into which we made a deep sondage and found some Roman material and possible water installations. Among the Roman material was a bowl with bronze pigments for coloring (FIG. 21). These might have been related to an adjoining room to the East, in which a very hard mortar floor had been found, which could have been related to a water basin, but this needs further investigation in the upcoming 2016 season. Later, in the early Islamic period, this area was used as a house.

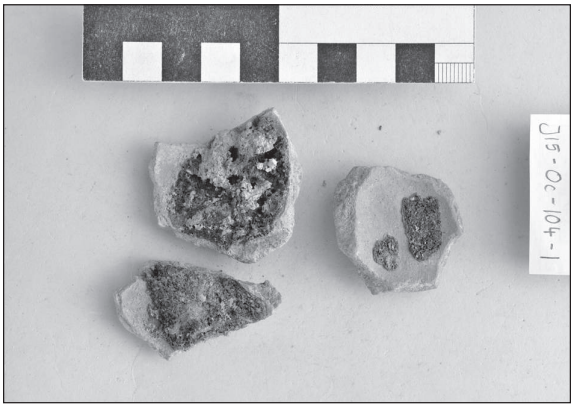
Due to buildings of later dates, which we did not remove, it was impossible to clarify the exact relationship between the strong mortar floor and the Roman/Late Roman phases of the large cistern. The most important result of this trench were the reconstruction of extensive Byzantine and Early Islamic building activity post-dating the large cistern. All evidences retrieved could be related to trenches F (2013) and L (2014) and support previous assumptions.

Trench P

Trench P continued work on the eastern terrace and it yielded a new Early Islamic house which was termed “House of the Tesserae”



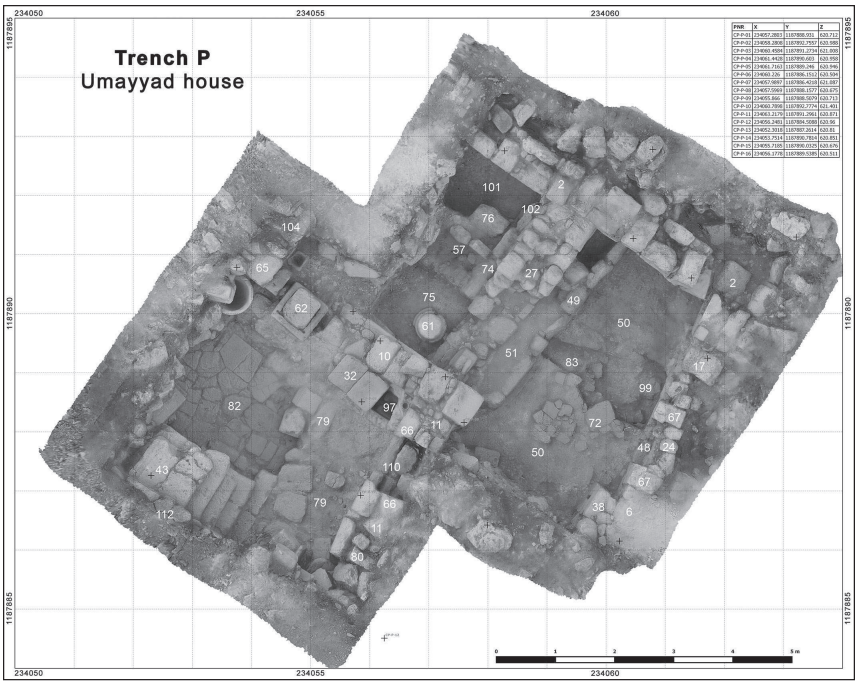
20. Photogrammetric plan of trench O.



21. Photo of bronze pigments from trench O.

(FIG. 22). After we had found in the 2014 campaign a well preserved Umayyad house with rich domestic inventory (trench K) it was decided to continue investigation of this area (eastern terrace) in this campaign. The trench was laid out further south of the 2014 trench in a flat area where few structures were visible on surface. Excavation revealed parts of an Umayyad complex that probably has been destroyed in the 749AD earthquake. As in trench K, the house had no Byzantine predecessor. We excavated a well-built staircase which led from the southwest into an open (?) area with a cistern. The cistern had a nicely cut well-head (two phases) and the cistern itself was pear-shaped, *ca.* 3.50m deep and apart from some collapse was empty (FIG. 23). The cistern was fed by a channel that led water, collected on the roof, into it. Close to the cistern several basins were also found.

From the open cistern court a door to another room to the east opened. Also to the North there was an opening to a room. This opening was given by an arch and a second arch ran in a line further to the east. Both opened to a room which at one point was divided by an intermediate wall running north-south. Attached to the eastern side of this later wall a stone built trough was constructed that ran along the wall and that was completely filled with thousands of white unused tesserae (FIG. 24). This evidence probably has to be interpreted as a preparation for laying a new mosaic in one or several rooms of the already existing house. Apart from many iron items probably belonging to a wooden door few finds were made in this part of the room and it seems this part of the house was undergoing renovation when it was destroyed in the earthquake. This is also supported by the find of a small basin with lumps of mortar in it which was used for some preparation of mortar and also by several fragments of wall plaster



22. Photogrammetric plan of trench P.

23. Well head from trench P.

24. Partly excavated tesserae trough from East.

with intentional cut marks on the surface for preparing for a new layer of wall plaster.

In the collapse of the room many fragments of mosaic stones partly still in larger formations with bedding were found. Since they were found quite high within the room and since no mosaic floor could be observed on the ground floor we have to assume that the first floor of the building had a mosaic floor.

This trench as last year`s trench K gives important insight into the latest Umayyad phase of Jarash and it provides us with undisturbed and well preserved layers. Therefore it is planned to continue excavation on the east terrace also in 2016.

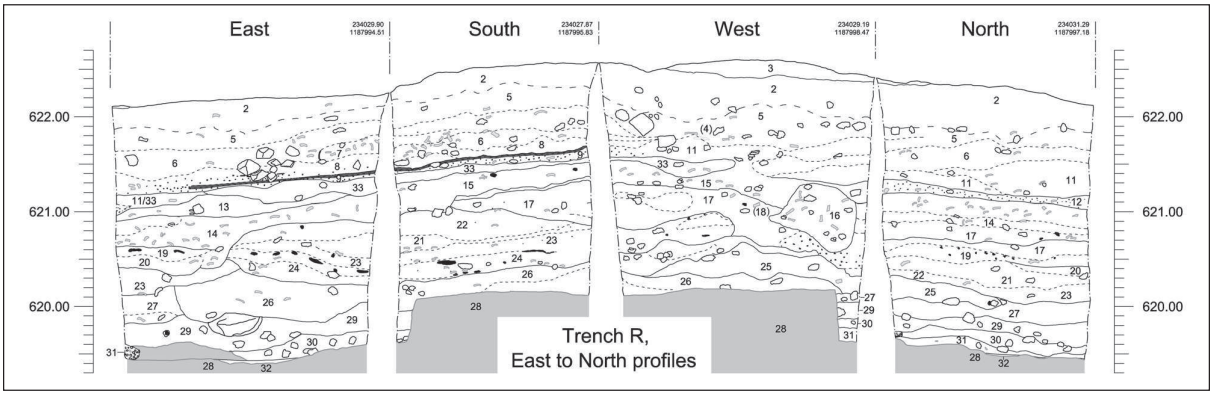
Trench R

This small trench R was laid out on the northern slope of the North-West Quarter. Its main aim was to analyze the different layers of erosion and human activity in this area. From our earlier excavations (2013 and 2014) in this area we already knew that we probably would not encounter built structures, a presumption confirmed by the excavation (FIG. 25). As we had known before, this area was mainly used for intra-urban gardening, and therefore we took archaeobotanical and soil chemistry samples in the sequence of layers dating from the Roman period to modern times. This will help to better understand erosion processes, human activity and farming in this part of the North-West Quarter. The samples are currently under analysis.

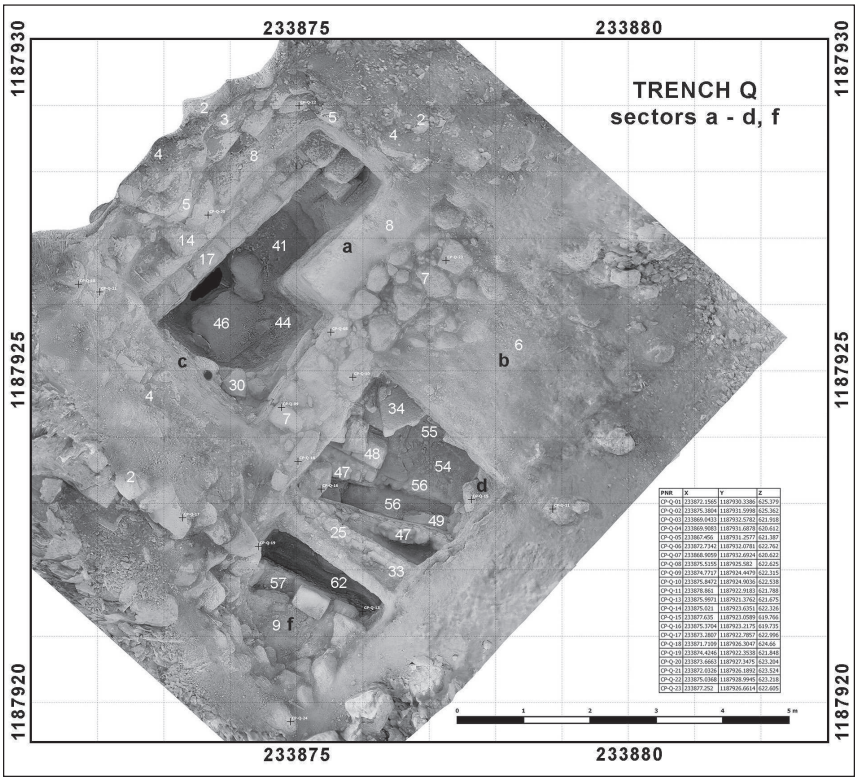
Trench Q

Trench Q was laid out at the city walls of Jarash with a stretch of a tower (FIGS. 26 and 27). Since the dating of the city walls of Jarash is contested[4], it was the aim of this trench to investigate the date of construction of the city walls and its relationship to intramural buildings. Excavation took place from both sides of the city wall, inside and outside. From both sides the fundaments of the city walls were reached. The fundaments especially from the inside but also partly from the outside were filled with much pottery and other finds of a Roman date. They need to be further investigated but this evidence supports a Roman (possibly second century

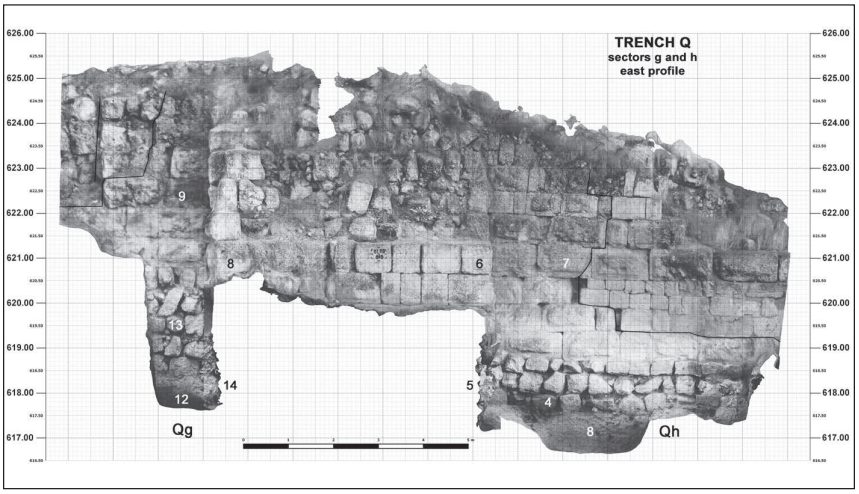
4. There is no consensus yet on the city walls of Jarash (Fisher 1938: 12–14) for a description of the visible fortifications. Kraeling 1938: 41 was the first to advocate a first century AD date for the city wall based on epigraphic evidence supposedly belonging to the Northwest Gate. This date has been questioned by Seigne on the basis of his excavations by the South Gate. Seigne argues for the erection of the city walls in this area in the late third or early fourth century AD. (Seigne *et al*. 1986: 55-59; Seigne 1992: 331). This date is disputed by Kehrberg and Manley (2001) who argue for an earlier date in the first quarter of the second century AD. for the western parts of the city wall (followed by Lichtenberger 2003: 193; Raja 2012:142-144). The Jarash City Walls Project headed by Kehrberg, Manley and Kennedy excavated strategically located trenches relating to the city walls and supplied data for an early second century AD dating, but without publishing all the related finds (Kehrberg and Manley 2001, 2002, 2003). In many places it is obvious that spolia were built into the city wall, which is a clear indication that at least some parts of the walls were heavily renovated or rebuilt at later points in time. All necropoleis of the second and third centuries AD are located outside the course of the city walls, indicating that the limits of the city were located here (walled or unwalled). For the necropoleis see (Seigne 1992: 340-341, ills:7–9).



25. Sections of trench R.



26. Photogrammetric plan of trench Q.



27. Photogrammetric section of trench Q.

AD) date for the construction of the walls (FIG. 28).

Approx. 2 m east of the city walls another later wall was constructed which in the excavated stretch ran parallel to the city walls. Further to the south an older well-built terrace wall running east west was found. Unfortunately its relationship to the city walls could not be determined since their projected meeting point could not be covered by the trench.

In the eastern part of the trench a water pipe (higher level) and a canal (lower level, on bed rock) were found. They are running east-west in a slightly oblique angle towards the south. The canal was a sewer, which was supported also by geochemical analysis. We tried to trace the course of these two water lines outside the city walls but we did not find them. Therefore the lower water canal either was cut by the construction of the city walls or it ran along the inside of the city walls and only crossing them in the area of a gate.

Conclusions

The 2014 and 2015 excavations in the North-West Quarter provided further information for the settlement history of this part of the city and also for the general layout of Gerasa/Jarash. Regarding the bigger picture, the most important result of the 2014-2015 seasons is the absence of a North Decumanus stretching beyond the area immediately west of the North theatre. The urban space of Roman period Gerasa to a large degree concentrated around the cardo and the city center. This is also corroborated by the observation that there is only few Roman period remains from the first centuries AD in the North-West Quarter, suggesting that only later this area of the city became a densely settled part of the city. This only happened in the Late Roman/Byzantine and Early Islamic periods. The evidence from the eastern terrace, where Early Islamic houses were found also contribute to this: The houses were built in an area which had no earlier occupation and after the destruction in the 749 AD earthquake the area was not occupied again. Therefore parts of the North-West Quarter were only settled during the Early Islamic period, suggesting that this period – at least in the North-West Quarter – was the period of the largest urban expansion of Jarash.

28. Roman oil lamp fragment from the foundations of city walls in trench Q.

Another important result from the two seasons is that there is still no noticeable evidence for the post-earthquake period and therefore it seems obvious that this area of the city remained unsettled after the catastrophe. This stands in contrast to what can be observed in the city center, where a small-scale Abbasid rebuilding took place (Gawlikowski 1986; Barns 2016). In the North-West Quarter only the Ayyubid-Mamluk period saw a noteworthy resettlement of the area.

As another general observation which must be mentioned that five seasons of archaeological research (including bone studies) yielded no evidence for the existence of Hellenistic and Roman necropoleis in the area of the North-West Quarter as previously assumed (Seigne 1992).

Concerning the Byzantine period the most important result of the 2015 season is the discovery of a mosaic hall with inscriptions dating to the years 576 and 591 AD. The hall had a direct spatial relationship with the so-called synagogue church. This building which lies south of the mosaic hall first was a synagogue, which most likely was converted into a church under the reign of the Byzantine emperor Justinian.

The military unit, mentioned in one of the inscriptions were the "electi Iustiniani", a special unit, which was created by Justinian. Therefore it can be assumed that the fact that the mosaic hall was related to the Byzantine army had to do with the transformation of a synagogue into a church under the emperor Justinian. The later reuse of the mosaic hall after the Islamic conquest suggests that after the defeat of the Byzantine army the property status of the mosaic hall changed and the hall lost its ecclesiastical function. We therefore through this complex get a glimpse into one situation of the impact of the Islamic conquest on Byzantine Jarash. Whereas in other cases the Islamic conquest brought no interruption in civic life and material culture does not show abrupt change, in this army context, we can trace a clear discontinuity of use, although one has to emphasize that it is not possible to date the moment exactly when the mosaic hall was converted and reused as a non-ecclesiastic complex. In theory it could have happened anytime between 591 AD (the laying of the floor) and 749 AD (the destruction of the hall), although it is most likely that it happened sometime soon after the defeat of the Byzantine army and the Islamic conquest of the Levant in 636 AD.

Acknowledgements

The authors would like to thank the DoA Amman and the Jarash Archaeological Directorate for their professional, supportive and friendly help. Especially we would like to thank general director Dr. Monther Dahash Jamhawi for his support of the project. Furthermore the DoA directors in Jarash, Ahmed Shami and Ali al-Khayyat have been an invaluable help to us and our project and we thank them and their staff in Jarash, as well as Aktham Oweidi and Ahmad Lash.

We also would like to thank our funding bodies, the Carlsberg Foundation, the Danish National Research Foundation, the Deutsche Forschungsgemeinschaft (DFG) and H.P. Hjerl Hansens Mindefondet for Dansk Palæstinaforskning. Furthermore thanks go to the German Protestant Institute Amman, its director Frauke Kenkel as well as Catreena Hamarneh for facilitating our work in Jordan. The authors would also like to thank Georg Kalaitzoglou, Heike Möller and Annette Højen Sørensen for their engagement in the project and for their continuous collegiality – without their expertise and constant work the project would not be such a success. Furthermore thanks go to the members of the team, who are all hard working and add to the research value of the project with their ideas and insight into the material which they work with.

2014 team: The team consisted of the two directors Achim Lichtenberger and Rubina Raja, head of the field Georg Kalaitzoglou, head of the registration Annette Højen Sørensen, architect Jens Christian Pinborg, conservator Margit Petersen, the palaeozoologist Pernille Bangsgaard Jensen and the field and registration team: Anders Meander Bjerggaard, Philip Ebeling, Till Flüchter, Pawel Grüner, Niels Benjamin Hansen, Ditte Maria Damsgaard Hiort, Charlotte Bach Hove, Anne Ditte Koustrup Høj, Hans-Peter Klossek, Signe Bruun Kristensen, Nadia Schmidt Larsen, Line Egelund Nielsen, Sara Ringsborg, Ulrike Rübesam and Janek Sundahl. Geologist Alf Hilding Lindroos (Åbo University, Finland) took mortar samples for 14C-AMS-analysis (Accelerator Mass Spectrometry) and geologist Peter Fink Jensen tested a hand-held spectrometer in practice. DoA representative: Akram Atoum and Ali Oweisi.

2015 team: The team consisted of the two directors Achim Lichtenberger and Rubina Raja, head of the field team Georg Kalaitzoglou, heads of the registration team Annette Højen Sørensen and Heike Möller, architect Nicole Pieper (Vienna), conservator Margit Petersen (Viborg), the paleozoologist Pernille Bangsgaard Jensen (Copenhagen) and the field and registration team: Malene Byø, Philip Ebeling, Julian Einschenk, Alessandra Esposito,

Luisa Goldammer-Brill, Niels Benjamin Hansen, Charlotte Bach Hove, Nicole Jezewicz, Hans-Peter Klossek, Kevin Kremser, Mie Egelund Lind, Kevin Luijer, Line Egelund Nielsen, Mette Normann Pedersen, Alex Hunter Peterson, Sören Pfeiffer, Sara Ringsborg, Ulrike Rübesam, Karen Elizabeth Spencer, Janek Sundahl and Nicolai Broen Thorning. Dr. Peter Hambro Mikkelsen, Director of Department of Conservation and Natural Science at Moesgaard Museum (Denmark), and Peter Mose Jensen assessed the potential for archaeobotanical sampling, while Dr. Holger Schwarzer (Münster University, Germany) examined the ancient glass finds and Ingrid and Dr. Wolfgang Schulze (Essen, Germany) the Late Byzantine and Early Islamic coinage of the years 2012 to 2015. A sampling project for geochemistry and environmental history research was started by Prof. Dr. Ian Simpson (University of Stirling, Scotland) and Dr. Søren Munch Kristiansen (Aarhus University, Denmark). DoA representative: Akram Atoum and Ali Oweisi.

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Alex Peterson

Ceramics in Context: Middle Islamic Evidence from The Danish-German Jarash Northwest Quarter Project

Scholars researching the urban history of Jarash have typically focused on settlement patterns along its main street and/or on the city's development during antiquity. This paper discusses how the excavations of the *Danish-German Jarash Northwest Quarter Project*[1] over the last five years have contributed to the understanding of the Middle Islamic period, which in this area is much better represented than previously thought. Nested within this larger research initiative researching the northwest quarter, the *Ceramics in Context*[2] project was created in 2015 to investigate the ceramic material of the site throughout its long settlement history spanning from antiquity to the middle ages. This paper outlines the preliminary results and future research plans on the analysis of the latter pottery documented in the Middle Islamic settlement. As such, this project is still very much a work in progress. Due to the early stage of the present research project, below I will aim to provide an overview of the excavation of the Middle Islamic domestic complex in the Northwest Quarter of Jarash, followed by a discussion on the ceramic material found thus far and some of my preliminary observations. Once an overview of the site has been examined, the aims and objectives for continuing research, and potential avenues of approach, can then be discussed in conclusion. By presenting the ceramic material from the excavations, and analyzing them contextually, the results impact the overall understanding of settlement history in the Northwest Quarter during a period of Jordan that is less well understood.

The Danish-German Northwest Quarter Project

The *Danish-German Northwest Quarter Project* began in 2011 as a joint archaeological project between Aarhus University and Ruhr University Bochum. Prior to 2011, fieldwork in the Northwest Quarter had been conducted by Yale University's excavations of the Synagogue

1. The *Danish German Northwest Quarter Project* is funded by the Carlsberg Foundation, H.P. Hjerl Hansens Mindefondet for Dansk Palæstinaforskning and the German Research Foundation (DFG). For the project website see (http://projects.au.dk/InternationalJerashexcavation/). Project is directed by Rubina Raja and Achim Lichtenberger.

2. Ceramics in Context research funded by the Danish National Research Foundation (DNRF119) and Carlsberg Foundation, CF14-0467. Directed by Rubina Raja and Achim Lichtenberger. I would like to express my gratitude the directors of the project and funding bodies which make this project possible.

Church, published in 1938[3], and two trial trenches by V.A. Clark and J. Bowsher in 1986. The Northwest Quarter of Jarash is located at the highest point within the walls of the ancient city, a prominent location with a view of the city, wadi, and valley. The aim of the project is to examine the settlement history of the largely unexplored Northwest Quarter of Jarash[4]. Located in the northwest of Jordan, Jarash was an important urban center and one of the cities of the Roman Decapolis[5]. Well known for its impressive Roman ruins and well preserved city walls, the modern landscape of Jarash is dominated by the remains of its colonnaded streets, hippodrome, roman theaters, and the temples of Zeus and Artemis. The early research focused on the city's history during antiquity and only recently has civic life in the Islamic periods become an object of study[6]. Notwithstanding some Decapolis city decline, it is now clear that Jarash remained an important urban center with a peak in population both during antiquity and the Early Islamic period. The flowering periods are evident both through signs of economic prosperity within urban areas in the 8th century[7] and the archaeological impact on the urban landscape through the construction of churches and mosques[8]. This peak of civic life in Jarash seemingly comes to an end in the northwest quarter during the devastating earthquake of the Umayyad period in 749 AD[9]. However, evidence for settlement

3. See Carl Kraeling, (ed.), *Gerasa. City of the Decapolis* (New Haven: American Schools of Oriental Research, 1938), 234-241.

4. For the research on this new project in the NW quarter see: G. Kalaitzoglou, A. Lichtenberger, R. Raja, D. Pilz, and R. Kniess, "Report on a geophysical prospection of the Northwest Quarter of Gerasa/Jarash 2011," *ADAJ* 56 (2012); Achim Lichtenberger and Rubina Raja, "Preliminary Report of the first season of the Danish-German Northwest Quarter Project," *ADAJ* 56 (2012); G. Kalaitzoglou, A. Lichtenberger, R. Raja, "Preliminary Report of the Second Season of the Danish-German Northwest Quarter Project 2012. *ADAJ 57* (2013); A. Lichtenberger, R. Raja, and A. H. Sørensen, "Preliminary Registration Report of the Second Season of the Danish-German Jarash Northwest Quarter Project 2012," *ADAJ* 57 (2013); G. Kalaitzoglou, A. Lichtenberger, R. Raja, "The Danish-German Jarash Northwest Quarter Project 2013: Preliminary Field Report" *ADAJ* 58 (2017 :11-37); A. Lichtenberger, R. Raja, and A. H. Sørensen, "The Danish-German Jarash Northwest Quarter Project 2013: Preliminary Registration Report" *ADAJ* 58 (2017 :39-103); G. Kalaitzoglou, A. Lichtenberger, R. Raja, "Preliminary Report of the Fourth Season of the Danish-German Jarash Northwest Quarter Project 2014," *ADAJ* 59 (2018: 11-43); A. Lichtenberger, R. Raja, and A. H. Sørensen, "Preliminary Registration Report of the Fourth Season of the Danish-German Jarash Northwest Quarter Project 2014," *ADAJ* 59 (2018: 45-131); A. Lichtenberger and R. Raja, "Jarash Northwest Quarter Project," *American Journal of Archaeology* 118, no. 4 (2014), 643.

5. For an overview on the history and archaeology of Jarash (Gerasa) during antiquity see Kraeling, *Gerasa*; Fawzi Zayadine (ed.), *Jarash Archaeological Project*, Vol. 1 (Amman: Department of Antiquities of Jordan, 1986); N.J. Andrade, *Syrian Identity in the Greco-Roman World* (Cambridge: Cambridge University Press, 2013), 160-169. In addition, for more recent research on the urban development of Roman Jarash in a publication associated with the *Danish-German Northwest Quarter Project*, see Achim Lichtenberger and Rubina Raja, "New Archaeological Research in the Northwest Quarter of Jarash and Its Implications for the Urban Development of Roman Gerasa," *American Journal of Archaeology* 119, No. 4 (2015): 483-500.

6. Early accounts of the excavations in the 1930s can be found in Chester McCown, "Archaeology in Palestine in 1930," *Bulletin of the American Schools of Oriental Research* 41 (1931): 11-12; Chester McCown, "The Yale University: American School Excavation at Jarash, Autumn, 1930," *Bulletin of the American Schools of Oriental Research* 43 (1931): 13-19; Clarence S. Fisher, "The Campaign at Jarash in September and October 1931," *The annual of the American Schools of Oriental Research* 11 (1931): 131-169; Nelson Glueck, "Jarash in the Spring of 1933. Preliminary Report of the Joint Expedition of the School in Jerusalem and Yale University," *Bulletin of the American Schools of Oriental Research* 53 (1934): 2-13.

7. For some references to Jarash economic development during Early Islamic/Umayyad period, see Fanny Bessard, "The Urban Economy in Southern Inland Greater Syria from the Seventh Century to the End of the Umayyads," *Late Antique Archaeology* 10, no. 1 (2013): 377-421; *Fanny* Bessard, "Foundations of Umayyad Economy: Jarash, a Case Study," *Al-'Usur Al-Wusta* 19, no. 1 (2007): 1-10; Zayadine, *Jarash Archaeological Project*, 107-136; Milwright, *An Introduction*, 145; Ian Simpson, "Market Buildings at Jarash: Commercial Transformations at the Tetrakonion in the 6th to 9th Centuries CE," in *Residences, Castles, Settlements*, (ed.) By K. Bartl and A. Moaz (Rahden/Westf: VML, 2008), 115-124; Alexandra Uscatescu and Martin-Bueno Manuel, "The Macellum of Gerasa (Jarash, Jordan): From a Market Place to an Industrial Area," *Bulletin of the American Schools of Oriental Research* 307 (1997): 67-88.

8. For research on the churches and mosques in Jarash during Late Antiquity and Early Islamic periods, see Kraeling, *Gerasa,* 171-262; *Barnes et. al.*, "From Guard House to Congregational Mosque: Recent Discoveries on the Urban History of Islamic Jarash," *ADAJ* 50 (2006): 285-314; Brizzi *et al*., "Italian Excavations at Jarash 2002-2009: The Area of the East Propylaeum of the Sanctuary of Artemis and the 'Propylaea Church' Complex," *ADAJ* 54 (2010): 345-369; Kristoffer Damgaard, "Sheltering the faithful: Visualising the Umayyad Mosque in Jarash," *ARAM* 23 (2011): 191-210; A. Walmsley and K. Damgaard, "The Umayyad Congregational Mosque of Jarash in Jordan and its Relation to Early Mosques," *Antiquity* 79 (2005): 362-378; Alan Walmsley, "A Mosque, Shops and Bath in Central Jarash: The 2007 season of the Islamic Jarash Project," *ADAJ* 52 (2008): 109-137; Charles March, *Spatial and Religious Transformations in the Late Antique Polis. A multidisciplinary analysis with a case-study of the city of Gerasa* (Oxford: Archaeopress, 2009). Also see the chapters discussing excavated churches in Zayadine, *Jarash Archaeological Project*.

9. Yoram Tsafrir and Gideon Foerster, "The Dating of the 'Earthquake of the Sabbatical Year' of 749 CE in Palestine," *Bulletin of the Schools of Oriental and African Studies* 55(2) (1992): 231-235.

continuity into the Abbasid period has been documented in the southern area of the city, but at a much smaller scale than in earlier periods[10]. The Arab geographer al-Ya'qubi writes in 891 AD that Jarash was still inhabited after the earthquake and consisted of a mix of Arabs and Greeks[11]. Although it is now clear that settlement continued in Jarash after the earthquake, parts of the urban landscape did not recover, such as in the northwest quarter where no new structures are built until much later during the Middle Islamic period.

After the Abbasid period, archaeological evidence of continuing occupation is much harder to detect. Despite this, our understanding of Jarash after the Early Islamic period has begun to evolve as new evidence for Middle Islamic activity has come to light. Middle Islamic material has been documented at several areas of the city. For example, Laurent Tholbecq's publication on material excavated at the temple of Zeus where a substantial node of Middle Islamic settlement was uncovered[12]. Other Middle Islamic finds appear sporadically across the ancient city, as is illustrated in figure 3 **(**FIG. 1**)**. In light of these discoveries and the ongoing excavation of a Middle Islamic settlement by the *Danish-German Northwest Quarter Project*, it is clear that civic life at Jarash continued into the later Islamic periods. Therefore, this new evidence indicates that northwest quarter of Jarash was not completely abandoned after the earthquake of 749 AD, rather there appears to be only a gap in occupation or a decline in activity. Still, the nature and extent of the Middle Islamic settlement history in Jarash is not yet fully understood and research remains at an early stage. Thus, through the contextual analysis of the ceramic material, the *Ceramics in Context* project aims to better understand the urban development of Jarash during these later periods that are less clear, specifically within the Northwest Quarter. Before discussing the ceramic material further, and my current project, a description of the layout and a summary of Middle Islamic activity located in the Northwest Quarter should be given first.

Middle Islamic Courtyard House and Domestic Complex in the NW Quarter of Jarash

The Middle Islamic structures in the Northwest Quarter were built upon, and adjacent to, older structures dating from Late Antiquity through the Early Islamic period. Excavations made clear that the entire Northwest Quarter was densely settled during earlier periods; however, buildings attributed to the Middle Islamic period appear to be restricted to the top of the hill, towards the north summit. Past campaigns, particular in 2011, 2012, and 2013, have resulted in many insights into the nature of the Middle Islamic (Ayyubid-Mamluk) hamlet on top of the hill. It is within this area that Middle Islamic builders razed the ground to the bedrock where possible, flattening the surface prior to constructing a substantial settlement complex.

10. Blanke, Lorien, and Rattenborg, "Changing Cityscapes in Central Jarash-Between Late Antiquity and the Abbasid Period," *ADAJ* 54 (2010): 318-326; Walmsley, "A Mosque, Shops, and Bath," 133.

11. See translated excerpts from Al-Ya'qubi in Guy Le Strange, *Palestine under the Moslems. A Description of Syria and the Holy Land from AD 650-1500* (London: Palestine Exploration Fund, 1890), 462.

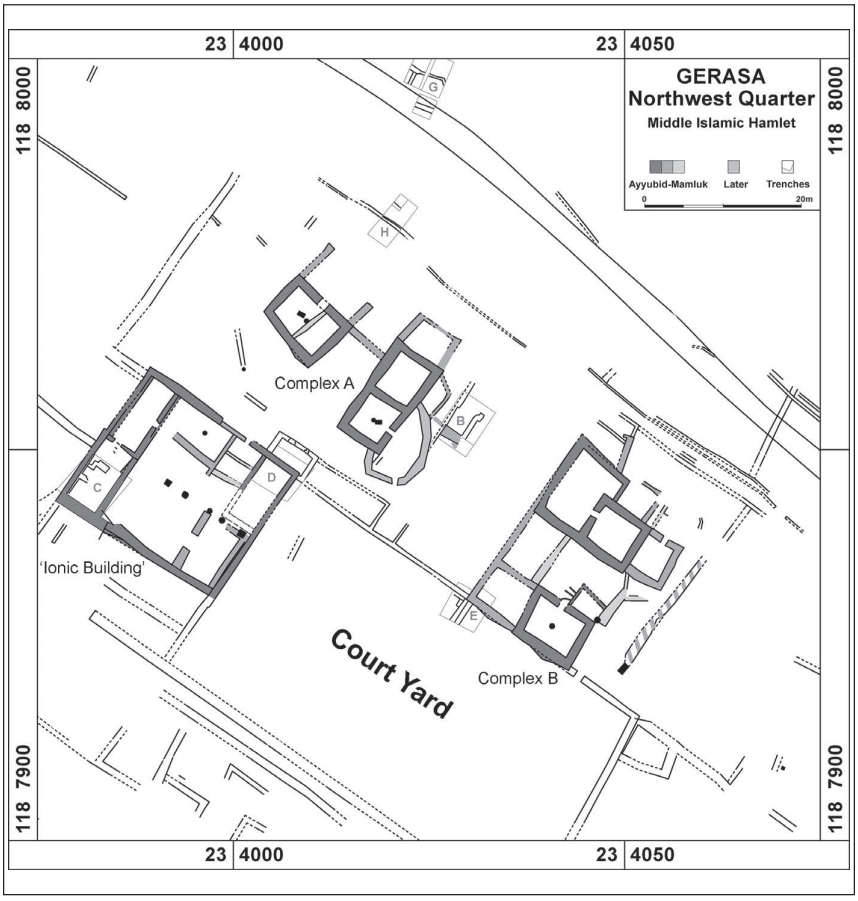
12. For an overview of Mamluk evidence identifying a node of Ayyubid-Mamluk settlement within the southern portion of Jarash, by the Sanctuary of Zeus and the Oval Piazza, see Laurent Tholbecq, "Une Installation D'époque Islamique dans le Sanctuaire de Zeus de Jarash," *ARAM* 9-10 (1997-1998): 153-179. For the temple of Artemis see Brizzi, "Italian Excavations," 365. For the North Theatre see Clark, Bowsher, and Stewart, "The Jarash North Theatre Architecture and Archaeology 1982-1983," in Fawzi Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman: Department of Antiquities, 1986, 239-241, 243, 247, and 315. Also see Mamluk glass from theater in Carol Meyer, "Glass from the North Theater Byzantine Church, and Soundings at Jarash, Jordan, 1982-1983," *Bulletin of the American Schools of Oriental Research* 25 (1988): 175, 215-216. The Church of Bishop Isaiah Vincent Clark, "The Church of Bishop Isaiah at Jarash," in Fawzi Zayadine (ed.), *Jarash Archaeological Project 1981-1983*, Amman: Department of Antiquities, 1986, 315. For the Hippodrome see Bert De Vries and Pierre Bikai, "Archaeology in Jordan" *American Journal of Archaeology* 97, no. 3 (1993): 499; Antoni Ostrasz, "The Hippodrome of Gerasa: A Report on Excavations and Research," *Syria* 66 (1) (1989); Antoni Ostrasz, "The Excavation and Restoration of the Hippodrome at Jarash, a Synopsis," *ADAJ* 35 (1991): 242-243. For the Oval Piazza see Gerald Lankester Harding, *The Antiquities of Jordan* (London: Lutterworth, 1967), 81-82.

1. Map showing locations of Middle Islamic finds in Jarash (After Thomas Lepaon, Created by Dr. Georg Kalaitzoglou).

The hamlet consisted of three building complexes situated alongside a terrace extending further to the east. A larger, monumental, and more representative courtyard house, the so-called "Ionic Building", was located centrally on the hill and measured approximately 23.40x19-20 meters[13]. "Respectively to the north (complex A) and the north-east (complex B) two other complexes are situated (FIG. 2), consisting of several rooms and at least in the case of the B complex organized around a courtyard. The 'Ionic Building' consisted of several rooms and a paved area in the southern corner with a row of columns. This might have been a courtyard or a large open reception hall."[14] Further excavations at the eastern and western corners of the "Ionic Building" revealed that older Umayyad walls were reused for the building's construction. Around the building, many areas were razed to the ground prior to construction and a cistern was dug out and backfilled. As such, it demonstrates the invasive nature of the Ayyubid-Mamluk building project, as earlier layers were removed and

13. Lichtenberger and Raja "Jarash in the Middle Islamic Period. Connecting Texts and Archaeology through New Evidence from the Northwest Quarter," in *Zeitschrift des Deutschen Palastina-Vereins* 132/1 (2016): 63-81.

14. Ibid. 9. Also see preliminary excavation reports cited earlier, particularly for campaign years 2012 and 2013.



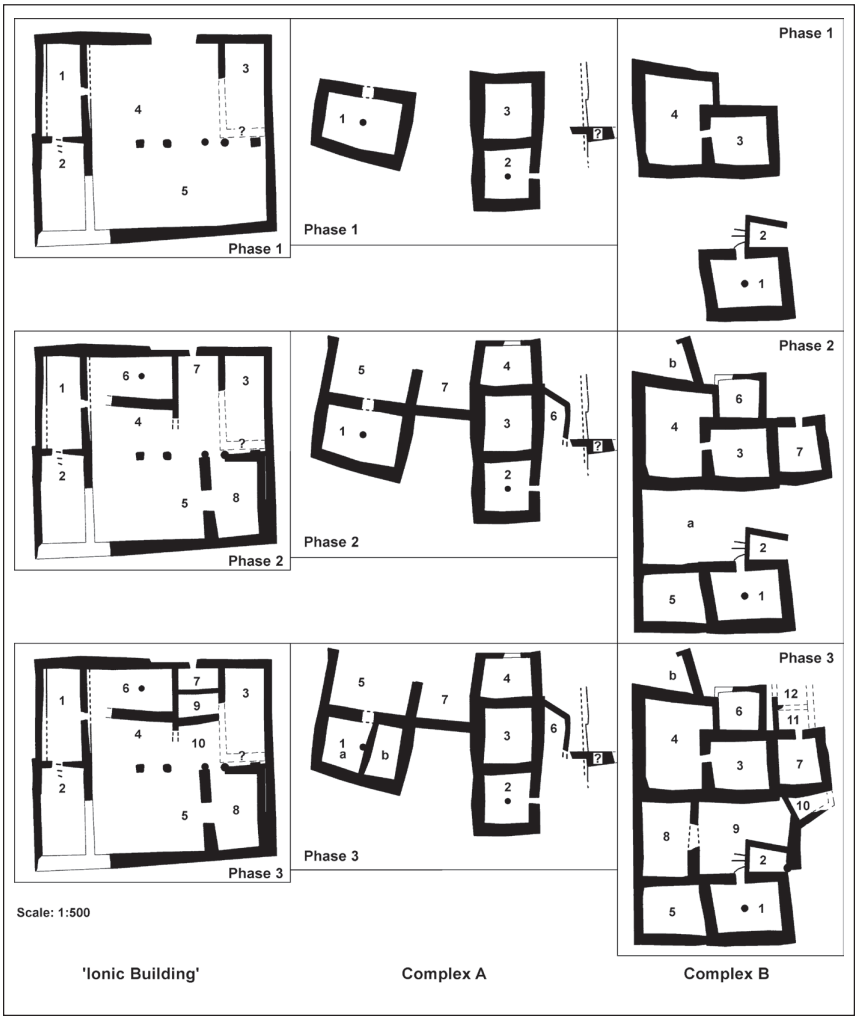
2. Layout of the Mamluk Hamlet in the Northwest Quarter. (Courtesy of the Danish-German Northwest Quarter Project).

the ground was leveled prior to construction[15]. Due to both the buildings central location on the hill and the discovery of traces of elaborate wall paintings, Lichtenberger and Raja suggestion that the building may have had an official or representational function is a strong possibility[16]. East of the "Ionic Building" is a larger rectangular terrace, bordered by a wall on the northern side, which the "Ionic Building" was situated on. This wall connected to the southern wall of complex B on top of the terrace further to the east. Excavations with the area attested to several phases of construction, as it seems that the complex originally developed from two independent complexes.

After the initial leveling and construction process took place, closer analysis of the architectural features revealed modifications and construction over a period of three phases (FIG. 3). Therefore, the excavations at the Middle Islamic complex indicate a significant construction effort took place over a period of several generations. Along with this, it is clear that in addition to building an extensive residential complex, isolated houses were also constructed in the Northwest Quarter of Jarash during the Middle Islamic period. The architectural layout of complex A, together with complex B and the "Ionic Building", reveals that it must have been the product of a sizable community. The length of time between each phase of the settlements construction remains unclear, it is hoped that further research of the ceramic material will be able to better ascertain the chronological development of the hamlet. Pottery found on the surface and in relation to the buildings demonstrated the hamlet's Middle Islamic provenance. Both handmade geometric painted ware (HMGP) and undecorated handmade wares were prevalent, a ceramic style

15. Ibid. 9-10.

16. Ibid. 10.



3. Plan of "Ionic Building," Complex A, and Complex B illustrating the three phases of Middle Islamic activity. (Courtesy of the Danish-German Northwest Quarter Project).

typically associated with the Ayyubid-Mamluk period[17]. In sum, the Middle Islamic material and structures were much better represented in the Northwest Quarter than previously thought, particularly HMGP ware.

Ceramics in Context

The discovery of both Middle Islamic pottery and a substantial node of Middle Islamic settlement is what laid the foundations for the *Ceramics in Context* project, my research aims to examine the ceramic material of the Middle Islamic complex contextually in order to better understand the settlement history across the hilltop of the Northwest Quarter of Jarash. In the past, ceramic studies have often been typological in nature and pottery is typically treated as an isolated group of material. On the other hand, *Ceramics in Context* will examine ceramic contexts related to selected finds in

17. For more on HMGP and its Chronology see Bethany Walker, "Production and Distribution of Hand-Made Geometric-Painted (HGMP) and Plain Hand-Made Wares of the Mamluk Period: A Case Study from Northern Israel, Jerusalem and Tall Ḥisbān," *Journal of Islamic Archaeology* 1, no.2 (2014); 192-230; Bethany Walker, "From Ceramics to Social Theory: Reflections on Mamluk Archaeology Today," *Mamluk Studies Review* 14 (2010): 109-155; Walker B. and LaBianca O., "The Islamic *quṣūr* of Tall Ḥisbān: Preliminary Report on the 1988 and 2001 Seasons," *ADAJ* 47 (2003):443-471; Edna Stern, "The Crusader, Mamluk and Early Ottoman-Period Pottery from Khirbat Din'ila: Typology, Chronology, Production and Consumption Trends." *'Atiqot* 78 (2014): 71-104; Sauer and Magness, "Ceramics"; Marcus Milwright. *An Introduction to Islamic Archaeology*. (Edinburgh: Edinburgh University Press, 2010), 155-156; Jeremy Johns, "The Rise of Middle Islamic Hand-Made Geometrically Painted Ware in Bilad al-Sham (11th – 13th centuries AD)," in Roland-Pierre Gayraud (ed.), *Colloque international d'archéologie islamique*. (Paris:Publications de l'IFAO, 1998), 65-93; Also see the following for systematic work offering methodological example for future work on ceramics, Robin Brown. "Summary Report of the 1986 Excavations Late Islamic Shobak." *ADAJ 32* (1988):225-245.

order to both investigate the history of settlement in Jarash and to better understand overall issues of urban lifestyle in the Eastern Mediterranean. The project aims to examine closed contexts, adopting an approach that ascribes first priority to empirical data, and thus provide a reference for future complete typologies of ceramics. Throughout the project, a more holistic and interdisciplinary approach is taken, integrating perspectives from the humanities and the methodologies from natural science. Currently, this project is still a work in progress. For this reason, only some preliminary observations and an overview of the material finds thus far can be presented below.

During the past campaigns, several trenches have been laid out to explore the Middle Islamic hamlet described above. The bulk of the finds have come from three trenches in particular, Trench C, D, and E. Due to recent disturbances, many of the excavated contexts have been disturbed, but several contexts offer fruitful avenues of approach for further research. As an example, two contexts in particular are worth mentioning in greater detail. HMGP pottery sherds found in evidence 9, of trench D, joined with sherds from evidence 17 in trench E (FIG. 4). Put short, the "Ionic Building" was not only found to be architecturally linked to the Middle Islamic structures to the east through a shared east-west running wall (ev.5), but also through the pottery. The corresponding evidence proves that the house in trench D is related to the structures in trench E.

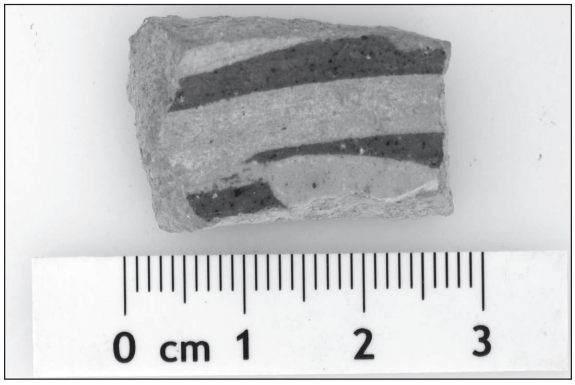
Sherd links can occur from many different circumstances. A link between contexts could result from the same context running across more than one excavated area. This is not the case here, as both the soil and character of the two evidences differ. Sherd links may attest to a sequence of closely spaced actions. Sherds may also be disturbed or redeposited at higher levels (*i.e.* residual sherds) or parts of the same vessel may reappear, signifying a reuse of an object in a new way. With that in mind, I think it is reasonable to suggest that the sherd link between trench D and E resulted from a sequence of closely spaced actions. Evidence 9 from trench D contains very large sherds, whereas evidence 17 in trench E is mainly characterized by very small sherds. The small size of the sherds is typical for a fill where pottery has been moved around frequently. Stratigraphically, both contexts have been interpreted as collapse. For trench E, evidence 17 is the soil on and within the collapse. It does not appear to be a fill taken from D for construction in E, as the other data and architecture shows the buildings to be contemporary to each other. For this reason, it is probable that when the complex went out of use and/or the structures had collapsed, soil was spread across the area over the collapsed Middle Islamic complex. Some of the soil material in D may have moved across the site during this process, which explains why the sherds in E are much smaller than in D as a result of this movement. At the same time, the joining sherd in E does stand out by being larger than the other sherds within evidence 17. Therefore, it may be an intrusion from the lower collapse attesting to chronologically close relationship between the activities in both trenches. In both cases, it is

4. Joined sherds found in the "Ionic Building" and complex B. (Courtesy of the Danish-German Northwest Quarter Project).

clear that the Middle Islamic structures are part of a larger complex.

In addition to HMGP ware, a variety of other Middle Islamic pottery types have been documented across the site. For example, plain handmade wares are present as well. Secondary contexts, or deliberate depositions of plain handmade pottery within fills, contained large amounts of plain handmade pottery that may be useful for determining ceramic associations at the time of the construction of the site (FIG. 5). Wheel made buff/sandy ware, grey ware, and a large mix of plain wares have also been registered. Plain wheel made wares constitute the majority of the finds, but are largely older pottery forms set within the walls during the construction process and are often very small and fragmentary. Within the better contexts, such as the walk on levels and collapse layers, there are less finds; however, the finds are larger and more diagnostic. Glazed wares are also found, albeit much rarer. Most of the glazed finds are either typical Middle Islamic green glazed ware or slip painted types. The soil/collapse layers of Trench C, at the "Ionic Building", contained an Islamic slip glazed sherd datable to the 13th century, or around the time of the Ayyubid/Early Mamluk period (FIG. 6)[18]. Finally, one body fragment of Kerbschnitt ware (molded pottery with hand-carved decorations) was documented. Past research typically attributed this pottery to the Abbasid period; however, recent studies have demonstrated that this style of pottery was produced in later periods as well. Evidence of finger smoothing, on the interior of the sherd, is a secure marker identifying the sherd as a post-Abbasid form likely dating to the 13th century[19]. For this reason, it should not be automatically treated as an Abbasid residual sherd and may be a useful chronological marker for the context. In sum, the preliminary dates above, in combination with HMGP sherds which are densely painted in geometric designs, appears to hint at an early Middle Islamic (Late Ayyubid/Early Mamluk) date for the construction of the hamlet. A large portion of the material remains to be analyzed and many questions remain regarding the function, lifestyle, and longevity of the complex, which will be discussed further below. As such, the material merits further research and offers an opportunity to better understand the settlement

5. Plain handmade pottery finds found within construction fill of Middle Islamic hamlet. (Courtesy of the Danish-German Northwest Quarter Project).



6. Islamic glazed sherd found in the Northwest Quarter similar to finds in Pella and Dhībān dated to 13th century Jordan or Late Crusade/Early Mamluk periods. (Courtesy of the Danish-German Northwest Quarter Project).

18. Similar sherds were found in Jordan and dated to the 13th century at Pella and Dhībān, for Pella see Smith R. and Day, L., *Pella of the Decapolis Volume 2: Final Report on the College of Wooster Excavations in Area IX, The Civic Complex 1979-1985* (College of Wooster, 1989), 239 and 197, group C, #494; For Dhībān see Porter, B. *et al*. "The Dhībān Excavation and Development Project's 2005 Season," *ADAJ* 54 (2010): 20, fig. 10 and table 1 (no. 3).

19. Stephanie Mulder, "A Survey and Typology of Islamic Molded Ware (9th-13th centuries) Based on the Discovery of a Potter's Workshop at Medieval Balis, Syria," *Journal of Islamic Archaeology* 1, no. 2 (2014): 153.

history of Jarash during the Middle Islamic period.

Aims and Objectives for Future Research

What is less clear is the chronological framework for the three phases of construction following the foundation of the Middle Islamic hamlet. Although two distinct walk on levels were detected in the "Ionic Building," diagnostic pottery was sparse within these layers, therefore detecting pottery changes over time remains problematic. For this reason, a new trench is planned for the upcoming 2016 campaign, within a part of the larger courtyard house which appears to be less disturbed by recent activity. Hopefully, the upcoming trench will shed light on the chronological changes of the ceramic material in the later phases. Along with this, I plan to compare the material from the Northwest Quarter with the material found near the temple of Zeus in order to determine if there was any possible relation between the two nodes of Middle Islamic settlement. It is also important to try and understand how pottery was actually used and how it can help inform us on urban lifestyle in the Middle Islamic period. For instance, considering the aspects of diet or food and eating trends is necessary to better understand and contextualize pottery.

As the project continues over the next couple of years and I begin to explore the questions above, I also aim to develop a more precise ceramic chronotypology for Jarash as an individual site. The large chronological and regional variation of Middle Islamic wares makes any broader typology or chronology untenable. Historical reality is likely much more complex and the ceramic repertoire of each site appears to vary during this period. As such, through empirical analysis of individual finds I will contextualize them within their contexts, the site, and the urban development of Jarash. After constructing a chronotypology and examining the pottery at a local level, it can then be placed in its regional context in order to gain insight on the social history of a region, production and consumption, lines of trade, and cultural regionalism. By analyzing the ceramics both empirically and contextually, and in relation to the deeper social and economic meanings of pottery use, a better understanding of both the settlement history and urban lifestyle of this newly discovered Middle Islamic settlement in Jarash can be attained.

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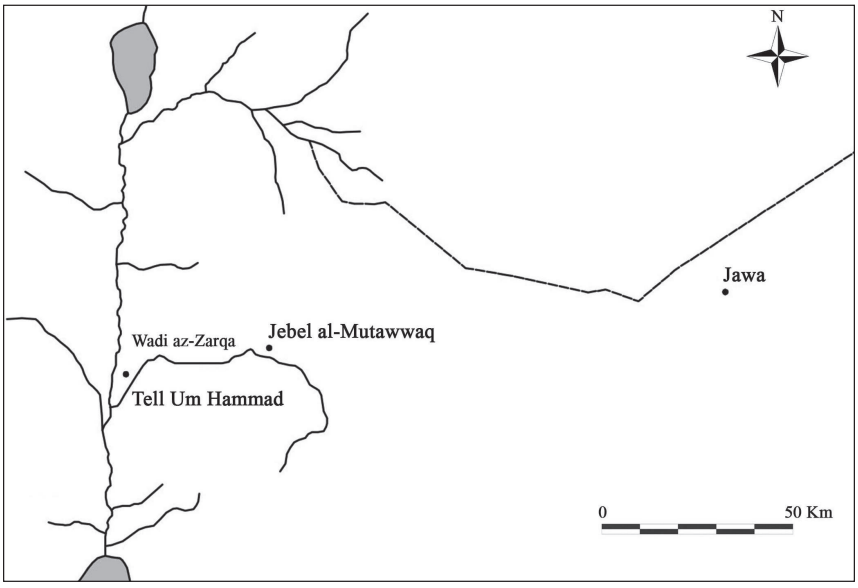
Preliminary Results of the 2014-2015 Excavations Campaigns at the Early Bronze Age I Settlement of Jabal al-Muṭawwaq, Middle Wādī az-Zarqā', Area C

Introduction

Jabal al-Muṭawwaq is an Early Bronze Age I site located along the Middle Wādī az-Zarqā' Valley, between the confluence of the Zarqa River with Wādī Ḥumayd (FIG. 1). It is characterized by a strategical location, looking toward the river valley and close to two springs, one of that, the Khuraysān Spring, still being the main source of fresh water for local villages, like al-Qunayyah.

The site, first surveyed by J.W. Hanbury-Tenison[2], then excavated by the expedition of



1. Location of Jabal al-Muṭawwaq, along the Wādī az-Zarqā' Valley.

1. The co-directors of the Spanish-Italian Archaeological Expedition to Jabal al-Muṭawwaq, Juan Ramon Muñiz and Andrea Polcaro, warmly thank all the students and colleagues from Italian and Spanish universities that have participated at the last five excavation campaigns, and all the friends of al-Qunayyah and of the Wādī az-Zarqā', workers and colleagues of local universities and of the Department of Antiquities of Jordan involved in different levels in the Jabal al-Muṭawwaq expedition and in the Khuraysān Spring Project. This kind of collaboration between foreign and local institutions is so much important in Jabal al-Muṭawwaq, in order to protect an impressive archaeological site that in the last decades has suffered systematic destruction of the village and the megalithic necropolis.
2. Hanbury-Tenison 1986, 1989.

Oviedo University directed by Juan Antonio Fernández-Tresguerres Velasco since 1989 till 2011[3], is from 2012 object of a joint Spanish-Italian archaeological expedition of the Facultad San Esteban of Salamanca and of Perugia University. The Early Bronze Age I settlement is well known for the main temple located in the center of the village[4], denominated the Temple of the Serpents for the presence of large jars with serpents applied decoration, recovered by the first Spanish expedition in the inner rooms of the sanctuary[5]. Moreover, the site had other important peculiarities, such as the stone fence enclosing all the area of the village, investigated in different areas, first by Fernández-Tresguerres and then by the Spanish-Italian archaeological expedition in Area A. The settlement wall did not have a defensive purpose, at least on its eastern side, but it was certainly a division between the space of the living and the space of the dead[6]. A megalithic necropolis, mostly contemporaneous to the village with hundreds of dolmens still preserved, in fact surrounds the settlement[7]. Moreover, the excavation at the eastern side of the settlement wall had recovered only sherds and materials dated to the Early Bronze Age IA, without any typical pottery shape or decoration indicative of the Early Bronze Age IB-II[8], the period during which the so-called walled settlement system started to appear in the Southern Levant[9].

The Excavations in Area C

Since 2014 the Spanish-Italian archaeological expedition started the excavation of Area C, located at the eastern side of the central sector of the Early Bronze Age I village (FIG. 2). This area, characterized by the presence of some structures, larger and different in shape from the usual double-apsidal dwellings of Jabal al-Muṭawwaq, is located east from the temple area. The central sector of the EB IA village is separated from the eastern one by an inner wall (not completely preserved), along which a huge door delimited by two high stone jambs was first discovered by Hanbury Tenison. This inner gate between the two sectors, called "the Hanbury-Tenison Door" (FIG. 3), gives access to Area C from the eastern side, being the ending point of a street (L. 5) coming directly from the eastern door of the settlement wall opened toward the necropolis (Area B)[10]. In front of this entrance (1.40 m wide)[11], there is an open space looking the eastern side of a large semi-circular structure denominated Great Enclosure. To the west, in the center of the Area C, we discovered between 2014 and 2015 other two buildings (Building 131 and Building C), separated by an open rectangular courtyard (L. 51). Continuing to the west of the area, toward the western sector of the village and the Temple of the Serpents, a series of dwellings with the typical double apsidal plan of Jabal al-

3. Fernández-Tresguerres 1999, 2005a. See for a reassessment of the Spanish excavations: Muñiz *et al*. 2014: 63-72; Muñiz and Polcaro 2016.

4. The building is the only one of Jabal al-Muṭawwaq where it was be possible to collect samples useful to perform two C14 analysis, that produced 5290-5040 BP = 3340-3090 BC (Beta-194526) and 5270-5170 BP = 3320-3220 BC (Beta-194527): see Fernández-Tresguerres 2008a: 49.

5. Fernández-Tresguerres 2005b, 2008b.

6. The doors identified on the settlement wall are simple, without defensive system like posterns and complex gates (Polcaro, Muñiz and Alvarez 2016; Polcaro *et al.* 2014; Fernández-Tresguerres 2008a: 40). Thus, the settlement wall of Jabal al-Muṭawwaq, at least on its eastern and southern sides, seems very different from the almost contemporary fortification systems of Jāwā, that shows at least a main complex gate in Area G (Helms 1991: 34-35) or the Early Bronze Age IB fortifications with rectangular towers and bent-gates, like Tall al-Ḥandaqūq North (Mabry 1995: 123-124). The hypothesis of two circular towers on the western side of the Early Bronze Age IA Jabal al-Muṭawwaq settlement wall (Nicolle 2012) is doubtful, because extended excavations have not been yet performed in that area and actually stratified materials in context from these structures are lacking.

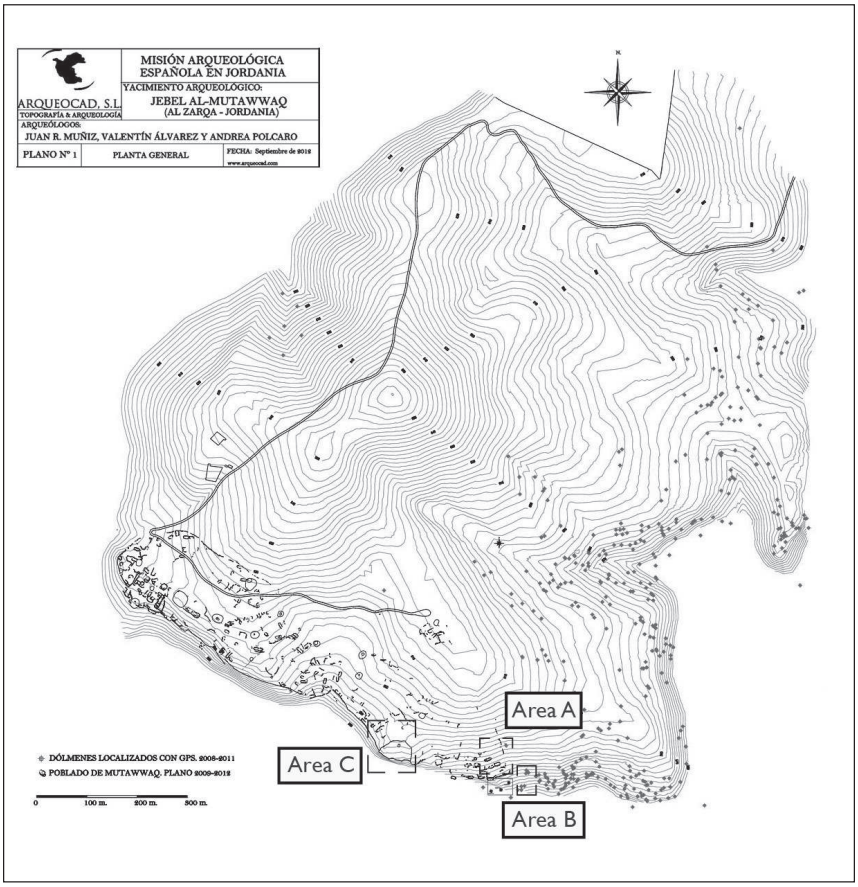
7. The Spanish-Italian Archaeological Expedition to Jabal al-Muṭawwaq performed two campaigns of excavation in the eastern sector of the necropolis, investigating six dolmens between 2012 and 2013 (Alvarez, Muñiz and Polcaro 2013, Muñiz, Alvarez, and Polcaro 2013; Polcaro *et al.* 2014, Polcaro, Muñiz and Alvarez 2016).

8. Polcaro *et al.* 2014. Pottery dated to the EB IB - EB II have been recovered till now only in few dolmens built inside the settlement after its abandonment (Polcaro, Muñiz *in press*). About the date of the Jabal al-Muṭawwaq pottery from Area A and B see also: Casadei *in press*.

9. See about a landscape approach Philip 2003.

10. Polcaro, Muñiz and Alvarez 2016: fig. 4.

11. This door is larger than the normal doors of the double apsidal houses of Jabal al-Muṭawwaq, usually between 0.75m and 0.80m (Muñiz, Polcaro and Alvarez 2013: 85).



2. Topographical plan of Jabal al-Muṭawwaq, with the indication of the excavation areas of the Spanish-Italian Archaeological Expedition from 2012 to 2016.

3. The Hanbury-Tenison door, from East.

Muṭawwaq are visible on the surface. From the number of houses[12], this area had a high density of population.

Building C and the Open Courtyard L. 51

Excavations begin in 2014 on the western part the Area C, in order to investigate the large courtyard of about 150 square meters, L. 51 (FIG. 4), opened between two buildings oriented north-south, delimited by long walls made of a single row of stones[13]. On the western part of the courtyard, close to the door of the first building still un-excavated (Building C), a large semi-circular platform, I. 57, built with large stone blocks, was discovered (FIG. 5). This platform was built against the two still standing stone jambs of the door of Building C, directly above the bedrock, representing the floor of the courtyard L. 51, just leveled where there were difference in altitude with a compact layer of earth and small stones. This platform is still un-compared in the site of Jabal al-Muṭawwaq and no other similar structures have never been identified in the private dwelling of the site. It is difficult at the present state of art to advance

12. In this sector, the past Spanish archaeological expeditions identified 71 houses (Muñiz, Polcaro and Alvarez 2013: 83).
13. This size of this courtyard is average compared to the courtyards of the private dwellings that are between 100 and 200 square meters (Fernández-Tresguerres 2008a: 41).

a hypothesis about its function[14].

North of the semicircular platform, close to the northern border of Courtyard L. 51, the natural bedrock rise in elevation; here the rock was carved in order to obtain small circular installations (I. 65 and I. 66), in which we found almost complete large storage jars (FIG. 6). Moreover, in the installation I. 65 the base of a jar was found *in situ* directly above the bedrock[15], testifying the use of the natural rock as the main surface of the courtyard. Thus, it seems that at least this part of the open courtyard was used as a storage area. This interpretation is supported by the analysis of the pottery sherds collected in Courtyard L. 51. In fact, the pottery recovered in the whole courtyard, dated to the Early Bronze Age I, is hand-made, with the typical red-orange fabric of the Jabal al-Muṭawwaq, with many examples of applied rope decoration with circular impressions on the body. The most frequent shapes are jugs and jars with vertical or slightly everted neck and simple rims and hole mouth jar with knobs and small circular impressions that finds comparison with those of EB IA Tall Umm Ḥamid and Jāwā[16]; Simple Ware is almost completely absent, with a great percentage of Storage Ware pottery (FIG. 7).

Concerning the flints, a small group of lithic tools, four small scrapers (FIG. 8: 1-4) and four blades (FIG. 8: 5-8), were discovered in the southern part of the courtyard, perhaps indicating the use of the area also for some working activities; between them also a Neolithic Jericho-Type point (PPNB), clearly out of context, has been discovered (FIGS. 8, 9)[17].

Building 131 and the Area Dedicated to the Food Production

In the eastern part of the courtyard the second building of Area C, Building 131, was completely excavated in 2015, recognizing at least two phases of use of the structure. In Phase I (FIG. 9), the building has an apsidal shape, larger than Building C, a main door opened on the western side toward courtyard L. 51 (FIG. 10)[18], with the door socket found in place, and probably another opposite entrance on the eastern side, not easy to recognize due to the bad state of preservation of the eastern wall in this area. As in Courtyard L. 51, the floor of the Building was the natural bedrock, in this point naturally well leveled. Close to the southern wall of Building 131, two large circular installations, I. 158 and I. 159, were identified. The presence in this point of a deep cup-mark, if interpreted as the base for a wooden pillar, could indicate that at least the southern area of the building was roofed. The two installations, 1.8 m of diameter and 20 cm height, are stone lined and filled with leveled layers of small white rubbles (FIG. 11). The installations occupied almost completely the southern part of the building, clearly with some purpose of production, and there are no parallels of such installations in the whole private houses since now excavated in Jabal al-Muṭawwaq. The two circular installations must have been used for working purpose, possibly for the production of butter, cheese or a product from sheep's milk. This indicates that Building 131 in Phase I could had have not a domestic purpose, but

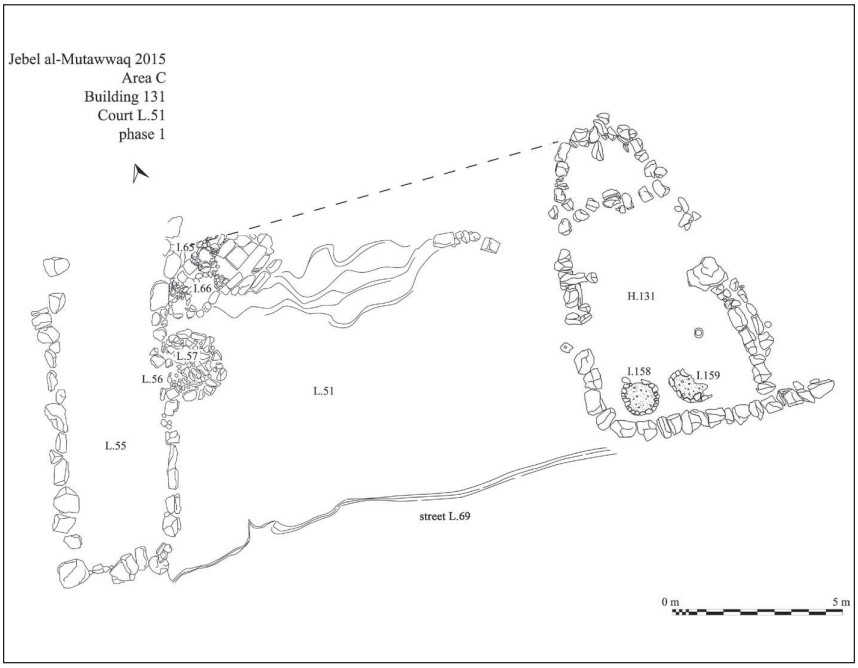
14. Circular stone platforms and installations located in courtyards are usually interpreted as open air altars in the Early Bronze Age II archaeological contexts in Jordan: see *e.g.* Bāb adh-Dhrā‘ (Rast, Schaub 2003: 157-166, fig. 10.57) and Khirbat al-Batrawy (Nigro 2013: figs. 4-5). Nevertheless, usually these features are located at some meters from the main broad room building (the *sancta sanctorum* of the temple) and not placed against its wall. Moreover, Building C seems different in plan from the other only cultic building discovered at Jabal al-Muṭawwaq, such as the Temple of the Serpents.

15. Noteworthy is the presence of reed impressions on the base of the large storage jar recovered *in situ* in the northern I. 65 installation. This technique is largely attested also in Chalcolithic contexts, such as Tulaylāt al-Ghassūl, but is quite common also in Jabal al-Muṭawwaq, in particular in some examples from the Temple of the Serpents, testifying the persistency of older pottery manufacture in the site (see Casadei *in press*; Polcaro, Muñiz and Alvarez 2016: 1640-1643).

16. Helms 1991: 51-55, 1992: 45-68.

17. See for comparisons: Gopher 1994: 36; Kujt and Goring-Morris 2002: fig. 11a. The presence of a PPNB point in an archaeological context clearly dated from the pottery sherds, architecture and stratigraphy to the Early Bronze Age I is very interesting. It could suggest the decision of the people of al-Muṭawwaq to keep an ancient object, perhaps recovered along the valley of the Wādī az-Zarqā' at the base of the mountain, where a Neolithic site, Khuraysān, was discovered (Edwards and Thorpe 1986) and it is actually under excavation by a Spanish expedition (see Ibañez *et al*. 2016).

18. The main western door of Building 131 is larger than the usual door of the houses of Jabal al-Muṭawwaq, reaching 1.5m wide.



4. Jabal al-Muṭawwaq, plan of Area C.

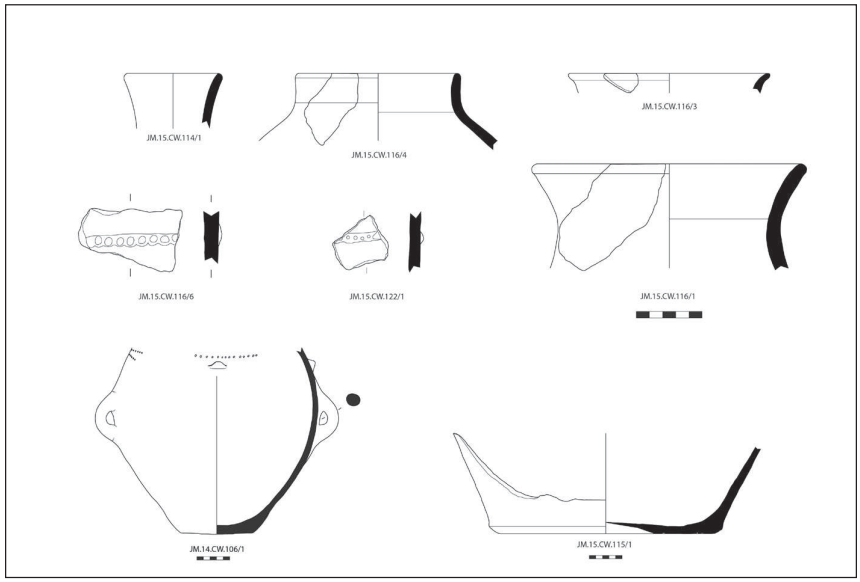
5. The circular platform L. 57 of Building C, from East.

6. The small installation I. 66 in L. 51, from East.

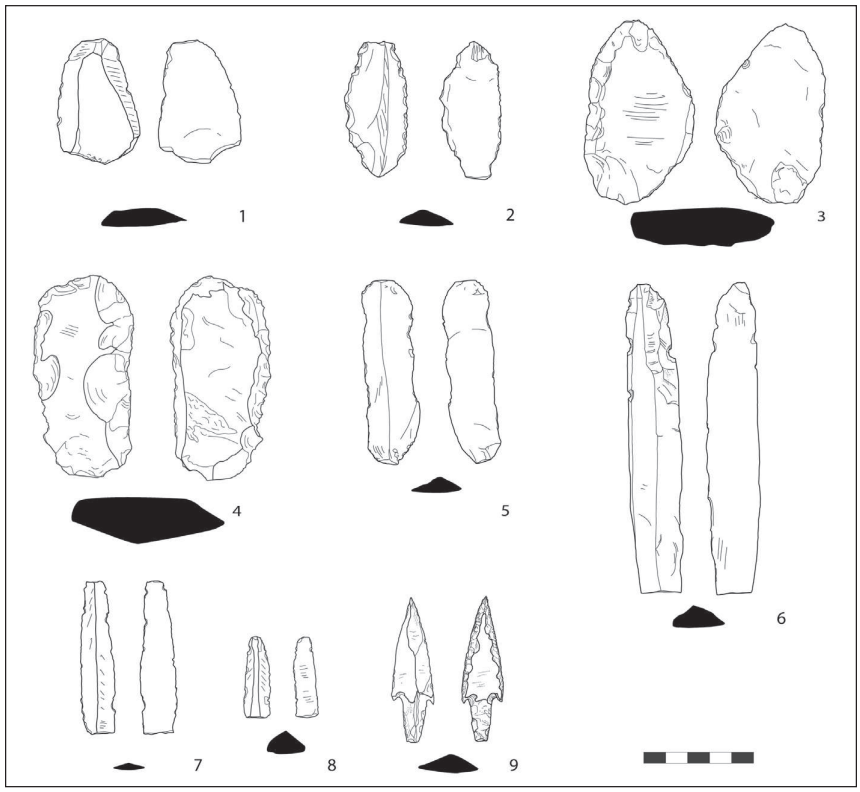
was dedicated to the production of food for the needs of a group larger than a single family.

Pottery from Phase I of building 131 is dated to the Early Bronze Age IA, handmade, row red-orange fabric. Except for the hemispherical cups and bowls, the majority of sherds are medium and large jars with vertical or slightly everted neck with plain ledge handles and hole-mouth jars. Both the shapes are attested in cooking and storage ware (FIG. 12).

In Phase II (FIG. 13) the inner space of the building was reduced and the floor slightly raised with a compact layer of earth. In the northern part, wall 172 was built, obtaining a small room (L. 174), as such as in the southeastern corner of the building through wall 160, obliterating the second platform, clearly no more in use during this phase. Moreover, a circular pit, P. 155, delimited by stones, was joined to the external eastern facade of the building, filled with stones, sandy layers and some animal bones. Pottery from Phase II is similar in morphology, decoration and fabric to the assemblages of Phase I, dated to the Early Bronze Age IA, as it is proved by the presence of hemispherical bowls and slight everted neck jars (FIG. 14).



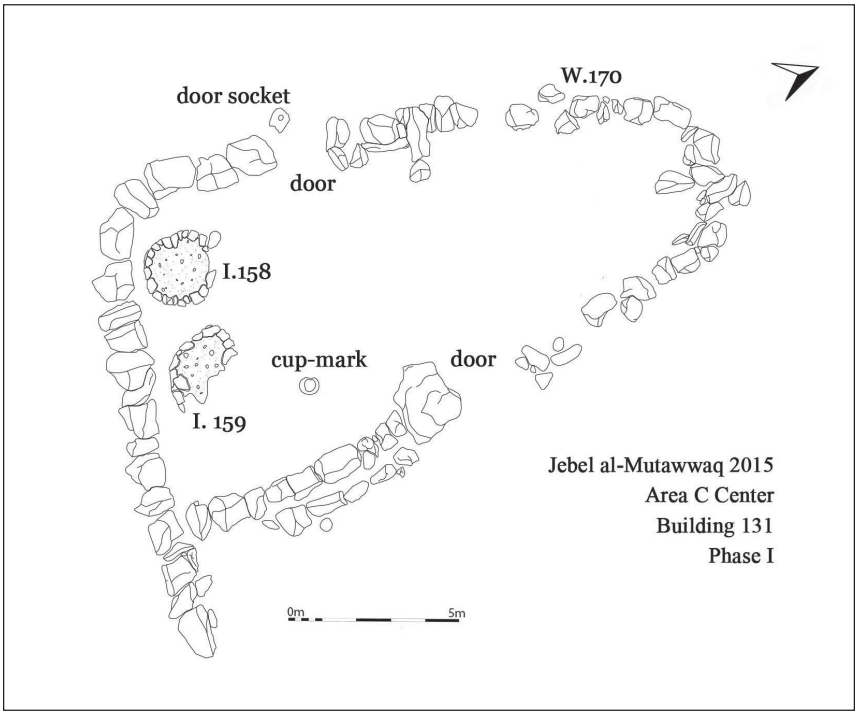
7. Early Bronze Age I pottery from the courtyard L. 51.



8. Lithic tools discovered in L. 51: 1-4 (EB scrapers), 5-8 (EB blades), 9 (PPNB Jericho-point).

In pit P. 155, a flat elongated flint scraper, similar to the one discovered in 2013 in Dolmen 317, has been discovered (FIG. 15). The elongated scraper of this typology discovered in the funerary equipment of Burial B25 in Dolmen 317 was in couple with a large flat flint tool of the fan or tabular scraper typology[19]. These kind of lithic tools could be reasonable interpreted as instruments for the wool cut during sheep shearing[20].

19. Polcaro *et al*. 2014: fig. 15. Other flint scrapers of this kind come from the Temple of the Serpents (Fernández-Tresguerres 2008b: fig. 15; Polcaro *et al*. 2014: fig. 5), whose last use was dated, by old C14 analysis performed on few olive seeds discovered in the sacred area by the past Spanish expedition, between the 3300 and the 3050 BC, at the end of EB I: see Fernández-Tresguerres 2008a, 49.
20. Barket and Bell 2011.



9. Plan of Building 131, Phase I.

10. The western door of Building 131, from South.

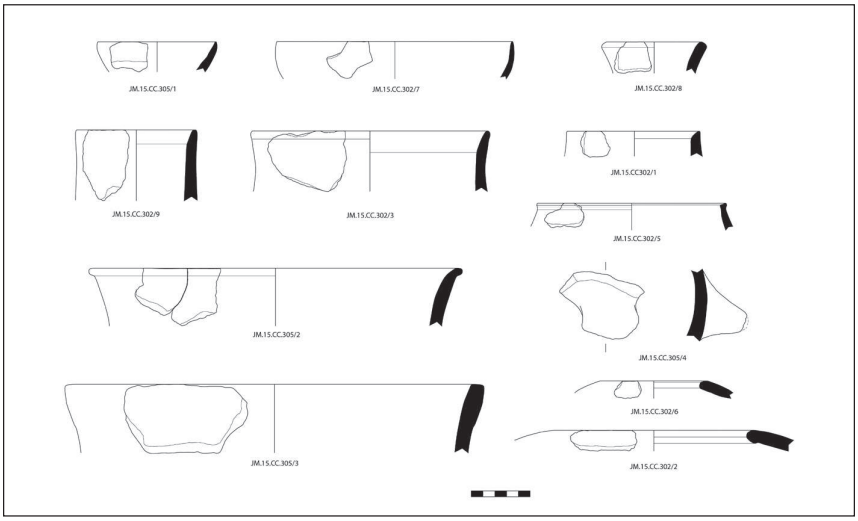
11. The two large installations (I. 158 and I. 159) in Building 131, from West.

Summarizing, this part of Area C seems to be related to production and storage activities, not directly connected to the private houses of the settlement, with two buildings linked by a large open courtyard, with some particular features like platform I.57 and installations I. 158 and 159. South of this complex of structures, following a lower natural level of the mountain, a street, L. 69, runs from west to east, bordering the southern wall of courtyard L. 51. The floor of the street was obtained leveling the natural bedrock and was covered by layers of deposition terrain (Strata 124 and 129) and collapsing layers of large stones of the southern wall of Courtyard L. 51 (Strata 126 and 128). The pottery recovered on the floor of the street is contemporary to the use of the courtyard (FIG. 16): hole mouth jars with pushed up lags and groove below the rim, having good comparisons with BA IA samples from Jāwā[21].

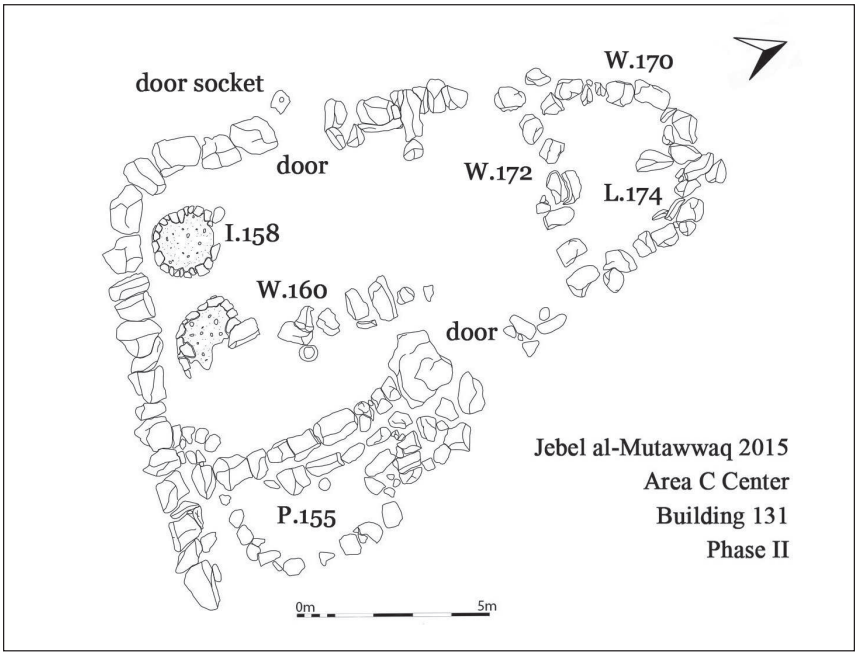
The Great Enclosure: an Enigmatic Structure

Street L. 69 leads toward a large enigmatic structure, called Great Enclosure. The structure consists of a large semicircular enclosure of *ca.*

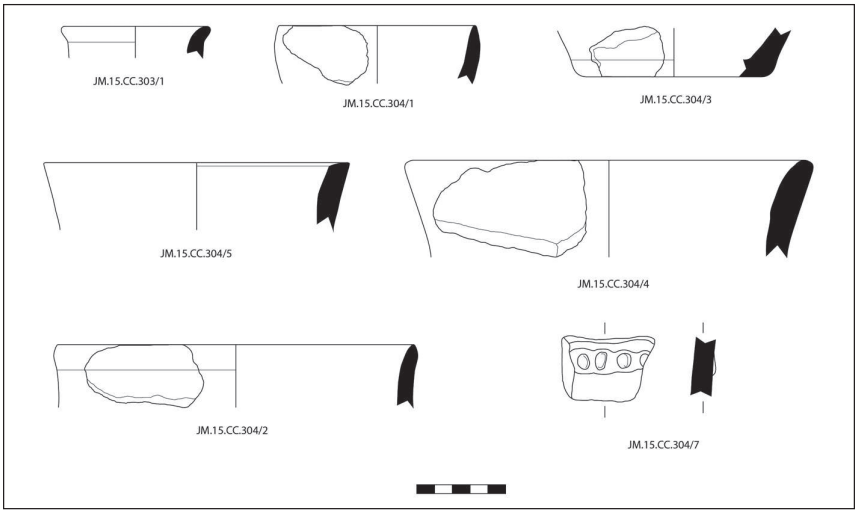
21. *e.g.* Helms 1991: fig. 112: 20-23.



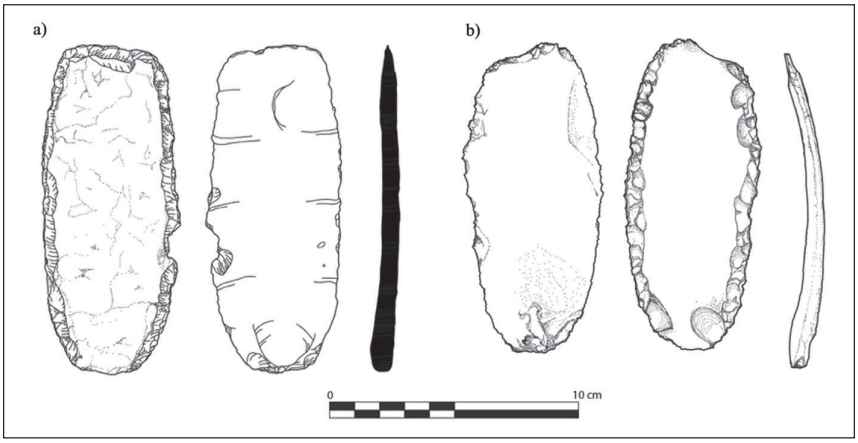
12. Early Bronze Age I pottery from Building 131, Phase I.



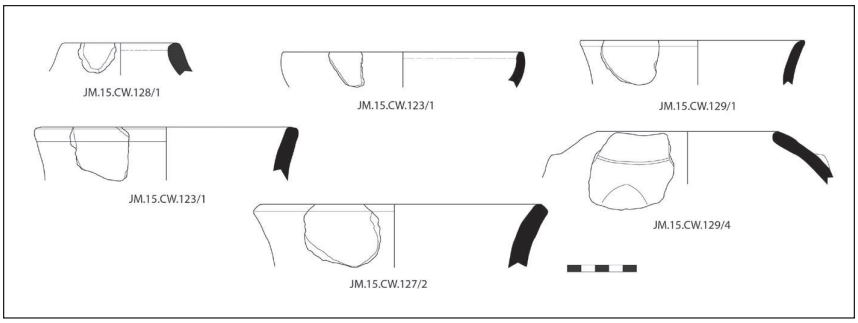
13. Plan of Building 131, Phase II.



14. Early Bronze Age I pottery from Building 131, Phase II.



15. Flat elongated scrapers from Building 131 (a) and from Burial B25 in Dolmen 317 (b).



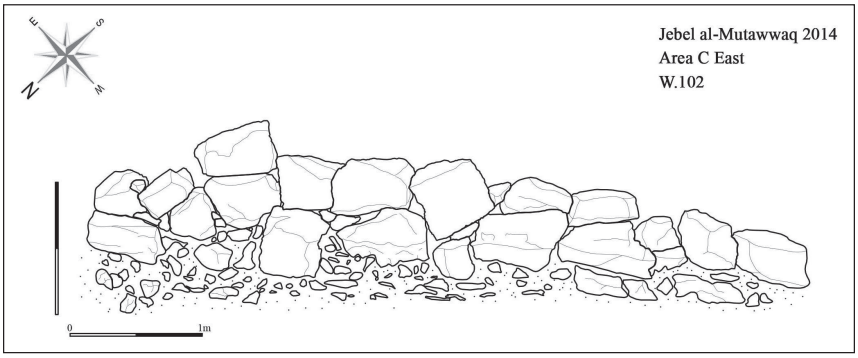
16. Early Bronze Age I pottery from street L. 69.

50 meters of diameter with a single standing stone in the center (FIG. 17). Firstly interpreted as a cultic open area for the presence of the standing stone, a campaign of survey and excavations of the structure allows to advance also different possible interpretations. This large open space is delimited with a huge massive stone wall (W. 102), built closed to the southern cliff of the mountain, without any clear entrance apart a megalithic door, partially covered by a high layer of huge collapsed stones, with a lintel in place made with a large capstone in a similar way of the dolmens. The external line of W. 102 is still preserved in some points for three courses of stones, reaching a height of 1.50 meters (FIG. 18). During the 2014-2015 excavation campaigns, a small circular room (L. 107), delimited by a single line of stones (W. 104) and with a circular installation inside (I. 109), have been discovered close to the western sector of the structure (FIG. 19). These kind of small circular architectonical features were discovered also inside the stone enclosure of the EB I sites identified around the settlement of Jāwā, like Khirbat Abū al-Ḥuṣayn[22], and were interpreted as circular storage facilities, like silos. Even if the poor stratigraphy preserved inside the Great Enclosure of Jabal al-Muṭawwaq had given almost no materials, the presence of few diagnostic sherds inside the inner part of the wall and its foundation can date the structure to the same period of the village.

Only future excavations campaigns in the area could clarify the real function of this huge

17. The Great Enclosure, from West, with the standing stone visible in the center.

22. Müller-Neuhof *et al*. 2013.



18. Northwestern section of wall W. 102.

19. The circular room discovered inside the Great Enclosure, delimited by wall W. 104, from North.

structure, but in any case some architectonical characteristics such as the impressive enclosure wall and the single small entrance, could point to a protective function for economic resources important for the whole community. In this regard, the comparison of the plan of the Great Enclosure with the large central enclosure of Khirbat Abū al-Ḥuṣayn (FIG. 20), a site located on an area suitable for pasture during the grazing periods[23], could suggest activities related to the exploitation of the herds, a place were the sheep flock can be collected for shearing and were the wool could be stored. Moreover, milking activities could have been performed in the same area, perhaps linked to the production activities performed in the nearby Area C. However, this hypothesis does not preclude the possibility that some rituals, possibly involving animal sacrifices, could be performed in the enclosure, perhaps in connection with the standing stone[24].

Conclusions

The discoveries in the central sector of the Early Bronze Age IA village of Jabal al-Muṭawwaq provided an important historical information about the organization of the economic activities of the settlement, pointing to the importance given to the herd exploitation, that seems to have been the central activity performed in Area C. The architectonical effort and the organization of the settlement space in a central area of the large EB IA village suggest also a kind of central organization, fact that seems to be confirmed by the set of fan scrapers discovered in the temple area by the past Spanish expeditions[25].

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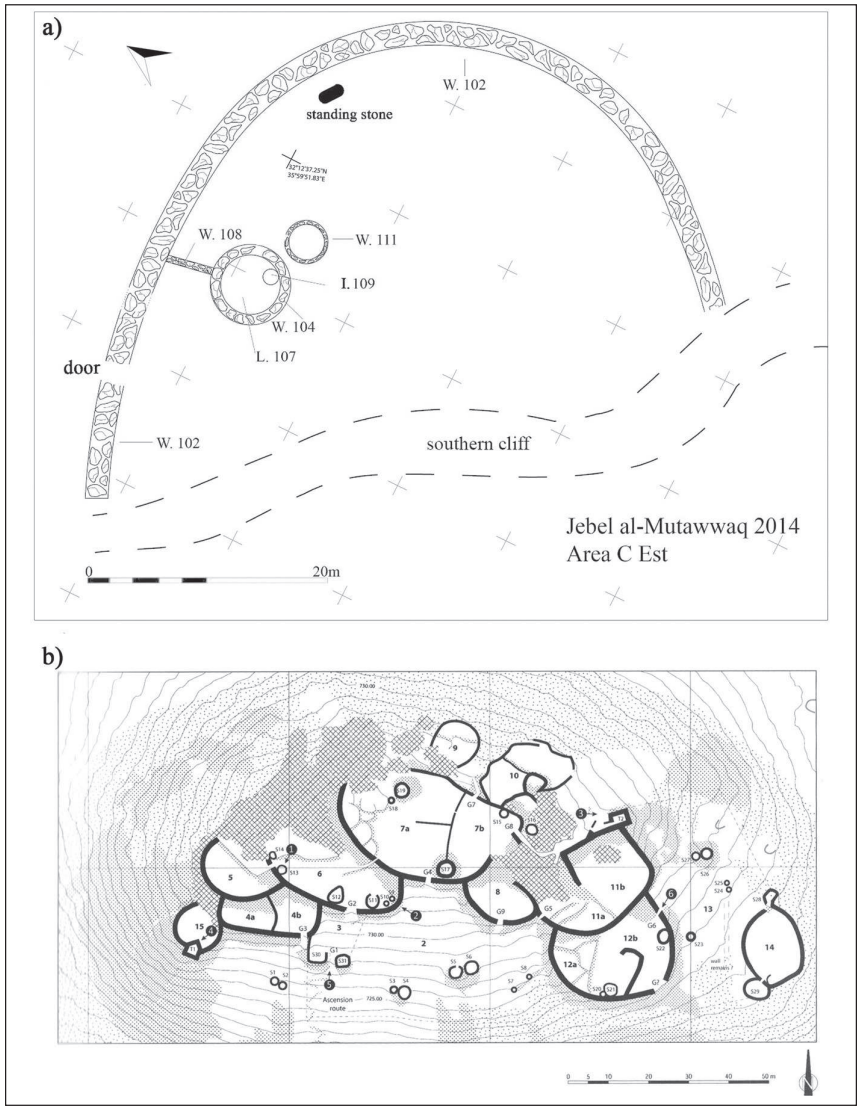
23. Müller-Neuhof *et al*. 2013.

24. In fact, a smoothed flat rock was discovered close to the standing stone, together with a small podium delimited by stones, presumed to by an altar, in an excavation sounding performed by the past Spanish expedition of Oviedo University on the southern side of the megalith (Nicolle 2012: 436).

25. Fernández-Tresguerres 2008b: fig. 15.



20. Comparison between (a) schematic plan of the Great Enclosure of Jabal al-Muṭawwaq and (b) plan of Khirbat Abu al-Ḥuṣayn (from Müller-Neuhof *et al*. 2013: fig. 7).

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Notes on Two Manjaniq Counterweights from Mamluk ash-Shawbak

The Site and the Finds

The castle of ash-Shawbak is located in Jordan few kilometers to the North of the homonymous town, along the road connecting aṭ-Ṭafīlah to Wādī Mūsā. A first archaeological campaign has been conducted by Robin Brown in the eighties in order to investigate the Late Islamic horizon of the settlement (Brown 1988). Since 2000 the Archaeological Mission *'Medieval' Petra. Archaeology of the Crusader-Ayyubid settlement in Transjordan* by the University of Florence started a new research in the area[2]. The results gathered since then show that the Crusader installation was preceded by a Late Roman-Byzantine fortified settlement whose curtain wall is partially preserved in the inner part of the castle. Baldwin I, king of Jerusalem, in 1115 built the castle, apparently taking advantage of the remains of the previous fortification, as part of the defensive apparatus of the eastern frontier of the Latin Kingdom of Jerusalem, protecting the southern part of Transjordan and the road towards the Red Sea. Mentioned in western written sources as Montréal due to its royal foundation, the castle became the political and military baricenter of southern Transjordan and the success of this role is also expressed by its urbanistic development. After its fall in 1189 into Muslim's hands, as an aftermath of the defeat at Ḥiṭṭīn (1187), the regional political importance of the castle was strengthened under the Ayyubids who added monumental and productive buildings. According to written, epigraphic and archaeological sources, few years after the dismantling of the fortifications accomplished by the Mamluk sultan al-Ashraf Khalil, his successor Lajin built up in 1297-1298 a new and strong defensive apparatus, including new bastions and towers (FIG. 1) (Nucciotti 2007: 45, 48; Walker-Dotti-Nucciotti 2009).

Prior to the start of the research by the 'Medieval' Petra Mission, in the nineties of the last century the Department of Antiquities of Jordan accomplished a clearance campaign in the area of the major monumental buildings

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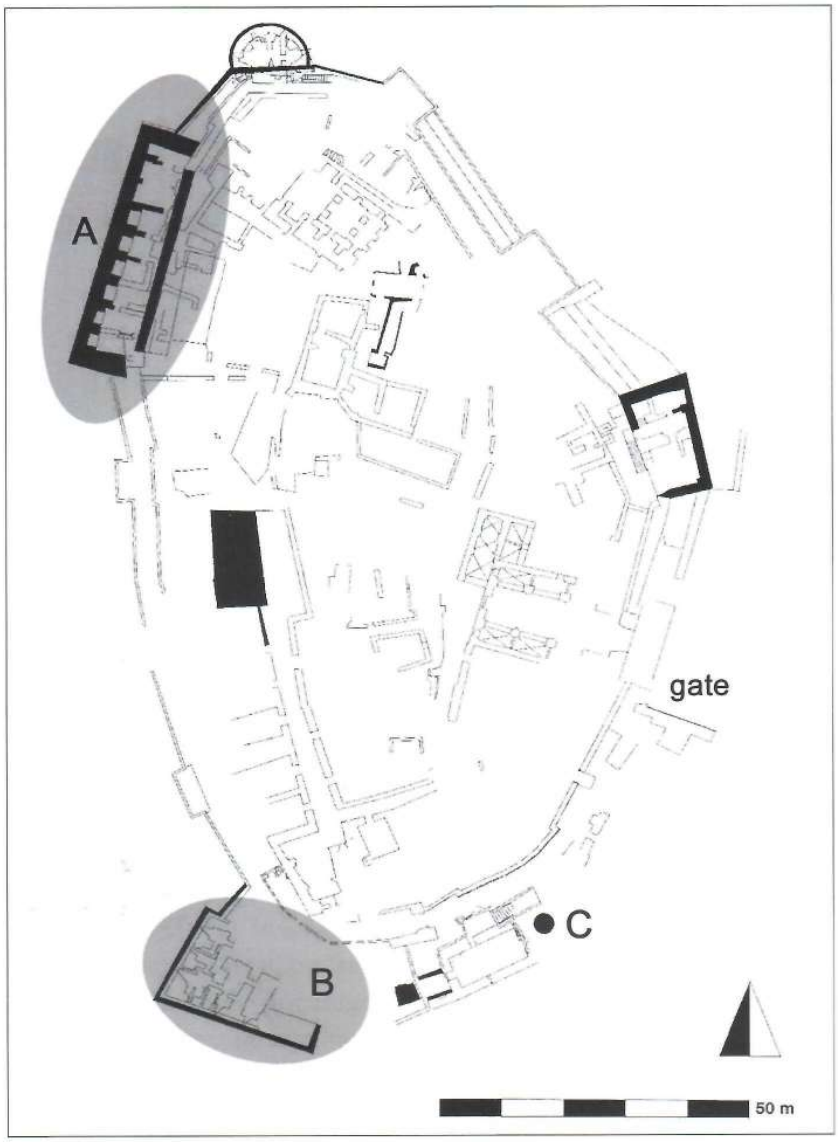
2. The research at ash-Shawbak is part of the wider project 'Medieval' Petra. Archaeology of the Crusader-Ayyubid settlement in Transjordan started in 1986 by the University of Florence. On the goals, method and results of the whole project see Vannini 2007, Vannini-Nucciotti 2009 and Vannini-Nucciotti 2012.



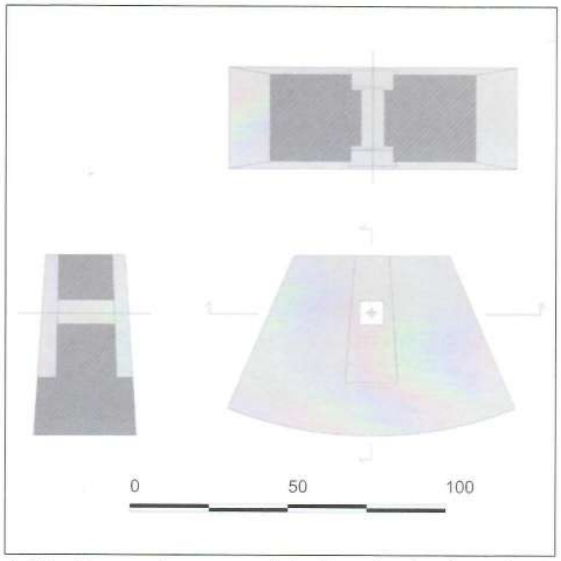
1. Plan of the castle of ash-Shawbak with the main Mamluk reinforcements of the late 13th century as indicated by the archaeological analyses (after Nucciotti 2007). Letters A and B show the probable areas of provenance of the two counterweights.

in the North-East part of the castle. During these works was unearthed a quantity of stone elements which were stored in the vaulted halls underneath the upper church of Saint Mary (FIG. 2). Among epigraphic fragments, decorative architectural elements, millstones and many spherical stone projectiles of various diameters, a particular element carved into a limestone block was recognised. Being conventionally indicated as "A" type (FIG. 3), it has a trapezoidal shape, with a convex base and a dovetail mortise carved on both faces with a square hole pierced through the thikness of the block (FIG. 4) (Vanni Desideri 2009).

Around 2000-2002 a new clearance campaign for consolidation works was accomplished by the Ministry of Energy and Mineral Resources in the southern part of the castle. During this campaign a second element of the same kind has come to light. It is conventionally indicated as "B" type and although lacking a small fragment in the upper part, the general shape is quiet similar to the A type but smaller and thinner, being every dimension about half of those of the previous one (FIG. 5). It differs from the latter in the extension of the mortise which goes from top to the base of the element and it is carved only on one face. But the more

2. The *lapidarium* where the stone elements were stored after the first campaign of clearance. Among them the A type of counterweight is visible with projectiles of various size in the background (Photograph, by the author, summer 1999).

3. The A type of counterweight (Photograph by the author, summer 1999).



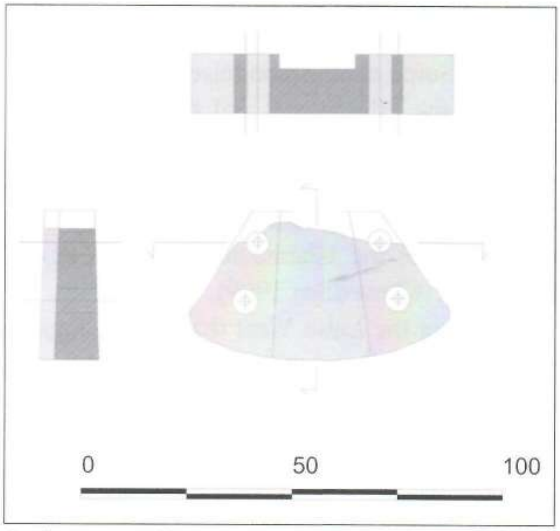
4. The A type of counterweight (Drawing by the author).

evident difference with type A is the absence of the square hole and the presence of four holes drilled through the thickness of the block and located laterally to the central mortise (FIG. 6).

Discussion

If we consider the two specimen from ash-Shawbak, although the archaeological context has been lost and a preliminary search for archaeological published comparison didn't succeed, their apparent similarity with drawings of counterweight artillery guided the research, in order to specify the type of engine to which the artefacts belonged, to propose a reconstruction of the coupling system and their chronology, starting from a concise review of Arab military treatises and related iconography[3].

5. The B type of counterweight (Photograph by the author, November 2012).



6. The B type of counterweight (Drawing by the author).

3. A preliminary bibliography on Arabic military literature was provided by Rahman Zarky 1965. On Islamic military technology see also: al-Hassan-Hill 1984: 93-120; Hill 1998: 99-115 specifically dedicated to trebuchet. See also the recent work by Tami 2012 dedicated to the cultural and technical aspects of warfare during the Crusades on both sides.

As regard to terminology, the hurling engines to which the elements most probably belonged are indicated by the Arab terms *'arrada* and *manjaniq*, according to some author recflecting their different size, being the *'arrada* smaller (Finò 1972). More recently, some scholar, on the basis of the description by al-Tarsusi, thought that the *'arrada* consisted in a pole-framed and the *manjaniq* a trestle-framed engine (Chevedden 2000: 95).

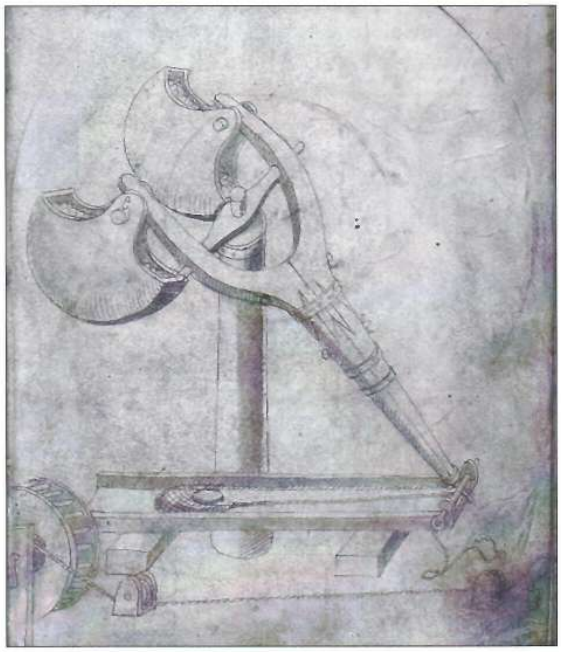
Originated probably in China as a traction powered engine, this weapon appeared in the Mediterranean area among Byzantine army, even in its hybrid design, combining human traction with gravity power (Chevedden 1999: 36; Chevedden 2000). Soon reaching the Islamic milieu, it was used increasingly often during the Islamic conquest from the siege of Mecca (683) to Baghdad (865).

A more advanced and effective counter-weight type, the *trabuchium* or *biffa* of western written sources, was developed in the Mediterranean area by the end of the 12th century[4]. From this type, rapidly disseminated by Arab engineers towards the Far East, there evolved around the mid-13th century the pivoting counterweight engine, or *biffa*, as it was called by Egidio Colonna in the *De re militari veterum ad mores praesertim medii aevi* (Colonna 1724, I: 1-69). Some author recognised a relationship between the effectiveness of this new design and the change in the planning of passive (fortifications) and active (weapons deployment) defence of castles and cities starting with the renovation of the Islamic fortifications in the Latin East (Chevedden 1999).

It was in the Latin West that a new engine, powered by twin pivoting counterweights and therefore called *bricola*, originated. His fortune spread in a relatively short time eastward and lasted until the Renaissance when Francesco di Giorgio Martini gave two of the most famous and detailed, although latest (1472-1477), graphic descriptions of this engine in his *Opusculum de architectura* (FIG. 7).

Following the diffusion of the *bricola* from the West Mediterranean area towards China, three main steps have been recognised. It seems that from Latin West the technical and practical knowledge of this design was first transmitted to the East Mediterraean thanks to the emperor Frederick II who, according to Caffaro's *Annales,* in 1242 sent some engines to the Near East (Chevedden 2000: 110, n. 143). Later on the new and more efficient artillery, since then called *manjaniq ifranjī* or *manjaniq firanjī* (mangonel of the Franks) because of its origin, was introduced as an updated ordnance in the Mamluk army (Chevedden 2000: 109). The third step eastward was accomplished by Muslim artillerists serving in the Mongol army who transmitted the *bricola* to China where its name was changed into *hui-hui phao*, or muslim trebuchet[5].

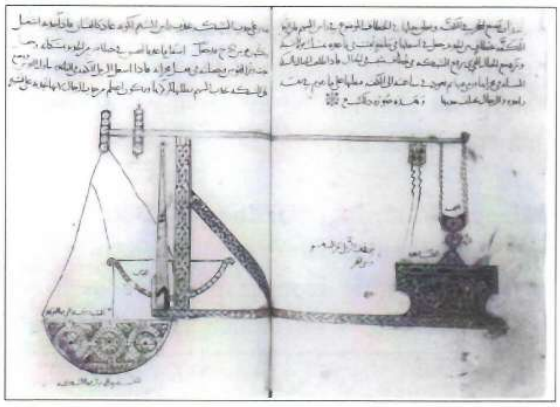
From the iconographic point of view, the most complete description and the earliest available illustration of a counterweight *manjaniq* is the



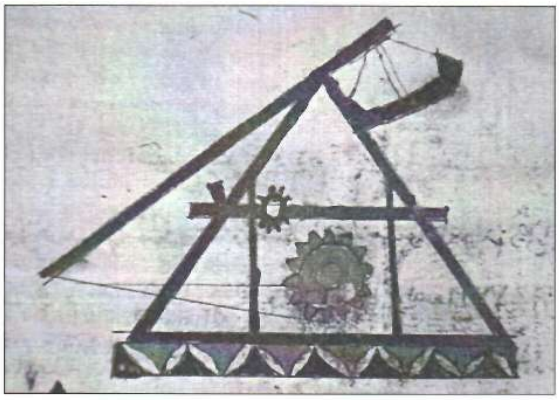
7. Francesco di Giorgio Martini drawing of a *bricola*.

4. For a discussion on the terminology see Chevedden 2000, passim.
5. About the diffusion of the counterweight trebuchet see Chevedden 2004: 102-106. A first glance on throwing engine in medieval and postmedieval China was provided by Needham 1976. For an overview on China medieval military technology see Needham-Yates 1995.

one displayed in the *Tabsirat Arbāb al-Albāb fi kaifyiat al-najāt fi al-hurub* (Instructions of the Masters of the Skills of the Methods of Salvation in Wars) by Murda bin Ali ibn Murda al-Tarsusi, written around 1187 and dedicated to Saladin[6]. The author specifies the details of the designs used among different peoples, including the Europeans, but the drawing is scarcely useful because of its too schematic representation of the engine (FIG. 8). As to the transmission of this design, al-Tarsusi attributes it to an Armenian master of weapons captured by the Fatimid army who offered his collaboration in change of his life and explained the principles of the new machine in Alexandria[7].



8. The counterweight *manjaniq* represented in Murda bin Ali ibn Murda al-Tarsusi's *Tabsirat Arbāb al-Albāb fi kaifiyat al-najāt fi al- hurūb*, around 1187 (after ...).



9. A counterweight *manjaniq* in Najm al-Din Hassan al-Rammah's *Kitab al-Furusiyya wa al-Manasib al-Harbiyya*, 1280 (after al-Hassan-Hill 1998, P. 110, fig. 4.15).

The *Kitab al-Furusiyya wa al-Manasib al-Harbiyya* (Book of Military Horsemanship and Ingenious War Devices) written by Najm al-Din Hassan al-Rammah around 1280 (al-Hassan 1998) contains the drawing of a launching engine (FIG. 9) recognisable as a pivoting counterweight *manjaniq*. The counterweight has a nearly trapezoidal shape with a reinforced base connected to a vertical central element coupled to the beam, possibly indicating a wooden structure with a reinforcing metal frame.

The *Jāmi' at-Tawārīkh* (Collected histories) by Rashid ad-Din Habïb, composed around 1306, provides the more detailed and abundant representations of *manjaniq*[8]. The plate depicting the siege of a town by the Mongol army gives a very interesting description of a ready to shoot engine (FIG. 10). The trestle frame appears particularly strong and provided with several buttresses, giving the idea of a *manjaniq* of great dimension able to project the round shells visible on the left. The hanging system of the triangular pivoting counterweight is very similar to the one which is possible to suppose for our A type. A possibly metallic keyhole shaped plate is clearly visible coupled by means of a cylindrical joint pin provided with a cotter. On the contrary, the represented distance between

10. A Muslim counterweight *manjaniq* firing against the curtain walls of a town as represented in Rashīd al-Dīn Ṭabīb's *Jāmi' at-tawārīkh*, 1306.

6. The treatise was first edited and translated into french by Cahen 1948 and more recently edited by Sander 1998.

7. Quoted in Chevedden 2000: 104-105.

8. For a recent study on the manuscript see Kamola 2013.

the counterweight and the fulcrum of the beam is not realistic, being too short to be effective, but the fact could be explained with the general tendency to *orror vacui* demonstrated by the author, trying to fill the illustrations of the manuscript with as many details as possible.

A drawing included in the *Kitāb Anïq fi al-Manājanïq* (An Elegant Book on Trebuchets) composed by Yūsuf ibn al-Zaradkāsh in 1462-'63 depicts a *manjaniq* with details similar to those in the latter document (FIG. 11). The beam is supported by the same kind of frame and the counterweight, whose shape is similar to the two elements from ash-Shawbak, is sustained by a presumably metallic element with an upper joint pin functioning as turning point.

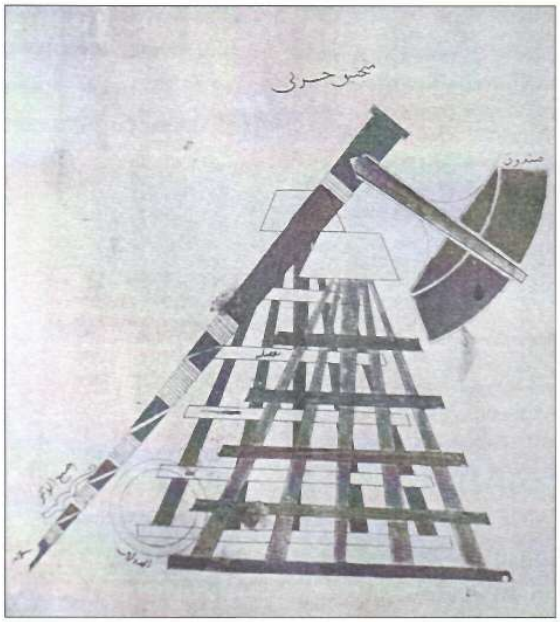
The two later documents are the most useful for the interpretation of the mortises and holes on the two counterweights from ash-Shawbak and the reconstruction of their coupling system. In particular, the supporting system represented in Rashïd ad-Din's manuscript helps us to understand the functional meaning of some detail.

Taking into consideration the mortises and the holes carved into the trapezoidal-monolithic counterweights and comparing it with the illustrations of *manjaniq*, their different coupling system could be reconstructed as follows. In the A type, two probable metal plates with a key-hole shape were placed into the corresponding dovetail mortises where a joint kingpin with a square section, passing through the thickness of the block was fastened by cotter pins. A second joint pin with a round section passing through the round holes in the upper end of the plates should have hung the counterweight to the beam (FIG. 12).

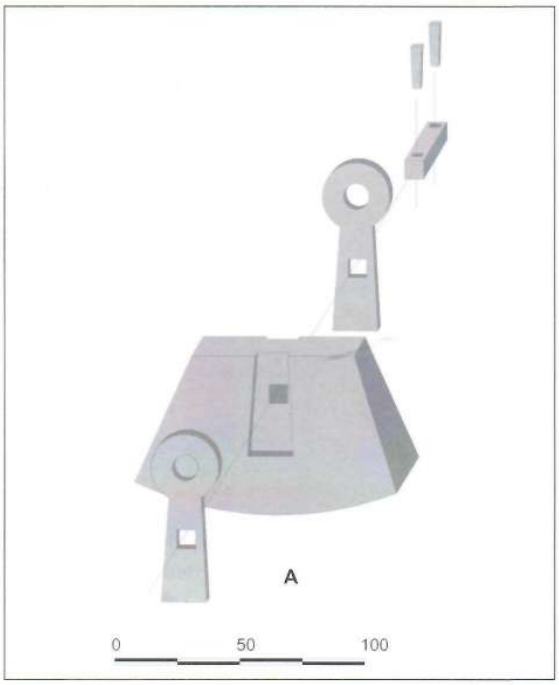
In the case of the B type, the presence of only one dovetail mortise reveals that for its correct coupling and use it was necessary at least a second element while the four holes were probably meant at the fast moving of the heavy counterweight but also for the assemblage of the two elements (FIG. 13).

Defence Planning, Ordnance Deployment and Effectiveness

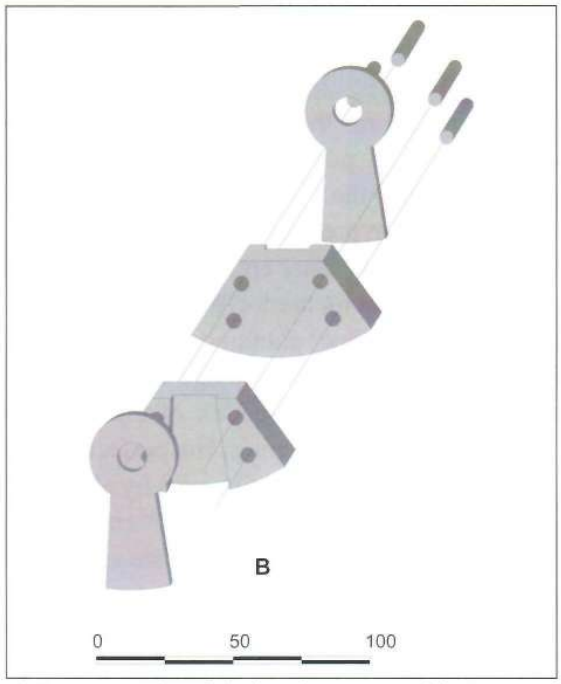
But comparing iconographic and archaeological sources, a difference is to be noted:



11. A *manjaniq* represented in *Kitāb Anïq fi al-Manājanïq* by Yūsuf ibn al-Zaradkāsh, 1462. Topkapi Sarayi Muzesi, Istambul (after al-Hassan-Hill 1998, P. 101, fig. 4.7).



12. Reconstruction of the hanging system of the A type of counterweight (Drawing by the author).



13. Reconstruction of the hanging system of the B type of counterweight (Drawing by the author).

while the manuscript by Rashid ad-Din doesn't show a connection between the keyhole metal plate and the counterweight, the A type element bears a square hole in midst of the mortise. Apparently the difference could only be explained with the different materials of the two counterweights, *i.e.* the monolithic limestone element from ash-Shawbak and the probable wooden box structure described in al-Zaradkāsh's and Rashid ad-Din's manuscripts. Actually a wooden box counterweights was the simpler and more convenient solution to increase rapidly and easily the propelling mass using any kind of material, and both features were obviously an advantage during siege activities when more specific material couldn't be available[9]. Such considerations show that the two solid limestone counterweights and related engines were not meant as offensive weapons to be used during an attack or siege, which should have requested a certain flexibility of use, but most probably they belong to a defence deployment.

The *manjaniq* were installed on the bastions of the castle, on the basis of a detailed reconnaissance and knowledge of the surrounding landscape. The limited possibility of adjustment provided by solid stone counterweights, means that the performance and the locations of the two *manjaniq* were carefully planned and specifically designed. In fact, combining the possible direction of an attack, the needed firing range and the more suitable positions of the engine, it was possible to precisely plan the performance of the artillery avoiding the building up of a more versatile but greater engine.

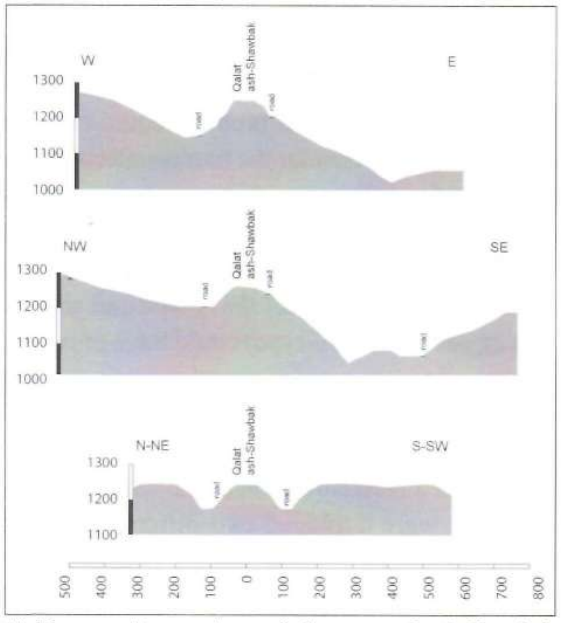
In comparison with iconographic sources, it is clear the counterweights from the castle of ash-Shawbak belong to the more advanced gravity artillery, *i.e.* the pivoting counterweight type. But if we take into consideration how the two are precisely realized, we can assume that their mass couldn't be easily increased and, as a consequence, it wasn't possible to adjust their performances. For both artillery pieces only limited adjusting operations were possible: moving the counterweight along the beam or modifying the calibre of the shells, consequently changing the shooting range. But even then, their mass wasn't sufficient to hurl effective projectiles, weighing type A around 450 kg and type B around 62 kg only. This problem could only be explained if we consider the two counterweights as parts of a different and more advanced kind of engine. In the case of a *manjaniq firanji*, the *bricola* of western origin, twin counterweights (of about 450 kg each for the A type and around 150 kg each for the B type) could have provided a more adequate gravity power, granting at the same time the balance and stability to the engines, thus increasing their accuracy.

In such a reconstruction at the castle of ash-Shawbak were deployed two different kind of *manjaniq* of the *bricola* design with sensibly different performances that could be explained as follows.

9. In this regard see the different raw material identified during the archaeological survey in the surrounding area of the battlefield of Arsuf. In particular, most of the projectiles, being limestone not available at the site, were made out of limestone blocks brought from the Samarian hills, some 15 km from Arsuf (Raphael and Tepper 2005: 87-88).

A rapid survey at the topographical features of the area around the castle, points out that the more threatening elevations are located along a N-NE/S-SW axis (FIG. 14). Two major heights of around 1200 m a. s. l. are located in the closest position, around 200 m, on both sides of the castle. Being these locations the more suitable for the positioning of artillery pieces they had to be covered by the defenders fire. Other elevations to the W and NW are suitable for an artillery attack but they are too much distant from the castle curtain walls, on the other hand the whole eastern sector is naturally protected by the slope.

Accordingly, the fortifications built by the Mamluk sultan Lajin at the end of the 13th century, included two large bastions, one facing NW and the other against a possible attack on the S-SW flank, with a flat and large roof suitable for operating the engine and both provided with batteries of arrow slits arranged in multiple rows. Combining the locations with the hypothetical shooting range deduced from the average different features of the engines (counterweights and projectiles mass, length of the beam ecc.) it is then possible to propose a reconstruction of the firing coverage of such artillery.



14. Topographic sections of the area of ash-Shawbak showing the more suitable elevation for an artillery attack. Elaboration by the author from the 1:25.000 "Ma'ān" map by the Royal Geographic Centre.

Judging from the place where the two elements were possibly found, the engine provided with the A type of counterweight could have been presumably placed on the NW bastion, while the other engine with the B type of counterweight on the S-SW bastion.

The whole defence planning of ash-Shawbak, based on the perfect knowledge of the logistic altogether with the evaluation of the possible locations of sieging engines, fits perfectly with the advices included in the tretaise by al-Ansari at the very beginning of the 15th century. In book twenty he writes that, once the siege take place, because of the limited resources of the defenders, they should know with the maximum precision the weapons to be used and how to get the major effects on the enemy (Al-Ansari 2012: 121).

The use of hurling engines as a defensive weapon mounted on bastions or towers is well known from written sources: Anna Comnena quotes a *helepolis* (a kind of traction trebuchet) mounted on towers or ships (Dennis 1998: 108-109) and Eustathios, bishop of Thessalonika, in his *The Capture of Thessaloniki* remembers how in 1185 artillery deployed on the curtain walls defended the town against the siege by the Normans (Chevedden 2000: 94). In 1148 the *manjaniqs* of the Saracens defended the town of Tortosa throwing shells of around 60 kg (Settia 2002: 126). Apart from this early examples, the major development of the use of artillery as a defensive weapon coincide with the introduction of the counterweight trebuchet, much more threatening the fortifications than the traction one. The new way of planning the defences of castles and cities as a countermeasure against the increasing effectiveness of the new design of trebuchet, combined larger fortifications with the defensive use of artillery, inaugurated by al-'Ādil was later on also applied by the Crusaders (Chevedden 1999: 38-43). The new

defence system. On such concerns al-'Ādil developed a new system of defence including thicker curtain walls and larger bastions combined with the deployment of artillery. The clearer and complete expression of this new defence planning is the citadel of Damascus, later on extended to Borsa (1218) and Mount Tabor (1215), but reinforcement based on the same concept are to be found in many Ayyubid strongholds (Chevedden 1999).

A good but late representation of this new role of artillery is provided by the al-Zaradkāsh's manuscript, which shows three different types of artillery (torsion, traction and rotating counterweight) defending a fortified gate (FIG. 15). More than three decades earlier the curtain walls of Orléans were protected by the fire of an out of date trebuchet located on top of the tower of Saint Paul, which was soon replaced by a more effective cannon (Finò 1972: 40, n. 52).

15. Different types of artillery pieces defending a fortified gate: a torsion engine, a *manjaniq* and a traction engine. *Kitāb Anïq fi al-Manājanïq* by Yūsuf ibn al-Zaradkāsh, 1462, Topkapi Sarayi Muzesi, Istambul (after al-Hassan-Hill 1998, P. 104, fig. 4.9).

In this regard, for the understanding of the castle's active defence system, the numerous limestone *manjaniq* shells found during the excavation of area 6000 assume further importance. On the back of the apse of the lower church of the castle, next to the inner gate, at least two Stratigraphic Units contained *manjaniq* shells, both included in Period 8 (Molducci and Pruno 2007). The earlier Stratigraphic Unit 6079 contained a quantity of roughly spherical shells with a diameter approximately of 35 up to 85cm, obtained by processing limestone blocks (FIG. 16), which could be interpreted as an ammunition deposit *in situ*. In a later moment, when evidently such artillery became obsolete, the floor (US 6040) underneath a vaulted ceiling (US 6052) was paved using a quantity of *manjaniq* shells as mere building material. The study of these projectiles, still in progress, will furnish important information concerning the different sizes and weights of the projectiles for determining the performance of the counterweight artillery. At the moment, their average weight, estimated in about 60kg, can be compared with the data recovered during the excavation at the site of Arsūf, where the battlefield of the siege led by Baybars has been investigated with archaeological method. Being the raw material the same, the average diameter and weight of the shells from ash-Shawbak

16. Area 6000, US 6079 under excavation (after Molducci, Pruno 2007).

correspond to the maximum used by the defenders of the fortress against the Mamluk besieging army, which mostly weights between 16 and 35kg: sensibly less than the 45kg hurled by the *ifranji manjaniq* used by the Mamluk army besieging 'Akkā (Raphael and Tepper 2005: 87, 99-100 and. 90).

About the effectiveness of these bastion engines, normally hurling smaller projectiles as can be deduced from the description given by William the Breton of the siege of Bôves by king Philippe August "...nunc mangonellus, Turcorum more, minora saxa rotat..." (Cathcart King 1982: 460), Jean Froissart writes in his *Chroniques* that in 1340 the defenders of Montagne destroyed the great trebuchet of the enemy with three shots (Contamine 2000: 270-271). The author of the *Itinerarium peregrinorum et gesta Regis Ricardi* describes how the defenders of the town of 'Akkā used manjaniqs to destroy the attacking trebuchets of Henry of Champagne (Chevedden 2000: 96) and the defence of the castle of Chinon, at the time of king Philippe August, also relied on a "...petraria turquesia..." (Finò 1972: 40, n. 49). Artillery of the same type was also located on movable towers during offensive activities, as reported by Jean Froissart during the siege of Bergerac by the French in 1377 (Finò 1972: 41-42).

The reconstruction of the active defence of Mamluk ash-Shawbak, as far as can be deduced by material sources, apart from the quantity of arrow slits arranged in multiple rows in the bastions, can now be completed with the deployment of a number of updated artillery as part of a wider plan accomplished in 1293-1294 under the rule of sultan Lajin. In particular, the new bastions and their locations, if intended as a consequence of the study of the surrounding landscape and the recognition of the main direction of a possible attack, seem to support this interpretation.

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Angela Atzori, Jehad Haroun and Gaetano Palumbo

Managing World Heritage Sites in Jordan: From Practical Experience to Operational Guidelines

An implemented site management plan is –since a few years– a requirement for any new World Heritage site nomination as well as for older inscriptions. This substantial change in the World Heritage List nomination process is an opportunity for the State Parties to the World Heritage Convention to review their conservation management strategies and to introduce, where necessary, changes to improve delivery and implementation of these plans.

The Department of Antiquities of Jordan has –in the past two years– developed site management plans for two of its World Heritage properties: Quṣayr ʻAmra and Umm ar-Raṣāṣ. The Quṣayr ʻAmra plan was developed in partnership with the World Monuments Fund between 2013 and 2014 while the Umm ar-Raṣāṣ plan was developed with UNESCO assistance in 2015.

Both plans follow UNESCO's recommendations concerning the establishment of policies and management actions aimed at preserving the Outstanding Universal Value of the sites, and both are part of a Department of Antiquities program to enhance its in-house capacities to prepare and implement site management plans for its World Heritage properties and for new possible nominations to the list. This means that the ultimate aim of these projects was not only the production of documents and plans for implementation, but also, and perhaps especially, to develop a solid methodology for the whole process of developing and implementing a site management plan using mainly its own professional capacity.

The planning process was based on a few basic elements:

- Analysis of present conditions and identification of factors affecting the conservation and proper management of the site;
- Identification of all site values (including and beyond those already identified as of Outstanding Universal Value);
- Full participation of stakeholders.

The final site management documents are supported by specific Implementation Plans which provide detailed, step-by-step action items that guide the proper adoption of the recommendations they contain.

The entire process of site management planning was documented in order to generate a set of operational guidelines for the preparation of

future management plans, both in World Heritage and in any site where these documents may be required.

This paper will present the methodology adopted for the preparation of these plans, the main characteristic of these plans, and will provide information on the structure and content of the operational guidelines which will become the document of reference at the Department of Antiquities for future planning activities.

Methodology

The methodology adopted to guide the planning process was based on a phased approach consisting of documentation, assessments, and the development of policies and actions, within an established category. These were identified in:

- The **Appropriate Use** of the site, defining how the site should be approached and experienced by the public and by the professionals,
- the **Legal and Institutional framework** within which the protection and management of the site operates,
- the establishment of **Conservation and Documentation** procedures,
- the definition of **Research and Excavation** objectives,
- the development of **Maintenance and Monitoring** programs,
- **Interpretation and Presentation**, providing suggestions for the development of such activities
- the activities related to the implementation and control of **Tourism, Facilities, Services and Infrastructures**,
- the actions related to **Public Awareness and Education**,
- **Community Participation and Economic Development Opportunities**, which opens to the local community the opportunity to participate in the planning and implementation process and derive economic benefit from it,
- the development of **Investment, Marketing and Funding** options.

A first phase of documentation was conducted in order to gathering published and unpublished information on the site from archives in Jordan and internationally. This allowed us to gather studies, photographs, plans, and drawings related to the sites. In fact this phase is of fundamental importance since our experience tells us that site archives are rarely complete and that the gathering of information often allows the discovery of documents that were either forgotten or whose importance was not properly assessed.

This phase was followed by on-site research and assessments and by the organization of several stakeholders meetings and tourism surveys, which together provided information on the state of conservation of the site, on possible threats to its integrity and authenticity, on management and tourism issues and opportunities, and which allowed identifying the causes of the observed threats.

The planning process was based on an inclusive, participatory approach involving a wide array of stakeholders from national and regional institutions, as well as from the local communities and from the Jordanian civil society, including Universities and their students, who were also engaged in assisting one of the projects in gathering tourism information. Extensive stakeholder consultations contributed to the elaboration of a comprehensive conservation and development strategy for the site.

These assessments were followed by the definition of actions towards the improved conservation and management of the site. These actions included conservation, research activities and metric surveys to establish the actual boundaries of the site and of an adequate buffer zone. They also ensured thorough implementation of a management planning process that identified a number of core values besides the established Outstanding Universal Value, and which elaborated policies for each of the identi-

fied main topics concerning conservation and development at the site. The policies were then further elaborated in a number of actions presented in a 5-year action plan and articulated by priority of intervention.

Assessing the Values of the Site

The values of the sites were identified through in-depth technical analyses as well as through broad consultations with stakeholders. Stakeholder engagement was conducted at several levels and through meetings and field activities.

Meetings served to gather information on issues directly or potentially affecting the site, to engage local authorities and the public in the process, and to provide opportunities to the local community to express their views over the future of the site and participate in the identification of opportunities for economic development.

Field activities, such as tourism surveys, served to gather important data on visitation patterns and pressures, as well as to engage local staff and university students in the process.

Meetings such as those that were conducted with various governmental agencies or local authorities, revealed a number of activities that were unknown to the Department of Antiquities and that could potentially affect the state of conservation of the site. These one-on-one meetings were accompanied by regular collective stakeholders consultations, at least twice a year, which allowed institutional stakeholders, UNESCO, and the local communities to share information and be involved in the planning process.

All these activities allowed to re-focus our understanding of the values of the site and to include the local communities, the landscape, and the environment among the factors that shaped the significance of the sites.

This means that besides the more traditional values usually associated with archaeological sites, such as their archaeological, historic, artistic and architectural importance, we also considered their natural, social, symbolic, educational, and economic values in order to have a more balanced view of the sites and of the emotions and expectations they generate in the community and among the public at large.

These core values are further reinforced and enhanced by the international recognition of the sites' **Outstanding Universal Value** and of their **authenticity** and **integrity**, which have gained both sites the nomination to the World Heritage List.

For both sites we reviewed their Outstanding Universal Value statements, and we found that there is ground for eventually improving them by including more of their outstanding characteristics, which are also emerging thanks to later studies and activities on the ground.

Integrity and Authenticity statements were also reviewed in the light of events that are affecting the sites, and while negative impacts have been identified, these have not reached the point where the integrity and authenticity of the sites may be considered at risk, but it is certainly a call to rapidly implement the actions recommended in the plans, especially as they concern the provision of adequate core and buffer boundaries, and the set up and enforcement of appropriate modalities to manage development works in the area.

Summary of Threats

The conservation, management and presentation of Quṣayr ʻAmra and Umm ar-Raṣāṣ present issues of various relevance, whose long-term persistence may have an impact on the preservation of the site. The analysis of these emerging issues and their root causes justify their merging in few thematic groups, already mentioned above.

Key issues within the "legal and institutional framework" concern the existing legal provisions for site protection and management and their implementation. They also include site management responsibilities and tasks, and

their distribution among concerned staff and authorities, namely the Ministry of Tourism and Antiquities and the Department of Antiquities.

Within the "conservation and documentation" theme, key issues particularly pertain the vision and strategy to conserve the site, as well as the modalities for site conservation and the documentation of interventions and its easy accessibility through the creation of a physical and digital repository of this information.

Within the domain of research and excavation, a key emerging issue is the definition of the strategy and modalities for future investigation and research, with the view to complete and integrate the quantity of studies and campaigns that to date have characterized the main monument building and its immediate surrounding structures.

Maintenance and monitoring are particularly relevant to the durable preservation of the site values. In this regard, key emerging issues concern the strategy and modalities for monitoring and maintenance, as well as the building of capacity of the staff in charge for monitoring and maintenance and their responsibilities.

Presentation and interpretation is another important domain, and it is currently concerned by the lack of a strategy for site visitation and interpretation, including actions and tools to convey the values of the sites. It also pertains to the management of visitors' impact on the conservation of the sites, as well as the coordination among bodies responsible for the design and development of site visitation and interpretation.

Tourism, Facilities, services and infrastructures are of fundamental importance to allow a pleasant and appreciated visit to the site, and there is a need for their upgrading.

Public awareness and education are relevant in so far as they engage the public in a durable engagement for the preservation of the site. Key emerging issues, in this regard, concern the public knowledge on the cultural and natural significance of the sites, as well as public awareness on heritage preservation and appropriate behaviours. They also include the definition of modalities and means to enhance public engagement and youth education.

Community Participation and Economic Development Opportunities is of course one of the most important topic to address in order to have the support of the community and to provide possibilities for economic benefits to be locally achieved.

Finally, the thematic group on investments, marketing and fundraising is of key importance to ensure the site continuous availability of funds for projects implementation. In this regard, key emerging issues include the entity of national investments to improve the sites' conservation and tourist appeal, and private investments in tourism-related activities.

Vision, Aims, Policies and Actions

The assessment of values and the understanding of threats at the site allowed the definition of a vision statement and of policies addressing long term conservation, presentation, and community engagement at both sites. The vision statement in Quṣayr ʻAmra stresses the importance of continuing research, documentation and conservation, in consideration of the extraordinary discoveries made at the site in the past 6 years, and encourages education, capacity building and community participation as the basic elements for a successful implementation of long term and sustainable conservation strategies.

In Umm ar-Raṣāṣ emphasis is put on the conservation, presentation and interpretation of the site, on continuing research, and on the participation of the local community in activities concerning the protection and presentation of the site.

The formulation of policies related to each of the themes presented previously carefully balanced the need for preservation and the respect of National laws and of the obligations towards the World Heritage Committee with

the expectations of the stakeholders.

Policies will be implemented through the adoption of specific strategies and actions, which have been classified in terms of priority (High, Medium and Low) and timeframe (1-2 years, 3-5 years, more than 5 years). Generally speaking, the most urgent actions concern the development of an appropriate management structure and of specific guidelines for actions concerning the maintenance, monitoring, tourism management, sustainable use, and presentation of the sites.

This Site Management Plan (SMP) should ideally be reviewed and updated every five years, under coordination of the Site Management Department. A first evaluation will be undertaken after one year from the approval and endorsement of the plan, and modifications will be applied as per relevant emerging needs. This review will include the implementation of new condition assessments, the evaluation of the impacts of projects and actions conducted on site, the drafting of recommendations for possible corrective actions, and the organization of stakeholder meetings to discuss draft recommendations.

Guidelines

These site management planning experiences, conducted following a similar methodology, resulted in the elaboration of basic guidelines which will guide future site management planning activities at the Department of Antiquities.

The guidelines loosely adopt a value-based site management planning approach codified by the Getty Conservation Institute in 2002 (Mason 2002) and by UNESCO in 2013 (Wijesuryia, Thompson and Young 2013) and have defined a step-by-step procedure for 5 basic phases:

- Preparation (identifying the body responsible for the plan preparation, team composition, and steering committee establishment);
- Data and information gathering;
- Assessments and Analysis (where threats are identified and classified);
- Response (consisting of the formulation of a vision statement followed by definition of policies and actions to implement the plan's recommendations.

The guidelines also provide a suggested plan structure to guide the compilation phase.

The fact that both plans have been developed by a team within the Department of Antiquities obviously provides hope that implementation will follow through with the plans' recommendations.

Both plans in fact identify the need for specific guidelines to be developed, to guide activities such as preventive conservation, site monitoring, and maintenance.

As a management plan is not an end but a beginning of a process, commitment must be towards implementation and follow up, and we hope that in the next conference we will be able to provide an update on the results of our efforts.

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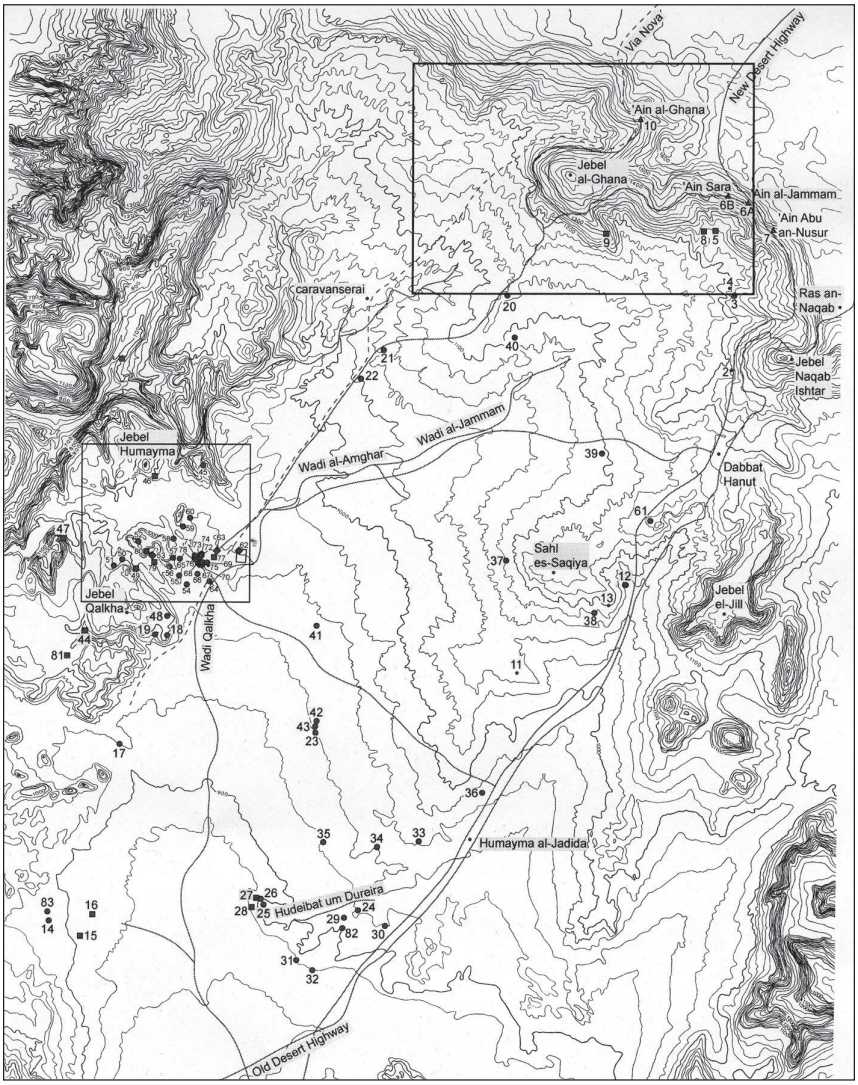
The Nabataean and Roman Towns at al-Ḥumayma: an Urban Design Perspective

In the first century AD a Nabataean prince founded a town at al-Ḥumayma (Nabataean Ḥawara, Roman Ḥauarra) in the desert 45 km south of Petra. The new town was strategically situated so that it was on a major pre-existing trans-regional trade route (the King's Highway) and also, by virtue of the sandstone hills that bordered its western side, at a location that provided lookouts over that trade route and could draw on a major rainwater catchment (FIG. 1). The Nabataeans further enhanced their town's water resources by connecting the town with springs more than 13 km away via an aqueduct. Both the town's water supply and its suitability for monitoring the trans-regional route must have been major factors in the Romans' subsequent decision to build a 500 person fort at al-Ḥumayma soon after their conversion of the Nabataean Kingdom into their Province of Arabia in the early second century AD (FIG. 2). The new fort, built adjacent to the Nabataean town, controlled access to the settlement, its water supply, and the important trans-regional route, now transformed into their province's primary north-south artery, the *Via Nova Traiana*. For the next three centuries, until the fort's abandonment in the early fifth century, al-Ḥumayma's military garrison and townsfolk co-existed and together contributed to the settlement's Roman character as a garrisoned community.

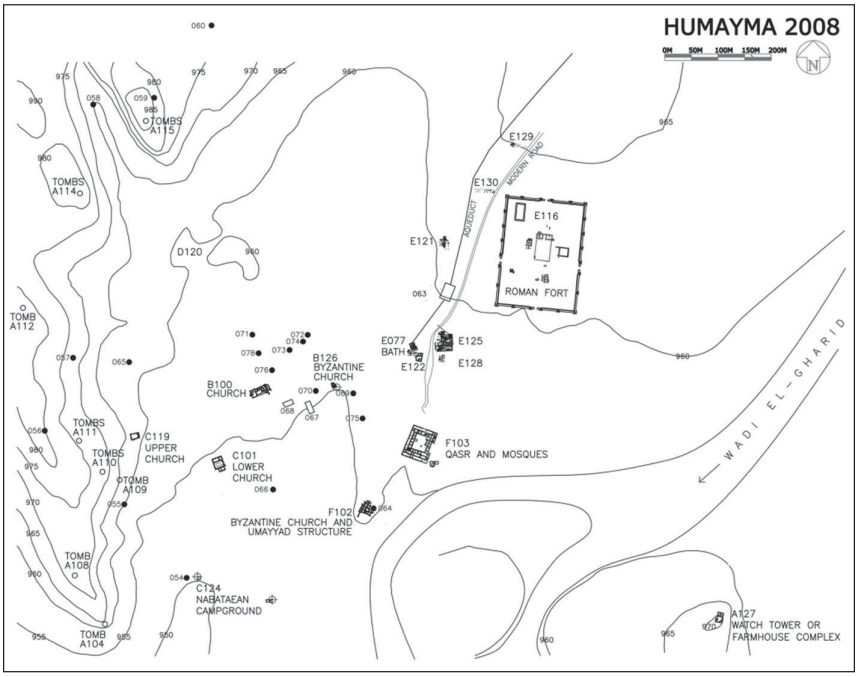
The archaeological site of al-Ḥumayma has been the subject of intensive archaeological survey and excavation since the 1980s. Research projects with particular relevance to the Nabataean and Roman period communities have focused on the ancient water-supply system (Oleson 2010), the Nabataean and Roman towns (Oleson 2013a; 2013c; Oleson and Somogyi-Csizmazia 2013; Oleson *et al.* 1999: 421-27, 2003: 47-50, 2008: 309-18, 332-34; Reeves 2009, 2015, 2016; Reeves *et al.* 2009, 2017), the Roman fort (Oleson 2009, this volume; Oleson *et al.* 1995: 321-30, 1999: 414-21, 2003: 37-47, 50-54, 2008: 318-34; Reeves *et al.* 2017), quarries (Reeves *et al.* in 2018), inscriptions (Bevan and Reeves 2010; Graf 1992; Oleson *et al.* 2002; Reeves 2015; Reeves *et al.* in 2018; Schick *et al.* 2013); and petroglyphs (Reeves 2015, 2016; Reeves *et al.* in 2018). This archaeological work has revealed a great deal about the structures, activity areas, and



1. Map of al-Ḥumayma (center left) and associated hydraulic features in the Ḥismā Desert's northwest corner (Courtesy J.P. Oleson).

objects belonging to the Nabataean and Roman communities. After excavating and analyzing structures in the Nabataean and Roman towns since 1995 as a researcher, assistant director, and associate director with the al-Ḥumayma Excavation Project, I took over as its director in 2008. Over the past two decades, my primary research goals have been to investigate the character and extent of al-Ḥumayma's Nabataean and Roman period civilian communities and to explore the nature of the interactions between the site's civilian and military populations (*e.g.* Reeves 2009, 2015, 2016; Bevan and Reeves 2010). In the course of this research, I have been directing excavations in the areas adjacent to the Roman fort (*i.e.* E077, E121, E125, E128, E129, E130), surveying petroglyphs and activity areas in the hills, and reviewing the data collected by other al-Ḥumayma archaeologists. The goal of this paper is to demonstrate how these data can be utilized to examine the physical layout and character of al-Ḥumayma's Nabataean and Roman communities from an urban design perspective.

For the purposes of this paper, urban design is simply taken to mean the archaeological remnants of the design decisions which contributed over time to the evolving physical appearance and character of al-Ḥumayma's settlements (*cf.* Cuthbert 2006: 1-2). These settlements existed within cultural and natural contexts so a range of both cultural and natural



2. Surveyed and excavated structures in al-Ḥumayma's main settlement area. (S. Fraser and D. Skinner).

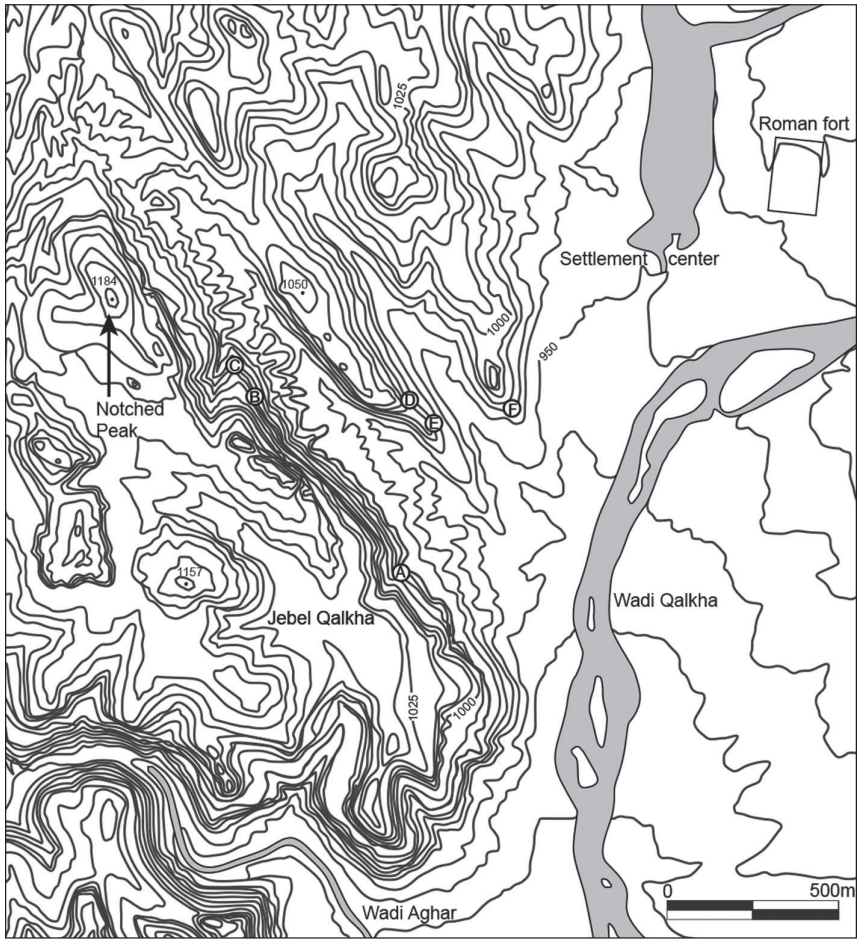
factors could have influenced particular design decisions. The archaeological remnants of such decisions provide us with a means for elucidating those influences and their role in shaping al-Ḥumayma's communities.

Although numerous factors likely influenced the overall design of the settlements at al-Ḥumayma, three factors specifically linked to this site stand out as being particularly influential. All three also influenced the original decision to found a town at this location. These factors are the combination of hills and plain, the rain-fed versus aqueduct-dependent water zones, and the pre-existing trans-regional route. Each of these will be discussed in turn.

Hills and Plain

al-Ḥumayma, located at the western edge of the Ḥismā Desert, straddles the boundary between hills and plain, or more precisely raised landmasses and plain (FIG. 3). On the west the site is bordered by Jabal Kalkhah, a sandstone hill whose highest peak, featuring a distinctive notch, rises more than 200 meters above the settlement center on the plain. Between Jabal Kalkhah and the settlement center are two sandstone dendritic ridges that descend down into the desert floor near the center of this image. Ridge 2, the narrow ridge running parallel to the western flanks of Jabal Kalkhah has runoff wadi's along each of its long sides. Ridge 1, with a wider triangular shape, has one side running parallel to Ridge 2 and one side bordering the settlement area on the plain. The settlement center took advantage of the raised landmasses on its west and north which funneled rainwater onto to the plain. The main area where that rainwater pooled is shown just north of the settlement and west of the Roman fort. In addition, a major collector of runoff from the region northeast of the site, the Wādī Kalkhah/ Wādī al-Gharīd, ran past the eastern and southern edges of the settlement. This wadi, which was impossible to cross while in flood and difficult to cross at other times (especially with wheeled vehicles), provided a natural boundary to the ancient settlement and its primary activity areas.

The Nabataean and Roman inhabitants of al-Ḥumayma took advantage of the benefits of the local topography in choosing locations for their activities and structures. Civic structures, houses, a Nabataean campground, the Roman fort, and the trans-regional road and aqueduct



3. Sites on Jabal Kalkhah and the two ridges in relation to the settlement center, Roman fort, and Wādī Kalkhah. (A: site with cistern, betyls and rock carvings; B-C: Cascading Plateau Site; D: Commemoration Cliff; E: Flat Top Activity Area; F: Tomb Complex A104). (A. Walsh, J.P. Oleson, M.B. Reeves).

were all located together on the desert plain where there was ample space available. Agricultural fields were probably concentrated, just as they have been for the past century, within a 5km radius of the ancient settlement where there was a combination of good soil, run-off water, and easy access (Oleson 2010: 35). The cultivated areas likely extended over the northwest corner of the site plan, where there are no known structures and grain is still cultivated today (FIGS. 2, 6). In addition to planting where the run-off naturally pooled (Oleson 2010: 33), the ancient inhabitants also built cisterns and reservoirs on the plain to collect and store the meager rainwater for year round use. These water storage devices were distributed throughout the western side of the settlement (indicated by solid dots on FIG. 2). Oleson suggests that the two large rectangular reservoirs at the center of the settlement (067, 068) were built together at the town's foundation and intended for public use, whereas the smaller cisterns were built by families for private use (2010: 408-9).

Although most of the raised landmasses, where the runoff originated, also featured rock-cut cisterns, Ridge 2 did not. That suggests that humans were choosing where to locate specific structures and activity areas based on particular preferences. That impression is maintained when looking at individual sites on the elevated landmasses. Although there is not enough space here to discuss the specific character of each elevated site, a few general observations give a sense of this important area adjacent to the ancient town. The elevated landmasses west of the town contained sites which can be fit into the broad categories of resource management (*e.g.* cisterns, dams, quarries, and storage areas), funerary sites (tombs and associated

structures), cultic and commemorative sites (featuring betyls, inscriptions, petroglyphs and associated activity areas), and lookouts or way stations (places with a good view from which people could monitor other humans and animals). Views, obviously important for lookouts and way stations, were important for many other categories of sites as well. Thus the placement of funerary complexes on the top and east side of Ridge 1 suggests they were intended to be seen on a daily basis by the inhabitants the town. Conversely, quarries were placed where they were hidden or difficult to see from the town (on the west and south sides of Ridge 1, on both sides of Ridge 2, and on the eastern side of Jabal Kalkhah; FIG. 4). And many cultic and commemorative sites (FIG. 5) provided views of Jabal Kalkhah's highest notched peak, which I have argued previously was a source of veneration and civic identity for al-Ḥumayma's Nabataean and Roman inhabitants (Reeves 2016).

Rain-Fed Versus Aqueduct-Depended Water Zones

Moving beyond basic topography, there is a major consequence of the cisterns' placement on the plain that warrants further explanation. As can be seen in Figures 2 and 6, cisterns were only located on the western side of the plain. That means that the structures on the eastern side of the settlement (including the bathhouse and the Roman fort) depended on piped water coming from the aqueduct. The aqueduct water was not necessary for the town's existence like the cistern water was, but rather served to increase the town's water supply and its prestige. But once structures were built on the aqueduct-fed eastern side of the community, they could only easily remain in use while the aqueduct was in operation. It is thus possible to make a functional division between the rain-fed western half of the community and the aqueduct-dependent eastern half.

The division in water supply on al-Ḥumayma's plain can provide insights into design decisions related to the ancient settlement's phasing. The site in Nabataean and Roman times was naturally arid. There were no local springs, groundwater was too deep to be tapped by wells, and all of the meager precipitation, which fell during a few winter storms, would have bounced off of the dry landmasses and sunk into the desert plain (Oleson 2010: 31-34). Humans could only establish a permanent settlement here if they trapped enough rainwater to last through the year (Oleson 2010: 398). The Nabataeans who settled here did exactly that. They built an elaborate hydraulic system to control the local run-off and direct it into their strategically placed cisterns and reservoirs. The Nabataean and later settlements depended on the trapped rainwater for their existence. In contrast, the spring water which flowed year round into the settlement through more than 26 km of aqueduct conduit represented a luxury. This aqueduct

4. Eastern quarries on Ridge 2 and Jabal Kalkhah that are hidden from the settlement center by Ridge 1. (M.B. Reeves).

5. The Cascading Plateau Site, a cultic and commemorative site beneath Jabal Kalkhah's notched peak. (M.B. Reeves).

water was not necessary for the town's survival, but provided it with a perennial abundance of flowing spring water. The location of the aqueduct and the pipelines it fed also allowed structures to be located beyond the cistern zone on the eastern side of the settlement.

Given that the town only needed stored rainwater to exist and that the long aqueduct would have required considerable time and effort to build, it is likely that the aqueduct represents an expansion phase in the Nabataean town. John Oleson suggests that these two Nabataean phases may have resulted from the patronage of two different royals:

Although the precise date of the original foundation of Ḥawara remains a puzzle, it is nevertheless possible that the foundation of the town and concomitant construction of Reservoirs 67 and 68 were the accomplishments of Aretas III, while the water-supply system was enhanced with a prestigious aqueduct system and pool/reservoir only during the reign of Aretas IV. (Oleson 2010: 383)

Although the archaeological data cannot confirm the proposed expansion, Oleson's alternative proposal, that Aretas IV was responsible for founding the town and building its two public runoff reservoirs, aqueduct and pool all at the same time (Oleson 2010: 398) seems less likely in terms of time and expense.

Following the two patrons' theory, the town would have begun to develop in the first century BC around reservoirs 67 and 68 and then expanded with the construction of the aqueduct, whose first phase was constructed in the late first century BC or early first century AD (Oleson 2010: 398). The main line of this aqueduct ran for 18.888 km and connected Ḥawara to the spring(s) of 'Ayn Janā. The date at which the 7.620 km branch line to the spring of 'Ayn Jamman was added is uncertain. Oleson (2010: 75; 388) proposes, based on a variety of design considerations, dates ranging from 10 to 20 years after the main branch to up to a century later to more than two centuries later (*i.e.* the late third century). There were presumably also phases associated with the aqueduct's functioning, ranging from standard maintenance (*e.g.* the periodic removal of the calcium carbonate deposit that built up within the water channel, Oleson 2010: 390-93) to the cessation or lessening of the flow following a natural disaster or human intervention. Evidence and phasing for such phases is currently poor. As for the end of their functional timeline, whereas many of the cisterns are still in use today, the aqueduct eventually ceased to flow sometime in the early Islamic period (Oleson 2010: 187).

The construction of the aqueduct had a huge impact on the town's character. So too did its subsequent operation. Because the eastern structures were dependent on aqueduct water, whenever in subsequent periods the aqueduct was not flowing, structures that absolutely depended on it (*e.g.* the pool and the bathhouse) could not have functioned. Other structures might have continued to be used, but only if their occupants were willing to transport water from cisterns in the western half of town more than 100 m distant. In the case of the Roman fort and elite residences (*e.g.* the E125 house, the F103 *qaṣr*), this seems unlikely.

If the eastern structures' dependence of the aqueduct is considered in relation to the Nabataean through early Islamic phasing of structures on al-Ḥumayma's plain, some interesting possibilities emerge. The first is the Jammam branch was possibly added after an earthquake or human event that caused damage to al-Ḥumayma's settlement and thus likely also to its aqueduct or to the spring(s) that fed it. Damage to al-Ḥumayma's eastern structures has been documented for phases corresponding to the late first or early second century AD, the late third century, and the 363 and 749 earthquakes (Oleson 2010: 57, 59; this volume, Oleson *et al.* 1999: 427, 2008: 313; Reeves 2009: 330; Reeves *et al.* 2009: 237-38; Reeves *et al.* 2017). The 7.620km Jammam expansion was a major construction project so it should

have been done at a time when the settlement had the resources to build it. The fact that the Jammam branch included *ca.* 18,000 inverted roof tiles in its construction narrows done the likely possibilities. Oleson notes that the most likely source of these roof tiles was the fort and thus suggests that they were recycled after its temporary abandonment in the late third century (Oleson 2010: 388) or after the 363 earthquake (Oleson in press). Although the third century is possible, I believe a better possibility is that they were recycled after the fort was damaged in the 363 earthquake. I further suggest that the renovation may date to the Umayyad period. There are several pieces of evidence for this beginning with the abandonment of the fort and other eastern structures by the early fifth century (E121, E122, E125, E128; Oleson *et al*. 1999: 427, 2008: 314; Reeves *et al*. 2009: 238, 244) followed by the decision to build five churches in the rain-fed section of the town in the fifth to seventh centuries (B100, C101, F102, B126, C119; Oleson 2013a: 551-53). Taken together, the abandonment of eastern structures followed by monumental constructions in the west may mean that from the late fourth into the seventh century the aqueduct was out of use. It is not until the Umayyad period that we have evidence for renewed occupation in the aqueduct-dependent part of town: activity around the pool fed by the aqueduct (Oleson 2010: 187), renovation of the aqueduct-dependent bathhouse (Reeves and Harvey 2016: 471; Reeves *et al.* 2017), renovation of the E122 house (Oleson *et al.* 1999: 427), and construction of the Abbasid family's *qaṣr* (F103, Foote 2007).

The Trans-Regional Route

The other factor to be discussed here that influenced the development of al-Ḥumayma's Nabataean and Roman communities was the major trans-regional route, the Nabataean King's Highway which became the Roman *Via Nova Traiana*. The importance of this route for the foundation of the Nabataean town and later conversion of that town into a Roman garrisoned community has already been noted. Although there were presumably routes leading to the east and west of al-Ḥumayma in the Nabataean and Roman periods (Oleson 2010: 30-31; Graf 1995: 257), the north-south King's Highway/ *Via Nova Traiana* was the most important in terms of Roman provincial design. It is the road celebrated in Roman milestone inscriptions as crossing from "the limits of Syria to the Red Sea" (*a finibus Syriae usque ad mare rubrum*) a region "reduced into the form of a province" (*redacta in formam provincae)* (Graf 1995: 241). It is also believed to be the road shown on the ancient route map known as the Peutinger Table as linking Roman Hauarra directly with Zadagatta (modern Ṣadaqa, 20 Roman miles to the northeast) and Praesidio (modern Khirbat al-Khāldy, 24 Roman miles to the south) (Graf 1995: 244; Oleson 2010: 54-55). Based on all of this evidence, it is clear that the north-south trans-regional route through al-Ḥumayma was very important in terms of regional organization. As I will argue, it also had a significant impact on the design of al-Ḥumayma's Nabataean and Roman communities.

Before discussing the significance of the major trans-regional route as a design influence, it is important to note first the lack of a settlement-wide orthogonal grid plan and directional orientation for al-Ḥumayma's Nabataean and Roman structures (*e.g.* E077, E116, E125, 063, and 068 in Figure 2). For some scholars of ancient urban design, the lack of an orthogonal layout means that an urban center's design should be classified as "unplanned" as opposed to "planned" (Smith 2007: 3, 5). Michael Smith (among others) takes exception to this "false dichotomy", noting that "Ancient kings and builders were clearly involved in 'urban planning,' and their cities were 'planned' settlements, following common sense notions of planning." (Smith 2007: 3). An alternative (non-grid based) approach to discussing ancient urban design is the urban armature approach

proposed by William MacDonald in his 1986 analysis of Roman imperial urban centers, including those in the Roman Near East.

In MacDonald's model "Armatures consist of main streets, squares, and essential public buildings linked together across cities and towns from gate to gate, with junctions and entranceways prominently articulated." (1986: 5) In terms of organization and development, "The path or road leading inward from the periphery of a primitive town to an open space used as a market and meeting place was the ultimate source of the armature" (MacDonald 1986: 17). When such a route also crossed the countryside and linked communities together at major entrances, the familiar pattern of an urban armature also served to demarcate the transition between urban and country life (*cf.* MacDonald 1986: 18). Finally, MacDonald argues that "Armatures were not created consciously and all at once within the controlling requirements of comprehensive city plans….Instead, they evolved over time through gradual elaboration and, quite often, extension." (1986: 17-18).

The value in employing MacDonald's urban armature model to discuss the design and character of al-Ḥumayma's Nabataean and Roman communities is readily apparent. The Nabataean town was founded on a pre-existing trans-regional trade route which became the major north-south road spanning the Roman Province of Arabia and linking it to the rest of the Roman Empire. This major route spanned al-Ḥumayma's Nabataean and Roman communities and linked them to other Nabataean, Roman, and foreign communities across the countryside.

The theorized course of this trans-regional route through al-Ḥumayma is shown in Figure 1. The theorized route takes into account both archaeological discoveries (*e.g.* the route of the *Via Nova Traiana* to the north and south of the site, the route of the Nabataean aqueduct, the presence of a road just outside E125, the presence of a hard natural surface outside the west side of the fort) and topographic constraints (*e.g.* the difficulty in crossing the Wādī Kalkhah) (*cf.* Reeves *et al.* 2009: 246-48). Given these discoveries and constraints, the route's entrance and exit points to the northeast and southwest are proposed with more confidence than its path through the town.

From an urban armature perspective, a major cross-country route, linking one town to the next, transformed into an urban thoroughfare once it entered the civic zone through a major gateway in the town's wall (MacDonald 1986: 18). As a Nabataean foundation, rather than a Roman or Greek one, the ancient town at al-Ḥumayma was not enclosed by walls (Strabo 16.4.26). Instead, the Nabataeans here demarked the beginning of their civic zone on the north with a monumental construction symbolizing the community's mastery over nature and their ability to be wasteful of water in a water-poor region (FIG. 7). This structure was a large uncovered pool similar in appearance and symbolism to the contemporary monumental pool at the center of Petra and to those in Jericho, Caesarea, Mas'ada, and Herodium in the neighboring Jewish kingdom (Bedal and Schryver 2007; Oleson 2010: 381-83). For travelers on the King's Highway who had first seen al-Ḥumayma and its aqueduct *ca.* 13km to the north on the escarpment, the symbolism of the townsfolks' willingness to allow the carefully harnessed spring water to evaporate in an uncovered pool would have been extremely impactful. This symbolism would have been enhanced by the agricultural fields and gardens made possible by the desert community's mastery of water.

The Nabataean pool made a bold statement regarding the town's identity, but that statement was eclipsed in both size and location by the construction of the Roman fort. The fort was the largest building at the site in all subsequent time periods and served as a new monumental entranceway to the community. Its massive walls paralleling the *Via Nova Traiana* and

manned by soldiers with bows and spears left no ambiguity about who was in charge of both the settlement and the trans-regional route. Travelers on the road were under official scrutiny and might have been required to stop to register and pay duties on shipments. Those passing through might have paused here at the northern edge of town and rested themselves and their animals under the protective watch of the fort's garrison. A very hard natural surface running through E129 and E130 to the northwest of the fort is posited to have formed part of an ancient parking area and the garrison's parade ground (*campus*) (Reeves *et al.* 2009: 250-51). The sight of Roman soldiers, mounted and on foot, practicing with weapons on a daily basis would have sent another strong message of control and protection to travelers and townsfolk alike.

The trans-regional route turned thoroughfare probably ran under the modern dirt road between the Nabataean pool and the Roman fort. After that, based on the expectations of an urban armature model and comparanda from other Roman and Nabataean sites, it is likely that the thoroughfare headed for a major public space that served as the town's symbolic center. That symbolic center is most likely the area surrounding the two rectangular public cisterns (067, 068) dating from the town's foundation. Unfortunately the Nabataean and Roman character of this area has been obfuscated by subsequent construction and agricultural activity (see FIG. 6), although there is some evidence for a temple under the B100 church (Oleson 2013b: 214). As for the thoroughfare's route from Pool 063 to the center of town, it is not yet clear. Evidence for roads, some of which may be the thoroughfare and some which will be minor, have been found outside the northwest corner of the E125 insula (Reeves *et al.* 2009: 247), along the northwest side/front entrance to the E077 bathhouse (Reeves *et al.* 2017), and between the E077 bathhouse and the E122 house (Reeves *et al.* 2017). Other roads likely existed between the E125 insula and the E128 structure and outside the shrine in the southeast corner of the E125 insula. Since a thoroughfare should be lined with important public buildings, a route past the entrance to the E125 shrine or, alternatively, past the front of the bathhouse would make the most sense given our current knowledge.

From the center of town, the north-south thoroughfare would have continued on to the southern edge of the urban center and then southwards towards the next settlement. Once again, an urban armature approach suggests that the route should have been lined with important public buildings. This cannot yet be confirmed. Although walls associated with a Late Nabataean/Roman period structure were found under Church C101, there is not enough

6. Aerial photo of al-Ḥumayma's plain, facing east with Church C101 at bottom right and the Roman fort at upper left. The rain-fed zone comprises the bottom two-thirds of the image with the aqueduct-dependent zone above. (Photo by David Kennedy, APAAME_20160919_DLK-0075 al-Ḥumayma.)

7. Nabataean pool 063, Roman fort and northeastern structures E077, E121, E122, E125, and E128 (and the modern visitors center). (Photo by David Kennedy, APAAME_20160919_DLK-0076 al-Ḥumayma.)

evidence to identify the building they came from (Schick 2013: 294) and other buildings in the surrounding area, visible in aerial photos (*e.g.* FIG. 6), have not yet been excavated.

As for the town's southern entrance, there is presently no evidence for monumental structures/activity areas associated with it unless they were located on raised landmasses. Tomb Complex A104 (Oleson and Somogyi-Csizmazia 2013: 54-58) is one possibility (see FIGS. 3.F, 8). Its shaft tomb, cut into the top of an isolated knoll at the southern tip of Ridge 1, was one of the largest tombs associated with the Nabataean and Roman settlement. The tomb complex was clearly visible from the urban zone, fort, and the trans-regional road, as well as from prominent sites on that road which will be discussed below. One set of rock-cut stairs led from the desert up to the tomb and another set led from the desert to a flat activity area at the knoll's southern tip. This activity area was just below the tomb and separated from it by a vertical quarried cliff. A betyl approximately half the size of a human was carved into this cliff face and a large rectangular block left from the quarrying served as a platform. The activity area with betyl and platform was probably associated with the commemorative ceremonies for the family buried in this prominent location. There might also have been freestanding structures here (*e.g.* over the tomb) but, if so, they have subsequently disappeared. 150 m to the southeast of this tomb complex was another set of rock-cut tombs (A105; Oleson and Somogyi-Csizmazia 2013: 58-59). It is possible that the route out of town passes between these two tomb complexes, just as the dirt road does today.

The road heading south from the settlement was constrained by the raised landmasses on one side and Wādī Kalkhah on the other. Its exact route between those two topographic constraints can only be speculated on. In Figure 1, reprinted from the first volume of the al-Ḥumayma Excavation Project's final reports, Oleson showed the road travelling out of town through the southern outskirts of the settlement, *i.e.* from F102, where there was a cistern, cemetery and possibly tent dwellers ('Amr and Oleson 2013: 153-54) and then through or beside the Nabataean campground (C124). After leaving the urban zone, the road is shown running beside the bank of the Wādī Kalkhah until near Cistern 18 where it shifted to running beside Jabal Kalkhah.

I propose a slightly different route, which in accordance with an urban armature approach, would include urban structures and important activity areas and vistas along the side of the road. I suggest that this route took in one or more of the Nabataean and Roman structures to the southwest of public reservoirs 67 and 68. It then passed between the Nabataean campground and Ridge 1, providing close views of several tomb complexes associated with the town's prominent families, before rounding Ridge 1 below Tomb Complex A104 and heading through or around the southern tip of Ridge 2. This route would pass below two prominent activity areas on Ridge 2 (FIGS. 9 and 10). The "Flat Top Activity Area" consisted of a *ca.* 115m long by up to 35m wide flat horizontal sandstone surface at the end of a section of the ridge elevated *ca.* 50 meters above the desert (FIG. 3.E; Reeves 2016: 167; Reeves *et al.* 2018). A footprint carved into the surface faced the southern tip of the ridge and road beneath. Behind the flat activity area on its northeast was a "Commemoration Cliff" into

8. Tomb Complex A104 viewed from the northeast with Tomb Complex A105 across the dirt road in the upper left. (Courtesy J.P. Oleson).

9. Flat Top Activity Area near southern end of Ridge 2 with desert varnish covered Commemoration Cliff at right rear. (M.B. Reeves).

10. Flat Top Activity Area from below on Ridge 2. (C.A. Harvey).

which Nabataean and Greek inscriptions and petroglyphs had been carved (FIG. 3.D; Reeves *et al.* 2018). One petroglyph at the center of the cliff depicted a Roman officer conducting a religious ceremony and reproduced the local topography, including Jabal Kalkhah's notched peak (Reeves 2015; 2016). That peak would also have been visible to people passing to the south on the trans-regional route.

The route from Ridge 2 to Jabal Kalkhah would have passed within sight of another important activity area containing a cistern, carvings of betyls and altars, petroglyphs, and inscriptions in Nabataean and Thamudic (FIG 3.A; Oleson 2010: 144-47). One the inscriptions here includes the name of the Nabataean town (Graf 1992; Oleson 2010: 53; Reeves 2016: 172). This site, although outside the main urban zone, probably still felt like part of the Nabataean and Roman town as it is prominently visible from the settlement as a patch of green vegetation against Jabal Kalkhah's beige sandstone slopes. The site's elevated position also provided excellent views of the settlement. This site, at the southern visual limit of the town, served as a way station within al-Ḥumayma's urban armature, a place "made for pausing or resting…the activity of the pavement" (MacDonald 1986: 99), but also a place to contemplate the appearance, water resources, and character of the adjacent Nabataean and Roman communities.

Concluding Thoughts

Throughout this paper I have argued that the design of al-Ḥumayma's Nabataean and Roman communities was influenced by both natural and cultural factors. al-Ḥumayma's hills and plain, its rain-fed versus aqueduct-dependent water zones, and the trans-regional route provided a context into which the site's Nabataean and Roman inhabitants inserted their own design decisions. This site was inherently desirable for human settlement but the decisions of al-Ḥumayma's settlers subsequently shaped its character both as a Nabataean town and as a Roman garrisoned community.

Acknowledgments

The sites discussed this paper were excavated or surveyed by the al-Ḥumayma Excavation Project, which is accredited by the Archaeological Standards Committee of the American Schools of Oriental Research and licensed by the Department of Antiquities of the Kingdom of Jordan. Funding related to the sites discussed was provided by grants from the Social Sciences and Humanities Research Council of Canada, the Taggart Foundation, and the Senate Advisory Research Committee of Queen's University. All images were created by members of the al-Ḥumayma Excavation Project unless otherwise indicated.

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The EBA Colonization of the Northern Bādiyah: Fixing the Chronological Framework

Introduction

Since 2010, the northern Bādiyah in northeastern Jordan has been the focus of the extensive archaeological "Jawa Hinterland Project"[1], which aims to identify and characterize traces of socio-economic activities dating to the Late Chalcolithic/Early Bronze Age (LC/EBA), from the late 5th to the early 3rd millennium BC. This period is of special significance due to the fact that in this era the first urbanization processes occurred in southwest Asia, particularly in Mesopotamia and in the Southern Levant. The aim of this project is to investigate whether and to what extent these extensive socio-economic transformations, which characterized the urbanization process, had an effect on the neighbouring steppe deserts, such as the northern Bādiyah. The preliminary results of eight fieldwork seasons in the basalt desert (*ḥarra*) and the eastern adjacent limestone desert (*ḥamād*) in the northern Bādiyah, prove an extensive utilization of these present-day seemingly barren landscapes. The identified evidence for LC/EBA socio-economic activities range from large-scale flint mining and export-oriented cortical scraper production (Müller-Neuhof 2012a, 2012c, 2013a, 2013c, 2013d, 2013e, 2013f, 2014a, 2014b), via intensive utilization of seasonal pastures in the basalt desert, documented by abundant remains of campsites close to wadi banks and mudpans (*qui'an*) (Müller-Neuhof 2012a, 2013b, 2013e, 2014b). Further identified evidence for LC/EBA socio-economic activities are extensive agricultural activities, facilitated by artificial irrigation with rainwater harvesting (run-off irrigation) (Meister *et a*l. 2017, Müller-Neuhof 2012b, 2013e, 2014b, 2014c, 2015a, Müller-Neuhof – Abu-Azizeh 2018 a), as well as sedentary communities based in hillforts and their immediate vicinity (Müller-Neuhof 2013b, 2013e, 2014a, 2014b, 2015a, Müller-Neuhof – Abu-Azizeh 2016, in press).

While these results were not all expected from the beginning of this research project, and while each of these outcomes has its own

1. The Jawa Hinterland Project consists of two consecutive projects. "Arid habitats in the 5th to the early 3rd millennium BC: mobile subsistence, communication and key resource use in the northern Bādiyah (NE-Jordan)" from 2010 until 2014 and "The colonization of the Northern Bādiyah (NE-Jordan) in the Late Chalcolithic and Early Bronze Age (4th to 3rd millennium BC): a contribution to archaeological settlement geography in the arid regions of Southwest Asia" since 2015. Both projects have been funded by the *Deutsche Forschungsgemeinschaft* (German Research Foundation) (DFG-MU3075/1-1, DFG-MU3075/1-2, DFG-MU3075/3-1).

specific significance, one result that needs to be highlighted here is the surprising discovery of several LC/EBA hillforts in the basalt desert. This discovery is of great importance, because, due to their fortifications, these sites can be regarded as permanent settlements and therefore prove the possibility of a year-round occupation in at least some areas of the basalt desert in the LC/EBA I.

This is particularly significant as the only EBA settlement in the region, which hitherto has been known to have been occupied year round, is Jāwā, located in the west of the basalt desert (Helms 1981). Jāwā's first period of occupation, according to the pottery typology, dates to the EBA I (Helms 1991); a chronological assessment, which recently has been confirmed with new radiocarbon dates (Müller-Neuhof *et al.* 2015b).

The discovery of new, almost contemporary sites east of Jāwā has not only proven that settlements could exist in this region, but furthermore it has "relieved" Jāwā from its previous reputation of being an "odd site", "lost" somewhere in the eastern desert. The existence of LC/EBA I fortified settlements in the basalt desert, such as Jāwā, are therefore not isolated cases, but instead seem to have been a frequent phenomenon, at least in the region east of Jāwā.

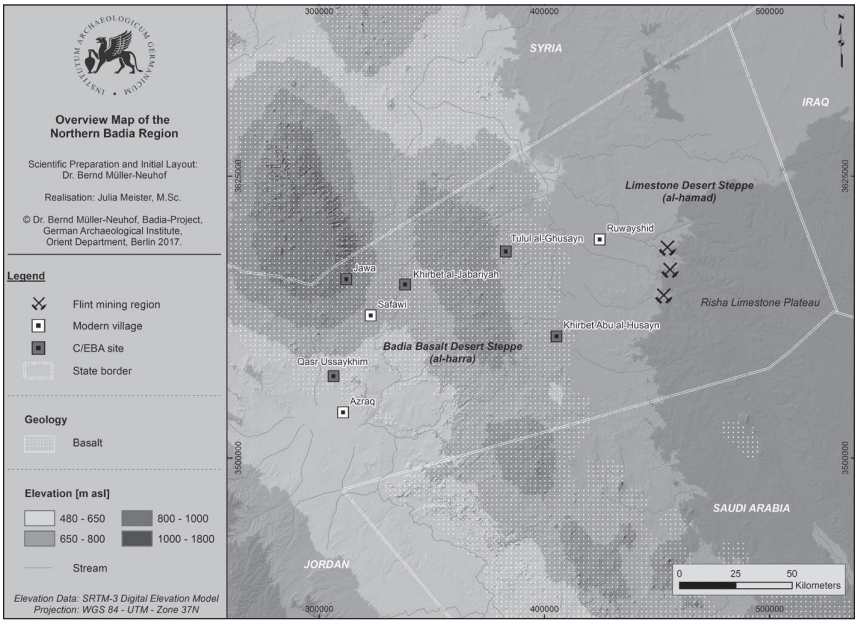
Four hillfort sites have been identified in the *ḥarra* (FIG. 1). Three of them (Khirbat Abū al-Ḥuṣayn, Tulūl al-Ghuṣayn and Khirbat al-Ja'bariyya) are located east of Jāwā and have been at least partially investigated. A new "discovery" is the identification of a possible EBA I occupation at the site Qaṣr al-Uṣaykhim, which is located between Jāwā and al-Azraq and which is hitherto known only by the small Roman fortress on the summit of the volcano.

The identified hillfort sites, among which Jāwā can be counted due to its location on a basaltic hillock, vary considerably in their size, in the construction, layout and dimension of their fortifications, and in the number and location of dwelling structures at the sites. However, all hillfort sites show clear similarities and a homogenous pattern of specific characteristics, which will be summarized after a brief description of the major features of each site.

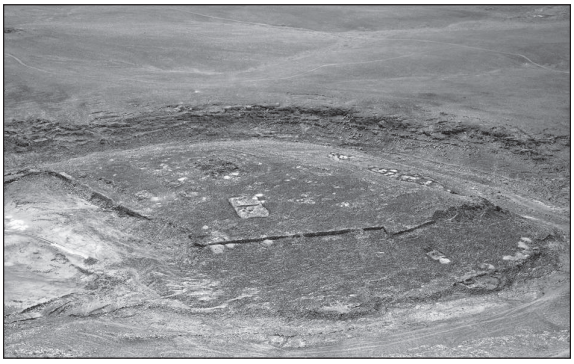
The Characteristics of the Northern Bādiyah Hillfort Sites

Jāwā

Jāwā (FIG. 2) was discovered by French pilot A. Poidebard in 1931 on one of his flights over the basalt desert. Excavations were conducted under the direction of S.Helms from 1972 until 1976, followed by minor investigations



1. Map of the northern Bādiyah with indication of Jāwā and the newly identified hillfort sites.



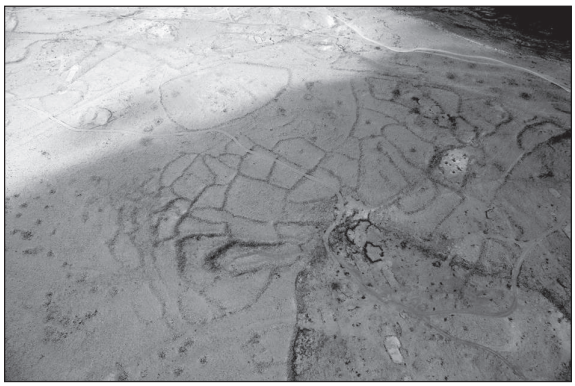
2. Aerial view of Jāwā (©APAAME, Matthew N. Dalton).

on the site by S. Helms until 1986. According to the discovered pottery, S. Helms identified two settlement phases. The first and major phase, which is characterized by the massive fortification wall with gates, several dwelling structures, and the extra-mural settlement outside of the main fortification on the foot of the hillock, which was fortified with a smaller fortification wall, date to the EBA IA (3,500 – 3,000 BC). This chronological assessment has since been confirmed by new radiocarbon dates (Müller-Neuhof *et al*. 2015, see also below). However, due to the revised chronology of the EBA I in recent years, which especially concerns the earlier portion of the EBA (Bourke *et al*. 2009), the early occupations at Jāwā need to be dated to the EBA IB rather than the EBA IA.

The second and minor reoccupation, which is characterized by the 'citadel', a massive multi-chambered structure with outbuildings in the centre, and on the highest point of the site, dates to the transition from from the EBA IV to the MB I (around 2000 BC). Furthermore, Jāwā is characterized by extensive waterworks. Most significant are a dam, which to date appears to be the most ancient dam in the world (*ca.* 3,600 cal. BC) (FIG. 3) (Müller-Neuhof *et al*. 2015; Vogel 1991), the extensive terraced gardens opposite Jāwā, which were irrigated by rainwater harvesting (run-off irrigation) (Müller-Neuhof 2012b, 2014b, 2014c) and date, according to OSL, to the mid and late 4th millennium cal. BC (Meister *et al*. 2017) (FIG. 4). Additionally the channels and pools in the Wādī Rājil beside Jāwā have to be mentioned, which according to the excavator, were contemporaneous with the EBA occupation at Jāwā (Helms 1981) (FIG. 5).

Jāwā extends in total over an area of *ca.* 8.3 hectares, whereas the size of the area enclosed by the major fortifications is *ca.* 5.3 hectares. The remaining area is the "lower town" on the foot and the slopes of the hillock, which was also fortified by a wall. The major fortification wall is characterized by a double-faced construction with two outer faces, constructed with large basalt boulders and a filling, consisting of

3. View of the western face of the dam at Jāwā (©DAI-Orientabteilung, B. Müller-Neuhof).



4. Aerial view of a part of Terrace Garden System 1 at Jāwā (©APAAME, D.L. Kennedy).

5. View of one of the pools in the Wādī Rājil (©DAI-Orientabteilung, B. Müller-Neuhof).

smaller basalt boulders and stones (FIG. 6). The thickness of the wall reaches up to *ca.* 4 meters and the preserved height extends in some sections to more than 4 meters. Five major gates and several posterns have been identified (Helms 1977: 29); with at least one of them being a chambered gate. Gates, posterns and probably even traces of towers have also been identified in the fortification wall of the lower town (Helms 1977, Helms 1981). The domestic architecture at Jāwā is mostly characterized by small round houses (Helms 1977: 30, Figs. 4 and 5), about five meters in length (FIG. 7).

Khirbat Abū al-Ḥuṣayn

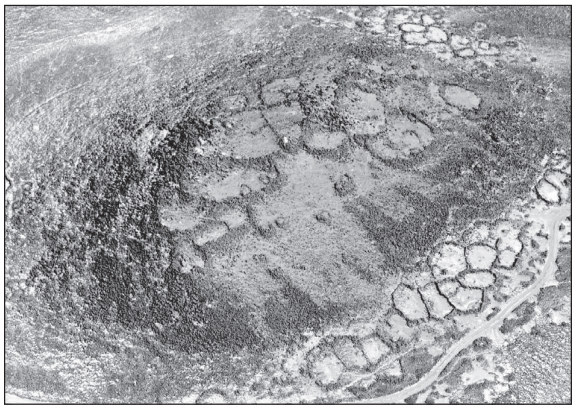
Khirbat Abū al-Ḥuṣayn (KAH) is located on the eastern edge of the *ḥarra* close to the easterly-adjacent large mudpan *Qā' Abū al-Ḥuṣayn*. The site lies on a volcano (FIG. 8), which belongs to a long chain of volcanos, forming the SE-NW oriented fissure eruption zone. This zone is furthermore characterized by a chain of large mudpans between and beside these volcanos. Due to the fact that large parts of the surface of the *ḥarra* are characterized by a densely-packed pavement of basalt boulders, which limit access, such mudpans and additionally, wadis, serve as natural and easily accessible routes. KAH was discovered on the first of the two transect surveys in the Jawa Hinterland Project in the autumn of 2010 (Müller-Neuhof 2013b; 2014a)[2].

In the spring of 2013, one week was spent at KAH in order to document the visible structures and to survey the surface of the site and its vicinity. Hitherto, no soundings or excavations have been carried out at the site. Therefore, the assumed date of the settlement in the 4th millennium BC is solely based on the few lithic and pottery remains, which have been found on the surface.

KAH is characterized by several jointly connected and enclosed flat areas on different levels on top of the volcano, extending over an area of *ca.* 0.9ha (FIG. 9). Large and closely-spaced basalt outcrops delimit the site to the west, northwest, north and northeast and constitute a natural fortification. The remaining edges of the summit are fortified by massive mostly collapsed enclosure walls. Despite the collapsed condition of the walls, their original

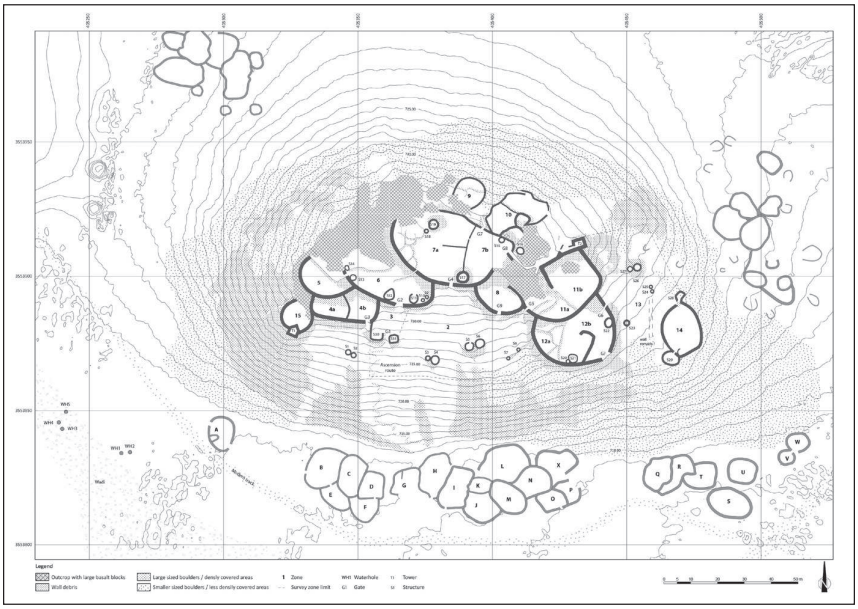
6. View of a section of the fortification wall at Jāwā with the eastern half of Gate 1 in the foreground (©DAI-Orientabteilung, B. Müller-Neuhof).

7. View of an excavated single-room dwelling structure at Jāwā (©University of Sydney, D. Fleming).



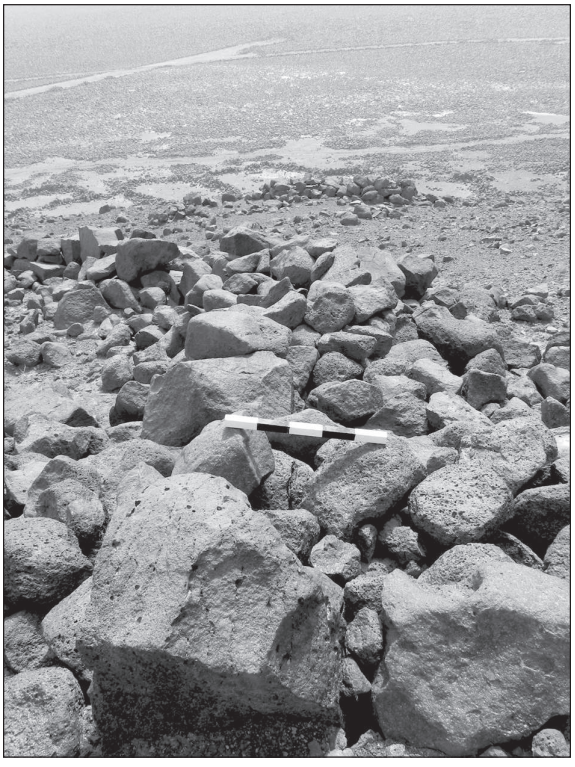
8. Aerial view of Khirbat Abū al-Ḥuṣayn (©APAAME, Matthew N. Dalton).

2. A more detailed description of the identified features of KAH can be consulted in Müller-Neuhof 2013b.



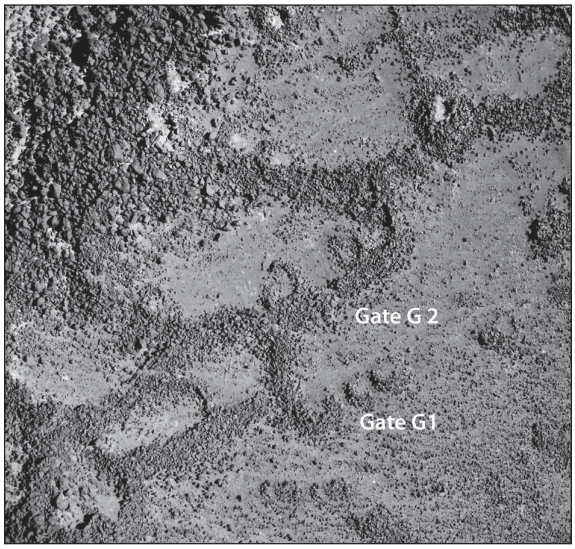
9. Plan of Khirbat Abū al-Ḥuṣayn (©DAI-Orientabteilung, L. Abu-Azizeh).

double-faced masonry and their width of *ca.* 1.30m in most cases is still discernible (FIG. 10). The remaining height of the walls is *ca.* 1.00m. Many of the basalt boulders that were used were very large, with diameters of up to 0.5 m. additionally, smaller walls inside the enclosed areas on the summit divide these areas into different units. Remains of two tower structures, located on strategic positions on the site, supplemented the defence system, and could have been entered via at least nine entryways, of which some show gate features. A serpentine path on the southern flank of the volcano leads to gate G1 (FIG. 11). About 31 small circular structures have been identified on the site.



10. View of one of the massive double-faced walls (scale 0.5 m) (©DAI-Orientabteilung, B. Müller-Neuhof).

In the first published report on KAH (Müller-Neuhof 2013b) these structures were interpreted as silos, however, on the basis of the observa-



11. Aerial view of an area of Khirbat Abū al-Ḥuṣayn with the gate structures G1 and G2 (©DAI-Orientabteilung, W. Abu-Azizeh).

tions at other hillfort sites in the *ḥarra*, it cannot be excluded that these are the remains of dwelling structures. Additionally, it seems that the structures on the southern foot of the volcano, hitherto identified merely as animal pens, might originally have been gardens, irrigated by run-off from the volcano. This would also explain the clearing of basalt boulders from the surface on the southern flank. This seems to have been undertaken in order to enable a controlled and direct influx of water into these gardens. However, this remains to be confirmed in the coming field season in October 2017. Further possible dwelling structures, characterized by circular single-room buildings, have been identified from aerial photos. These are located at the foot of the volcano, outside of the fortifications. Also, investigating this issue the coming field season will hopefully confirm this assumption. Possible evidence for the provisioning of fresh water was identified in a small *wādī* just south of the site, where several waterholes have been identified, and which are outlined and enforced by stone settings and characterized by shallow depressions. Additionally, considering the most likely contemporaneous structures on the foot of the volcano and its immediate vicinity, the entire site would cover *ca.* 7ha.

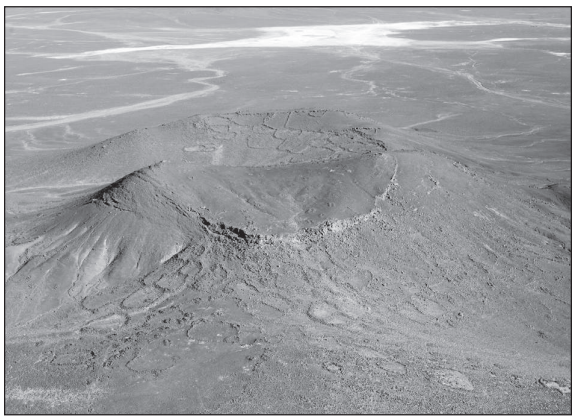
Tulūl al-Ghuṣayn

Tulūl al-Ghuṣayn (TaG) is located north of the ʻAmmān – Baghdad road in the eastern half of the *ḥarra ca.* 25 km west of the eastern edge of the *ḥarra*.

This volcano is characterized by a blown-out crater, a rim on the preserved edges of the crater and an elongated terrace-like elevation beginning on the foot of the southeastern outer flank of the volcano that expands in a southeastern direction (FIG. 12).

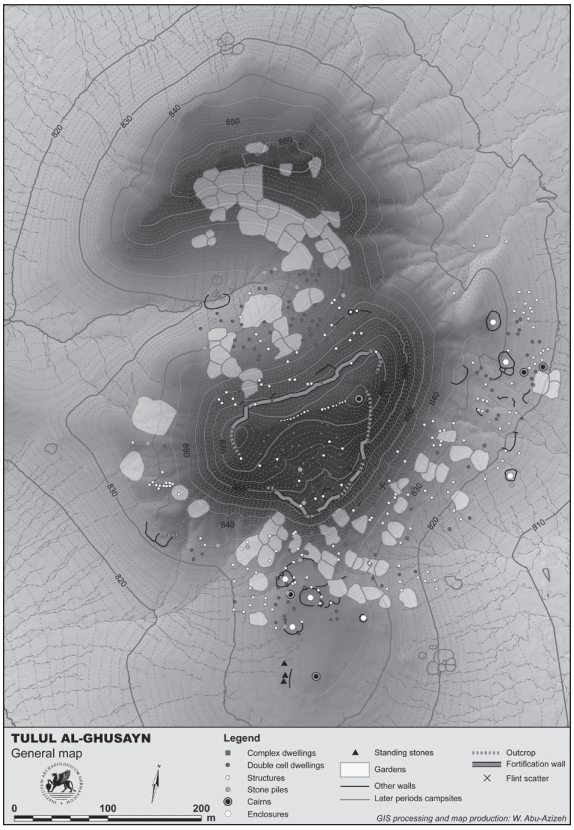
The site was discovered by David Kennedy and Robert Bewley in 2011 during one of the aerial reconnaissance flights of the APAAME project. Both colleagues kindly provided the project with photos and coordinates. A first on-ground inspection of the site, which included a preliminary documentation, was carried out in 2013 (Müller-Neuhof 2013b, 2014b). In 2015, a full, two-week fieldwork season was spent on TaG for a detailed documentation of the settlement and garden structures, and for several soundings and small-scale excavations[3].

The site consists of four residential areas that are located inside the crater, on top of the southern ridge, on the southern outer slope and the adjacent southern terrace, and on the eastern outer slope of the volcano (FIG. 13). Of special interest is the enclosure of the residential area on the crater rim, which covers an area of *ca.* 1.5ha, while the extension of the entire settlement including the terraced gardens is 9.4 ha. The fortification wall of the upper settlement of the rim consists of a *ca.* 0.75-1.00m wide double-faced masonry wall, erected on a basalt outcrop and in some areas preserved to a height of almost 1.0 meter (FIG. 14). In some sections large basalt outcrops were included in the fortifications; here, further masonry was probably not necessary. Additionally, sections with very steep slopes were not further strengthened by walls since they offered a natural fortification. Access to this part of the settlement is provided by five to six gates or posterns. Two of them



12. Aerial view of Tulūl al-Ghuṣayn (©APAAME, R.H. Bewley).

3. A detailed report on the results of this survey and the excavations at TaG was delivered to the Department of Antiquities of Jordan, to be published in one of the coming ADAJ volumes (Müller-Neuhof – Abu-Azizeh 2018 a). See also Müller-Neuhof – Abu Azizeh 2016.

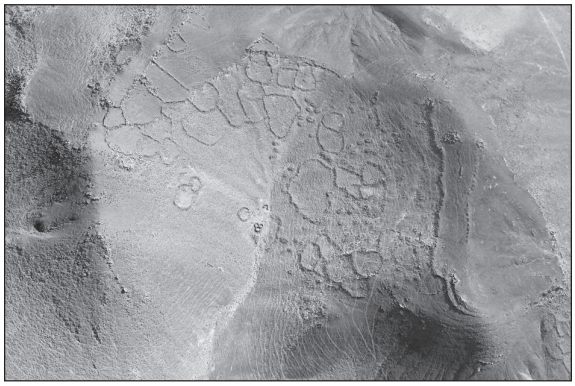


13. General map of Tulūl al-Ghuṣayn (©DAI-Orientabteilung, W. Abu-Azizeh).

14. Section of the fortification wall at Tulūl al-Ghuṣayn (scale 0.5 m) (©DAI-Orientabteilung, B. Müller-Neuhof).

could be reached by clearly identifiable access routes, with a partly serpentine course on the southern outer slope of the volcano.

Altogether 85 terraced gardens have been identified, mainly incorporated in garden clusters, which are located inside the crater (FIG. 15), on the southern, and on the eastern outer slopes. The terraced garden clusters



15. Aerial view of the terraced gardens in the crater of Tulūl al-Ghuṣayn and of the fortified southern rim (right side) (©APAAME, B. Müller-Neuhof).

cover an overall area of almost 5.8 ha. Garden walls are still preserved to a height of *ca.* 1m. Horizontal terrace walls are interrupted by overflows and inlets, which enabled the distribution of water from the higher gardens into the lower gardens according to the cascade principle. An interesting observation is the size of the catchment area of the run-off water (rain water), which is limited solely to the summit of the volcano itself, and covers an area of 0.15 km^2. This is very small compared to the terraced gardens at Jāwā, which cover 36 ha and has a run-off catchment area extending over an area of *ca.* 5.5km^2. Altogether, *ca.* 303 dwelling structures have been identified. These include double-cell dwellings (also known as ‘Ghura huts‘ or ‘double-apsed’ dwellings), single-room structures, and more complex dwellings that consist of more than one room as well as attached and enclosed activity areas (courts). Two dwelling structures have been excavated entirely. One is a double-cell structure (TAG 209) (FIG 16), and the other a larger single room dwelling structure (TAG 181) (FIG. 17), which is attached to a court and further buildings.

Both structures were almost empty. However, in TAG 209 two large grinding slabs made of basalt were discovered, whereas in TAG 181 a nearly complete jar (FIG. 18), containing one fresh water clam and two worked pieces of limestones, was discovered. The form of the jar does not appear to be local, nor does it have any

16. View of the double-cell dwelling structure TAG 209 with two grinding slabs *in situ* (©DAI-Orientabteilung, B. Müller-Neuhof).

17. View of the single-room dwelling structure TAG 181 (©DAI-Orientabteilung, B. Müller-Neuhof).

18. Jar from TAG 181 in Tulūl al-Ghuṣayn (restored by Naif Zaban, with support from the ACOR Conservation Cooperative) (©DAI-Orientabteilung, B. Müller-Neuhof).

affinities to EBA I ceramics from the nearby Jordan Valley. Furthermore, petrographic analyses, which recently have been carried out by Schneider and Diaszkiewicz refer to the Euphrates or Habur region as a possible origin of the clay. Beyond the aforementioned finds, both buildings revealed remains of a fireplace with charcoal remains that were used for C14 dating.

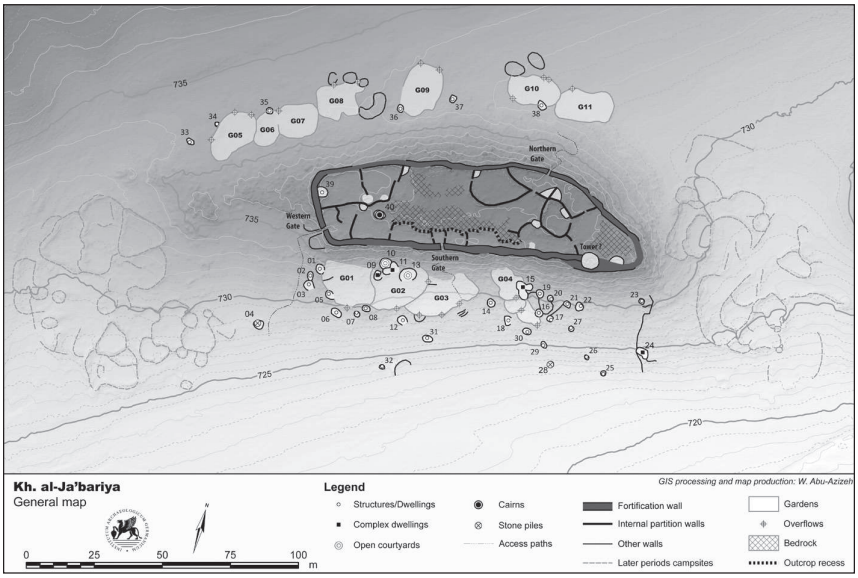
Khirbat al-Ja'bariyya

Khirbat al-Ja'bariyya (KaJ) was "discovered" by the author from satellite images in the spring of 2015. In October of 2015 the author accompanied the APAAME team on a reconnaissance flight to the site (FIG. 19). In the spring of 2016 the planned fieldwork activities at KAH were relocated to KaJ, because of the flooded mudpans at KAH, which prevented access to KAH, the primary fieldwork destination. KaJ is located north of the Amman – Baghdad road *ca.* 25km aerial distance east southeast from Jāwā and is located on a basaltic ridge on the bank of the Wādī Marrab al-Ja'bariyya, which is a tributary of the Wādī Rājil.

KaJ consists of an area on top of the ridge that is enclosed by a fortification wall, and dwelling structures as well as garden structures on its northern and especially southern slopes of the ridge (FIG. 20)[4]. The enclosed area is characterized by basalt outcrops and several partition walls. Dwelling structures have not yet been encountered here during the survey, however several larger piles of stones indicate several buildings, whose function and layout have not yet been determined. The fortification

19. Aerial view of Khirbat al-Ja'bariyya (view towards the northeast) (©APAAME, R.H. Bewley).

4. A detailed report on the results of this survey and the excavations at KaJ was delivered to the Department of Antiquities of Jordan, to be published in one of the coming ADAJ volumes (Müller-Neuhof – Abu-Azizeh 2018 b). See also Müller-Neuhof – Abu Azizeh 2016.



20. Plan of Khirbat al-Ja'bariyya with gardens (©DAI-Orientabteilung, W. Abu-Azizeh).

wall consists of a double-faced wall with widths between 1.10 and 1.80 m and preserved heights up to 2 m (FIG. 21). Three gates provide access to the fortified area (FIG. 22), and access routes link these gates to the foot of the ridge.

21. View of a section of the south wall of Khirbat al-Ja'bariyya (©DAI-Orientabteilung, B. Müller-Neuhof).

22. View through the west gate (©DAI-Orientabteilung, B. Müller-Neuhof).

Four terraced gardens are located in a row on the southern slope (FIG. 23). All these gardens have low, simply-made (single course) garden walls and outlets in the lower walls. Partly connected with these garden walls, but also more distant to the gardens, are the 28 dwelling structures, which have been identified here. These are in most cases sub-circular single cell structures (FIGS. 24 and 25). Two of them have been partially excavated and revealed grinding slabs as well as fireplaces with charcoal remains that have been used for C^{14} dating. On the northern slope only six such dwelling structures have been encountered. Additionally, five gardens have been identified at the foot of the slope, and are aligned in a row.

23. View of the terraced gardens on the south slope (arrows indicating the individual gardens) (©DAI-Orientabteilung, B. Müller-Neuhof).

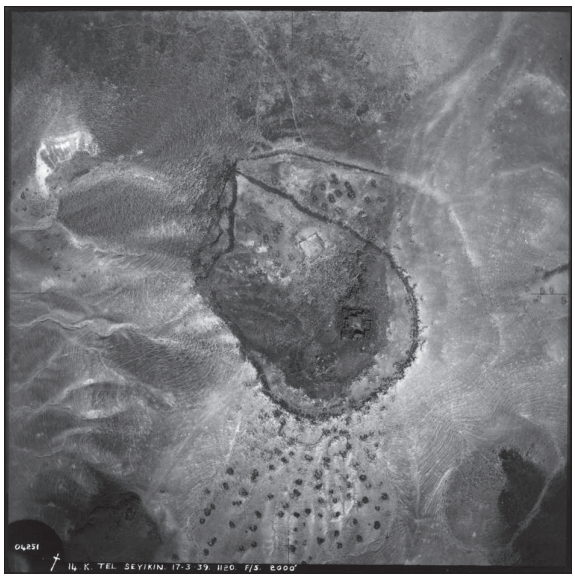
24. View of the partly excavated dwelling structure KAJ_01 at Khirbat al-Ja'bariyya with a stone-packed fireplace in the centre (©DAI-Orientabteilung, B. Müller-Neuhof).

25. View of the partially excavated dwelling structure KAJ_03 at Khirbat al-Ja'bariyya with charcoal remains in the trench near to the section and with grinding slabs embedded in the surface (former mudplaster of the roof) on the right side of the image (©DAI-Orientabteilung, B. Müller-Neuhof).

Qaṣr al-Uṣaykhim

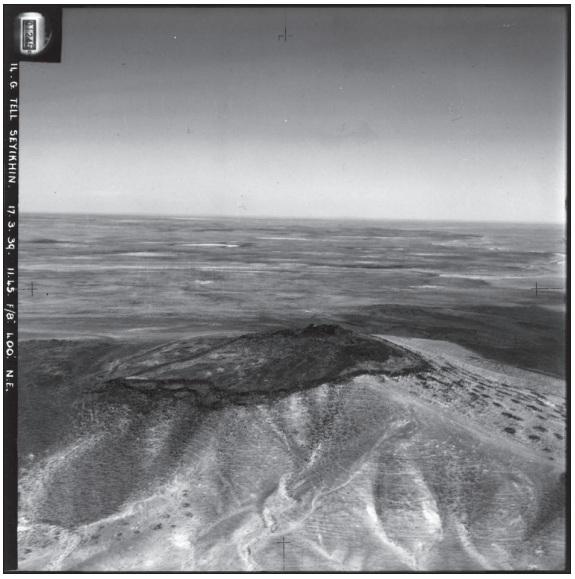
Qaṣr al-Uṣaykhim (QU), located *ca.* 14km northeast of Azraq, has long been known for its small Roman fort on top of a basaltic mountain (FIG. 26). One of the first visitors was Gertrude Bell in 1913. In 1938 Sir Aurel Stein took several aerial photos of the site (FIGS. 27 and 28). The function of this Roman outpost, which probably had a preceding building dating into the Nabatean period, was probably to guard the al-Azraq oasis and the nearby Roman road, as well as a track linking al-Azraq with Qaṣr Burqu' to the east (Kennedy 2004: 65f.). However, the fort is constructed inside an earlier circuit wall, which was restored in the early 2000s by a Jordanian – Italian team of archaeologists

26. Aerial view of Qaṣr al-Uṣaykhim (©APAAME, Robert H. Bewley).



27. Aerial view of Qaṣr al-Uṣaykhim taken by Sir Aurel Stein in the 1930s (©British Academy_Sir Aurel Stein Archive_ASA/3/466).

and restoration specialists under the direction of G.C. Infranca (Al-Khouri – Infranca 2005?). The wall is a double-faced wall with a width of *ca.* 2m. The preserved (restored) height is *ca.* 1m. Several openings in the wall indicate gates. A pre-Roman date for the wall was acknowledged by Kennedy (Kennedy 2004: 65) and al-Khoury and Infranca (Al-Khouri – Infranca 2005), however, proper investigation and dating was not conducted. While reviewing satellite images of the *ḥarra* in 2015, the author had a closer look on the site and its enclosure. Additionally, he observed several structures within the fortifications and on the southern slope outside of the enclosure that do not belong to



28. Aerial view of Qaṣr al-Uṣaykhim taken by Sir Aurel Stein in the 1930s (©British Academy_Sir Aurel Stein Archive_ASA/3/468).

the Roman fort. It became clear that these structures are double-cell dwellings comparable to the dwellings at Tulūl al-Ghuṣayn and are not planting pits, as was suggested by Infranca and al-Khoury (Al-Khoury – Infranca 2005). A short visit to the site in the same year confirmed this observation. Moreover, it became clear that the enclosure wall, which fortified the summit, most likely dates to the same period as the dwellings. It can therefore be assumed, that QU dates to the 4th millennium (EBA I) and would represent the westernmost EBA I hillfort site in the region to date. The fortified area extends over 2.21 ha, while the entire site, defined by the fortification and the extramural extension of dwelling structures, covers an area of *ca.* 7ha.

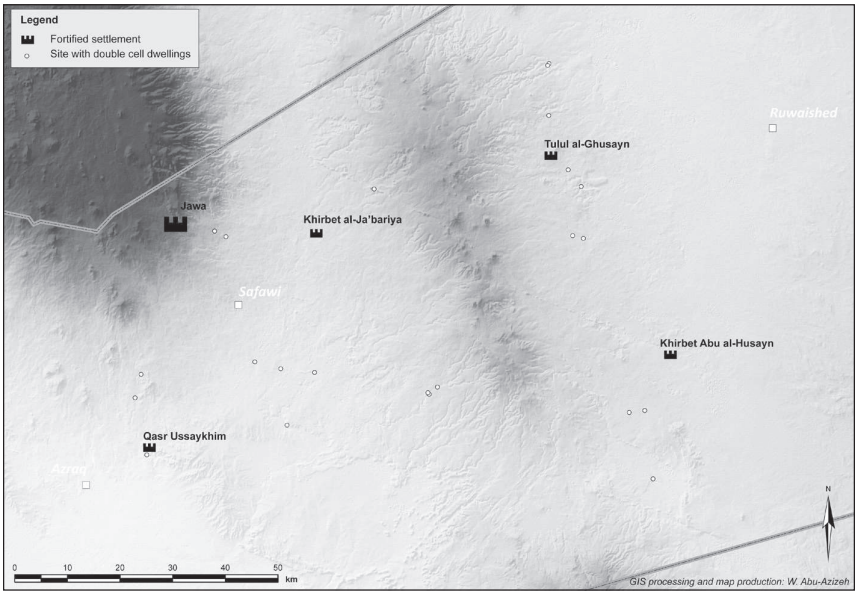
A detailed documentation of the fortifications, the dwelling structure and possible contemporaneous structures in the close vicinity, such as a dam, as well as soundings in the dwellings structures are planned for the coming seasons and will probably reveal more information about the date of this occupation phase at QU.

Unfortified Sites

The satellite image survey, which was carried out in 2015 revealed, besides the fortified sites of KaJ and QU, several other anthropogenic structures and clusters of structures in different parts of the *ḥarra*. Due to the fact that double-cell structures can, according to the results of the survey and the excavations at TaG, most probably be synchronized with the EBA IA/B, a special attention was paid to dwelling clusters with such double-cell dwellings. It was determined that at least 22 sites possessing between 50and 100 such double-cell dwellings, exist in the *ḥarra* (FIG. 29). It is interesting to note that these sites do not appear to have any fortifications. However, these are very preliminary observations, which need in-depth investigations and especially C14 dates. Therefore, it is too early at this time to speculate about possible relations and enmities between these settlement clusters and the hillfort sites of the *ḥarra*.

Dating

While radiocarbon dates from KAH and QU are not yet available, the C14 dates from Jāwā (Müller-Neuhof *et al*. 2015) as well as from Tulūl al-Ghuṣayn and Khirbat al-Ja'bariyya (Müller-Neuhof – Abu-Azizeh 2016) provide the first steps for a chronological framework for the late prehistory of the *ḥarra*. The dates range from the second half of the 5th millennium (KaJ) to the second half of the 4th millennium (early occupation phase at Jāwā) and thus cover a chronological sequence from the LC via EBA IA to EBA IB (Müller-Neuhof – Abu-Azizeh 2016). The KaJ dates range from 4,449 until 3,715 cal. BC, with a cluster between 4,229 and 3,997 cal. BC. The TaG dates range from 3,761 until 3,352 cal. BC with a cluster between 3,642 and 3,385 cal. BC. The dates from the early occupation phase at Jāwā, as well as the dam, range from 3,630 and 3,090 cal. BC, with a concentration of data from dwelling horizons dating roughly between 3,500 and 3,400 cal. BC (Müller-Neuhof *et al*. 2015). The dates from KAH and UQ are awaited in order to



29. Map of the *ḥarra* showing the LC/EBA hillfort sites and the unfortified sites with double-cell dwellings, which are presumably of the same age (©DAI-Orientabteilung, W. Abu-Azizeh).

complete the chronological sequence of the LC/EBA hillfort site phenomenon. Additionally, C14 dates from at least some of the unfortified villages are needed for such a sequence. Of high importance will be the generation of additional C14 dates from the already examined hillfort sites in order to establish local chronological sequences of the respective occupations.

Conclusion

The surveys of the Jawa hinterland project revealed several hitherto unknown sites east of Jāwā in the *ḥarra*. Even though not all sites seem to be contemporaneous with Jāwā, which especially seems to be the case with KaJ, they all belong to a characteristic settlement type, which was even able to evolve in the *ḥarra*. At the least, a time span for the evolution of these hillfort sites can be identified in the *ḥarra*. All sites have several characteristics in common. Among these characteristics are the fortifications of areas on top of a basaltic elevation, which in most cases is a volcano. Additionally, the enclosures are characterized by double-faced fortification walls and access to this fortified summit was provided by a restricted number of gates or posterns. At some sites (KAH and KaJ) the enclosed summit is either differentiated into several areas by internal walls, or sparsely covered by dwelling structures (TaG). The situation at Jāwā is yet unclear due to the fact that the extension of dwelling structures is not easy to identify on the surface of the site in the unexcavated areas. However, the fortified summit of all hillfort sites seemed to have provided enough space to accommodate several more people (and livestock?) from settlements in the vicinity and probably even from villages further away in times of needed defence. Another similarity is the existence of an extra mural or "lower settlement," which could be observed at all of the aforementioned hillfort sites. However, this characterization is not really true for Jāwā, due to the fact that its lower settlement is fortified with a secondary fortification wall rather than the main fortification wall. In QU, TaG and KaJ the buildings outside of the fortifications are clearly discernible and even represent the majority of dwelling structures. It seems also that there is an extramural "lower settlement" at KAH, however, this needs to be confirmed.

Another characteristic feature is that at almost every site evidence for agriculture was identified. Indirect evidence includes grinding slabs and handstones. Direct evidence includes terraced gardens, which were artificially irrigated by using runoff irrigation[5]. It is one

5. Due to the fact that the EBA structures at QU and in its surroundings have not yet been closely investigated and documented, it is too early conclude whether agriculture was conducted here or not.

of the greatest surprises that in such an arid environment agriculture was possible and especially that local precipitation could have been used for such a task. The terraced gardens are either located close to, or within the dwelling areas, such as at TaG, KaJ and probably also KAH, or in close proximity to the settlement, as can be observed at Jāwā. While the gardens at Jāwā and TaG extend over large areas on slopes and are arranged according to the cascade principle, the gardens at KaJ and probably at KAH are located at the foot of the elevation and are arranged in single rows, respectively. It may be that we can observe a kind of evolution of the construction of the terraced gardens in the *ḥarra*, which started with single rows of gardens on the foot of the slope and later turned into clusters of garden terraces. However, due to the fact that we have no C^{14} dates of KAH yet, this is a very hypothetical assumption.

Finally, it can be stated that the discovery of the hillfort sites challenges the hitherto common reputation of Jāwā as an odd site in a secluded location somewhere in the eastern desert. It became clear that Jāwā had a hinterland, at least in the east and south, and it seems that it can even be suggested that at least a specific time span of an evolution of hillfort sites in the *ḥarra* is observable. These preliminary results will enable us in the near future to develop a more detailed and chronologically differentiated map of the colonization of the *ḥarra* in the LC/EBA I.

With the discovery of these hillfort sites, their dating into the LC/EBA, the evidence for artificially irrigated agriculture at most of the hillfort sites, and also the discovery of the eastern adjacent mines, it is clear that the northern Bādiyah became an intriguing landscape for the 5th and 4th millennium civilizations. It is a landscape that still holds a large number of secrets, particularly of its LC/EBA colonization that needs to be explored in the coming future.

Acknowledgements

I express my sincere thanks to the Department of Antiquities of Jordan and its director Dr. Munther Jamhawi for the long lasting support of this research activity in the NE Bādiyah. I am also thankful to the Bādiyah Research Program and its former director Dr. Odeh al-Meshan as well as the current director Mr. Nawras al-Jazi for their support and the possibility to use the facilities of the Bādiyah Research Program Field Station in Safawi during the fieldwork season. I am grateful to the German Protestant Institute of Archaeology in Amman for hosting the team after the fieldwork season and to CBRL Amman for further support and the project's affiliation to CBRL. Furthermore, it has to be emphasized that without the generous funding by the German Research Foundation (DFG MU 3075/1–2, MU 3075/3-1), this project would not have been possible. Finally, it has to be stressed that such a project could not have been undertaken without the cooperation and help of other colleagues. In this regard I want especially name Dr. Wael Abu-Azizeh, Dr. Arno Kose, Mr. Tobias Schmidt M.A. as well as of our DoA representatives of the two last field seasons Mr. Khaled al-Janaida and Mr. Mohamad Atoom B.A. for their work. I am additionally grateful to Mr. Andrew Danielson M.A. who took the burden of proof reading. Any remaining mistakes are mine.

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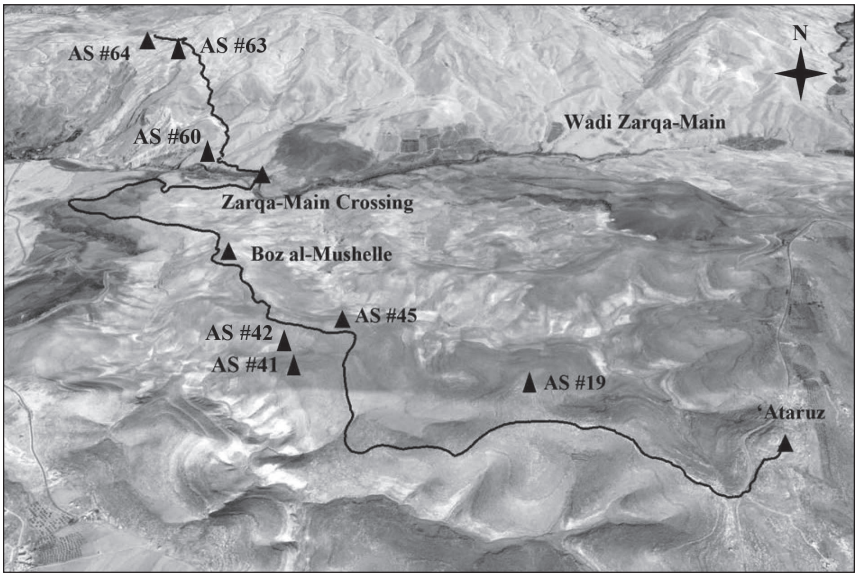
The Ancient Road in Wādī Zarqā'–Mā'īn, North of Khirbat 'Atarūz

Khirbat 'Atarūz is a prominent ancient ruin in the region of Jabal Ḥamidah, central Jordan. It was a thriving cultic, urban center in the 9th - 7th centuries BC that was built and maintained by national political entities (Ji 2011, Ji 2012; Ji and Bates 2014). It was resettled during the late Hellenistic period following a long settlement hiatus from late Iron II through the early Hellenistic era. Further, 'Atarūz lay at an important crossroads in antiquity. A north-south road from the land of ancient Moab and Edom passed through the site by way of Dhībān in route to the Jordan Valley (Strobel 1981, 1997). Another pivotal road from the east arrived at 'Atarūz by way of the military fort at Rujum 'Atarūz (Ji 2016). At Khirbat Libb, this eastern road joined the King's Highway, a major trade route of vital importance to the ancient kingdoms of Transjordan. In addition, a branch road led to the west from 'Atarūz to ad-Dayr and Machaerus. In short, roads from all points in Jabal Ḥamidah came together at 'Atarūz.

A description of the eastern route has already been published along with a detailed study of Rujum 'Atarūz (Ji 2016). The southern part of the 'Atarūz road system still warrants more fieldwork and study for a systematic publication. The purpose of this paper is to describe and date the northern road as its survey and analysis have recently come to closure. On the basis of the results, the author now can reconstruct a complete series of the ancient sites of the region north to 'Atarūz, corresponding to the Wādī Zarqā'–Mā'īn valley area (FIG. 1). Part of this series is rather well known from Strobel's earlier archaeological survey (1981, 1982, 1990). The 'Atarūz Regional Project team not only revisited all the sites in Strobel's report but also covered the southern section that was missing in his survey, documenting all the ancient remains including even small to medium round structures along the stretch between 'Atarūz and Wādī Ḥimara. The present paper also intends to discuss the historical importance of this road for the study of Iron Age and Hellenistic-early Roman history in the 'Atarūz region.

Upper Southern Section

When 'Atarūz was at the peak of its settlement, as stated above, multiple regional and local roads appear to have developed in the region (Ji 2016). Probably the most salient of

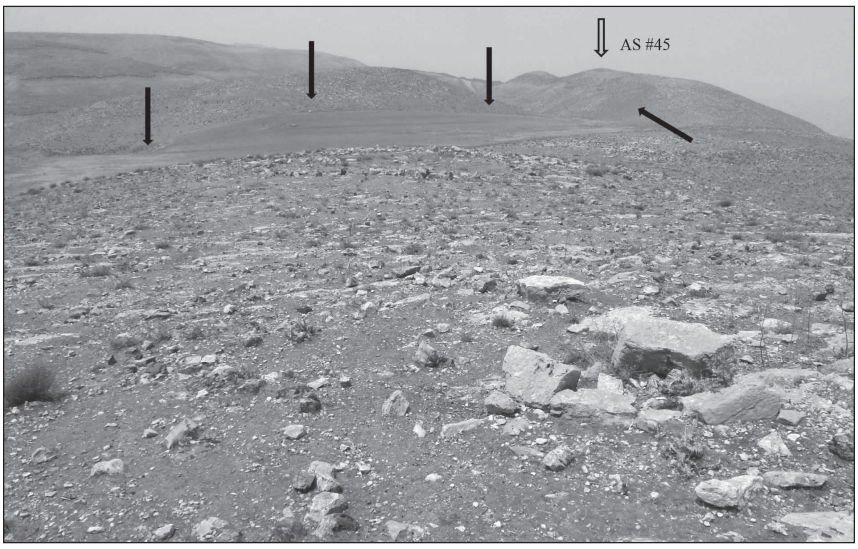


1. The Wādī Zarqā'–Mā'īn Road on Google Earth.

these was the north-south thoroughfare that passed through Sayl Haydān, Wādī Zarqā'–Mā'īn, and the Wilderness of Minya, connecting such prominent cities as 'Atarūz, Dhībān, and Jericho (Strobel 1997). This northern road was actually the only highway that people could travel directly between the 'Atarūz region and the Jordan Valley without going through the Madaba Plains and Transjordan Plateau. For this reason, in antiquity, it may have been frequently used by people who wished to move from 'Atarūz to Jericho and the Jordan Valley by the shortest and most convenient route available. In this paper, I simply refer to this road as the Wādī Zarqā'–Mā'īn Road because it crosses over a major gorge called Wādī Zarqā'–Mā'īn in connecting the 'Atarūz region with the Jordan Valley.

The upper southern section of the Wādī Zarqā'–Mā'īn Road runs about 4 km from 'Atarūz to Boz al-Mushelle ('Atarūz Survey Site (AS) #31) through one fortified villa site and several watchtower sites. In detail, after the road departs from the western end of 'Atarūz, it first runs mostly downhill about 2 km northwest along the modern dirt truck road. This dirt road ends at a medium-sized basin that is currently under cultivation for grain and seasonal farming (FIG. 2).

About halfway between 'Atarūz and this



2. Course of the ancient road near the cultivated basin area, looking northwest.

farming basin area is a rocky hill on which a building ruin (AS #19; *ca*. 10m in diameter), possibly a watchtower, is situated. This site is clearly visible from 'Atarūz and commends an excellent view over the basin northwest of the hill. To the northwest of the basin is another prominent hill that contains a round watchtower-like structure (AS #41; *ca.* 13m in diameter) with an attached enclosure, possibly an animal-pen, measuring roughly 30 m in diameter. Approximately 100 m northwest of AS #41 is a small circular building remain (AS #42) that measures 3 m in diameter. These three sites are situated on high points of the hills along the Wādī Zarqā'–Mā'īn Road, so their visibility is quite fair over the road that makes the circuit of the basin along its western boundary. Their presence at these points is unlikely to be entirely fortuitous; they were plausibly set up there with intent in relation to the Wādī Zarqā'–Mā'īn Road.

The modern dirt road ends at the northwestern edge of the basin, but the ancient road continues to the north, soon ascending a rocky mound northwest of the basin. Located at the top of this mound is a massive rectangular structure (AS #45) that covers an area some 20 by 150 m (FIG. 3). There are many visible solid wall lines inside the structure, some of which measure 1.3 m thick. The outer walls of this rectangular structure currently stands only one to two courses high. As for inner walls, its thickness is measured 1.3m on the average, indicating the building was probably defensive in nature, most likely a fortress or fortified villa. At the center of this building is a potential circular water cistern dug into bedrock.

On the western side of this site is a large oval-shaped building (13.5×15.5m) incorporated into the western wall of the rectangular structure. The outer wall was again built in a solid and impressive manner (1-1.3 m thick). It presently stands up to 40 cm. Attached to this building from outside is an elliptical-shaped structure measuring 2.0×3.5m. It appears to be a tower from which there is an especially good view to the northwest and of the ancient site of Boz al-Mushelle (AS #31), located on a lower hill west of this site. At AS #45, the Wādī Zarqā'–Mā'īn Road runs straight about 200 m westward right along the southern wall of the site before it starts to descend rather steeply at the northwestern edge of the mound. Here, 108 sherds were collected, which include two Iron II and two late Hellenistic-early Roman diagnostic specimens.

Boz al-Mushelle (Farsh al-Mesala)

West of AS #45, the road descends about 0.8 km toward the Wādī Zarqā'–Mā'īn, leading to the ancient ruin of Boz al-Mushelle (AS #31) (Strobel 1990; Wimmer 2000). Currently, this site is better known to local villagers as Farsh al-Mesala (FIG. 4). This is the most important site among the ancient ruins found along the Wādī Zarqā'–Mā'īn Road. Boz al-Mushelle is situated on a narrow rocky spur with strategic value in that it provides superb visibility in most

3. 'Atarūz Survey Site #45, looking east.

4. Boz al-Mushelle, view from AS #45, looking northwest.

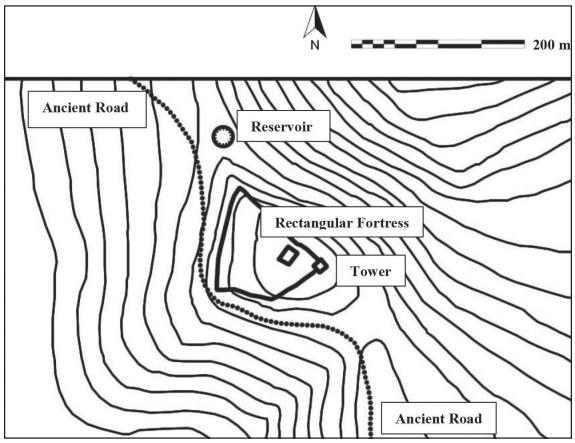
directions including Wādī Zarqā'–Mā'īn to the north and 'Atarūz and AS #45 to the south. At this site, the survey team collected 127 pottery fragments of which seven Iron II and one late Hellenistic-early Roman sherds were distinguishable.

In 1988, Boz al-Mushelle was investigated by Strobel and his German team who conducted a two-week excavation at the summit (Wimmer 2000). Strobel (1990) identified this site as a Moabite town of Zereth Schahar in the Hebrew Bible (Joshua 13:18), which is as yet far from confirmatory. In their report, Boz al-Mushelle is presented as a military fort with casemate wall that circumscribes a ridge top in a roughly triangular outline. At the acropolis was a rectangular building measuring 11×22m, one made up of heavy and rather large stone blocks. Their excavation took place at the northeastern corner of this building where an entrance (1.5 m wide) into the building was located. Near the entrance was a circular stone-lined silo dug down to the ground. It was 2.5 m deep and 2.3-2.6 m in diameter. Three natural terraces were observed inside the fort. Strobel (1990; Wimmer 2000) connected them with the location of an upper, middle, and lower city. The excavation produced a very limited number of pottery sherds, based on which the German team dated Boz al-Mushelle to Iron Age II.

In 2011-2012, Boz al-Mushelle was revisited by the author for survey as part of the 'Atarūz Regional Project. In light of this new survey, the site measures *ca.* 110m (east-west)×120m (north-south) and is surrounded by one-meter-thick defense walls, possibly casemate, which constitutes a trapezoid or triangular enclosure as observed by Strobel (1990) (FIG. 5). It is still possible to trace most of this fortification wall since large parts of the system remain visible above ground. The southern and western parts of the walls have suffered greatly from erosion.

A square-type tower (*ca.* 12×12m) stands at the eastern corner of the site with its entrance at the southeastern corner. It was constructed on the defensive wall. This corner tower must have been an imposing structure in antiquity that provided its users with an advantage in surveying defensive positions during wars and obtaining a good view of the surrounding areas, including the Wādī Zarqā'–Mā'īn Road. The residents would have fortified this area with the tower because it was the most vulnerable section of the settlement in terms of topography. The ravine on the north is so deep and vertical that it is impregnable; the slopes on the other three sides, though less extensive than the north one, are still rather impracticable for purposes of attack. In contrast, Boz al-Mushelle is easily accessible from the southeast via a narrow ridge connected to a low saddle between the site and a small round-structure site (AS #32). The corner tower was erected at this vulnerable point. Outside of the tower and the southeastern section of the defense wall are artificial trenches that appear to be ancient ditches that prevented invaders from getting close to the wall from the saddle.

As noted above, the highest point of the site is occupied by a rectangular building (FIG. 6). Its exterior dimensions are 12.2×22.6m with its wall being measured about 80cm thick. This size is in accord with the 11×22m of the German team that probably reported the interior dimensions of the building (Wimmer 2000: fig. 3). The aforementioned circular silo still remains in decent condition, about 4m northeast



5. Map of Boz al-Mushelle and the ancient road, adapted from Strobel 1990 and 1997.

6. The acropolis of Boz al-Mushelle, looking east.

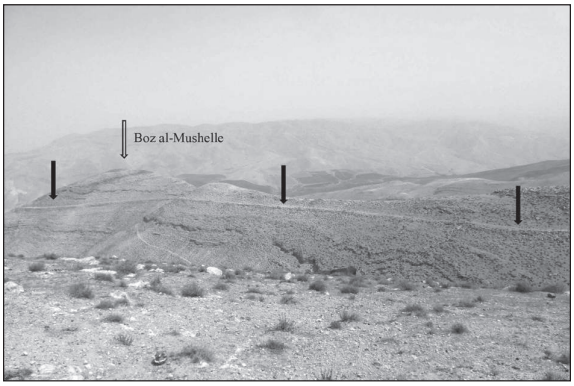
of the building entrance. This rectilinear building is well and solidly built at the commanding location from large and heavy limestone blocks, giving the impression of belonging to a public or military headquarter structure. Multiple wall lines are visible inside the building. Although no definite outline of interior structures is discernable due to several piles of rubble blocks inside the building, the surface observation and Strobel's earlier report suggest the existence of four rectangular long rooms, three in a vertical row with a fourth running the opposite horizontal direction, each separated by a solid wall. The two side vertical rooms seemingly consist of three to five small rooms, while the central one appears to have been an aisle that allowed access to the side and back rooms.

There is no natural water spring around Boz al-Mushelle. The primary water source would have been a manmade reservoir (AS #40) in the saddle of the northern ridge, about 50 m north of the city (FIG. 7). It appears to be oval- or rectilinear-shaped, measuring 20×25m. The reservoir was dug into soil ground and then bedrock. A retaining wall was erected around the reservoir to hold back the lateral pressure of soil, the wall constructed from stones without any mortar binding them together (FIG. 8). Part of the northern side wall is currently preserved up to seven courses high with a height of about 1.5 m, where visitors can see the presence of load-bearing facade of carefully selected interlocking unhewn stone blocks. Water would have been lifted by human and animal power to Boz al-Mushelle at the hill top via a faint trail that is still traceable. Near the upper end of this trail are a couple of parallel wall lines and small stone piles, positing the potential existence of a staircase and/or retaining walls in antiquity.

The Wādī Zarqā'–Mā'īn Road, which descends from AZ #45, winds around the southern, southwestern, and western sides of Boz al-Mushelle (FIGS. 5 and 9). The ancient road is astonishingly well preserved in this sector. Here, the road is 10-15 m wide, depending on the location. A long stretch of wall constructed of unhewn stone blocks runs along the western side of the road rising to a height of 1 m to retain soil on the road (FIG. 10). The road passes by the water reservoir after it turns past the southwestern corner of Boz al-Mushelle's city wall. Next, it turns to the northwest, descends following a gentle downhill, and then passes through a basalt stone field in which part of the ancient retaining walls are still discernable.

7. Ancient reservoir at Boz al-Mushelle, looking northwest.

8. Retaining wall of the reservoir at Boz al-Mushelle, looking north.

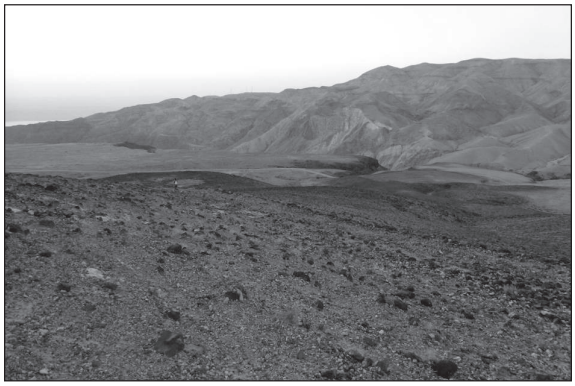


9. The ancient road in the Boz al-Mushelle area, looking northeast.

10. Retaining wall of the ancient road, west of Boz al-Mushelle, looking east.

Lower Southern Section and Zarqā'–Mā'īn Crossing

The course of the Wādī Zarqā'–Mā'īn Road from Boz al-Mushelle to the bottom of this basalt stone field is clear or at least relatively easy to reconstruct because it remains remarkably unimpaired over thousands of years (FIG. 11). Yet, the section from the basalt stone field down to the Wādī Zarqā'–Mā'īn Crossing (AS #58) is far more difficult to determine due to frequent ploughing out, development, and bulldozing for road construction in the area. This area is locally called the valley of al-Buqe'a. It represents sparsely populated desert plains with some gentle hills and several dry streams that flow into Wādī Zarqā'–Mā'īn. But it seems quite probable that the ancient road here makes a turn to the northeast at the bottom of the basalt stone field and follows a modern dirt road on a rather flat area about 2 km to the east, a road heading to the agricultural area at the upper stream of Wādī Zarqā'–Mā'īn.



11. The basalt stone area, looking northwest.

Soon after two small stream-crossings, this modern dirt road reaches the top of the ancient stone stairway that leads down to the bottom of Wādī Zarqā'–Mā'īn (FIG. 12). This area has been badly disturbed by bulldozers working on road construction. The destruction is not total, however. A careful survey of the bulldozed area discloses the remnants of retaining walls and more than two dozen stone steps *in situ* that once comprised an ancient staircase system that helped people walk down to and cross Wādī Zarqā'–Mā'īn. In this part of the region, Wādī Zarqā'–Mā'īn forms a deep and steep-sided gorge that is difficult and dangerous to cross with high risk of accident. Ancient people who had to travel across this part of the gorge needed an "easy and safe" access to the bottom of the valley, so they installed two stone staircases, one each on the southern and northern sides of the gorge, most likely following earlier

12. Course of the ancient road, east of the al-Buqe'a valley, looking south.

dirt trails that existed there prior to the staircase construction (FIG. 13).

The stairway on the northern portion of Wādī Zarqā'–Mā'īn is the better preserved due to the lack of modern development activities on that side of the valley (FIG. 14). To think this stairway was built no later than the Roman era (see below for dating), the author is amazed by its rather pristine condition. The total number of steps is difficult to count because of rock tumbles from the cliff north of the staircase. Also part of the staircase has fallen into disrepair because of erosion. But it is estimated roughly 50 steps were originally laid out here to complete the staircase using medium to large unhewn basalt and limestone blocks.

For reference, in the valley of al-Buqe'a, a local road appears to have branched off westward from the Wādī Zarqā'–Mā'īn Road to the basalt-stone-quarry site (AS #51) on the Hellenistic-Roman road that connected Machaerus and 'Ayn az Zāra (*cf.* Ben David 2015; Strobel 1990). This secondary road closely follows the modern paved road to 'Ayn az-Zāra from the junction south of the hot-spring resort of Ḥammāmāt Mā'īn. The antiquity of this road is attested by the Herodian remains at 'Ayn az-Zāra (Clamer 1997; Strobel and Wimmer 2003) and the quarry site where high-quality basalt stones were quarried in ancient times. During Iron Age II, this quarry site would have been one of the primary sources of basalt stones that were used at 'Atarūz for cultic and private purposes. In this sense, this branch road is likely to have been of great socio-economic utility and importance to the residents at 'Atarūz and its vicinity.

13 The Wādī Zarqā'–Mā'īn Crossing, looking southeast.

14 The northern staircase at the Wādī Zarqā'–Mā'īn Crossing, looking northeast.

Northern Section

At the northern bank of Wādī Zarqā'–Mā'īn, the road first proceeds about 0.7 km westward rather horizontally along the contour line of large gentle hills (FIG. 15), makes a sharp turn to the northwest, and then arrives at a large wadi without a name. The course from Wādī Zarqā'–Mā'īn to this nameless wadi is well marked by ancient retaining walls still evident along the road. There is a small round structure (AS #60) at the point where the road turns northwest.

The section of the road that leads from the nameless *wadi* to the modern Mā'īn-Jordan Valley Road can also be traced with equal cer-

15. The ancient road along the northern bank of the Wādī Zarqā'–Mā'īn, looking north.

tainty, except in a few areas, due to its relatively good condition of preservation. The most impressive section is found at 350 - 400 m in elevation where the road goes around natural amphitheater-type terrain disturbed by frequent erosion. Here, the retaining wall is higher and thicker than in the other sectors of the road for an obvious reason: it has to hold large amounts of soil and rock on a rather vertical slope (FIG. 16). Next, the road comes to a small saddle at the elevation of nearby 400 m, where it turns almost 90 degree to the north (FIG. 17). The Wādī Zarqā'–Mā'īn Road continues about 2.5 km and arrives at the modern paved road that connects Mā'īn and the Jordan Valley. The ancient road is no longer traceable from here to 'Ayn Ḥimāra. It is completely lost to the modern road, development, and bulldozing.

As stated above, the northern section of the Wādī Zarqā'–Mā'īn Road was previously explored by Strobel (1981) who wrote a rather thorough description of the road. The author revisited this section of the road a couple of times, searching for archaeological sites along the road and its vicinity. To the author's surprise, the northern section of the Wādī Zarqā'–Mā'īn Road has very few ancient ruins or settlements. One village settlement (AS #59) was noted on a basalt stone knoll, about 0.5 km northeast of the northern Wādī Zarqā'–Mā'īn staircase. At this site, the survey team documented several long faint wall lines and the possible remains of a couple of rectangular houses. But this site seems to have been an Early Bronze village or camp site for animal grazing, one having little to do with the Wādī Zarqā'–Mā'īn Road. The northern section of the road is also largely void of small circular structures that frequently dot the section between 'Atarūz and Wādī Zarqā'–Mā'īn, particularly the area around Boz al-Mushelle (*e.g.* AS #35-38 and 46-47). Only two small circular structures were noticed along the entire stretch of the northern section, one being AS #60 mentioned above and another a small structure (AS #63) on a minor spur near the upper end of the road.

One exception for this generalization is AS #64 located on a prominent rocky hill on the watershed Main ridge, a hill near the radio antennas standing by the modern Main - Jordan Valley Road (FIG. 18). The hill offers a commanding view to the Wilderness of Minya in the north and the entire southern section of the Wādī Zarqā'–Mā'īn Road. 'Atarūz is rather clearly distinguishable from this site despite the distance between the two. This site is comprised of two stone structures, one measuring 15 m in diameter and the other one 3 m in diameter. They are approximately 15 m apart. Although partially disturbed, wall lines and stone piles suggest a solid and impressive watchtower constructed from medium to large sized blocks.

AS #64 is likely a watchtower site associated with the Wādī Zarqā'–Mā'īn Road. The ancient

16. Retaining wall of the ancient road, the northern section, looking northwest.

17. The ancient road in the northern section, looking north.

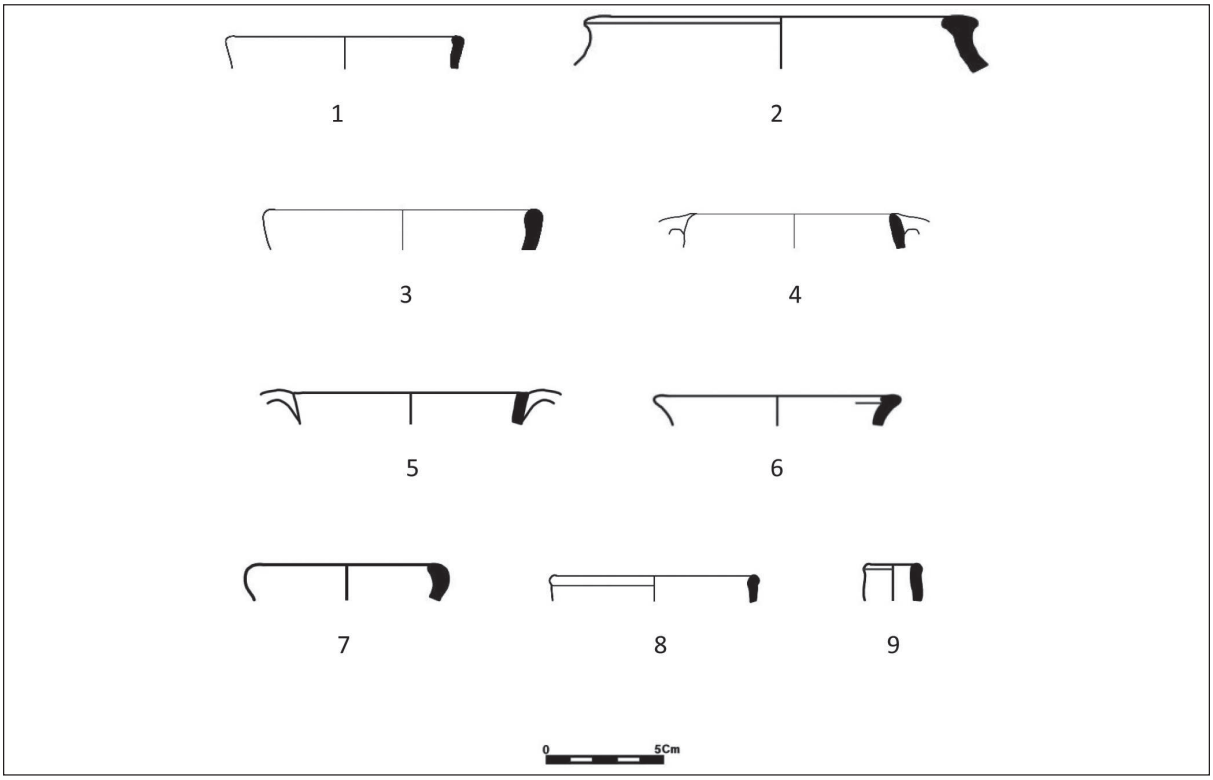
18. 'Atarūz Survey Site #64, looking west.

road starts to descend near AS #64 toward Wādī Ḥimara in the northwest and then continues northward through the wilderness of Minya. The ancient road would have run in the northwest-southeast direction about 50 m east of this site. Further, its location is strategic enough to overlook the long stretch of the ancient road as well as send signals to 'Atarūz and Boz al-Mushelle in case of war or emergency. Water is available at a small ancient village settlement (AS #65) in Wādī Ḥimara, roughly 2 km northwest of AS #64 (*cf.* Strobel 1974). At the wadi, water still flows year round, and springs are active in the *wadi* bed, although water is now piped into the nearby farms and industrial facilities. Possibly, watchtowers were erected at AS #64 with the intent of military defense of the 'Atarūz region and traffic surveillance on the Wādī Zarqā'–Mā'īn Road when the road was constructed or in use during ancient times.

Dating

An ancient road is difficult to date. In this paper, the author would suggest the most probable chronology of the Wādī Zarqā'–Mā'īn Road, referring to the pottery collected from the sites along the road. Eight of the 28 sites found along the road contained diagnostic pottery sherds. Late Hellenistic-early Roman sherds were recovered from six of the eight diagnostic-sherd sites (75%), indicating the significance of these periods for the use and development of the road. The next highest frequency is pertinent to Iron Age II with 63% (n = 5) of the eight sites. Smaller proportions Early Bronze (one site) and mid Islamic sherds (two sites) are present at the surveyed sites, indicating some limited use of the road during these periods. Other periods, surprisingly including the Byzantine period, are not attested. Looking at this result from the survey, it is clear that the Iron II and late Hellenistic-early Roman periods stand out as the possible periods of construction, use, and renovation of the Wādī Zarqā'–Mā'īn Road. The road might have been in use during the mid Islamic period, but given its meager representation in the ceramic repertoire, traffic along the road would have been much less than that of the Iron II and late Hellenistic-early Roman periods.

For references, (FIG. 19) contains some selected pottery examples collected from the sites located along the Wādī Zarqā'–Mā'īn Road, including three sherds (FIGS. 19:1-2 and 5) from Boz al-Mushelle. To begin with Iron II, (FIG. 19:1) is a medium-sized krater with an inverted, downwardly-angled, rounded hammerhead rim. It is normally dated to Iron II A-B (Gitin 2015: pl. 2.5.5:1), even though it originally appeared in the Iron I period as demonstrated at Tall Abū Shūshah (Gezer) (Gitin 1990: fig. 6:19). A holemouth krater is depicted in (FIG. 19:2), a type that was popular in the 9th-8th centuries BC krater assemblage. The earliest appearance of holemouth kraters took place late in the 10th century BC. This rim shape was also extensively adopted for storage jars. Parallels are found at Tall Abū Shūshah (Gezer) (Gitin 1990: pls. 12:11; 18:1-2), Tall ad-Duwayr (Lachish) (Zimhoni 1997: figs. 3.54:1-6; 5.20:1-4; 2004: figs. 25.18:10, 17; 25.17:26; 25.21:9; 25.35:9; 25.46:24), Samaria (Tappy 1992: fig. 3:35), Tall al-Mutasallim (Megiddo) (Finkelstein, Zimhoni, and Kafri 2000: figs. 11.44:3; 11.46:11; 11.52:10), Lahav (Cole 2015: pls. 7:10; 9:32; 11:14; 14:1-6; 17:10), Bisan (Beth Shean) (Mazar 2006: pls. 19:16; 24: 2 and 4; 29:3), as-Sa'īdiyyah (Pritchard 1985: figs. 8:4, 6-9; 17:27, 29-32), Dhībān (Winnett and Reed



19. Selected pottery from the Wādī Zarqā'–Mā'īn Road survey.

No And Type	Origin	Reg. #	Description (E: External; I: Internal)
1. Krater	AS #31	AS31-1	Reddish yellow (7.5YR7/6) ware, no slip, small gray core, few gray grits
2. Krater	AS #31	AS31-2	Reddish yellow (5YR6/8) ware, no slip, large gray core, few white grits
3 Bowl	AS #41	AS41-1	Light red (2.5YR6/8) ware, no slip, large gray core, no grits
4. Cooking Pot	AS #47	AS47-1	Reddish brown (2.5YR4/3) ware, no slip, no core, many gray grits
5. Cooking Pot	AS #31	AS31-3	Reddish yellow (5YR7/6) ware, pink (5YR5/3) slip (E), no core, no grits
6. Bowl	AS #38	AS38-2	Yellowish red (5YR6/8) ware, reddish yellow (5YR7/6) slip (E&I), no core, few white grits
7.Bowl	AS #45	AS45-2	Reddish yellow (5YR7/8) ware, no slip, no core, no grits
8. Bowl	AS #41	AS42-1	Brownish yellow (10YR6/6) ware, no slip, small gray core, no grits
9. Unguentarium	AS #47	AS47-2	Reddish yellow (5YR7/8) ware, yellow (10YR7/6) slip (E&I), no core no grits

1964 pls. 75:18; 76:10), and Bīr as-Sabi' (Beer Sheba) (Aharoni 1973: figs. 55:20; 56:18; 58:29, 33-36; 65:1-4, 7).

A simple-rim bowl in *Figure 19:3* has come from a circular-stone-structure site by the Wādī Zarqā'–Mā'īn Road, about 0.7km south of Boz al-Mushelle. This style of bowl was in wide use in the late 10th-8th centuries BC. Similar bowls are noted at Tall Abū Shūshah (Gezer) (Gitin 1990: pls. 10:3-5, 14:11, 15: 9), Tall al-Mutasallim (Megiddo) (Finkelstein, Zimhoni, and Kafri 2000: figs. 11.24:2-3; 11.36:6), Tall al-Qudah (Hazor) (Yadin *et al.* 1960: pls. LXIII:25; LXVII:4; LXXV:3), Tall ad-Duwayr (Lachish) (Zimhoni 1997: figs. 3.6:1; 3.7: 2; 3.19:1-4 and 9; 3.57:1-6; 2004: figs. 25.19:13-14, 19; 25.22:8; 25.32:14; 25.39:5), Bisan (Beth Shean) (James 1966: fig. 67:15-16, 22-23; Mazar 2006: pls. 6:8-10; 14:10; 19:1; 23: 1 and 6), Rumayth (Barako 2015: fig. 3.1:3-6, 8,12-13), Bir as-Sabi' (Beer Sheba) (Aharoni 1973: fig. 54:3), Samaria (Tappy 1992: fig. 4: 3-6), Wādī Jizrīl (Jezreel) (Zimhoni 1997: fig. 1.8:1), Mudayna ath-Thamad (Daviau and Steiner 2000: fig. 13:2), Ta'annak (Taanach) (Rast 1978: fig. 44:4; 64:1-8, 10-12), Ḥisbān

(Ray 2001: fig. 3.7:14-15; 3.8:8; Herr 2012: fig. 2.24:11-12; 2.25:1), as-Sa'īdiyyah (Pritchard 1985: figs. 2:12; 6:4), and 'Umayrī (Lawlor 2000: fig. 3.23:9-11; 2014: fig. 3.34:6, 8).

(FIG. 19:4) represents a frequent type of early Iron II cooking pot with a short, triangular rim inwardly tapered at the upper edge. This sherd is from another round-structure site, located between AS #45 and Boz al-Mushelle. Parallel vessels appear at Tall Abū Shūshah (Gezer) (Gitin 1990: pls. 7:24; 8:23-24; 9:20; Dever *et al.* 1974: pl. 34:7), Tall ad-Duwayr (Lachish) (Zimhoni 1997: fig. 3.38:6; 2004: fig. 25.44:50), Tall al-Mutasallim (Megiddo) (Finkelstein, Zimhoni, and Kafri 2000: fig. 11.13:13-14), Ta'annak (Taanach) (Rast 1978: figs. 28:1-3; 66:17), Bisan (Beth Shean) (Mazar 2006: pl. 15:9), as-Sa'īdiyyah (Pritchard 1985: fig. 3:30), and Ḥisbān (Ray 2001: fig. 3.8:14; Herr 2012: fig. 2.25:6), mostly dated to the 10th-9th centuries BC with sporadic appearance early in the 8th century BC.

Next for the late Hellenistic-early Roman periods, the cooking pot in *Figure 19:5* was collected from the surface of Boz al-Mushelle. It is typical of a high straight-neck variety with a simple rim, flattened on top. This was the dominant type of the late Hellenistic era, especially the time frame from the 2nd century through the first half of the 1st century BC. Selected parallels are found at Khirbat al-Burj (Dor) (Guz-Zilberstein 1995: fig. 6.17:2-4), Tall al-Akhḍar (Anafa) (Berlin 1988: 54-56), Bayt Zūr (Beth Zur) (Lapp and Lapp 1968: figs. 24:2; 27:1-7), Jerusalem (Geva 2003: pls. 5.:9; 5.7:19; 5.10:22; Geva and Rosenthal-Heginbottom 2003: pl. 6.2:17), Jericho (Bar-Nathan 2002: pl. III:28), 'Irāq al-Amīr (Dentzer, Villeneuve, Larche, and Zayadine 1982: fig. 7:1), and Ḥisbān (Gerber 2012: figs. 3.6:5-8, 10-14; 3.15: 3).

(FIG. 19:6) shows a bowl with an infolded rim and everted body wall. This particular bowl type is reportedly closely linked with the Hasmonean and Herodian rule; they are rarely found outside of their territory (Gerber 2012: 207). Parallels in the literature are dated from the late 2nd through the end of the 1st centuries BC: Machaerus (Loffred 1996: fig. 39:18, 21, 26-28, 31), Ḥisbān (Gerber 2012: figs. 3.7:19-24), Pella (McNicoll *et al.*, 1992: pls. 77:3; 81:9), Jerusalem (Geva 2003: pls. 5.3:23, 26; 5:39, 43; Geva and Rosenthal-Heginbottom 2003: pls. 6.1:16; 6:1-2; Geva and Hershkovitz 2006: pl. 4.5:5-6; 4.8:1; 4.9:13), Herodium (Bar-Nathan 1981: pl. 2:10), Jericho (Netzer and Meyers 1977: figs. 6:1; 9:1; Bar-Nathan 2002: pl. I:24; IV:66-68; VII:39-40), Qumrān (Magness 1998: fig. 1:10), and Mas'ada (Bar-Nathan 2006: pl. 26:57).

(FIG. 19:7) illustrates a bowl with an incurved rim and curved body. Although this form was popular throughout the entire Hellenistic period, its peak period for development and distribution corresponds to the 3rd - early 1st centuries BC (Lapp 1961: 201). It is sparse in the early Roman assemblage, even though its later variant with thin wall is frequently noted in the 1st century AD horizon. Similar bowls are reported at Tall al-Akhḍar (Anafa) (Berlin 1988: 133-135), 'Ayn az-Zāra (Clamer 1997: fig. 4:1), Khirbat al-Burj (Dor) (Guz-Zilberstein 1995: fig. 6.1: 1-30), Jerusalem (Geva 2003: pls. 5.3:18-21; 5.8:40-41), Jericho (Bar-Nathan 2002: pl. IV:46, 50-57), and Ḥisbān (Gerber 2012: fig. 3.8:1-16). Lastly, the bowl or drinking vessel in (FIG. 19:8) would also be dated to the late Hellenistic period. Parallels may not be plentiful in the literature. One potential parallel is found at the Hasmonean palace at Jericho (Bar-Nathan 2002: pl. X:54). An early-Roman unguentarium or bottle rim is illustrated in (FIG. 19:9). It may belong to the piriform ungeuentarium corpus that was in very frequent use during the 1st century AD (Lapp 1961: Type 92F-G).

Discussion

The presence of an ancient road in the Wādī Zarqā'–Mā'īn region has been known for some time due to the earlier investigations of the re-

gion, particularly the northern section of the Wādī Zarqā'–Mā'īn Road. However, as a result of continued archaeological work in the region of Jabal Ḥamīdah under the auspices of the 'Atarūz Regional Project, a series of sites previously unknown have been discovered along this ancient highway. This has also made it possible to connect the dots through 'Atarūz, Boz al-Mushelle, Wādī Zarqā'–Mā'īn, and the modern Main-Jordan Valley Road, rendering a complete picture of the Wādī Zarqā'–Mā'īn Road.

With respect to historical context, the above ceramic evidence points to the 9th - 8th centuries BC as the most reasonable date for the construction of the Wādī Zarqā'–Mā'īn Road. During this period, 'Atarūz was a major cultic and urban center with national importance (Ji 2011; 2012). It was also characteristic of an impressive defense system with ditches and solid city walls that encircled the entire site. Besides this fortification, the residents of 'Atarūz built chains of fortresses and smaller civilian settlements around or near the city, especially along the major routes leading to the city. Rujum 'Atarūz, for instance, was erected as part of such a broader regional defense strategy in order to control and protect the eastern border and the major highway along the ridge of Jabal Ḥamīdah (Ji 2016). Boz al-Mushelle seems to have served this same purpose in the north. That is to say, it was a key military facility or fortified habitation site built to protect the area north of 'Atarūz and to oversee human movement along the Wādī Zarqā'–Mā'īn Road. Based on the regional survey, this defense system was expectedly further reinforced with a string of small watchtowers and defense facilities (*e.g.* AS #34-38, 45-47, and 63-64) along the road. In this perspective, Boz al-Mushelle, together with Rujum 'Atarūz, seems to be a notable example of the organization of a military zone and illustrates the defensive techniques and geopolitical strategy of ancient 'Atarūz during Iron Age II.

The Wādī Zarqā'–Mā'īn Road appears to have been reused from the 2nd century BC to the 1st century AD. This fact is indicated by the late Hellenistic-early Roman sites that have been discovered along it, including Boz al-Mushelle. Actually, the ancient remains currently visible on ground are most likely to be late Hellenistic and early Roman granted the building technique and architectural resemblance to the Machaerus-'Ayn az-Zāra Road certainly built during the same periods (*cf.* Ben David 2015). In the author's view, this reconstruction project is likely to have started under the Hasmoneans late in the 2nd century BC or early in the 1st century BC, if he takes into account the higher frequencies of late Hellenistic pottery found during the survey compared to those securely assignable only to the early Roman period. The 'Atarūz region was the most isolated part of the Hasmonean-Herodian kingdoms. The rulers would have needed an interregional highway that could aid in the everyday maintenance and socio-economic activities of the region. The earlier Iron II road is likely to have conveniently been reused to this end with proper repair and expansion. More importantly, the area corresponded to the southeastern frontier of the kingdoms (Ji 2009a; Ji and Lee 2004). The renovated road was probably aimed to ensure the Hasmoneans and Herodians to outmaneuver the Nabateans, their principal enemies from the south who controlled the Dhībān Plateau (Ji 2009b). Via the Wādī Zarqā'–Mā'īn Road, the region could expect to be swiftly supplied or reinforced in the event of an emergency, lessening the need for large and costly garrison units along the borderlines such as *Sayl Haydān* and Wādī al-Mūjib. Accordingly, as supported by the Wādī Zarqā'–Mā'īn Road, the route was presumably renovated with speed of travel in mind, following a straight trail across the desert, valley, and countryside as much as possible. It is even possible that the road was patrolled by special detachments of army troops, who might have used settlements and multiple circular-stone structures dotting the route as their temporary stop-over facilities. They could man the watchtowers to relay military messages, help

vulnerable travelers, and keep an eye on potential enemies.

Conclusion

The Wādī Zarqā'–Mā'īn Road covers a length of roughly 12 km from the western side of 'Atarūz to the modern Main-Jordan Valley Road in the northwest. This ancient road is presently in varying states of preservation with and some part having disappeared forever. Notwithstanding, it might still represent the best preserved ancient road in central Jordan, a rare phenomenon in the region under constant pressure for development and urbanization (Ben David 2009). The Wādī Zarqā'–Mā'īn Road was part of a rather complex road system that crisscrossed the 'Atarūz region during the periods of Iron II and late Hellenistic-early Roman. It was primarily of a national character during these periods. The road was possibly in use during the mid Islamic period. But evidence of this is at best sketchy and limited when compared to the Iron II and late Hellenistic-early Roman periods. Boz al-Mushelle appears to have been central to this road system and was built for residence and military purposes during the Iron II period, probably under the auspices of 'Atarūz inhabitants. The Wādī Zarqā'–Mā'īn Road seems to have flourished once again in the late Hellenistic-early Roman periods when the Hasmoneans and Herodians came to the region and constructed a fort palace at Machaerus. These facts postulate that the history of the Wādī Zarqā'–Mā'īn Road was closely tied with the settlement vicissitude of 'Atarūz and its surrounding region. The road would have played a pivotal role in the development, prosperity, and military security of the 'Atarūz area during the Iron II and late Hellenistic-early Roman periods as it provided the shortest and most efficient means for solders, residents, and merchants to travel between the region and the Jordan Valley.

Acknowledgments

The author would like to express his gratitude to Chaim Ben David and Yeshu Dray who provided insight and expertise about the ancient roads in the Levant during the early stage of this survey research.

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A Preliminary Typology of Brick and Tubuli from the Late Roman Bath at ʻAyn Gharandal, Jordan

Introduction

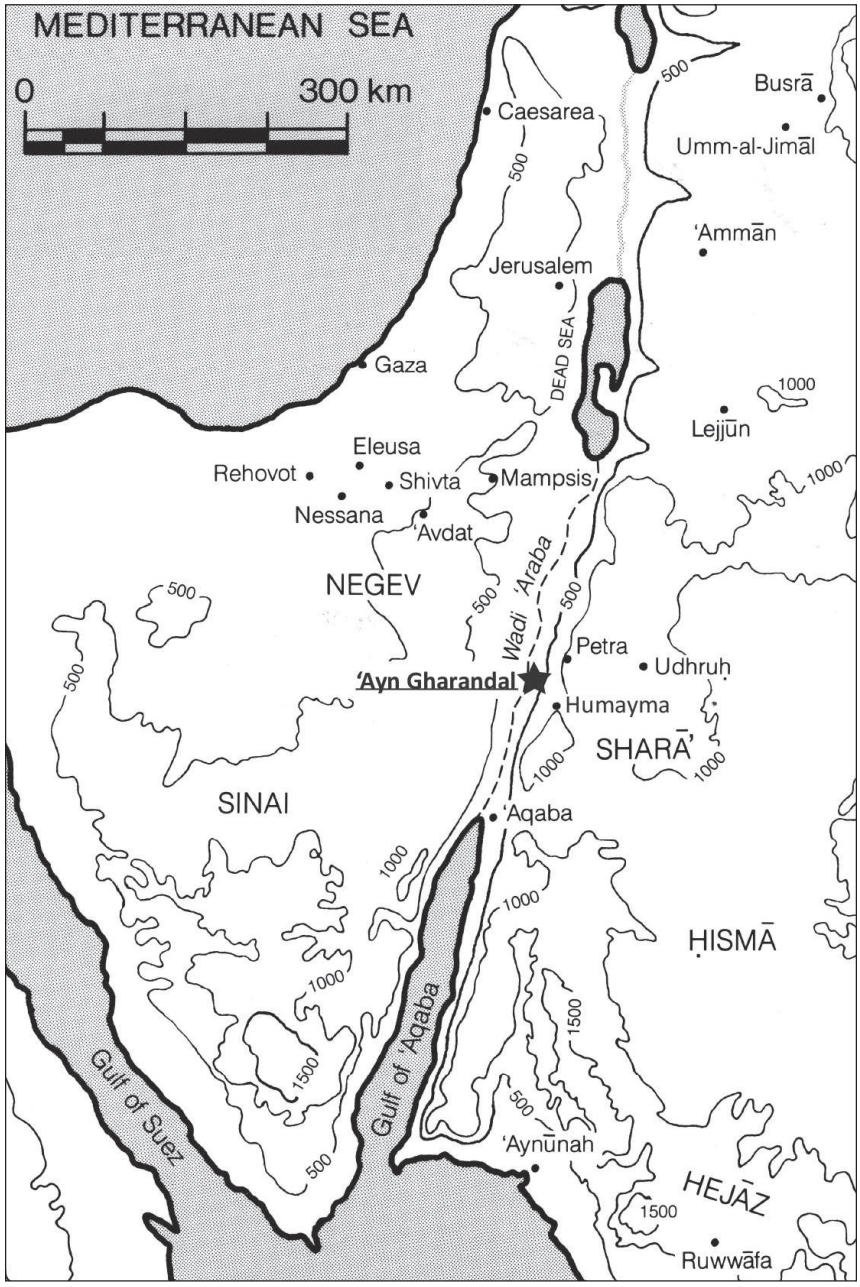
During the 2015 field season of the ʻAyn Gharandal Archaeological Project, excavators uncovered a large corpus of ceramic building materials from the heating system of the site's late Roman bath. Such material typically receives little scholarly attention, yet its study can reveal a great deal about the construction and renovation of buildings, as well as regional trade and economy. The intent of this article is to present a preliminary typology of the bricks and *tubuli* found during excavation of the bath at ʻAyn Gharandal and to provide a brief discussion of their use within the heating system. The nature of the bath's ceramic building material precludes a quantitative typological study and the limitations of this publication format prevent its complete presentation here. It is hoped, nevertheless, that this article will be a resource for similar studies and will serve as a reference for future work on this class of material both at ʻAyn Gharandal and other sites in the region.

ʻAyn Gharandal

The site of ʻAyn Gharandal is located *ca.* 70 km north of the Gulf of Aqaba and *ca.* 40 km southwest of Petra (FIG. 1). Situated on the eastern edge of the Wādī ʻArabah and immediately west of a spring feeding a small oasis, the site consists of a late Roman outpost, comprising a *castellum* and its associated bath. The fort's dedicatory inscription, found during excavation outside the main gate, securely dates the foundation of the fort to the reign of Diocletian (Darby 2015).

Beginning with Alois Musil in 1902, numerous explorers and archaeologists have visited ʻAyn Gharandal (Musil 1907: 193-97; Darby and Darby 2015: 461). Excavation of the site, however, only began with the ʻAyn Gharandal Archaeological Project, which first conducted a survey of the site in 2009 and subsequently undertook excavations in 2010, 2011, 2013, 2014, and 2015, with further excavation seasons planned (Darby *et al.* 2010; Darby and Darby 2012, 2015, 2017). The focus of these excavations has primarily been on the Late Roman *castellum* and its associated bath.

Excavation within both the fort and bath found a wide range of ceramic building material, including bricks, cylindrical pipes, and *tubuli* (specialized rectangular heating pipes). The

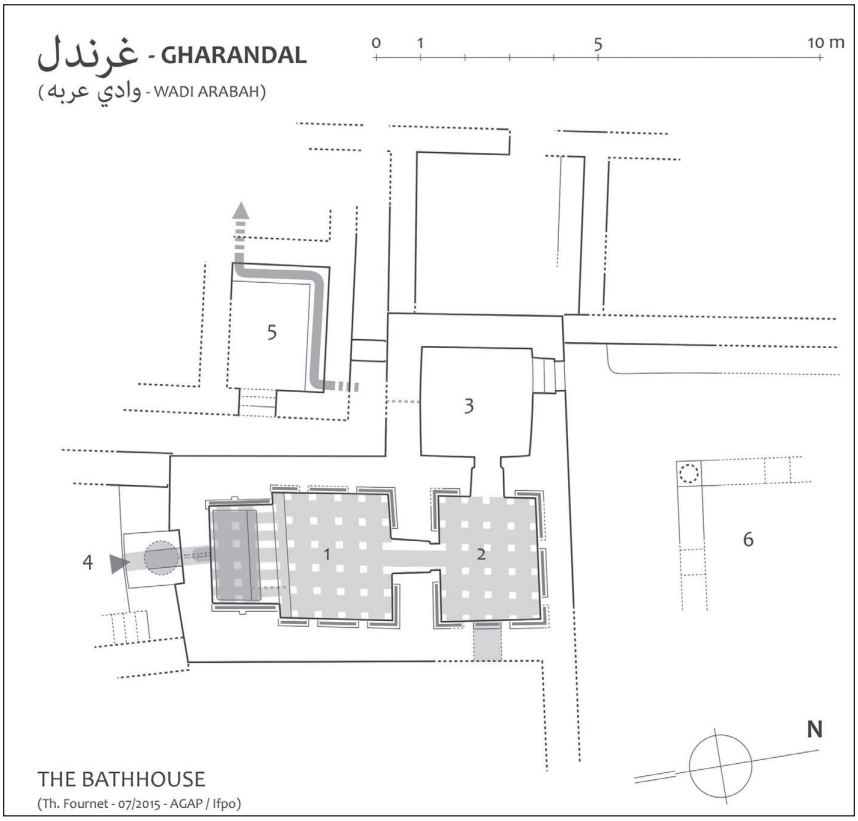


1. Site of 'Ayn Gharandal (C. A. Harvey, after Reeves and Harvey 2016).

complete absence of any roof tiles on the site suggests that pitched and tiled roofs were not present at 'Ayn Gharandal. The ceramic building material from the fort is relatively scarce and mostly consists of fragments of brick and cylindrical pipe no longer *in situ*. The occasional *tubulus* find could indicate the presence of a heating system within the fort, but most likely comes from the nearby bath. The vast majority of ceramic building material found on site comes from the bath, and specifically its heating system, and it is this material on which this article focuses.

Bath

The bath at 'Ayn Gharandal is located about 60 m east of the fort and remains only partially uncovered. Ongoing excavation of the bath has thus far revealed two heated rooms (the *caldarium* (FIG. 2:1) and *tepidarium* (FIG. 2:2), an unheated room (*frigidarium*) (FIG. 2:3), the furnace (*praefurnium*) (FIG. 2:4), a latrine



2. Plan of bath – 1. *Caldarium*; 2. *Tepidarium*; 3. *Frigidarium*; 4. *Praefurnium*; 5. Latrine; 6. Courtyard (Th. Fournet).

(FIG. 2:5), and a section of a large courtyard (FIG. 2:6). Future excavation should clarify whether or not this facility is part of a larger caravanserai, similar to those at Bir Madhkur (Smith 2010: 147) and En Hazeva (Cohen and Israel 1996:111-12).

Prior to the bath’s excavation, illicit digging had severely damaged the heating system within the *tepidarium* (Darby *et al.* 2010: 190- 91). The 2009 survey of the site recorded this disturbance and collected samples of the bricks and pipes that the looters had removed from the bath (Darby *et al.* 2010:193-4, 198, figs. 19, 20). Actual excavation of the bath began in 2010 with the intent to clarify the damage to the structure and reveal its architecture for study. The 2010 field season saw the clearing of the *tepidarium*, the latrine, and parts of the *caldarium* and *frigidarium* (Darby and Darby 2012: 407-411, 2015: 463-26). The removal of the disturbed sand within the *tepidarium* revealed a large hole through the hypocaust floor created by the looters. The excavation also unearthed a large quantity of ceramic building material removed from the heating system during the clandestine digging. Although much of this material remained on site for study in the 2015 season, a few samples were collected and have already been published (Darby and Darby 2012: 411, figs. 11,12; 2015: fig. 7). The renewed excavation of bath in 2015 resulted in the full exposure of the *caldarium* and *tepidarium*, as well as the removal of sand from the looter’s hole into the hypocaust. During this last season, excavators collected every fragment of ceramic building material, including those dumped on site in previous seasons.

Methodology

The early looting of the *tepidarium* and the variation in collection methods between excavation seasons complicates the study of the bath’s ceramic building materials and precludes the possibility of a fully quantitative study and typology of the material. Furthermore, there was no purposeful removal of ceramic building material from *in situ* contexts, with the result

that an understanding of this material and the creation of this typology relied primarily on fragments and the partially reconstructed bricks and pipes they formed. In total, the 2015 excavation of the bath collected 2,106 fragments of ceramic building material, weighing 266kg, from which a subsequent study season in 2016 identified only 65 complete or partially reconstructed bricks and 24 partially reconstructed *tubuli*. During this subsequent study season, the form and fabric of these bricks and pipes were described in detail using the same conventions of a similar study of ceramic building materials from the nearby site of al-Ḥumayma (Reeves and Harvey 2016, TABLE 1). These qualitative descriptions of the complete or partially reconstructed bricks and *tubuli* formed basis of the following typology. Although the corpus used for this typology is very small and a few types are represented by as few as two samples, the qualitative differences between types are distinct enough to be sure of the categorization. Nevertheless, the preliminary typology presented here should only be taken as an initial investigation using what evidence was available.

Brick (TABLE 1)

With the exception of a few fragments reused as packing within the wall heating system, all the bricks collected from the bath for this study were those torn from the hypocaust by the looters. A total of 362 fragments and whole bricks, weighing over 168kg, were available for study. This corpus comprises four distinct groups representing three sizes of brick: *bessalis* (*bessales*), capping brick, and covering brick. In what follows, only the smallest of the bricks can be assigned a Latin term, as the measurements of this brick type correspond to those of a typical *bessalis*, which measure 2/3 of a Roman foot (*pes Monetalis* = 29.59 cm) on each side. Neither the so-called capping brick nor the covering brick correspond in size to the typical Roman *pedalis* (one Roman foot square) or *bipedalis* (two Roman feet square).

Bessales (FIGS. 3:1, 3:2, 4-5)

The *bessalis* (*bessales*) was the smallest and most common brick used within the hypocaust. Stacks of these square bricks formed the columns (*pilae*) upon which the elevated floor (*suspensurae*) rested. Although a total of 60 complete *bessales* were available for study, 24 of these were still mortared together and thus could provide individual measures but not weights and descriptions of their surfaces. All the *bessales* collected for study are fairly uniform with the exception of a variant type (represented by only two bricks), which differ in form and surface treatment but not fabric from the others. These two variant bricks are discussed after the description of the normal bricks.

The typical *bessalis* (FIGS. 3:1 , 4) found within the bath is represented by 58 complete bricks, 34 of which are relatively free of mortar. The sides of these 58 bricks range from 16.3cm to 18.9cm, with a mean of 18.2cm long. They are between 2.1cm to 2.8cm thick, and their mean is 2.4cm thick. The weight of 34 complete bricks range from 1076g to 1465g, with a mean of 1302g. The fabric varies from light reddish brown (5YR 6/4) to light brown (7.5YR 6/4) to yellowish brown (10YR 5/4), while the surface is usually white (10YR 8/2) or very pale brown (10YR 8/3). A few samples have a pale brown (10YR 6/3) core. Typical inclusions are medium sub-rounded multicoloured sand, with some white inclusions and a few small pebbles. The top surface is typically flat and even, although a few samples have raised rounded ridges along edges. All bricks with visible top surfaces show linear bands of smoothing across the face, overlaid by a perpendicular band of smoothing on one or two of the edges. The bottom surface is flat, even, and rough, with no sign of smoothing. The sides are flat, even, and smooth. In rare cases, finger impressions are visible from handling when the brick was not fully dried. Mortar is typically present on both the top and bottom surfaces. In some cases, this mortar obscured the surface treatment or two

Table 1. Descriptions of Individual Bricks.

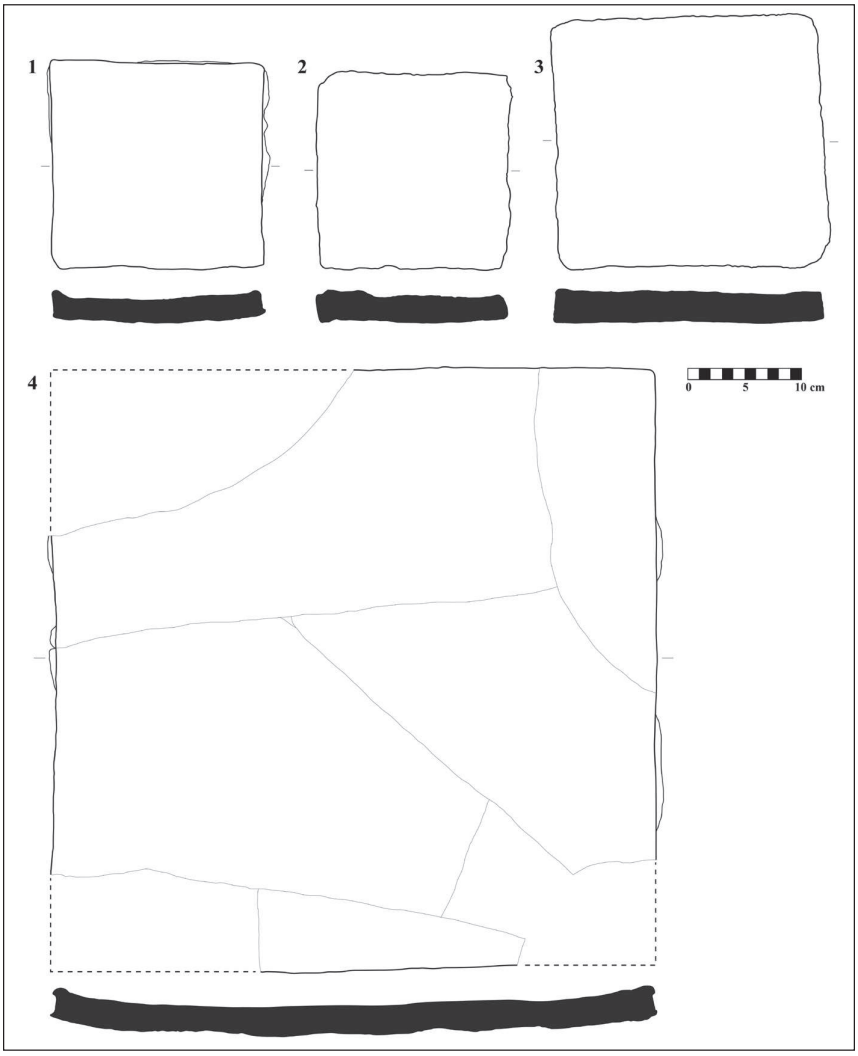
Entry	Brick Type	Registration #	Description	% Complete	Context	Length (cm)	Width (cm)	Thickness (cm)	Weight (g)	Colours	Fabric	Notes on Surface
1	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	17.8	17.6	2.6	1299.0	*	*	Top face smoothed.
2	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.6	18.4	2.5	1395.0	*	*	Top face smoothed.
3	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.4	18.3	2.4	1221.0	*	*	Top face smoothed.
4	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.9	18.4	2.5	1294.0	*	*	Top face smoothed.
5	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.6	18.6	2.4	1326.0	*	*	Top face smoothed.
6	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.7	18.2	2.8	1363.0	*	*	Top face smoothed.
7	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.5	18.5	2.5	1341.0	*	*	Top face smoothed.
8	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.4	18.3	2.6	1420.0	*	*	Top face smoothed.
9	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.5	18.3	2.6	1368.0	*	*	Top face smoothed.
10	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.9	18.4	2.5	1400.0	*	*	Top face smoothed.
11	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.5	18.4	2.5	1273.0	*	*	Top face smoothed.
12	Bessalis		Unbroken	100%	D:7-6/14-13.1211.2	18.9	18.6	2.4	1333.0	*	*	Top face smoothed.
13	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.2	18.1	17.9	2.3	**	**	**	**
14	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.2	18.3	17.9	2.3	**	**	**	**
15	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.2	18.8	18.6	2.3	**	**	**	**
16	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.2	18.0	17.9	2.5	**	**	**	**
17	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.2	18.4	18.3	2.4	**	**	**	**
18	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.2	17.9	17.6	2.4	**	**	**	**
19	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.2	16.6	16.6	2.4	**	**	**	**
20	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.2	16.6	16.3	2.3	**	**	**	**

21	Bessalis	3004	Unbroken	100%	D:7-6/14-13.1211.4	18.1	17.9	2.7	1303.0	Fabric: 7.5YR 6/4; Surface: 10YR 8/2	Medium and course sand, very few small voids.	Top face smoothed.
22	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.1	17.4	2.4	1150.0	*	*	Top face smoothed.
23	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.4	17.5	2.4	1137.0	*	*	Top face smoothed.
24	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.0	17.5	2.4	1138.0	Fabric: 10YR 5/4; Surface: 10YR 8/3	Medium sand, some coarse inclusions, very few small voids.	Top face smoothed.
25	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	17.4	17.9	2.2	1076.0	*	*	Top face smoothed.
26	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	17.5	18.0	2.2	1173.0	*	*	Top face smoothed.
27	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	17.9	18.4	2.4	1261.0	*	*	No Smoothing.
28	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.6	18.2	2.6	1395.0	*	*	Top face smoothed.
29	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.4	18.3	2.4	1307.0	*	*	Top face smoothed.
30	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.4	18.3	2.5	1465.0	*	*	Top face smoothed.
31	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.4	18.3	2.3	1369.0	*	*	Top face smoothed.
32	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.5	18.3	2.3	1343.0	*	*	Top face smoothed.
33	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.4	18.3	2.5	1291.0	*	*	Top face smoothed; raised edges on top face.
34	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.6	18.3	2.6	1410.0	*	*	Top face smoothed.
35	Bessalis	3005	Unbroken	100%	D:7-6/14-13.1211.4	18.1	18.0	2.7	1194.0	Fabric: 7.5YR 6/4; Surface: 10YR 8/2	Medium sand, some white inclusions, many small voids.	Top face smoothed; raised edges on top face.
36	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.7	18.4	2.4	1329.0	*	*	Top face smoothed.
37	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.5	18.5	2.1	1440.0	*	*	Top face smoothed.
38	Bessalis		In three fragments	100%	D:7-6/14-13.1211.4	18.7	18.2	2.2	1256.0	Fabric: 7.5YR 6/4; Core: 10YR 6/3; Surface: 10YR 8/2	Medium sand, some white inclusions, many small voids.	Top face smoothed.
39	Bessalis	3006	In two fragments	100%	D:7-6/14-13.1211.4	18.6	18.5	2.5	1450.0	Fabric: 5YR 6/4; Surface 10YR 8/2	Medium and course sand, some white inclusions, a few very small pebbles, some small voids.	Top face smoothed.

40	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.5	18.4	2.5	1120.0	*	*	Top face smoothed; raised edges on top face.
41	Bessalis		Unbroken	100%	D:7-6/14-13.1211.4	18.8	18.5	2.5	1377.0	*	*	Top face smoothed.
42	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.5	18.2	2.4	**	**	**	**
43	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.5	18.3	2.5	**	**	**	**
44	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.7	18.6	2.5	**	**	**	**
45	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.5	18.3	2.3	**	**	**	**
46	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.1	17.3	2.6	**	**	**	**
47	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.6	18.6	2.2	**	**	**	**
48	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1211.4	18.2	18.0	2.3	**	**	**	**
49	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.3	18.2	2.1	**	**	**	**
50	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.5	18.2	2.3	**	**	**	**
51	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.8	18.4	2.3	**	**	**	**
52	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.8	18.2	2.5	**	**	**	**
53	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.6	18.6	2.2	**	**	**	**
54	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.4	17.9	2.3	**	**	**	**
55	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.8	18.3	2.4	**	**	**	**
56	Bessalis		Unbroken, mortared to second brick	100%	D:7-6/14-13.1211.4	18.7	18.6	2.5	**	**	**	**

57	Bessalis		Unbroken, mortar-covered	100%	D:7-6/14-13.1233.73	18.2	17.9	2.4	**	**	**	**
58	Bessalis		Unbroken	100%	D:7-6/14-13.1233.77	17.9	17.6	2.5	1235.0	*	*	Top face smoothed.
59	Variant bessalis	3003	Unbroken	100%	D:7-6/14-13.1211.4	17.5	17.1	2.5	948.0	Fabric: 7.5YR 6/4; Surface: 10YR 8/2	Medium sand, some white inclusions, many small voids.	No smoothing.
60	Variant bessalis	3008	One corner missing	90%	D:7-6/14-13.1233.77	17.1	16.1	2.5	1090.0	Fabric: 5YR 6/4; Surface 10YR 8/2	Medium sand, some white inclusions, many small voids.	Top face smoothed.
61	Capping brick	3001	Unbroken	100%	D:7-6/14-13.1211.2	23.5	21.9	2.7	2365.0	*	*	Top face smoothed.
62	Capping brick		One corner missing	90%	D:7-6/14-13.1211.2	23.7	22.0	2.7	2080.0	Fabric: 5YR 5/1; Surface: 7.5YR 8/2	Coarse and very coarse sand, many white inclusions, a few very small pebbles. A few very small voids	Top face smoothed.
63	Capping brick		One corner missing	80%	D:7-6/14-13.1211.2	23.4	21.8	2.7	2065.0	Fabric: 2.5YR 6/6; Core: 7.5YR 6/0: Surface: 10YR 8/2	Medium and coarse sand, many white inclusions, a few very small pebbles, some very small voids.	Top face smoothed.
64	Capping brick	3007	In two fragments	100%	D:7-6/14-13.1211.4	23.2	21.7	3.1	2515.0	Fabric: 5YR 6/6; Core: 7.5YR 6/0: Surface: 10YR 8/2	Coarse and very coarse sand some white inclusions, A few very small voids	Top face smoothed.
65	Covering tile	3002	Five fragments giving full length and width	85%	D:7-6/14-13.1211.2	52.7	52.6	3.4	9115.0	Fabric: 10R 6/8; Surface: 7.5YR 7/2	Coarse to very coarse sand, some white inclusions, few small pebbles up to 0.4 cm long, many small voids.	Top face smoothed.

* Time constraints during processing prevented recording the fabric of these bricks.
** The presence of thick layers of mortar or an adhering brick made it impossible to record the weight, fabric, and surfaces of these bricks.

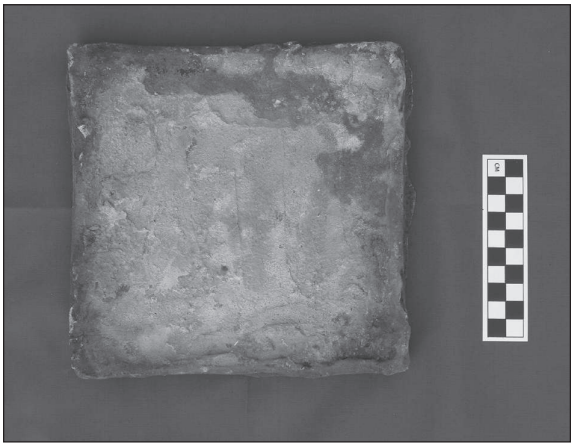


3. Drawing of bricks - 1. *Bessalis* - 3005; 2. Variant *bessalis* - 3003; 3. Capping brick - 3001; 4. Covering brick - 3002 (C. A. Harvey).

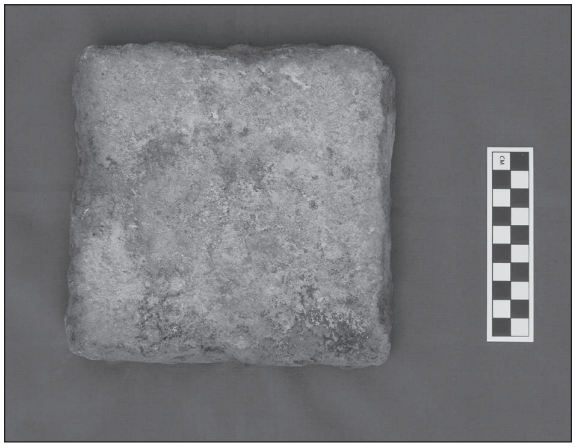
bricks remain mortared together. Soot staining is present on all surfaces, particularly on sides and edges of the bricks.

The two variant *bessales* (FIGS. 3:2 , 5) are slightly smaller than the typical *bessalis*, measuring 17.1cm by 16.1cm and 17.5cm by 17.1cm. Both are 2.5cm thick. They weigh 1090g and 948g. The fabric of these variant *bessales* is identical to that of the typical *bessales* described above. The variant type differs from the typical version primarily in its surface treatment, as the lateral smoothing that characterizes the typical *bessalis* is absent on one of the variants and very faint on the other. Furthermore, the sides of these two bricks are less straight and their corners less square than those on the typical *bessales*. In general, these two bricks seem to be less carefully made than the others, or made in different molds.

Although the characteristics that distinguish the variant *bessales* are primarily qualitative, they suggest that their manufacture followed different steps. Unfortunately, the lack of data on *in situ* bricks prevents a firm understanding of the relationship between the variant and non-variant *bessales*. The variant bricks could represent a different phase, or simply a different batch of bricks made in a different mold or by a different brick-maker. It is also entirely possible that more examples of this variant exist in the samples collected, but the amount of mortar adhering to them inhibits their identification as such.



4. *Bessalis* - 3005 (C. A. Harvey).

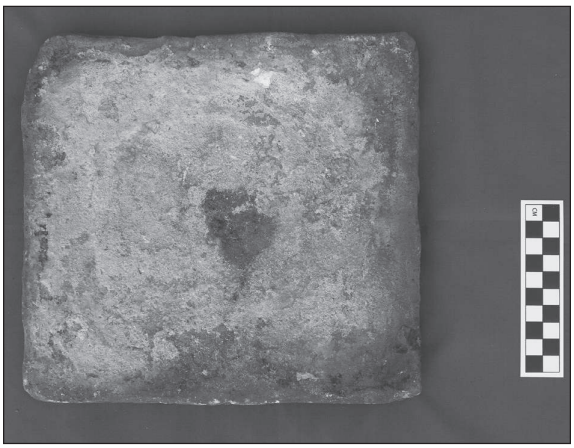


5. Variant *bessalis* - 3003 (C. A. Harvey).

Capping Bricks (FIGS. 3:3, 6)

The capping bricks are approximately square and slightly larger than a *bessalis*. These bricks formed the uppermost part of the *pilae* and acted much in the same way as a column capital, broadening the *pilae* and concentrating the weight of the supported floor upon them. Far less common than *bessales*, few complete capping bricks were available for study, and the following description is based on only two complete and two nearly complete capping bricks.

The slightly longer side of the four complete or nearly complete bricks ranges from 23.2cm to 23.7cm and has a mean of 23.45cm, while the slightly shorter side ranges from 21.7cm to 22.0cm and has a mean of 21.85cm. The thickness of these four bricks range from 2.7cm to 3.1cm, with a mean of 2.8cm. The weight of the two complete bricks are 2365g and 2515g. The fabric varies from grey (5YR 5/1) to light red (2.5YR 6/6) to reddish yellow (5YR 6/6). The core is typically grey (7.5YR 6/0), while the surface can be a very pale brown (10YR 8/3) or pinkish white (7.5YR 8/2). Typical inclusions are medium to very course sub-rounded multicoloured sand, with numerous white inclusions and occasional small pebbles. There are also a few very small voids. The top surface is typically flat and even, with evidence of smoothing that runs across the brick. The bottom surface is also flat and even, but is not smoothed. The sides are flat, even, and smooth. In rare cases, finger impressions are visible from handling when the brick was not fully dried. Mortar is typically present on both the top and bottom surfaces. Soot staining is present on all surfaces, particularly on sides and edges of the bricks.



6. Capping brick - 3001 (C. A. Harvey).

Covering Bricks (FIGS. 3:4, 7)

Covering bricks were the largest but also least common bricks found within the bathhouse. These bricks rested on four adjacent *pilae*, with each of their four corners on a separate *pila*, much like a table on four legs. Two layers of these covering slabs topped with a thick layer of mortar and stone paving slabs formed the suspended floor in the *tepidarium*. Excavation uncovered only one fragmented covering brick (no. 3002) and a few fragments of suspected covering brick.

This nearly complete covering brick has full

7. Covering brick - 3002 (C. A. Harvey).

measures of 52.6cm by 52.7cm and ranges between 3.0cm to 3.4cm in thickness. Although only about 85% complete, the fragments of this brick weigh a total of 9115g. The fabric is light red (10R 6/8), and the surface is pinkish grey (7.5YR 7/2), although fragments of suspected covering bricks show that the fabric can also be light red (2.5YR 6/6) or reddish brown (5YR 5/3), a grey (5YR 6/1) core can exist, and the surface can be also be white (10YR 8/2). Typical inclusions are coarse to very coarse sub-rounded and sub-angular multicoloured sand, with some white inclusions, a few small pebbles, and some angular rock inclusions up to 0.4cm in diameter. It also has many small to very small voids. The top surface is typically flat, even, and smoothed. The smoothing is evidenced by lateral strokes across the face and smoothing along the edges. The bottom surface is also flat and even, but not smoothed. The sides are flat, even, and smooth, with outward protruding ridges at the top and bottom. The nearly complete brick has two finger impressions on the bottom of one of the sides. It also has trace amounts of mortar on its bottom face and the sides. This brick was evidently face-down and rested directly upon the *pilae*, as there is heavy soot staining across its top face with the exception of the extant corners, which rested on *pilae* and were thus not exposed to smoke.

The Use of Bricks, their Phasing, and Comparanda

Though none of the collected bricks were found *in situ*, photos of bricks in the extant hypocaust system reveal their use (FIG. 8). Stacks of *bessales* formed the *pilae* upon which the elevated floor (*suspensurae*) rested. Two or three capping bricks placed on top of each stack of *bessales* served to broaden the *pilae* and concentrate the weight of the supported floor upon them, just like column capitals. Covering bricks rested on four adjacent *pilae*, with each of thier four corners on a separate *pila*, much like a table on four legs. In turn, each *pila*, excluding those in corners or against walls, helped to support the corners of four separate covering bricks. Two layers of these covering slabs topped with a thick layer of mortar and stone paving slabs formed the *suspensurae* in the *tepidarium*.

Brick fragments could also be used as packing within the wall system, as evidenced by a fragment of capping brick found within the wall heating system of the *tepidarium*. This use as packing is suggestive of reuse and may in fact be a result of a reconstruction or repair of the heating system. It is likewise possible that the variant *bessales* come from an earlier phase of the hypocaust than the non-variant type, but this theory is currently only speculative.

The lack of similar studies of hypocaust bricks makes it difficult to identify *comparanda* for this material. One of the only regional sites where there has been an emphasis on the study

8. Cross-section of hypocaust in *tepidarium* (Th. Fournet).

of ceramic building materials is al-Ḥumayma (Reeves and Harvey 2016). While numerous types of hypocaust bricks exist at al-Ḥumayma, they are all slightly larger than those found at ʻAyn Gharandal and are of a different fabric. Hopefully, the publication of this preliminary typology will help to identify regional *comparanda* and spur similar studies of this material elsewhere.

Wall Heating Pipes

Both the *tepidarium* and *caldarium* at ʻAyn Gharandal had wall heating systems consisting of specialized rectangular *tubuli* and cylindrical pipes of the type typically found in hydraulic installations. Within the *tepidarium*, all four walls had heating systems built primarily with cylindrical pipes with only a few rectangular *tubuli*. In the *caldarium*, wall-heating systems existed against all but the south wall and mostly consisted of rectangular *tubuli* mixed with some small cylindrical pipes. The extensive use of cylindrical pipes in the *tepidarium* is curious and may be a result of a shortage of the more traditional rectangular *tubuli*, which allowed for the lateral flow of air and created more efficient wall heating systems. The builders evidently recognized the benefit of using rectangular *tubuli* and prioritized these pipes for the *caldarium*, where higher temperatures and thus more efficient heating systems were necessary.

No typology currently exists for the cylindrical heating pipes from ʻAyn Gharandal, and it is not possible within the scope of this article to give a full description of these pipes. The remainder of this article will therefore primarily focus on the rectangular *tubuli* found during excavation of the bath.

Tubuli (TABLE 2)

Tubuli are ceramic pipes with rectangular profiles, designed to be stacked against walls in rows and columns, creating a continuous void that allowed hot air to rise from the hypocaust and heat the walls. Vents cut into the sides of *tubuli* allowed for the lateral flow of air between adjacent columns of pipe. All the *tubuli* from ʻAyn Gharandal were wheel-made. Once removed from the potter's wheel, the *tubuli* were pressed into their box-like shape by hand, resulting in one end being rectangular while the other remained more oval. Before drying and being fired, the *tubuli* had their lateral vents cut out with a knife.

The 2015 excavation of the bath uncovered a total of 1,248 *tubulus* fragments, weighing 37,624g. Regrettably, there was no removal or detailed study of *tubuli* from *in situ* contexts, with the result that the exact use of the *tubuli* is unclear and the creation of this typology relied entirely on fragments and the partially reconstructed *tubuli* they formed. The preliminary typology presented here includes only reconstructed *tubuli* for which the following three criteria have been met. First, there is more than one sample from the type, proving that it is not a unique specimen. Second, the full height, width, and depth of the type is known from one or more samples. Third, the type is qualitatively different in form or fabric from the other types. This typology is therefore qualitative and not quantitative and is not inclusive of all the fragments collected, but it does represent a step forward in our understanding of this material and an important first step in the study of *tubuli* at ʻAyn Gharandal.

Type 1 (FIGS. 9, 10)

The first type of *tubulus* is the most common type found during excavation and is characterized by its squat oval vents and its fabric, which is unique from the other types in that it is not of the typical Petra ware type. The following description is based on nine partially reconstructed pipes (nos. 60008, 60009, 60019, 60034-36, 60041, 60043, and 60045).

Nine full heights range from 17.6cm to 20.0cm and have a mean of 18.9cm. Four full widths range from 16.3cm to 18.4cm, with a mean of 17.45cm. Five full depths range from

Table 2. Descriptions of Individual Tubuli.

	Flue Type	Registration #	Description	Context	Height (cm)	Width (cm)	Depth (cm)	Thickness (cm)	Weight (g)	Colours	Fabric	Top Rim	Bottom Rim	Shape of lateral vent(s)
1	1	60008	Reconstructed, nearly complete	D:7-6/14-13.1211.2	18.4	17.4	8.0	0.6-0.7	970.0	Fabric: 5YR 6/6; Surface: 10YR 7/2	Fine/medium subrounded quartz, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior	Thickened, flattened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
2	1	60009	Reconstructed, nearly complete	D:7-6/14-13.1211.2	19.4	17.7	8.7	0.5-0.8	1225.0*	Fabric: 5YR 6/6; Surface: 7.5YR 7/4	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior	Thickened, flattened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
3	1	60019	Reconstructed, nearly complete	D:7-6/14-13.1224.42	18.1	18.4	8.5	0.6	734.0	Fabric: 5YR 6/6; Surface: 10YR 7/2	Fine subrounded quartz, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior	Thickened, flattened; rounded overhang on exterior; rounded edge on interior	Oval
4	1	60034	One large sherd	D:7-6/14-13.1224.53	19.6	?	?	0.5-0.9	191.0	Fabric: 2.5YR 6/6; Surface: 7.5YR 6/4	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
5	1	60035	One large sherd	D:7-6/14-13.1224.53	17.6	?	?	0.5-0.8	194.0	Fabric: 2.5YR 6/6; Surface: 7.5YR 6/4; Core: 2.5YR 6/0	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior with slight overhang	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
6	1	60036	Reconstructed, partially complete	D:7-6/14-13.1224.53	18.8	?	?	0.6-0.8	280.0	Fabric: 5YR 6/6; Surface 10YR 8/2	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior with slight overhang	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval

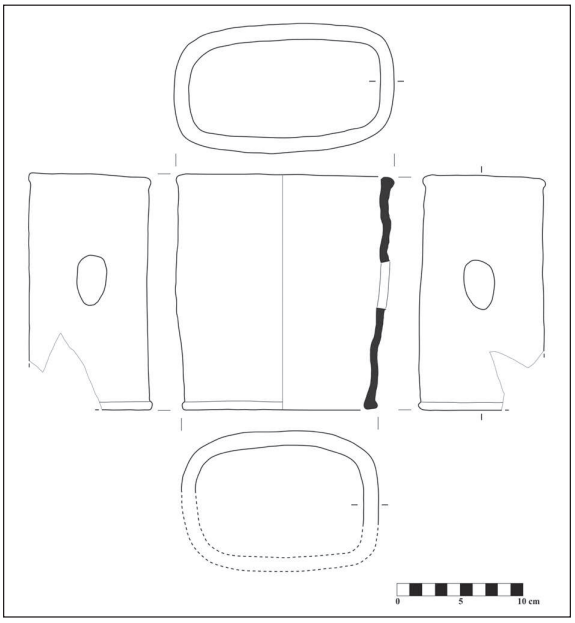
7	1	60041	Reconstructed, partially complete	D:7-6/14-13.1231.64	20.0	?	10.6	0.6-0.8	481.0	Fabric: 5YR 6/6; Surface 7.5 7/6	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded overhang on exterior; rounded edge on interior with slight overhang	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
8	1	60043	Reconstructed, partially complete	D:7-6/14-13.1235.66	19.4	?	?	0.6-0.8	373.0	Fabric: 5YR 6/6; Surface; 10YR 7/2	Fine/medium subrounded quartz, few small voids	Thickened; rounded over-hang on exterior; rounded edge on interior	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
9	1	60045	Reconstructed, nearly complete	D:7-6/14-13.1233.68	18.6	16.3	8.7	0.5-0.7	955.0	Fabric: 5YR 6/6; Surface; 10YR 7/3	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened; rounded over-hang on exterior; rounded edge on interior	Thickened; rounded overhang on exterior; rounded but rough overhang on interior	Oval
10	2	60023	Reconstructed, partially complete	D:7-6/14-13.1225.47	13.3	?	9.5	0.4-0.6	229.0	Fabric: 2.5YR 5/6; Surface: 10YR 7/3	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened, flattened; rounded slight overhang on exterior; sharp slight overhang on interior	Thickened, rounded; slight rounded over-hang on exterior; sharp edge on interior	Oval
11	2	60024	Reconstructed, partially complete	D:7-6/14-13.1225.47	?	15.2	?	0.3-0.5	198.0	Fabric: 2.5YR 5/6; Surface: 10YR 7/3	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened, rounded; rounded over-hang on exterior; rounding on interior without overhang	?	Unclear
12	2	60025	One large sherd	D:7-6/14-13.1225.47	13.1	?	?	0.4-0.5	90.0	Fabric: 2.5YR 5/6; Surface: 10YR 7/3	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened, flattened; rounded overhang on exterior; slight rounded over-hang on interior	Thickened, rounded; rounded overhang on exterior; sharp edge on interior	Oval?

13	3	60026	Reconstructed, partially complete	D:7-6/14-13.1225.47	?	22.5	9.6	0.5-0.8	685.0	Fabric: 5YR 6/6; Surface: 10YR 8/3; Core: 7.5YR 5/0	Medium sub-rounded quartz, few small white inclusions, few small voids	?	Thickened, rounded; rounded edge on exterior; rounded but rough edge on interior	?
14	3	60039	Reconstructed, nearly complete	D:7-6/14-13.1229.61	24.2	21.7	9.8	0.4-1.0	1179.0	Fabric: 2.5YR 6/6; Surface: 10YR 8/3; Core: 7.5YR 5/0	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, flattened, slightly inverted; rounded edge on exterior; rounded edge on interior with slight overhang	Thickened, rounded; rounded edge on exterior; rounded but rough edge on interior with slight overhang	Oval, irregular oval
15	4	60016	Reconstructed, nearly complete	D:7-6/14-13.1215.36**	19.4	15.1	10.4	0.5-0.8	1044.0	Fabric: 5YR 5/6; Surface: 5YR 5/6	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened; overhang on exterior coming to rounded point; rounded on edge on interior	Thickened, flattened; rounded overhang on exterior; slight rounded overhang on interior	Irregular oval
16	4	60037	Reconstructed, partially complete	D:7-6/14-13.1224.53	19.5	?	?	0.5	196.0	Fabric: 5YR 5/6; Surface: 5YR 5/6	Medium sub-rounded quartz, few small white inclusions, few small voids	Rounded; slight overhang on exterior; rounded on edge on interior	Thickened; rounded overhang ending in point on exterior; rough and rounded edge on interior	Pointed oval
17	5	60010	Reconstructed, nearly complete	D:7-6/14-13.1211.2	16.0	13.3	10.2	0.5	248.0	Fabric: 5YR 6/6, 5YR 6/6; Core: 7.5YR 6/0	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, hooked; rounded overhang on exterior; pointed hooked overhang on interior	Thickened, flattened; rounded overhang on exterior ending in point; sharp and rough edge on interior	Oval?
18		60011	Reconstructed, partially complete	D:7-6/14-13.1211.2	17.3	?	9.4	0.4-0.7	275.0	Fabric: 5YR 6/6; Surface 7.5 7/6	Medium sub-rounded quartz, some small white inclusions, few small voids	Thickened, flattened; rounded overhang on exterior ending in point; rounded edge on interior	Thickened; rounded overhang on exterior; sharp and rough edge on interior	Irregular oval

19		60012	One large sherd	D:7-6/14-13.1211.2	16.9	?	?	0.3-0.5	174.0	Fabric: 2.5YR 6/6; Surface: 5YR 6/6	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, pointed overhang on exterior; sharp edge on interior	Thickened, flattened, rough	Oval?
20		60018	One large sherd	D:7-6/14-13.1216.37**	?	16.5	?	0.5	177.0	Fabric: 5YR 6/6, 2.5Y 7/4	Fine/medium subrounded quartz, few small white inclusions, few small voids	Thickened, rounded; rounded overhang on exterior	?	Unclear
21		60020	One large sherd	D:7-6/14-13.1224.42	16.3	?	?	0.5-0.7	181.0	Fabric: 5YR 5/6; Surface: 5YR 5/6	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, rounded; rounded overhang on exterior coming to point; rounded edge on interior	Thickened, rounded; rounded overhang on exterior, rounded and rough edge on interior	Oval?
22		60027	Reconstructed, nearly complete	D:7-6/14-13.1225.47	19.0	19.5	11.0	0.6-0.8	860.0	Fabric: 2.5YR 5/6; Surface: 10YR 6/3; Core: 10YR 7/4	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, rounded	Thickened, rounded; rounded edge on exterior; rounded and rough overhang on interior	Oval
23		60030	One large sherd	D:7-6/14-13.1224.49	23.0	?	?	0.5-0.7	454.0	Fabric: 7.5YR 6/6; Surface: 7.5YR 7/6	Medium sub-rounded quartz, few small white inclusions, few small voids	Thickened, flattened; both edges sharp, with slight overhang on interior, and none on exterior	Thickened, rounded; rounded edge on exterior; sharp edge on interior with slight overhang	Oval?
24		60038	One large sherd	D:7-6/14-13.1224.53	16.6	?	?	0.5-0.6	131.0	Fabric: 2.5YR 6/8; Surface 10YR 6/3	Medium sub-rounded quartz, few small white inclusions, few small voids	Rounded, thickened	Rounded; sharp edge on exterior	?

* This weight includes a large chunk of mortar adhering to the tubulus.
** These two tubuli fell from walls during excavation and are the only two tubuli in this corpus found *in situ*.

8.0cm to 10.6cm and have a mean of 8.9cm. The wall thickness varies from 0.5cm to 0.9cm. The fabric is light red (2.5YR 6/6) or reddish yellow (5YR 6/6), and the surface is most often light grey (10YR 7/2), light brown (7.5YR 6/4), or very pale brown (10YR 7/3). One sample has a grey (2.5YR 6/0) core. Typical inclusions are fine and medium clear quartz, with a few small white flecks. Macroanalysis suggests that this fabric is not Petra ware, but rather of an unknown source. Rims on the rectangular top end tend to be thickened with a rounded overhang on the exterior and a rounded edge on the interior that has a slight overhang on some samples, while those on the oval bottom are thickened and slightly flattened with a rounded overhang on the exterior and a rounded but rough edge on the interior that has a slight overhang on some samples. Lateral vents are oval, and range in height from 2.8cm to 4.6cm and in width from 1.8cm to 2.9cm. The presence of off-white mortar with carbon inclusions on the exterior and soot staining on the interior of reconstructed examples indicates that this type was used in the wall heating system.



9. Drawing of Type 1 *tubulus* - 60045 (C. A. Harvey).

10. Photo of Type 1 *tubulus* - 60045 (C. A. Harvey).

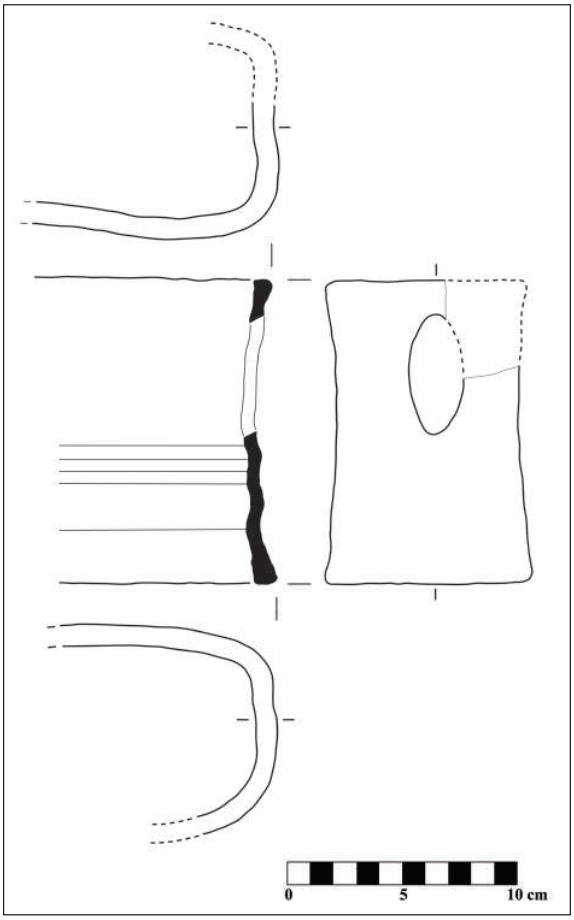
Type 2 (FIGS. 11, 12)

The type two *tubulus* is characterized by its small size. The following description is based on three partially reconstructed examples (nos. 60023-25).

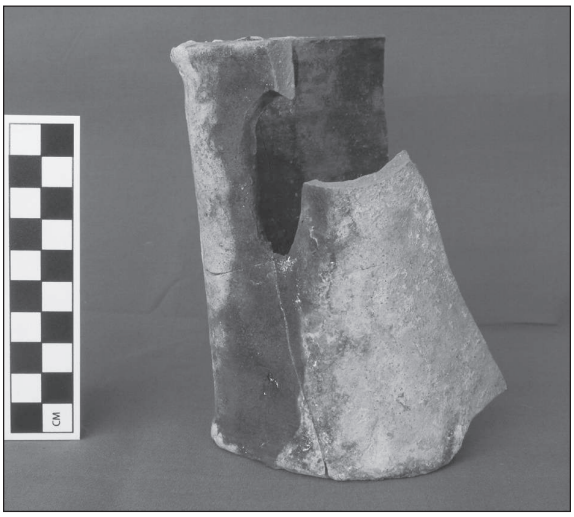
Two full heights are 13.1 and 13.3cm, the only full width is 15.2cm, and the one full depth is 9.5cm. The wall thickness varies from 0.3cm to 0.6cm. The fabric is red (2.5YR 5/6) with a very pale brown (10YR 7/3) surface. Typical inclusions are fine and medium clear quartz, with a few small white flecks. Macroanalysis suggests that this fabric is Petra ware. Rims on the rectangular top end tend to be thickened and flattened with a rounded overhang on the exterior and a sharper lip on the interior, while those on the oval bottom are thickened and rounded with a rounded overhang on the exterior and a sharper interior lip. Lateral vents are oval, and the one fully preserved vent is 5.0cm high by 2.2cm wide. Curiously, the lateral vents are always located in the top half of the pipe, being between 1.7 to 3.4cm from the top rim. The presence of grey mortar with carbon inclusions on the exterior and soot staining on the interior of reconstructed examples indicates that this type was used in the wall heating system.

Type 3 (FIGS. 13 , 14)

The third type of *tubulus* is characterized by its relatively large size. The following descrip-

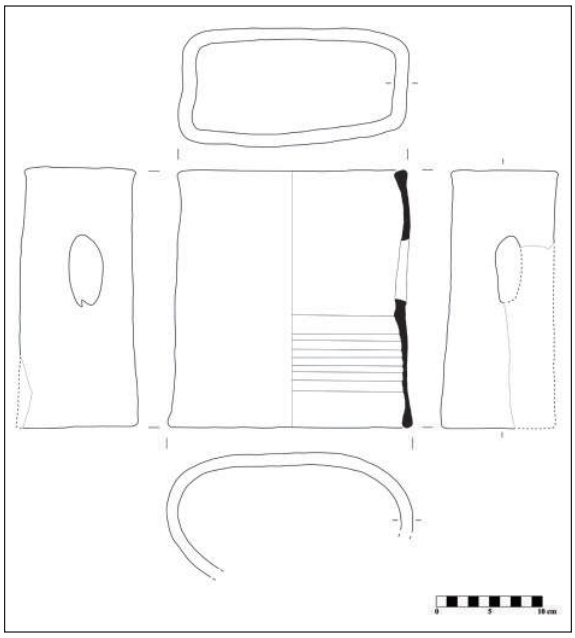


11. Drawing of Type 2 *tubulus* - 60023 (C. A. Harvey).


12. Photo of Type 2 *tubulus* - 60023 (C. A. Harvey).

tion is based on only two partially reconstructed pipes (nos. 60026 and 60039).

The only surviving full height is 24.2cm, two full widths are 21.7cm and 22.5cm, and two full depths are 9.8cm and 9.6cm. The wall thickness varies from 0.4cm to 1.0cm. The fabric is light red (2.5YR 6/6) or reddish yellow (5YR 6/6) with a grey (7.5YR 5/0) core and a very pale brown (10YR 8/3) surface. Typical inclusions are medium sub-rounded clear quartz, with a few small white flecks. Macroanalysis suggests that this fabric is Petra ware. Rims on the rectangular top end tend to be thickened and slightly inverted with a rounded edge on the exterior and interior and a slight overhang on the


13. Drawing of Type 3 *tubulus* - 60039 (C. A. Harvey).

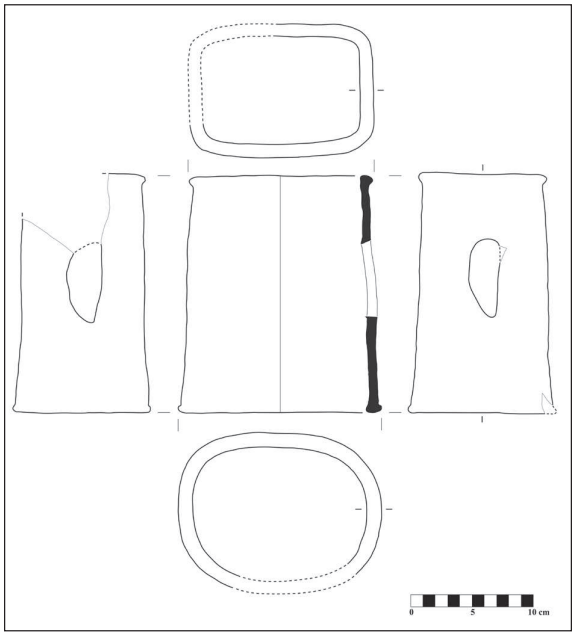

14. Photo of Type 3 *tubulus* - 60039 (C. A. Harvey).

interior. The rims on the oval bottom are thickened and rounded with a rounded edge on the exterior and a rounded but rough edge on the interior. Lateral vents are oval or irregular oval and are located in the centre of the side, closer to the top than the bottom. The vent size ranges between 5.9cm and 6.2cm high, while the only preserved width is 2.9cm. The presence of off-white mortar on the exterior and soot staining on the interior of reconstructed examples indicates that this type was used in the wall heating system.

Type 4 (FIGS. 15, 16)

The fourth type of *tubulus* is characterized by its large and irregularly shaped lateral vents. The following description is based on only one nearly complete reconstructed and one partially reconstructed pipe (nos. 60016 and 60037).

The full heights of these samples are 19.4cm and 19.5cm, the only surviving full width is 15.1cm, and the only surviving full depth is 10.4cm. The wall thickness varies from 0.5cm to 0.8cm. The fabric and surface is yellowish red (5YR 5/6). Typical inclusions are fine and medium sub-rounded clear quartz, with a few small white flecks. Macroanalysis suggests that this fabric is Petra ware. Rims on the rectangular top end are thickened with a slight overhang on the exterior coming to a rounded point, and a rounded edge on interior. Rims on the oval bottom are thickened with a rounded overhang on the exterior, sometimes ending in a rounded point, and a rounded but rough lip on interior that can have a slight overhang. Lateral vents are irregular or pointed ovals and are located in the centre of the side, slightly closer to the top than the bottom. The vent size ranges between 6.4cm and 6.8cm high, and 2.3cm and 2.7cm wide. The most complete of these examples (no. 60016) fell from the wall during excavation, proving that this type was used in the wall heating system. Both samples have a relatively high amount of soot and heat damage compared to the other *tubuli*.



15. Drawing of Type 4 *tubulus* - 60016 (C. A. Harvey).

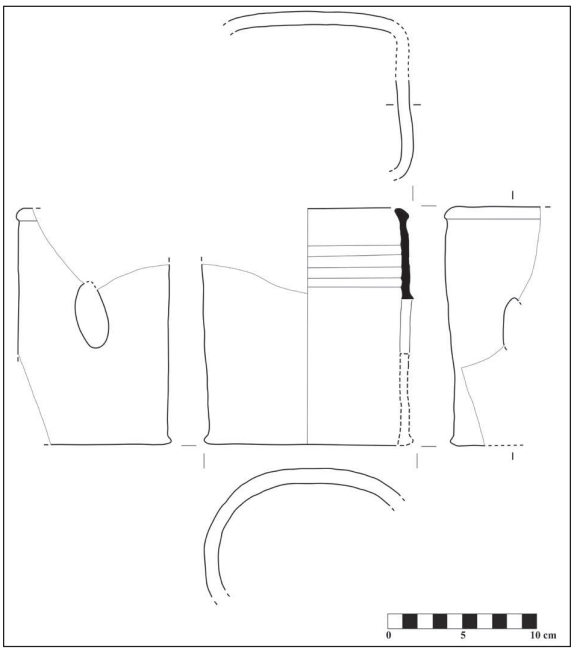
16. Photo of Type 4 *tubulus* - 60016 (C. A. Harvey).

Type 5 (FIGS. 17, 18)

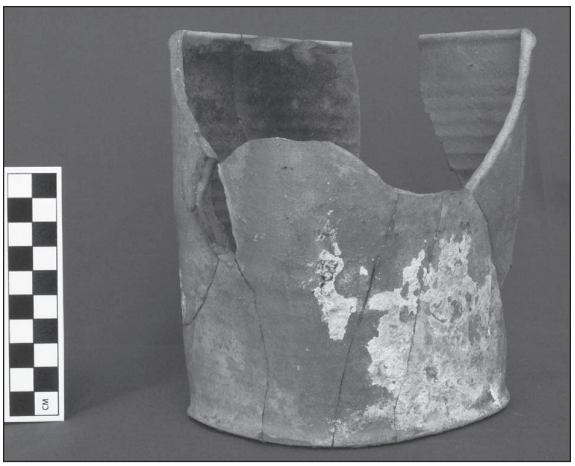
The fifth type of *tubulus* is characterized by its distinctive rim. The following description is based on only one reconstructed example (no. 60010); however, fragments from other examples of this type exist. A complete specimen of this type was uncovered during the 2010 excavation of the bath and previously published (Darby and Darby 2012: fig. 112; 2015: fig. 7).

The full height of the *tubulus* is 16.0cm, the

width is 13.3cm, and the depth is 10.2cm. The wall thickness is 0.5cm. The fabric is reddish yellow (5YR 6/6), and its core is grey (7.5YR 6/0). Typical inclusions are medium sub-rounded clear quartz, with a few small white flecks. Macroanalysis suggests that this fabric is Petra ware. Rims on the rectangular top end are triangular and can appear hooked as they come to a rounded point that curves to the interior with a slight overhang. On the exterior, the top rim has a rounded overhang. Rims on the oval bottom are thickened and flattened with a rounded overhang on the exterior that can end in a point and a sharp and rough edge on interior. Lateral vents are oval and are located in the centre of the side, slightly closer to the top than the bottom. The best-preserved vent measures 4.1cm high and 2.1cm wide. The presence of mortar on the exterior and soot staining on the interior of this pipe indicates that this type was used in the wall heating system.



17. Drawing of Type 5 *tubulus* - 60010 (C. A. Harvey).


18. Photo of Type 5 *tubulus*- 60010 (C. A. Harvey).

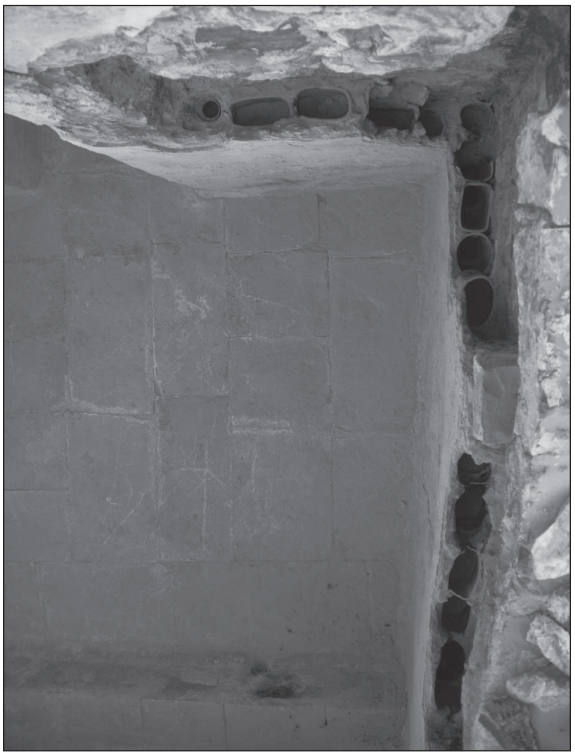
The Use of *Tubuli*, their Phasing, and Comparanda

With the exception of a single *tubulus* that collapsed from the eastern wall of the *tepidarium* during excavation (no. 60016), none of the *tubuli* available for study came from *in situ* contexts. As a result, it is impossible to say with complete certainty exactly how and where the *tubuli* discussed above were used, which is unfortunate as the variation in sizes may have reflected different or specialized uses. Like other wall heating systems, however, the *tubuli* lined the walls to create a continuous void through which hot air from the hypocaust could rise, circulate, and heat the walls (FIG. 19). One curious feature of the *tubuli* within the *caldarium* is that they were placed in staggered rows (like bricks in a wall), rather than in linear columns as done elsewhere, such as in Wādī Mūsā where mortar impressions attest this arrangement (‘Amr *et al*. 1997:472, fig. 5).

The *tubuli* by themselves reveal very little about the phasing of the bathhouse; however, a close examination of the heating walls during excavation suggested that they underwent a major renovation during their lifetime. While the numerous types of *tubuli* may be the products of different workshops or represent specialized uses of the *tubuli*, they may also be the result of multiple phases of construction or renovation in the bath; however, without a quantitative study or a good understanding of how each type was used in heating system, this theory remains speculative. Nevertheless, the relative abundance of the Type 1 *tubulus* and the fact that these *tubuli* exhibit much less soot

build up and heat damage than the other types suggest that the Type 1 *tubulus* may date to a later renovation of the bath. Furthermore, the relative paucity of the Type 4 *tubulus*, the extent to which both examples are damaged by heat exposure, and the fact that one of these *tubuli* (no. 60016) fell from a wall in the *tepidarium* otherwise containing cylindrical flue pipes suggests that the Type 4 is a comparatively old type, possibly reused.

There are a number of sites in the wider region that have produced wheel-made *tubuli*. These sites include al-Ḥumayma (Reeves and Harvey 2016, figs. 10, 12, tables 4, 6), Yotvata (Meshel 1989: pl. 32 D), Petra (Kolb and Keller 2000: 362, fig. 8; Schmid 2002: 265), and al-Lajjūn (Parker 2006, 361, figs. 16.76-79). While the *tubuli* from these sites were produced in the same fashion as those from ʻAyn Gharandal, they do not appear from their publication to be exact parallels for any of the five types presented here. Further research and excavation may reveal closer *comparanda*.



19. Top down view of *tubuli* against wall in *caldarium*. (Th. Fournet).

Conclusion

The typologies presented here represent the first detailed study of ceramic building material in the Wādī ʻArabah and are an important contribution to the study of this material in the wider area. These typologies are preliminary, and further work remains to be done, including the examination of the cylindrical flue pipes, the continued search for parallels, and the possibility of fabric analysis. While the focus of this article has been on the typologies themselves, it has laid the groundwork for continued analysis this material. For the site of ʻAyn Gharandal, this study opens a new avenue for the examination of the bath and its relationship to others in the region. This publication will also assist with the development of a regional typology of ceramic building material, which will not only result in a new tool for dating the construction and use of baths, but will in turn also lead to a better understanding of the local economy and supply in the region, particularly in connection with military establishments. Although the study of ceramic building material remains undeveloped, this publication will hopefully encourage similar endeavors at other sites.

Acknowledgments

I would like to thank the directors of the ʻAyn Gharandal Archaeological Project, Dr. Erin and Robert Darby for their support in publishing this material. I owe a great debt of gratitude to the American Center of Oriental Research and the American Schools of Oriental Research for providing me with the funding that made this project possible. Finally, I would like to thank Dr. Barbara Porter and the staff at ACOR for their continued support of my research.

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SHAJ 13 (2019):181-194
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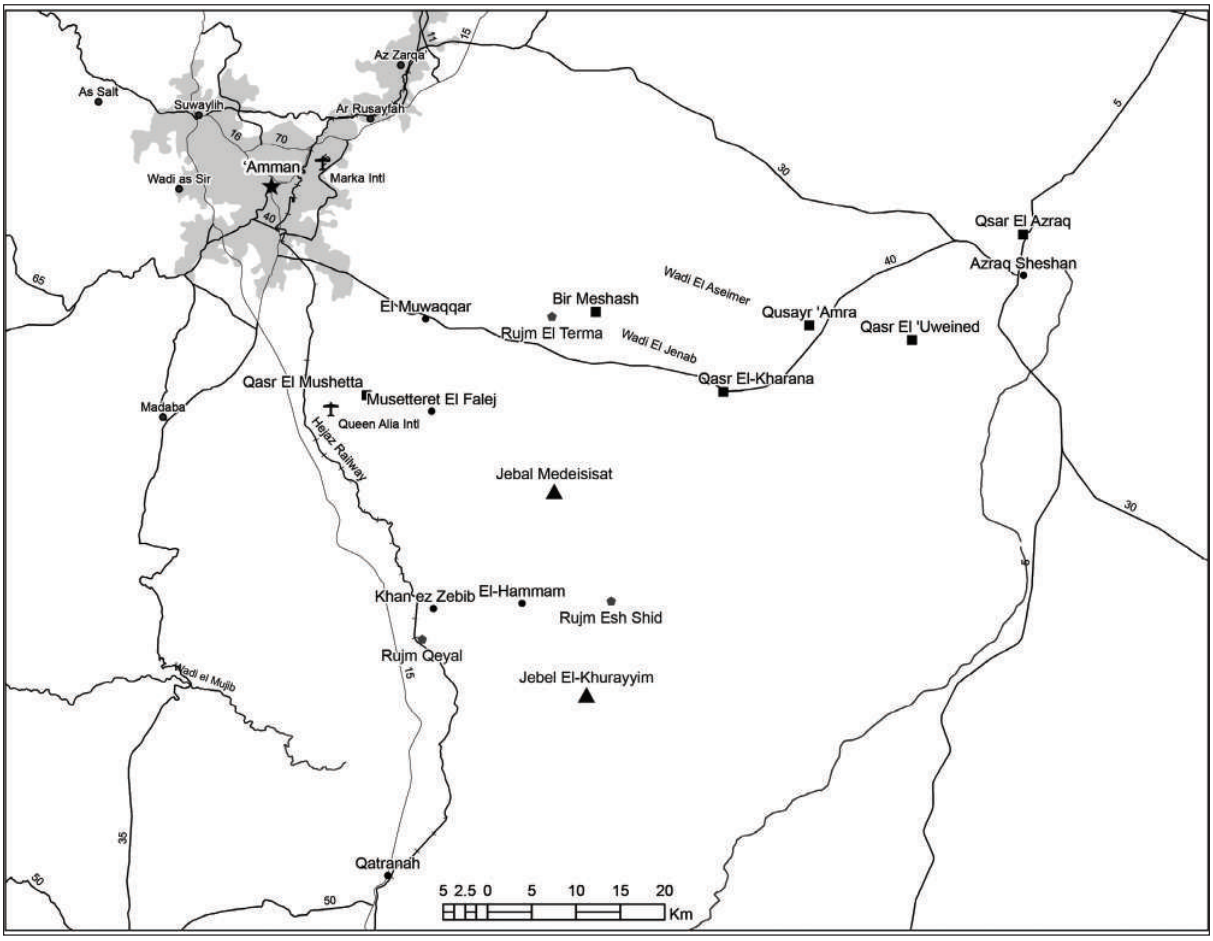
Central Jordan Epigraphic Project

In Memory of Fawwaz al-Khraysheh and George E. Mendenhall

The stimulus for this project began with the Hinterland Survey of the Madaba Plains Project (MPP) directed by Dr. Øystein Labianca of Andrews University, when some "trimal marks" (*wusūm*) were discovered in a cave at Khirbat ar-Ruṣayfah near al-Yadūdah in 1992. In a meeting at various epigraphers and archaeologists at the cave in 1995 organized by Dr. Labianca, it was observed that many of the *wusūm* were similar to the camel brands and tribal marks recorded by Henry Field during his earlier exploration of Jordan (Field 1952).

However, Dr. Khraysheh surmised that beneath many of the symbols there appeared to be several Thamudic texts with the graphemes later distorted by modern visitors to the cave who enlarged, corrupted, and even imitated some of the graphemes. But the "palimsest" theory was never pursued because of the discovery of other Thamudic inscriptions in the region. In 1982, E. A. Knauf discovered at Uraynibah west, *ca.* 15km southeast of Mādabā, the longest and most eloquent Thamudic inscription ever found,which preserves a rare dedication to the Nabataean fortune deity Ṣa'ba,and which has a close parallel at Mādabā, implying perhaps a Nabataean sanctuary in the vicinity (Graf and Zwettler 2004). Later, more lengthy Thamudic texts were found by Michele Da-viau in the Wādī ath-Thamad Survey just south of Uraynibah (Daviau *et al.* 2000: 277). These texts seems to suggest that the "middle ground" between the Safaic Inscriptions in the north of Jordan and the so-called "Hismaic" texts of the Wādā Ramm region in the south was actually a Centra population that used the Thamudic scriptl Jordan called "Thamudic E" (King 1990) (FIG. 1).

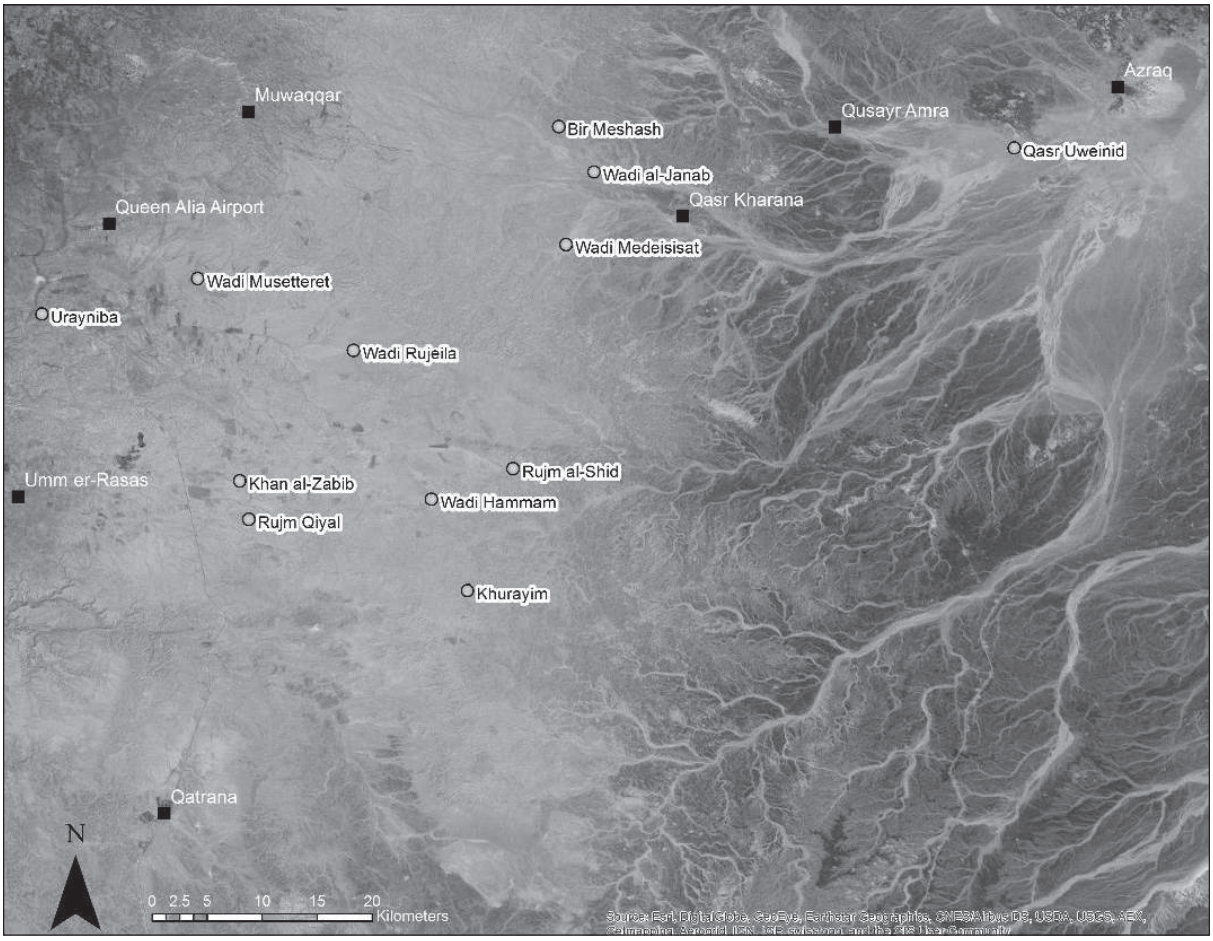
For this reason, an epigraphic survey was organized to explore this region and test this hypothesis. The first season was conducted in July 15-26 in 1996, focusing on the area east of the desert highway between al-Yadūdah, Khān az-Zabīb and al-Qaṭrānah. The staff included David F. Graf from the University of Miami (Coral Gables, Florida), Fawwaz al-Khraysheh of the Department of Epigraphy in Yarmouk Univer-sity's Institute of Archaeology and Anthropology (Irbid, Jordan), and George E. Mendenhall, Professor Emeritus of The University of Michigan as the consultant of the project. In addition, three of Dr.



1. Survey map.

Khraysheh's graduate students also participated in the effort: Mohammad I. Ababneh, Mohammad Jarrah, and Mohammad Haza'a. The survey extended as far as 25km east of the Desert Highway, essentially the areas on the periphery of the Queen 'Alia Airport. The time was limited, so only forays into this extensive region were possible.

Most of this extensive region is characterized by gravel desert, penetrated rarely by larger sur-face stones, and only sufficient in a few ares to be gathered into occasional cairns or small "watch-towers." Nevertheless, 40 pre-Islamic North Arabian texts were discovered, almost all of the Thamudic E variety. Three areas were particularly productive. The first was the Wādī Janāb area about 25km east of 'Amman and some 5km south of the Amman-Azraq highway. Some 15 Thamudic texts were recorded from about a half dozen stones in a cairn in the area and several more from a nearby cairn that also contained a number of modern Arabic graffiti and tribal marks. The second productive area was 5-15km southeast of the Queen 'Alia International Airport, where several cairns were found with Thamudic texts, but without any pottery.The third area where texts were concentrated was the region of Khurayyim, some 60 km south of 'Amman and about 20km east of Khān az-Zabīb. Pottery was found at all of these sites, predominantly of the Nabataean-Roman era, with a few possible Byzantine sherds. These sites are all located near modern new agricultural projects utilizing irrigation from recent wells dug in the region. In the process of developing these cultivated areas, many cairns and sites were damaged or destroyed. At one cairn, seven texts were found on a single broken stone. At Rujum



2. Graf Survey Map, revised 2.

ash-Shīd, there is a well-constructed tower (*ca.* 4×6m) of probable Nabataean-Roman date, judging from a few sherds found in its environs. The eastern wall is particularly well preserved, but the other walls are all collapsed. Five small Thamudic E texts were found on stones of the structure and a number of others were in the immediate area with manany *wusūm*. Several other towers were found SE of Rujum ash-Shīd at about 5 km intervals, but they lacked any pottery or inscriptions although some stones were marked with modern graffiti and tribal marks. In addition, a visit was also made to the region of al-Lajjūn where Bruce Routledge of the University of Pennsylvania informed us of several Thamudic or Safaitic texts discovered during his survey of the region about 5km SE of al-Lajjūn just south of the al-Qaṭrānah-Karak highway (FIG. 2).

The importance of the fiinds is that they represent the first substantial corpus of Thamudic E texts ever discovered in the ‘Amman-Mādabā region, just east of the Ammonite-Moabite plateau Although their number was not as impressive as the Thamudic E texts found in the Wādī Ramm region in the south, and certainly the enormous quantities of Safaitic texts in the *ḥarra* region of NE Jordan, their number is still significant for this location It seems clear that Thamudic E is typical of the Transjordan plateau as far north as the region of ‘Amman if not further. In addition to collecting pre-Islamic epigraphic texts, the survey also recorded many modern bedouin tribal marks (*wusūm*) from the region, primarily occupied in recent times by the Banī Ṣakhr.

In regard to the script of the pre-Islamic texts, the majority appear to be in that designated as

Thamidic E (King 1990). The typical Thamudic E grapheme of *d* appears in many texts, supporting the designation of the script as Thamudic E. The content of the texts is brief, most preserving the name of an individual and his patronym. Many of the texts are fragmentary, incised on broken and fragmented limestone or flint.The only deity invoked in the texts is LT, but DŠR appears once in a theophoric personal name. Several typical expressions also occur in the inscriptions like DKRT LT ("[O goddess] Lat, remember PN") or LʿNT LT ("O [goddess] LT curse PN"). The personal names that appear are mostly known from other Safaitic and Thamudic texts. One text contains seven names in a geneaology followed by a (missing) tribal name, which is quite exceptional in Thamudic E. Although female names appear rarely in the texts, one stone from Wādī Janāb bears two texts from different women and a third text from the brother of one of the women on the same stone.

The epigraphic results of the first season of the Central Jordan Survey prompted a second season. This took place between June 13 and 28 in 1997. The expedition team was comprised of Dr. David F. Graf from the University of Miami, Dr. Fawwaz al-Khraysheh of the Department of Epigraphy in Yarmouk University's Institute of Archaeology and Anthropology (Irbid, Jordan), and Dr. George E. Mendenhall (Professor Emeritus, University of Michigan). The three universities provided funding and equipment in support of the project. Several students from Yarmouk University also assisted in the fieldwork and recording of the texts. The focus of the second season was the area east of ʿAmmān between Muwaqqar and Azraq. In this region, at least 68 stones were found inscribed with 104 texts. These stones were almost all located on the tops of hills and high points in the region. Four particular areas were productive: (1) the area 20km east of Muwaqqar between Wādī Janāb and Kharrānah; (2) the area just north of the Muwaqqar-Azraq highway east of Bīr al-Mushāsh on the hills of Jabal Ṣafrāʾ; (3) The area north of Quṣayr ʿAmra on the hills of Tulūl al-ʿĀliyaq; and (4) the lava area of Ḥarrat ʿUwaynid just north of Qaṣr ʿUwaynid. Of the more than 100 texts collected, almost all were in Thamudic E, but a few Safaitic texts were found in areas (2 and 4). Although the region was penetrated occasionally by a few Safaitic texts, the predominant script was Thamudic E. The majority of the stones with clearly incised texts were deposited at the *aṣ-Ṣayyād* (Hunt-er's) Hotel in Azraq, with the cooperation of its owner Lydia A. Hassan, who generously agreed to store the stones at the Hotel for future study. Some of the texts were quite faint and were taken to Yarmouk University for further study. In this context, only a few of the texts can be discussed.

The Thamudic Tribes of Central Jordan

The majority of the almost 147 texts recorded contain merely names and on occasion genealogies of two generations. The unusual aspect of these mostly fragmented mundane texts is that they also contain six "tribal" or "clan" names designated by *dhul*. These "tribal" names are more frequent in Safaitic than Thamudic inscriptions (al-Rusan 1986), so the number of tribal names for this small corpus of primarily Thamudic texts is significant. From the close to 10,000 recorded Thamudic E inscriptions in the Ḥismā desert in the south, Geraldine King assembled 23 tribes (King 1990: 691), and another half-dozen can now be added to the Ḥismā occurrences (Corbett 2010: 427, *s.v. ʾāl*, "family, tribe"). and a fews cattered more from the Jordanian plateau (all of which constitute less than 1%). In contrast, the "tribal" names in the Central Jordan corpus constitutes about 4% of the texts, significantly higher than where there is a larger concentration of Thamudic texts.

The problem is the exact meaning of *dhul* is ambiguous and complex (Harding 1969: 5). The pronoun *dhu* suggests some kind of affilation for an individual, but *l* can also refer

to various social groups including family, clan, or the sub-branch of a tribe, not just a tribe or ethnic group (Musil 1928; 47 and 480). The *l* in North Arabian texts is often associated with Arabic *'āl,* which Lane identifies with family "relations, kinsfolk, [or] household followers" (1970: 127-128). All of these social groups presumably are bound together biologically by a common ancestry normally portrayed in a genealogical tree or lineae stemming from an eponymous ancestor. But as these families expand to external families (by marriage or alliance), the genealogy becomes artificial, part truth and part fiction. With regard to the modern Rwala Bedouin tribe, the larger social groups can "split, subdivide and coalesce", so that members know only three generations and certainly not the eponymous ancestor (Lancaster 1981: 24-32). In between the gaps, there are inventiuons. For example, the lengthier Safaitic genealogies extend frequently to six generations and t at times as many as twelve or fifteen generations (Milik 1985: 183-188). But after four generations, there is occasiobnally a different order in the lineage, insertions, and misspellings (Winnett and Hardin 1978: 21). In contrast, Thamudic inscriptions rarely extend beyond the grandfather. Another case is the prototype genealogy of al-Kalbi constructed in the Ummayad period (Caskel 1966: 22) in which its economic agenda created such ancestral fictions (Smith 1885: 5-6). In essence, the tribal structure is not stagnant, but constantly developing and changing. The assumption of a successive generations of blood relatives of patrilneal descent must be regarded with suspicion (Smith 1885: 35; Dresch 1988: 55-56). The translation of *dhul* as "tribe" is then just an educated uess, complicated by the existence of these other familial social groups, so that a family or clan may just as well be at stake as tribe in the use of *dhul*.

As a prototype for a tribe in the Mādabā region, the 'Amrat tribe may be considered. A Nabataean-Greek bilingual inscriptions from Mādabā dated to AD 108/9 for a Mun'at of the tribe of 'Amrat (*'l 'mrāt*) locates them at Mādabā (Milik 1958: 245). As a consequemnce, they have been associated with the Iambri (I Macc. 9: 32) and Odomera (9:66) who resided at the city in the second century BC. This correlation is supported by Josephus, who calls them the Amaraios Arabs, who dwelt in the vicinity of Mādabā (*AJ* 13.11-18). As the Mādabā tomb inscription of the Nabataean strategos Itaybel and his son indicates (*CIS* II, 196 = *RES* 674), the town was well within the Nabatean realm in AD 37. The identity of the Amaraios as "Nabataeans" was already proposed by Clermont-Gannneau, based on the personal name *y'mrw* in a Nabataean inscription dated to AD 39 at Umm ar-Raṣāṣ, 16 miles SE of Mādabā (1897: 185-218 on *CIS* II, 139), which sugges the tribe was prominent throughout the region. As a result, it is assumed that Mādabā was occupied by a "Nabataean elite" (Ferguson 2016: 419) or a heavily "Nabateanized" population (Ferguson 2015: 377). In the fourth century AD, Uranios still identified Mādabā as "a city of the Nabataeans" (*FGrH* 675 F8).

As further evidence of their wide-ranging activities, there are a number of Safaitic texts attesting the 'MRT tribe that distributed over an extensive territory in northern Jordan well beyond Mādabā: at the cairn of Hani' (H5), the Wādī Shām (C 2947), Dayr al-Kahf (Clark 1977: 1a-b), but also further east in the region of H4 in Jordan at Qā' al-'Arqadiya (Clark 1979: no. 628), Qaṣr Burqu' (Macdonald and Harding 1976: nos. 8, 10, 12), and Ruwayshid (Kraysheh 1995: nos. 1, 2, 5 and 6). Theses Safaitic texts indicate that the 'MRT tribesmen aree well integrated into the Nabataean realm. The texts indicate they petition the Nabataean gods Lāt and Dhūsharā (Macdonald and Harding 1976: no. 10), date their texts to the "year the Nabataean king died" (Khraysheh 1996: no. 1, *snt mt mil nbṭ*), perhaps monitored the movements of the Nabataen king Rabbel (Clark 1979: 628, *nẓr l rb'l*), and even rebelled against Rome (*'l 'l-rm*), the year Caesar left Bosra, perhaps during the

visit of Hadrain to the region in AD 129/130 (Khraysheh 1995: no. 6, *snt brḥqṣr lbṣry*). More important, the Safaitic-Nabataean bilinguals at Qaṣr Burqu‘ indicate the tribemen were bilingual, and familiar with Nabataean Aramaic (Milik 1980: 41-54, MNT 8 = MNT 2c; MST 10 = MNT 2a; MST 12 = MNT 1). The name ‘MRT retained its resiliency, and was a name for various tribes in the modern period: see Musil 1908: 515, index, s.v.; and 1927” 589, index s.v.). As a result, given the popularity of the name, it is possible that there is more than one tribe named ‘MRT. But as will be noted below, the activities of some tribes is quite extensive, covering vast areas of the Syrian-Atabian landscape. It is just as possible that if this is correct, the *Amaraioi* tribe was composed of both sedentary and pastoralist segments.

With these considerations in mind, we can discuss the six texts that mention a *d’l* or “tribe” in our small corpus of texts from Central Jordan, two of which are of exceptional interest.

No. 1. Tribe of QDM: WādīMudaysīsāt(FIG. 3)

L-TM[..] bn MLG bn TM [……] ḏ’l *’QDM* wḥd ‘l [……] [M]D‘T bn T….

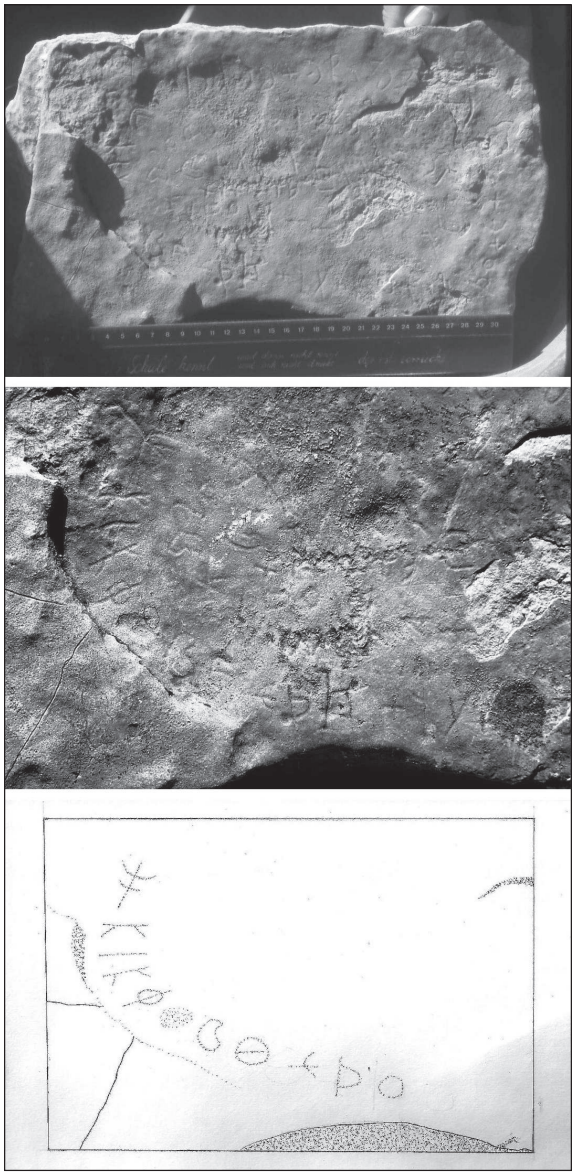
By TM son of MLJ son of TM […..] of the tribe of ’QDM and he mourned [for] MD‘T bn T….

The name TM is common in Safaitic and Thamudic (*HIn* 136).

The name MLJ is known in Thamudic E: See King 475, KnEG 1. See Arabic *malaja* ‘suckling kid’ and *malīj* ‘foster brother, illustrious man’. For MLJN in Thamudic E, see King 580: KJC 8, 273, 760, 762.

The name MD‘T appears once in Thamudic: Hu 38.5 (see *HIn* 534). See also King 545 for MD‘, which appears in Safaitic (6) and Thamudic E: TIJ 111. Note also *myd*‘ in Nabataean: Cantineau 113. See Arabic *da‘ā* ‘claim’and *madda‘I* ‘claimant’.

The tribal name ’QDM is new. The restoration of the “D” is based on the frequent occurrence of ’QDM as a personal name: see *HIn* 60 for ’QDM in Safaitic (26), and note QDM in *HIn* 478: Safaitic (222) and Thamudic (5), and add for Thamudic E King 536, AMJ 71 to JS 672, and TIJ 206, 326, 355. For Nabataean, see Cantineau 141, *qdmw.* For Arabic, *cf. qadanma* ‘precede, come before’, *Qadīm* ‘ancient’ and see CIK 454,2 for Qadim, and 459,2 for Qudam.



3. No. 1. TRIBE ‘QDM.

No. 2. Tribe of RWH: Wādī Mudaysīsāt (FIG. 4)

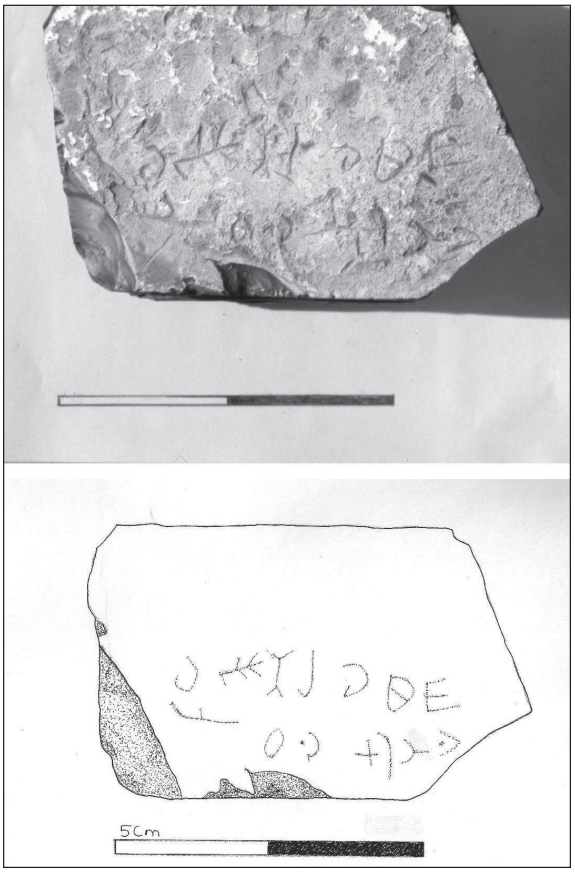
…bn SLT bn *‘KR* ḏ’l RWḤ

…son of *SLT* son of *‘KR* of the tribe of RWḤ

The name could be read as SLT, which appears in Safaitic a few times: WH 42 and 3396: see HIn 324, and add Ababneh no. 242. See Arabic *salīt* 'bald-headed'. It seems less likely that it be read as STT, which is new, although ST is known in North Arabian: HIn 316 lists Lihyanite (1), Safaitic (3), and Thamudic (3). See Arabic *sitt* 'lady' and *satt* 'vice, defect'. But SLT is preferable.

The name 'KR is known previously only in Safaitic: HIn 428. But for Thaamudic E, see King 527-528 for *'krw* in TIJ 316, Perhaps with a Nabataean ending, and see Arabic *'akkār* ("one who returns to fight after fleeing") and for the Arabic name CIK 150,2 *'Akkār.*

As a personal name, RWḤ appears frequently: HIn 290, lists Safaitic (16) and Thamudic (1 = WT 29). See the Arabiac name *Rūḥ*: WR 387. The Tribal name RWḤ also is known elsewhere in North Arabia. At Umm al-Jimāl, it appears in a Safaitic inscription on a stone in the west wall of a house in the eastern part of the town, which reads *L-WHB bn ŠMT d*'l *RWḤ* (C 5162 = LP 1269). It also appears in a Palmyrene text dated to AD 132, a dedication by a 'Ubaydu, a Nabataean from the Rawāh (*rwḥy* [ʾ] I) tribe, who was a cavalryman at the fort and camp at 'Ana'('n'). an island on the Middle Euphrates. The dedication is for Shay al-Qaum, "the good and bountiful god who does not drink wine" (CIS II, 3973 = RES 285 and 2065 = PAT 0319)--the "protector of the clan" or "conductor of the group"(Sourdel 1952:81-84,Healey2001:143-147), or "protectorof caravans" (Teixidor 1977: 88-89). From Umm es-Salabikh near Aleppo, a text dated to AD 225 refers to another "strategos" and his lieutenant from the same town of 'Ana on the Euphrates, some 115 km northwest of Palmyra (Cantineau: 1931: 178-180, no. 4 = PAT 275). What the Palmyrene officials were doing so far from this post remains unknown.



4. No. 2. RWH.

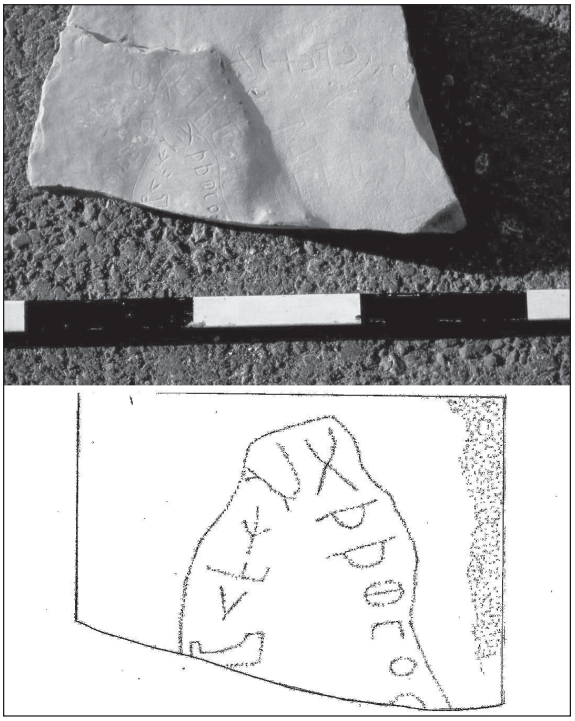
msk d'l ḫdd wr'[y]

msk of the tribe of *ḫdd* and he pastured.

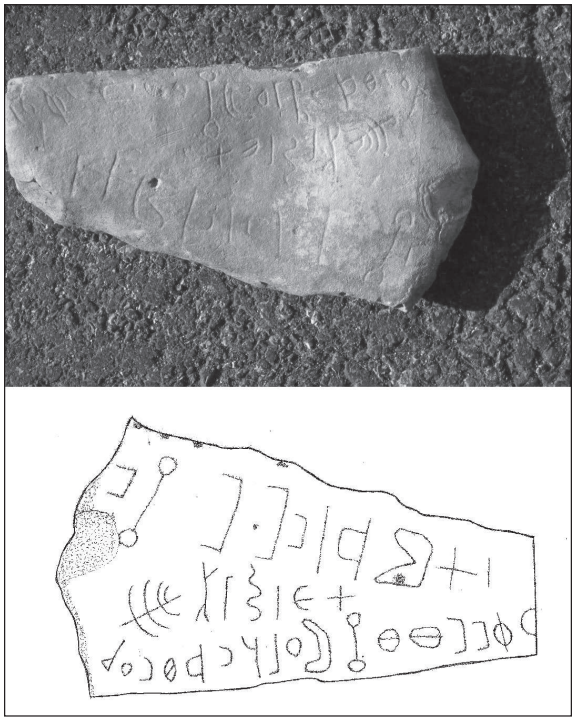
The name MSK occurs frequently in ancient North Arabian texts, especially in Safaitic where it appears over a hundred times (*HIn* 545, lists 110 times). But is also fairly frequent in Thamudic E, see King 546-547, who lists KJC 131 ~~ i, KU 1, TIJ 91; add WHPS 07-001-02.8. For the Arabic name, see CIK 401,1 *Masīk* and *cf.* Arabic *masaka* 'seise', *masuka* 'be tena-cious', and *misk* 'miusk'.

For ḪDD, see HIn 216, who lists two Safait-ic texts, once is a personal name and the other is a geographical location or place. For the latter see SIJ127: "And he has gone down to Khadad. So_O Dhu-Shara grant immunbity from harm" (*wwrd ḫdd fhd*šr *rwḥ mb's*). The location of Khadād is unknown.

The verb *r'[y]*, 'he pastured', is common in Safaitic. Its appearance in Thamudic is ex-ceptional and use in this text in an unusual manner. Normally, the phrase *wr'[y]* ("and he



5. No. 3 HDD.



6. No. 4. FLTT.

pastured") is a transitive verb cobined with a phrase or word designating the particular place or animals involved., but here it appears without an object. See WH p: 637 and Ababneh no. 59 for discussion.

No. 4. Tribe of FLṬT: Wādī Janāb (FIG. 6)

l ʻqrbn wwgm ʻl srd wrʻy ḏ'l FLṬT

By *ʻQRBN* and and he grieved for SRD and he pastured, the tribe of FLṬT

The name ʻQRBN is attested in Safaitic, but only once in Thamudic (*HIn* 437). This is its first appearance in Thamudic E. For theArabic name see CIK 574, 1 *ʻUqrubān,* which seems to represent Arabic ʻmale scorpion' The name also appears in Palmyrene (Stark 107).

The verb *wgm* (he grieved) with the preposition *ʻl* appears regularly in Safaitic (Ababneh no. 87), but is unusual in Thamudic.

The name SRD is attested a few times in Safaitic (*HIn* 315), but is new in Thamudic E.

As observed in the previous text, the transitive verb *raʻy* (to shepherd, tend, pasture) normally appesr in Safaitic with an object (animals, specific places, or plants), but appears here again without an object.

Although the personal name FLṬT (Arabic *falaṭ* ʻsurprise, unexpected event) occurs frequently in Safaitic (*HIn* 471 lists 71 times: add Clark no. 201 and 350, and Ababneh nos.180. 349, 350,), but is rarer in Thamudic E (AMJ 107, KJA 208, KJC 228; PH 345 bis g; and WHPS R 206). This is its first appaearance as a "tribal" name.

The stone contains a second text: TMDŠR Bn BJR. The name TMDŠR ("servant of DŠR", the Nabataean god) is known elsewhere in Thamudic E (in CSP 2 at Mafraq, as re-read by King 624, with p, 484, and WHPS 390.4 in theWadi Hafir in the Ḥismā). It is significant here as representing a Nabataean element in our texts. In Nabataean Aramaic, it occurs as *tymdwšr*': see Cantineau 156 and Negev 1217, where it is listed for North Arabia (1), the Sinai (6), aand the Hauran (2).

The name BJR is rare. HIn 93 list only BJRT: Safaitic (8) and Tahmnudic (JS 757 uncertain). But see CIK 219, 2 *Bajara* and Arabic *bajair*

(large bellied) and *Bajīr* (‘abundant’). The name appears elsewhere in Thamudic E only in JS 707. (King 477).

No. 5. Tribe of WḌ’: Wādī ‘Amra (FIG. 7)

l ’s bn hn’lh bn ‘sr bn ’st bn ‘mrt bn hn’lh bn shb bn zdlh d’l wd’ fhlt slm

By ’S son of HN’LH son of ‘SR son of ’ST son of ‘MRT son of HN’LH son of SHB son of ZDLH from the tribe WḌ’, Oh Lat grant security.

The genealogy of eight generations is long for Thamudic, where two or three generations are typical. The names are also familiar in North Arabian texts, but more common in Safaitic. Other are rare in each script.

The personal name ’S is common in Safaitic, but also frequent in Thamudic E, see *HIn* 41. For the latter, add King 471 and WHSJ 653.3, 654.4. See Arabic *’ās* ‘myrtle’, *’aws* ‘gift’ and CIK 213,2-215,2 *Aws.* The name occurs as *’wšw* in Nabatean (Cantineau 57-58).

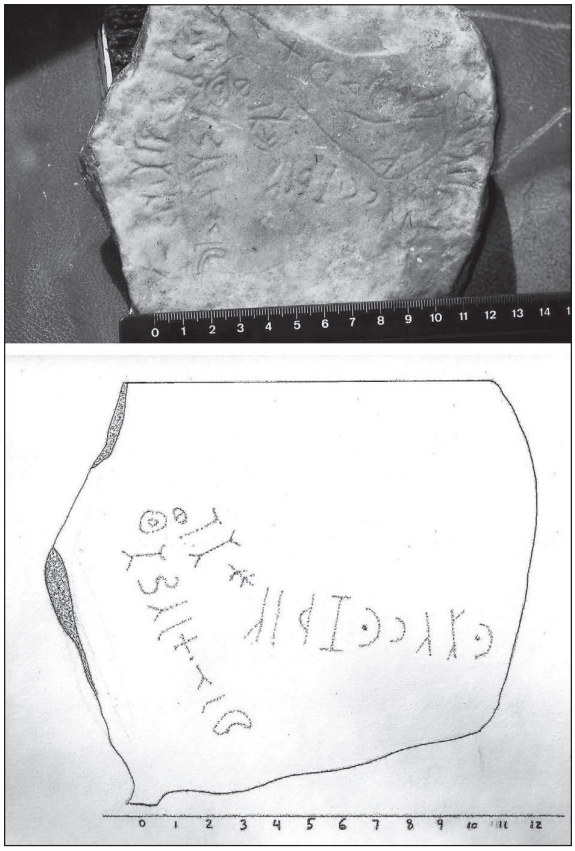
HN’LH See Arabic Hāni’ ‘servant’: CIK 278, 2-279,1. The name is fairly frequent in Thamudic E: King 559, lists AMJ 132, KJC four times, and TIJ five times; add WHSJ R 445.6, R 742.2; R 749.3. It also occurs in Lihyanite (*HIn* 626), but not in Safaitic as far as I am aware.

’SR See Arabic Aisar: CIK 145,2. The name appears in Safaitic ten times (HIn 423), and Thamudic E eight times (King 472).

’ST is rare, appearing only in Safaitic twice (*HIn* 41).

‘MRT The name ‘MRT appears frequently in Safaitic, both as a personal name (*HIn* lists 48 times) and as the name of a tribe (Harding 1969: no. 86). The perssonal name is also known in Nabataean (Cantineau 133, *‘mrt*) and Palmyrene (Stark 106). In Thamudic E, it is less frequent that Safaitic: King 531 lists six times and once in a ‘mixed text’ (WTI 48).

SHR See Arabic *Sāhira* and CIK 498,2 Arabic *Sāhir*; ‘sleepless, wakeful, and sahara ‘evening, night’ and for “a fountain that runs day



7. No. 5. WD’.

or night”: Lane 1451-52. The name appears in Nabataean (Cantineau 149 *Šhrw*) but in Safaitic rarely (*HIn* 333). It also is rare in Thamudic E: KJC 606, but add WHSJ R 379.3; and R310.9 for *Shrt* (*cf.* Arabic *saharāt).*

ZDLH Theophoric name: Arabic *zayd* ‘increase” + Allah. See CIK 604,1 *Zaidallah.* It appears in Lihyanite (*HIn* 297) and Nabataean (Cantineau 93, *zyd’lhy*) and is frequent in Thamudic E: King 506 cites AMJ 72, 132, KJB 71; KJC 5, 138, 144, and add 9 more occurrences in WHPS p. 406. But as far as I know, not in Safaitic: see *HIn* 297.

WḌ’ (Arabic “to outshine”) is rare as a personal name in North Arabian: *HIn* 643 lists it twice in Safaitic and perhaps one in Thamudic (Hu 294, 27?). The middle grapheme *Ḍ* is clearly that of Thamudic E, not the Safaitic *G* (*cf.* Ababneh no. 362 and Clark no. 101. As far as I am aware, this is the first attestation of the tribe of WḌ’.

In sum, there are some unusual aspects of this Thamudic E text. The eight generations in the genealogy is much longer than usual. The theophoric names with Allāh (HN'LH and ZDLH) are typical of Thamudic, but are absent in Safaitic. In contrast, the expression *fhlt slm* is attested in Safaitic (Clark 1979: 410 nand 422), but not Thamudic.

No. 6. Tribe of TTS: Wādī Amra (FIGS. 8, 9)

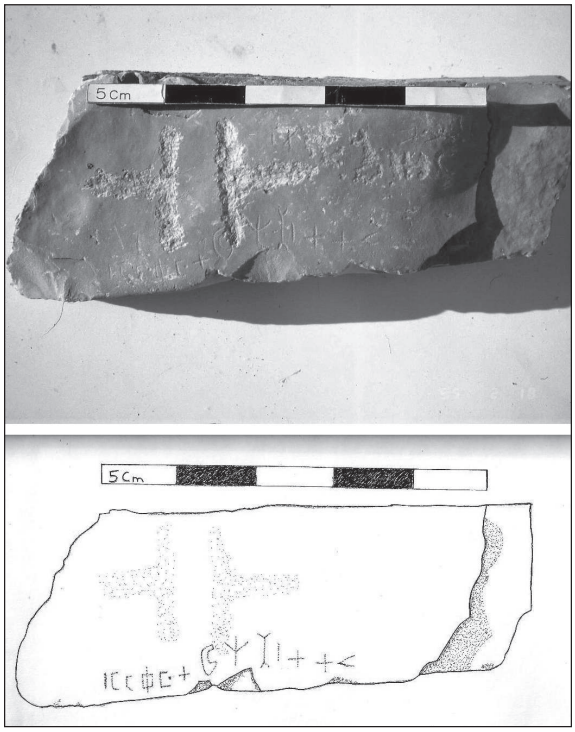
l brq bn tm ḏ'l tts

by *brq* son of *tm* of the tribe of *tts*

The name BRQ is attested in North Arabian (HIn 102), in both Safaitic (4) and Thamudic E: TIJ 11; *cf.* BRQY in WHPS 07-001-02-17. See CIK 224,2 for Arabic *Bāriq* and *Barrāqa*. An *cf.* Ar. *Bāriq* 'shining, gleaming'. The name TM is also attested in North Arabian: HIn 136 cites Lih (3), Safaitic (230) and Thamudic (22). For Thamudic E, see King 483, for more occurrences (30). See CIK 542, 1 for Taim. The nameTM (Taym 'servant') is known also in Nabataean (Cantineau 155, tymw) Palmyrene (Stark 117).

The name of the tribe is clearly TTS. The personal name TTS is listed as occurring twice as a personal name (HIn 129), but in both instances (C 2308 and 2309,) the name is *tḫs,* a name familiar in Safaitic (HIn 130). In regard to TTS, there is a struggle to find an Arabic name. Oxtoby observed TTS "resists attempts at a Semitic etymology" (Oxtoby at ISB 176, who suggests emending it to *hts*, "the roebuck"in his text, which does not occur either in North Arabian). It seemed clear TTS represents a foreign name. The Greek name *Τατας* was earlier proposed (Wuthnow 11, and *cf.* C 2896). More compelling, Müller suggests TTS represents a Latin name, ostensiably 'Titus', in spite of that name normally rendered in Aramaic as TYTWS.

More importantly, this is not the first time the tribal name TTS occurred. In an earlier text that was without provenance, located in the Archaeological Museum at the University of Jordan (Museum Registration no. P.U. 107 , formerly



8. No. 6a. TTS.

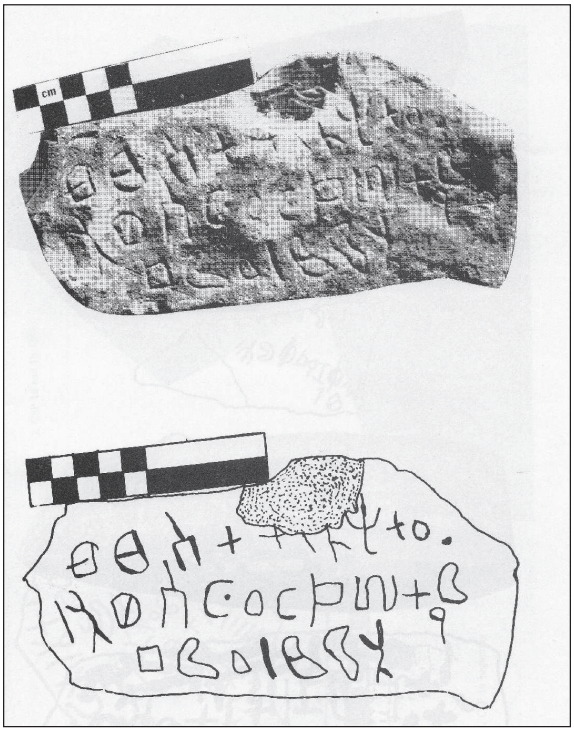
in the collection of Dr. Yousef Shwihat), which was published by Macdonald (1980: 185-208, at 188 with Pl. CXV and designated SIAM no. 41). Unfortunately, the text has subsequently disappeared. The text, inscribed on a piece of tabular flint with a red-brown crust, is read as:

l-'ws bn 'bd fty mn't ḏ[l] [t]ts w wjm 'l mn'

By 'WS son of 'BD, the young servant of MN'T, of the tribe of [T]TS, and he grieved for [M]M'.

The letters of *'l* and the first letter of the tribal name are damaged, but the restoration proposed by Macdonald seems evident. It is possible *D'l* may refer to the *fty*, rather than his master.

If indeed, the tribe is named after the later Emperor Titus (AD 79-81), the circumstances seem best associated with the earlier time when he was the commander of the Roman army during the Jewish Revolt (AD 66-73). During his campaign against the Jewish rebellion, the Nabataean king Malichos II supplied 1000 cavalry and 500 archers to assist the Roman army Titus (Josephus *BJ* 3.68). The composition of the Nabataean cavalry must have been scattered



9. No. 6b. TTS.

and diverse, involving probably contingents from the various regions of the kingdom (Graf 1994: 265-311). This may be reflected in some Safaitic texts related to the ‘MRT tribe. One of these texts from from H4/Ruwayshid suggests the ‘MRT Tribe constituted a cavalry unit, ostensiably a unit in the Nabataean army: *Ms* 64: “By ‘QRB bn ’BGR, is identified as a horseman in the camp of the tribe of ‘MRT (*l-‘qbr bn ’bgr b mšrt ’l ‘mrt frs*). The term *mšrt* suggests a “camp, barracks” (Hoftijzer and Jongeling 1995: 706, s.v. *mšry,*and 1050 *s.v. rb2* for Nabataean Aramaic *rb mšryt’*, “the commander of the camp, indication of a military function” and *rb pršy*’ for commander of the cavalry). The terminology suggests a military organization of some nature, and probably integration of the tribal contingent into the Nabataean army (see Graf 1994: 265-311). Another Safaitic text of the ‘MRT Tribe indicates they followed the movements of the Nabataean king Rabbel (II?) (Clark 1979: 628, *nẓr l rb’l*). Another text of the same tribe is dated to “the year the Nabataen king died” (Kraysheh 1995: no. 1). These asso-

10. Rujum ash-Shīd.

11. ‘Uwaynid.

12. Wādī as-Samīr.

13. Wādī Mudaysisāt.

ciations with the Nabataeans makes it possible the TTS Tribe was part of the cavalry units that the Nabataeans provided the Roman commander Titus duing the Jewish Revolt. If the 'MRT tribe can be connected with the Mādabā tribe of similar name, the proposal becomes even more attractive. The inscriptions are just east of 'Amman, and they could have been used in the assault on Jerusalem, the subjection of the rebels in Peraia east of the Jordan, or the campaigns in the Dead Sea area, taking the name of Titus as a badge of honor for their participation in the Roman campaign. As is well known, the region between Mādabā and al-Yadūdah, south of 'Amman is the traditional horse-breeding region in Jordan.

There also is a parallel for a tribe at Palmyra bearing the name of a member of the Roman imperial fanly. In AD 79/80, a tower tomb in the northwest necropolis at Palmyra was deduicated in Greek to Malik*ū* son of Muqīmu, son of Būlbarak, a member of the "tribe of Claudius" (Yon 2012: no. 461 = CIS 4122 = PAT 0471). This is the sole mention of the *phylē Klaudias* at Palmyra, that is both ephemeral and mysterious, presumably named after the Emperor Claudius sometime during his reign of AD 41-54. The Aramaic version implies the clan of Ḥawmal was a component part of the tribe. But the circumstances for the adoption of name remain obscure (Galikowski 2003: 9; *cf.* Milik 1972: 259-264; Sartre 1996: 387). It is possible it represents an honorific title con-ferred to the tribe for some exceptional service rendered to Roman imperial administration (*cf.* Smith 2013: 231 n. 116). Whatever the case, the *phylē Klaudias* at Palmyra provides an example of a tribe named after the Emperor, supporting the suggestion that the "Tribe of Titus" here is a result of some act of imperial administration, probably associated with the Roman quelling of the Jewish Revolt and the participation of the tribe as part of the supporting Nabataean military cavary contingent.

Abbreviations

AAAS	=	*Les Annales Archéologiques Arabes Syriennes.*
Ababneh	=	Ababneh, *Neue safaitische Inscriften,* 2005.
BAH	=	*Bibliothè*que *Archéologique et Historique.*
Cantineau	=	Cantineau, *Le Nabatéen* II, 1932.
CIK	=	Caskel, *Ǧamharat an-Nasab. Das genealogische Werk des Hišam ibn Muḥammad al-Kalbī*, vol. 2: *Erläuterungen zu den Tafeln*, *Das Register*, 1966.
CIS	=	*Corpus Inscriptionum Semiticarum,* II (Aramaic), V (Safaitic).
Clark	=	Clark, *Study of New Safaitic Inscriptions in Jordan*, 1979.
FGrH	=	F. Jacoby, *Fragmente der grieschischen Historiker.*
HIn	=	Harding, *An Index and Concordance of Pre-Islamic Arabian Names and Inscriptions.* Near and Middle East Series 8. Toronto: University of Toronto, 1971).
King	=	King, *Early North Arabian Thamudic,* 1990.
IGLS	=	*Inscriptions Grecques et Latines de la Syrie.*
Negev	=	Negev, *Personal names in the Nabataean Realm,* 1991.
PAT	=	Hillers and Cussini, *Palmyrene Aramaic Texts*, 1996.
Stark	=	Stark, *Personal Names in Palmyrene Inscription*, 1971.
WH	=	Winnnet and Harding, *Safaitic Inscriptions* 1978.
WHSJ	=	Corbett. *Mapping of the Mute Immortal*, 2010.

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Between Here and There: Locating Abila of the Decapolis in the Past, Present and Future

To begin I would like to thank Dr. Monther Jamhawi and many people at the Department of Antiquities who have worked with us over the years, especially in recent years Eng. Amjad Bataineh Director of the Irbid Office and Mr. Emad Obeidat Director of the Bani Kinannah office of the DoA. In addition, David Kennedy and his colleagues at the Aerial Photographic Archive for Archaeology in the Middle East have produced excellent aerial photographs of our site which – given our proximity to the Syrian border are difficult to obtain otherwise; and also to John Brown University for financial and institutional support of the excavation.

The 2016 season of excavation at Abila of the Decapolis in Northern Jordan will mark 36 years and 18 seasons of excavation at this important Decapolis site. Work began at Abila in 1980 under the lead of Harold Mare of Covenant Seminary in St. Louis, Missouri and continued under him until his passing in 2004. The excavation was then directed by David Chapman, also of Covenant Seminary until 2008. I have been working with the Abila Excavation since 1990 and was named director beginning with our 2010 excavation season. From its' founding the Abila Archaeological Project was incorporated in the United States as an independent, non-profit organization with a Board of Directors who provided funding and support for the organization. In 2013, the Abila Archaeological Project was "adopted" by John Brown University, an independent, liberal arts college in Northwest Arkansas and is now an official program run by the University. An endowment was also set up at John Brown University to fund the ongoing work of the excavation, especially supporting the production of final publications and the conservation/restoration and presentation of the site. The future of work at Abila looks bright, but before I get too far, I'd like to present a survey of where we've come from and what we are currently doing at the Abila.

The site is located in northwest Jordan approximately 20km east of the Jordan Valley and 5km south of the Wādī al-Yarmūk. We are 20km north of the modern city of Irbid, and along with Pella/Ṭabaqat Faḥl, Gadara/Umm Qays, Capitolias/Bayt Rās, and to the east a bit further Umm al-Jimāl, form an important "northern constellation" of significant archaeo-

logical sites in northwest Jordan[1].

During the first two seasons of excavation at Abila, work focused on surveys of the site. The coverage of the initial survey in 1980 was deemed to include a little over 20% of the entire site, working out from what was thought to be the city center producing a total of just over 33,000 sherds from Early Bronze through the Modern period. Somewhat surprisingly, of the total sherds that were collected nearly 95% were dated between the 4th and 8th centuries AD[2]. Excavation since that time has not yielded numbers quite so high for those periods of occupation, but nonetheless, these do appear to be the periods of densest occupation at the site. The intent of this initial survey was to locate areas of interest in what was thought to be the center of the city.

During the summer of 1982, a regional survey was conducted under the leadership of Michael Fuller that attempted to locate the site of Abila within the broader settlement patterns of the area. This survey laid out four transects extending 2.5km from the urban center of the site. Among the findings were several farmsteads, a wine press, animal pens, many tombs, various cisterns, several water tunnels, among many other indicators that there was a substantial "suburban" population surrounding Abila, especially during the Late Roman and Byzantine periods, with occupation in various areas stretching from Early Bronze down to the Ottoman period. From work done by Michael Fuller and more recently by Bernhard Lucke, population estimates for the site at its peak range from 10,000-15,000 people, based primarily on the size of the urban footprint, water supplies, and the excavated tombs[3].

After these initial surveys, excavation focused on the apex of the north and south talls, where it was clear that there was significant occupation. In time, excavation uncovered one large basilica on the north tall, two basilicas on the south tall, one more just east of the south tall, and then one more down by the Roman bridge east of the north tall. There is also what appears to be a Christian monastic complex in what we call Area B, that we are tentatively dating to the late seventh or early eighth century. (FIG. 1).

The work on the north tall, which was labled Area A began in 1982 and it soon became clear that the structure was a Byzantine basilica with significant earlier and later use. In 1994 a life sized statue of Diana/Artemis was found in the area, and so excavators assumed that the area was once home to a Roman temple. In addition, coins minted at Abila all of which date between the middle of the 2nd and the first quarter of the 3rd century AD commonly depict a large Roman temple at the site[4]. Most of the excavation of the basilica in Area A was done during the 1990s, but one final season was needed in 2006 to answer a few lingering questions – namely, our quest for some clear indication of Roman occupation. That season we excavated a few sealed loci beneath a limestone paved plaza just south of the basilica and encountered clean Late Roman pottery calls dating that plaza, at least, to the period in which we hypothesize there was a Roman temple[5].

Although several of the early seasons of excavation of the basilica on the north tall were directed by various archaeologists, most of the area was excavated by Dr. John Wineland.

1. The best recent study of the broader region, including Abila, is that of David Kennedy's *Gerasa and the Decapolis: A Virtual Island in Northwest Jordan*. London, Duckworth: 2007.

2. See especially W. H. Mare, D. W. Roller, C. J. Lenzen, A. McQuitty, J. J. Davis, M. J. Fuller, K. D. Smith, N. B. Fuller, W. W. Winter, and C. E. Rowe, "Abila Excavation: The Second Campaign at Abila of the Decapolis (1982). A Preliminary Report," *Near East Archaeological Society Bulletin;* New Series, Part I, 21 (1983):5-68; Part II, 22 (1983): 5-64; and pages 10-20 of John Wineland's, *Ancient Abila: An Archaeological History.* Oxford, Archaeopress: 2001.

3. Bernhard Lucke's work that includes a discussion of Michael Fuller's earlier research on the population estimates for ancient Abila can be found here: *Abila's Abandonment*. Anthology of Scientific Publications and Research Papers, RPR 14, Chair of Environmental Planning, BTU Cottbus, Cottbus, 2002.

4. See Wineland, Chp 6 for a discussion of this. For images of the coins, *see* F. de Saulcy, *Numismatique de la Terre Sainte,* (Paris: Rothschild1874), plate 16.

5. See Robert Smith's "Possible Evidence of Roman Emperor Worship at Abila" *Annual of the Department of Antiquities of Jordan* 54: 499-503; and David Chapman's "Roman Remains at Decapolis Abila: an Update on Twenty-Eight Years of Excavations." ARAM 23: 11-25.

1. Aerial Photograph of Abila of the Decapolis Provided by the Aerial Photographic Archive for Archaeology in the Middle East (APAAME).

The structure is a tri-apsidal basilica, with all three apses facing east, and measures 35 meters from the outer edge of the central threshold to the outside edge of the central, salient apse and 20 meters from the outside edges of the north-south walls. Excavation in 1992 focused on the western edge of the basilica and an atrium measuring 16 meters by 20 meters was uncovered, paved with the larger 3cm square tesserae commonly found in the atriums of the churches at Abila. Wineland proposes that the church continued in use until the massive earthquake that struck the region in the middle of the 8th century, after which it was used for domestic occupation into the early Abbasid period. Somewhat surprisingly, no dated inscriptions have been found in any of the five churches at Abila, and four of them, including the Area A church have no inscriptions relating to the church structure whatsoever. The only inscription found in Area A was what we call the "Abila stone," a limestone fragment with an inscription that mentions "Abila." Pierre-Louis Gatier notified has written recently of a discovery at Jarash of an inscription that bears significant similarities to our "Abila stone" such that, he suggests the author of the epigramme in the inscription at Jarash likely also authored that on our "Abila Stone"[6] The lack of datable inscriptions at the site has made sequencing the construction of the churches at Abila a very difficult task. As soon as funds are available, our plan is to construct a shelter over the Area A basilica and, to the extent we are able restore and reconstruct the *opus sectile* flooring.

The Area D church, located on the apex of the southern tall -often called Umm al-'Umud- was first excavated beginning in 1984. Initial squares located several capitals, a few with inscribed crosses, and numbers of tumbled columns. From the direction and lay of the columns, and from depressions in the floor surfaces uncovered in later seasons, the excavators concluded that the church likely suffered catastrophic damage during the mid-8th century earthquake. As seasons progressed this structure was determined to be a tri-apsidal church, with all the apses facing east. The length of the sanctuary from threshold to the outer edge of the central, inscribed apse is 38m, with a width of 20m, slightly larger than the Area A church. A narthex extends three meters to the

6. For this see Pierre-Louis Gatier and Jacques Seigne, "Un Exceptionnel Document D'Architecture a Gerasa (Jerash, Jordaine). *Syria* 92 (2015): 263-77, Abila stone inscription discussed on P. 273-276.

west of the western wall under a roof which was supported by four monumental columns, and an atrium extends 6 additional meters to the west. The flooring in the atrium is similar to that in the other churches at Abila, consisting of the larger 3cm square primarily white tesserae. Along the south side of the structure a number of pastophoria were located and excavated. On the outer edge of the northwest of the church the baptistery was found. The flooring of both aisles and the nave is *opus sectile*. The narthex, pastophoria, and the baptistery all have mosaic flooring, some of which contains designs of baskets of fruit, geometric designs, and floral motifs. As in the Area A church, excavators determined that after the collapse of the structure in the mid 8th century, it was used for domestic occupation into the Abbasid period. Numbers of whole objects dating to the mid eighth through the ninth centuries were found in the pastophoria, primarily storage jars. Work in this church was completed in 2008. As with the Area A church, our plan is to erect a shelter over the structure and then restore and reconstruct the floor surfaces, which in this structure is primarily *opus sectile* in the nave, and then do more work conserving the mosaic flooring in the pastophoria (FIG. 2).

During the 1992 season, while excavating along the western edge of the atrium of the Area D church, what appeared to be the top of a monumental staircase was visible from the surface. Upon further exploration excavators landed upon what appeared to be part of an apse, and no evidence of a staircase was found. So, work there was halted until the 1994 season when excavation resumed under the label of Area DD.

Work in DD uncovered a basilical structure measuring 19.5 meters from the threshold to the edge of the central, inscribed apse and 15 meters from the edges of the north and south aisles. This is the smallest of the church structures at Abila. The north and south aisles were covered in a carpet mosaic flooring, while the nave was paved with sheets of marble 1m by 60 cm and 1 cm thick, large portions of which remained *in situ*. The structure is tri-apsidal but curiously, unlike all the other tri-apsidal churches at Abila where the nave apse is somewhat larger than the other two, in this church all three apses are of identical size. I am not aware of any other church structure in Jordan where the three apses are identical, and in Anne Michel's corpus of trans-Jordanian churches and several other sources, there are no parallels[7]. I welcome any

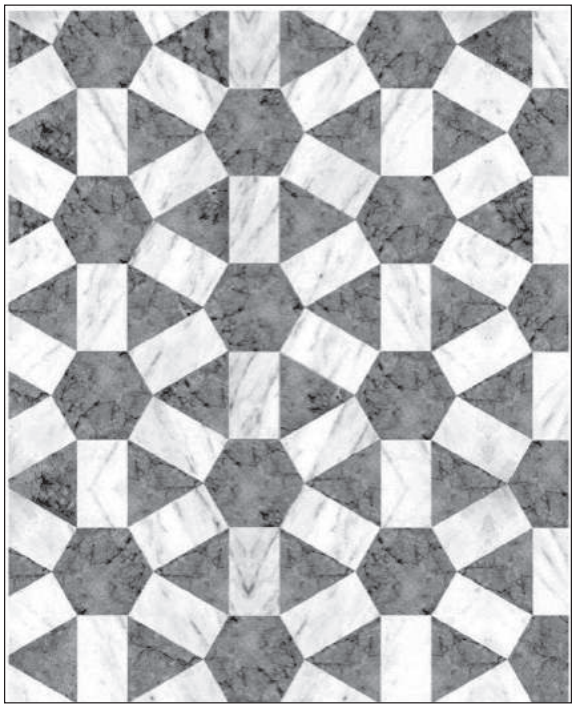
2. Aerial Photograph of the South Tall, Depicting the Area D and Area DD Basilicas. Photo Courtesy of APAAME.

7. See Anne Michel's Les Églises d'Époques Byzantine et Umayyade de Jordainie. Bibliotheque de l'Antiquité Tardive. Brepols: Turnhout, 2001.

suggestions about the implications of this. The only distinguishing feature of the central apse is that it is raised approximately 30cm with steps leading up only from the nave. Curiously, several stylobates were uncovered *in situ*, but there were no capitals, columns, or bases. And so we are assuming that this structure probably fell into disuse and was robbed out to build the basilica in Area D, described previously. We also found an empty sarcophagus that was placed across the eastern end of the North aisle that had been used for mixing plaster, again, probably for use in the construction of the Area D church. As with the two previously described churches, this structure also had significant domestic occupation during the Umayyad and Abbasid periods. We located both an upper and nether grindstone, numbers of ash pits, several storage containers, as well as significant pottery dating to the Umayyad period, and even more dating to the Abbasid period, including some whole Abbasid period objects, dating into the 9th and 10th centuries. Structural modifications to the north aisle and nave, especially, with walls bisecting both gave evidence of the domestic use of the structure after it had ceased being used as a church. Significant also was the finding of numbers of whole glass lamps and a bronze ewer with a handle in the shape of a panther/leopard. They were sitting on 15cm of soil above the church floor, and so our assumption is that they were from the church in Area D and were for some reason, stashed in the ruins of the Area DD church possibly at the mid 8th century earthquake. Work in the Area DD church was completed in 2006.

Due east of the south tall, another church structure was located in the year 2000 and was labeled Area G. Work there continues until today and we expect that at least one or two more seasons of excavation will be needed to complete this Area. This structure is Abila's only single apsed church. The structure measures 29.5m from the west threshold to the outer edge of the salient apse, and 19.5m from the north to the south walls. A narthex of 4.5m was excavated during the 2006 and 2008 seasons. The pastophoria along the south of the church are still under excavation and so its dimensions are not clear yet. The nave of this church, like that of our Area DD church was paved with marble. The north and the south aisles were paved with *opus sectile*, significant amounts of which remained *in situ* (FIG. 3). Within the apse we located a sarcophagus which although had all of the sealing stones on the top in place when it was uncovered, was empty. A well preserved ambo was situated along the southern edge of the nave, five meters west of the altar screen. Regrettably, in just a few months after our probe under the ambo was completed and nothing was found, looters came and tore the whole structure to pieces. The eastern end of the south aisle ends in a chancel screen which is situated two meters from a flat wall. There was no evidence of any paint on the fragments of plaster that remained on the wall.

Excavation during the 2012 and 2014 seasons focused on general clean-up of the area,



3. Reconstruction of the Pattern of the *Opus Sectile* Flooring in the Area G Church Courtesy of Mr. Ronnie Rama, Abilene Christian University.

including the removal of numbers of balks, and then the excavation of the attached rooms on the south side of the structure. Three squares were opened and we were able to trace two of these down to a floor surface. In the process, numbers of secondary walls were exposed – drawn, photographed, and removed – which give evidence of some level of occupation, probably domestic, after the structure ceased functioning as a church. A probe was also taken in the atrium revealing a nice *opus sectile* floor surface. Our 2016 season will continue to expose the rooms on the south side and the atrium.

A final area of excavation that I will discuss is the basilica in what we call Area E. This area was first located and excavated in 1990, and excavation has continued every season down to the present[8]. We hope that with one or two more seasons, we will be able to complete our work here.

The church in Area E is tri-apsidal, though unlike the other churches at Abila, this one has the north and south apses facing north and south respectively – in a clover leaf, or cruciform shape. The structure measures 25.4m from the threshold to the outer edge of the central apse and 26.6m from the edges of the north and south walls of the sanctuary, being wider than it is long with four aisles and then the nave. To the west, a narthex measuring 5.5m extends to the back retaining wall that runs up against the side of the northern tall. Two cisterns were located in the narthex, one on the north and the other on the south sides. And on the west wall we uncovered what appears to be a "seat" built into the wall. Along the south of the structure pastophoria were excavated. Numbers of crosses were carved into walls and columns. And interestingly, along the south wall three niches were located. Two of them had been filled with plaster in antiquity leaving only one open. In informal conversations with Bethany Walker, Gideon Avni and a few other scholars and they all confirm my suspicions that it niche is likely a mihrab and that possibly the room was converted into a *musalla* during the early Islamic period[9]. (FIG. 4) A sample of the plaster from the central niche which contained three charred olive pits has been removed and at the time of this writing is being tested for a more secure date. In the SW corner of the structure a chapel was located. The floor was paved with black and white checkerboard squares and there was an altar screen set up in the middle of the room adjacent to a small column. (FIG. 5) Throughout the church, most of the floor surfaces were paved in sheets of marble, and on many of the standing walls there were hooks for hanging marble facing also. A few, but not many ashlars were uncovered with the remains of painted plaster on them. During the 2010 season of excavation, irregularities observed on the outside of the east wall of the structure led

4. Image of the south wall of the Area E church, taken by Cheryl Eaton. The image depicts three niches, two of which were filled in at some point in antiquity.

8. For a description of the early stages of the excavation of this structure *see* Clarence Menninga, "The Unique Church at Abila of the Decapolis," *Near Eastern Archaeology* 67 (2004): 40-49; and David W. Chapman and Robert W. Smith, "Continuity and Variation in Byzantine Church Architecture at Abila: Evidence from the 2006 Excavations" Pp. in Fawwaz al-Khraysheh (ed.), *Studies in the History and Archaeology of Jordan Vol. X*.: 2009: 525-533.

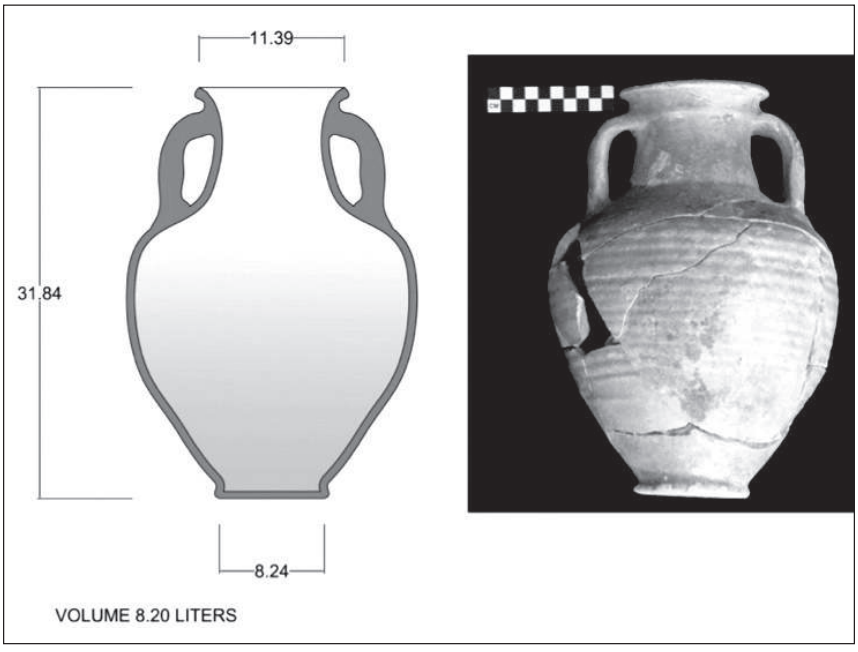
9. Though there are not many examples of churches that functioned simultaneously as churches and as places for Muslim prayer a few examples from the southern Levant and Palestine do exist. For a discussion see, David Vila's, "The Byzantine-Islamic Transition at Abila of the Decapolis." *ARAM* of the Oriental Institute at Oxford University, 28.1(2016): 157-66; and the relevant bibliography there.

5. Image of the chapel in the SE corner of the Area E church, taken by Cheryl Eaton.

our lead excavator in this area to hypothesize about the phasing of the structure, and so a probe was taken three meters on the opposite side of that wall, in the interior of the church. That probe landed on a paved mosaic surface and so squares were opened in the north and south aisles that revealed what we are fairly certain is an earlier church located one meter below the one being excavated. Crosses in the middle of the "aisles" as well as an altar screen with a cross in front of it in the north "aisle" seem to confirm such a view. No more work was done on this lower church because of a desire not to disturb the "upper" church. Various things have led us to conclude that the upper church was destroyed in the mid-eighth century earthquake. The lay of columns as they were being excavated, indentations in the floor surfaces from ashlars that fell from a significant height, as well as numbers of whole objects, all with dates consistent with the mid-8th century, seem to confirm that this (FIG. 6).

Work during 2014 season of excavation focused on the northern side of the structure and we will continue there during the 2016 excavation season. Eventually, these squares revealed nicely paved mosaic surfaces. At present we are not certain what the function of these rooms might have been. Although it is more common to find pastophoria along the south sides of churches in the Transjordan, there are some examples of churches where they are on the north side of the structure, but excavation is still too early on to be able to discern the exact function of these rooms.

A final project in Area E last season was an exploration of a number of inscriptions, both Greek and Arabic that are to be found on various surfaces in the area. Andrea Zerbini and Firas Bqain are working on the Greek and Arabic inscriptions respectively. Publication of the Greek inscriptions should be completed by the



6. Reconstructed green glazed pot from the mid 8th century found crushed under likely earthquake destruction.

end of this year, with the Arabic inscriptions following shortly thereafter.

In conclusion, the churches at Abila provide important comparative material for those working in the Byzantine and early Islamic periods in Jordan and beyond. I trust that the impending publication of our findings will be an aid to better understanding this important period in the history of northwest Jordan and the region more broadly.

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New Archaeological Discoveries in the Basilica of the Memorial of Moses, Mount Nebo

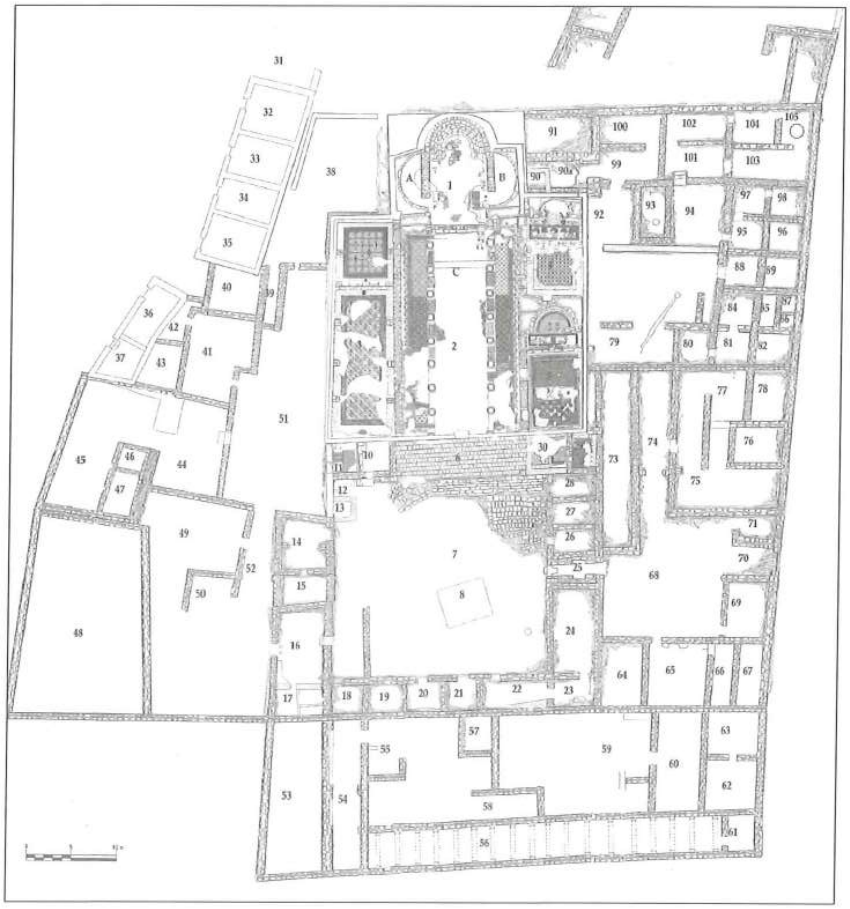
Introduction

The Memorial of Moses on Mount Nebo, in the Roman province of *Arabia*, in the territory of modern Jordan, is a classical example of a monastic complex related to the shrine of a biblical figure. In this site the devotees used to worship the memory of the place in which, according to Biblical tradition, the "Prophet Moses" died after having seen the Promised Land (Sir. 45:1). The word Ṣiyāgha, used to call the western spur of Mount Nebo, means in Aramaic "monastery, community of monks" (Saller 1941: 115-117). This name is indeed related the ruins of a large Byzantine monastery (almost 6640 sq.) established in the fifth century AD. and articulated in several rooms surrounding the central basilica (FIG. 1). In addition to the main coenobium, a colony of ascetic monks have dwelled in the caves of the mountain located in the surrounding valleys (Hamarneh 2014). Although most of these hermitages were beyond the boundary of the monastery, the abbot of Ṣiyāgha had jurisdiction over them (Hamarneh 2012: 279). The life of the monastic community continued also during the Islamic rule, most probably up to the end of the ninth century.

After having acquired the site thanks to the concern of the Emir Abdallah Ibn al-Husayn I, the Custody of the Holy Land began the first archaeological expeditions on July 14/ 1933 under the direction of Fr. Sylvester Saller (Saller 1941: 17). The excavations then continued with Fr. Virgilio Corbo (1963), Fr. Michele Piccirillo (1976) and Carmelo Pappalardo (2008)[1]. Since 2012, the Studium Biblicum Franciscanum, under the direction of Fr. Eugenio Alliata assisted by the author, have conducted some archaeological investigations in connection with the re-roofing of the ruins of the church. The geological instability of the mountain led indeed to replace the old shelter with a new one (Marino 2004: 47-64).

The aim of this article is to provide a general presentation of the excavations conducted between 2012 and 2014, with a focus on the most important discoveries and their interpretation. Due to the limited space given for this paper, the analytic study of the archaeological record will be published in a forthcoming monograph of the auther (Bianchi dissertation forthcoming).

1. For the history of research, see Piccirillo and Alliata 1998: 13-52. Moreover see the article by Franco Sciorilli in this volume.



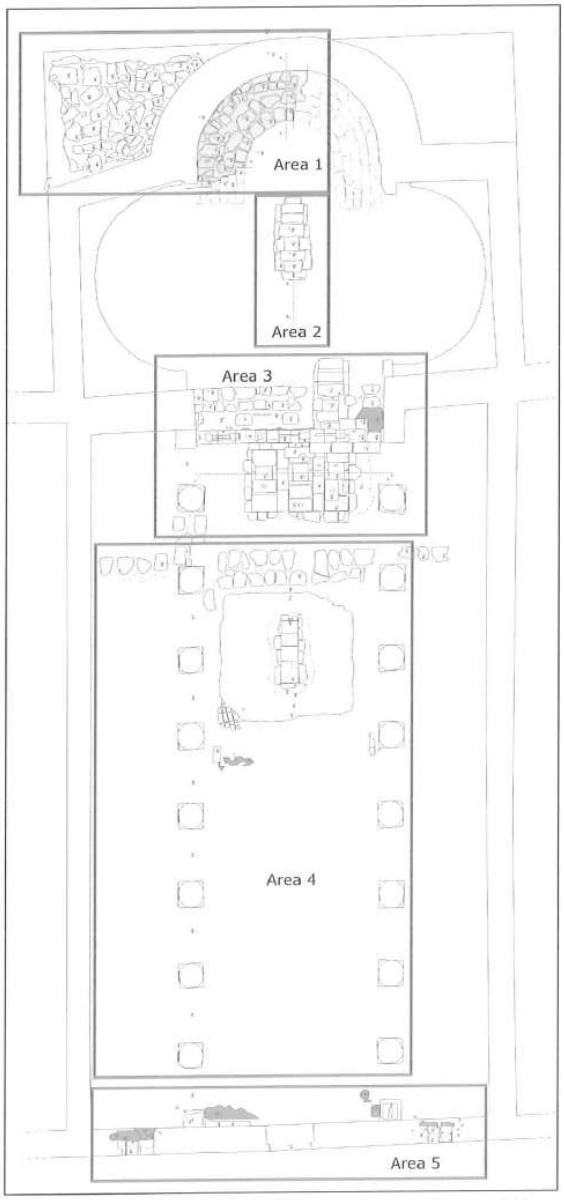
1. Plan of the monastic complex of the Memorial of Moses (after Marino 2004: 96).

The Excavation

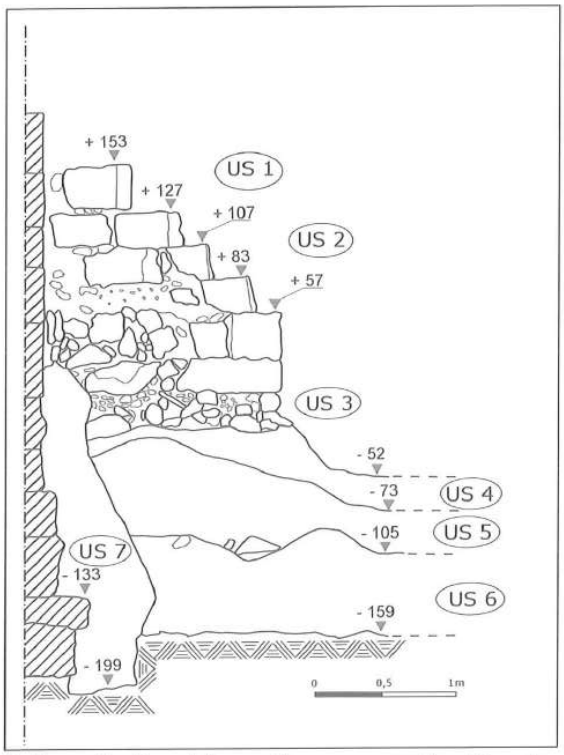
The surveys were conducted in five areas of the basilica which were never excavated by Saller, Corbo and Piccirillo (Saller 1941; Corbo 1970; Piccirillo and Alliata 1998). The fieldwork was addressed particularly to the following areas: the section under the *synthronon* in the apse; the centre of the presbytery; the entrance of the *trichora* cell; the main nave and the northern area between the columns, and finally in the area beneath the walls of the façade (FIG. 2).

Within the above mentioned sectors, important discoveries were detected under the *synthronon* (FIGS. 3, 4). In order to preserve the stability of the clergy's sitting, Corbo avoided the demolition of the structure, but he recorded one layer of black soil with Roman pottery in the cross section (Corbo 1970: 273-281). After removing the upper rows of the northern half of the *synthronon*, a layer full of the so-called *Red-Painted Ware* dated to the late Umayyad period was identified (FIG. 5). In the same context, the recovery of many organic finds, such as pieces of coals, plant seeds, animal bones with butcher marks have provided a valuable evidence to define the diet of the monastic sanctuary. Furthermore, many fragments of fine-grained white Parian marble decorated with stylized vine scroll and lily leaves were recovered. Two of them, probably used for the balustrade of the ambo, bear some engraved Greek letters filled with a dark mixture containing traces of gold leaf[2]. Finally, at the bottom of the layer, a base of a column made of the local bituminous schist

2. The two marble fragments recovered in the excavation combine with other pieces found by Saller. On this topic, see Acconci 1998: 525-527, n. 150; Di Segni 1998: 435, n. 17 For the new epigraphic data, see Bianchi (forthcoming).



2. The areas of the basilica excavated from June 2012 to September 2014(drawing by the author).



3. Cross Section of the *synthronon* excavation (drawing by the author).

4. Orthophoto of the *synthronon* excavation (drawing by the author).

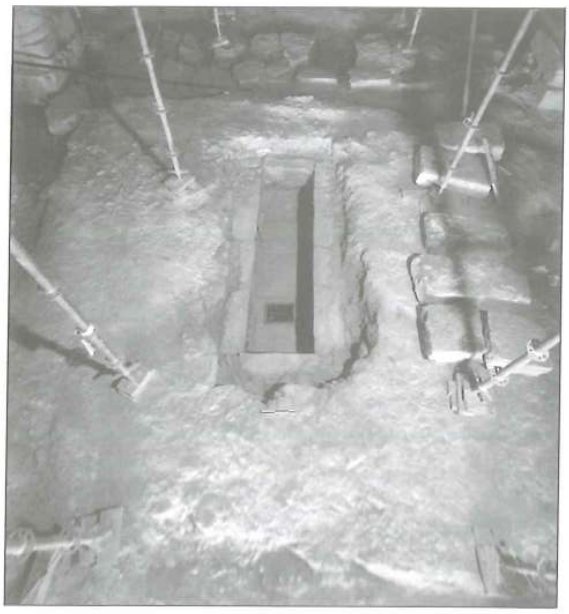
(called in Arabic *ḥajar "neby mûsa"*) was found. Furthermore, few coins discovered in the layers, were analyzed by Bruno Callegher[3]. These numismatic records show an octagonal copper flan, dating back to the Umayyad or Abbasid period and three coins dated between 425 and 435 AD. found in the lower layer of the *synthronon* (US3) (FIG. 3).

After the complete demolition of the stairs, three underground layers were identified. The upper US4, with yellowish soil, held sherds of byzantine pottery and one coin of Valentinian II (383-392 AD). The layer US5, the same outlined by Corbo, was the richest archaeologically. Many pottery sherds dating back to the late fifth and early sixth century, colored *tessarae*, small fragments of plaster, glassy fragments and seeds were found. The oldest pottery sherds are

3. All the coins mentioned in this article were studied by Bruno Callegher. On this topic, see Callegher (forthcoming).

5. Pottery sherds recovered in the upper layers of the *Synthronon* excavation (photo by the author).

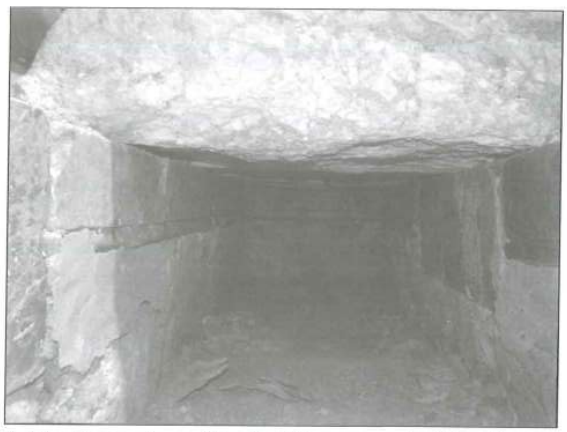
6. The tomb at the moment of the discovery, still covered by stones (photo by the author).



7. Areal view of the squared bedrock with the tomb (photo by the author).

dated back to the fourth century AD. and they came out in the lowest layer US6. Moreover, the cross section of the excavation showed the fill of the cut carried out after the rebuilding of the apse (US7) (FIG. 3). The pottery sherds found inside this layer were heterogeneous, both morphologically and chronologically, and they dated to a chronological range between the fifth and seventh century AD. These elements suggest that the rebuilding of the foundations of the apse might have took place at the end of the sixth century, while the restoration of the upper part of the of *synthronon* might be assigned to the end of the Umayyad period. Pottery from the same period was also found in the external counter, at the level of the last two *synthronon* rows.

At this point it is important to examine the excavation of the nave. The removal of the modern concrete floor allowed the identification of the preparatory layer of the oldest mosaic of the nave. This layer, which ended directly over the bedrock of the mountain, showed many production scraps of *tesserae* and four coins. Among the latter, the earliest was dated to the time of Arcadio/Honorius/Theodosius (406-408 AD) and another, more eroded, could be dated to the reign of Theodosius II (408-423 AD). Under this layer and along the central axis of the nave, five stones covered a grave place (FIG. 6). The burial was set at the centre of a squared shape portion of the bedrock, exactly on the highest



8. The inner view of tomb at the moment of the discovery (photo by the author).

peak of the spur of Ṣiyāgha (FIG. 7). The interior of the tomb was completely empty without any organic remains or burial goods (FIG. 8). These elements demonstrate that the burial was closed immediately after its construction. The structure was built with a lower row of local stone covered with red plaster and architectural reused fragments of alabaster marble, while on the bottom, five pinkish local stones were laid (FIG. 9). At the southwest corner of the tomb a layer with a molded fragment in alabaster and some pottery sherds dated back to first two centuries of Christian Era have been found.

During the excavation a review of the inner masonry of the western façade of the basilica was carried out. After removing the concrete floor, two red marks, painted on the masonry in the center of the north and south aisles, were found. In addition, two portions of mosaic with white *tasserae* at the floor level were recognized.

Due to a partial modern reconstruction of the western façade by Corbo, the two central sections of the wall were demolished. This allowed to identify the ancient access thresholds to the aisles; both the facilities had a water drainage channel and the recesses for the door.

Interpretation of the Excavation

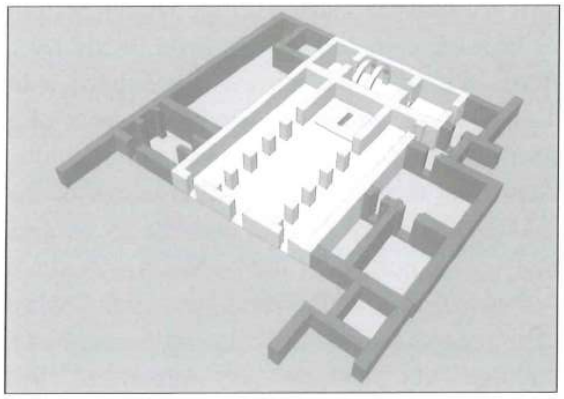
The Construction of the First Basilica

The analysis of the last archaeological data and the review of the previous interpretations support a new hypothesis about the oldest worship building arose on Mount Nebo. The first crucial issue is related to the understanding of the space in front of the tri-conch presbytery. According to Saller's suggestions, this cell was the oldest shrine erected on the site and the area in front of it was an open courtyard with a mosaic floor (Saller 1941: 23-44). However, the excavation conducted by Corbo and later by Piccirillo and Alliata have determined that some walls of the church were built before the *thricora* cell (Alliata and Bianchi 1998: 151-154). In addition, the shape of the area in front of the cell, surrounded by regular masonry and paved with mosaics, seemed not to characterize an outdoor courtyard.

Considering all the architectural evidence, it is thus possible to assume that the first church probably showed a rectangular basilical plane divided into three naves by two series of pillars (FIG. 10). Many parallels in Transjordan support this hypothesis (Michel 2001: 18-33).

The perimetral masonries related to this phase are located on the northern and western sides of the church, under the walls of the main nave which are visible today. The north wall is thus connected perpendicularly to the eastern wall and continues on the south side with the façade characterized by three doors. As aforementioned, the small portions of the mosaic floor found in the nave do not indicate epigraphically when they were laid. However,

9. Particular of the reused marbles of the empty tomb (photo by the author).



10. 3D reconstruction of the first architectural phase of the basilica (second half of 5th century AD) (drawing by the author).

the pottery sherds and coins recovered in the preparatory layer of this mosaic provide a *terminus post quem* between the 408 and the 423 AD which suggest that the mosaic floor, and so the first church, could be dated to the second half of the fifth century AD.

The excavation of the three rooms behind the east wall of the church allowed to recover many pottery sherds of the early Byzantine period and one coin dated back between 383 and 425 AD This data suggest that this sector was built after the second half of the fifth century AD, most probably at the time of the first architectonical phase of the basilica. The three tombs located in the central room were covered with a white mosaic floor, which is of the same type and at the level to those found by Saller and Corbo in the northern and southern rooms (Alliata - Bianchi 1998: 187, nn. 43,50,51; Saller 1941: 50; Corbo 1970: 278). It is noteworthy to mention that the quality of the mosaic of the southern room, decorated with a cross in black and white cubes, well agrees with this archaeological record (Piccirillo 1998: 268). The central room would probably be covered with an arched roof: two blocks of the arches foundations have been identified in the excavation.

Similarly, the empty tomb was probably built in this first phase because it was found sealed by the preparatory layer of the nave mosaic. In addition, looking at the topography of this burial place, it is possible to observe how the tomb is located on the higher portion of bedrock compared to the level of the nave floor. Moreover, the grave is surrounded with a shallow cut, which suggest the presence of a frontal step and two lateral walls in antiquity. According to the architectural typology of the "*sanctuaire carré*"[4], it is possible to assume that square portion of the bedroom with tomb was actually under the presbytery of the oldest church provided with two lateral *pastophoria*. Another key element in support of this hypothesis is given by the written sources. A reference in the *Life of Peter the Iberian*, wrote by John Rufus, recalls the presence of a special altar above the grave in the memory of the "Prophet Moses" (Peter the Iberian 2008: 177-179).

The origin of the alabaster marbles, reused in the tomb, remains an open question at this state of research. The three angular bases with fine moulding, thin slabs and three fragments of frame were probably part of the external or interior façade of a small building. If we assume a specific production related to the first memorial on Mount Nebo, the marbles might have adorned the oldest cenotaph built in the memory of Moses. In connection with this hypothesis, it is crucial to mention the description of the pulpit saw by Egeria, who visited Nebo around 384 AD.

«We arrived, then, at the summit of the mountain, where there is now a church of no great size, on the very top of mount Nebo. Inside the church, in the place where the pulpit is, I saw a little raised place, containing about as much space as tombs usually contain»[5].

According to the textual source, the sentence *a church of no great size* (*ecclesia non grandis*) may properly suggest a modest building. Concerning to the location of the burial of the Prophet, the monks showed to Egeria a generic point inside the church, without providing more detailed information (*Itinerarium Egeriae*, XII, 3). Unfortunately, at this stage of the study, no stratigraphic evidence dates back to the time of Egeria. The oldest structures discovered in the site were indeed built not prior to 408/423 AD, with a gap of more than thirty years after Egeria's visit. However, the topography of the squared area around the empty tomb might suggest that the *pulpitus* described by the pilgrim was located in this place.

It is worth to stress that no violation has occurred previously in the grave. Although

4. The architectural typology of the *sanctuaire carré* was widespread in the Christian East between the middle of the fifth and the early seventh century AD. On this topic, see Weber 2012: 207-254.

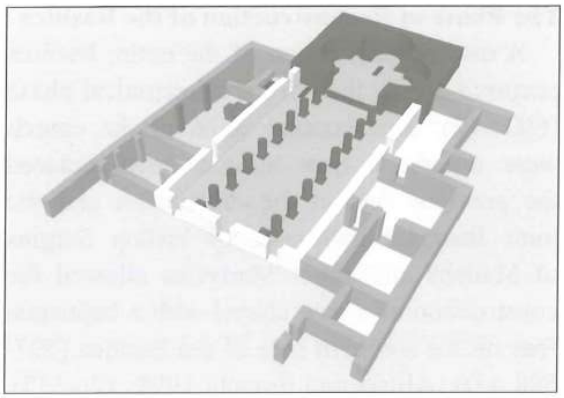
5. *Itinerarium Egeriae*, XII,1.

the absence of human bones could suggest a later removal, the shallow type of the tomb with no traces of liquid decomposition or soil, contrast with this hypothesis. This evidence may support the identification of the tomb as a cenotaph, probably built by Christian monks. Therefore, trough the creation of this memory, the Christian devotees could go on a pilgrimage to a specific site related to the worship of the prophet Moses but without any tangible remains. In addition, the detailed description of John Rufus, who mentions the oral tradition related to a vision of the prophet by a local shepherd, adds a bold rhetorical exercise to support the precise identification of the worshipped tomb (Bitton-Ashkelony and Kofsky 2006: 64-65; Satran 1995: 97-105). This evidence confirm that the cenotaph on Mount Nebo was a Christian prerogative since both the Torah and the rabbinic tradition considered unknown the burial place of Moses (Bitton-Ashkelony and Kofsky 2006: 62-81; Tromp 1993: 115-123; Manns 1998: 65-69).

In this perspective, the monastic shrine of the memorial of Moses is part of a network of Jordanian *coenobia* associated with the worship of the biblical figure[6] (Hamarneh 2012: 277-279).

The Phase of Partial Reconstruction with the Addition of the Tri-Conch

During the second architectonical phase the church underwent a radical transformation (FIG. 11). Firstly, a new mosaic floor in the nave replaced the previous one, probably because of the replacement of pillars with columns resting on independent foundations. The mosaic portions and the sherds of pottery recovered at the base of the columns confirm clearly this hypothesis. Furthermore, the cenotaph was completely obliterated; the three rooms behind the chancel were demolished to lengthen the three aisles at the end of which a new tri-apsidal presbytery was added. The slight divergence of



11. 3D reconstruction of the second architectural phase of the basilica (end of 5th - beginning of 6th century AD) (drawing by the author).

the tri-conch presbytery with the masonry of the three apses, which rely upon the foundations of the nave, suggest indeed a later construction. The choice to build a tri-conch presbytery is related probably with the funerary function of this architecture, as the parallels with the Egyptian churches may suggest (Grossmann 1999: 216-236; Grossman 2007: 103-136).

The pottery and coins recovered in the excavation of the presbytery date its construction to the end of the fifth or the beginning of the sixth century AD, probably at the time of abbot Elijah and the bishop Elijah of Madaba. The mosaic floor, which seals the two graves located under the presbytery and leans on the first row of the *synthronon*, confirms this chronological range. Moreover, according to Piccirillo the iconography of this mosaic demonstrate that it was laid before the flowering of the Justinian mosaic school of Madaba. (Piccirillo 1998: 270-272; Piccirillo 2000: 139-190).

Finally, a new *diakonikon* with a baptismal font was erected on the northern side of the aisle, one-meter lower than the nave (Alliata and Bianchi 1998: 168-171). The floor was covered with an exquisite mosaic, which was funded in 530 AD by three σχολαστικοί (lawyers), members of important families of the imperial administration (Piccirillo 1998: 273-287).

6. A deeper analysis of this issue is part of the unpublished doctoral dissertation of the author. See Bianchi (forthcoming).

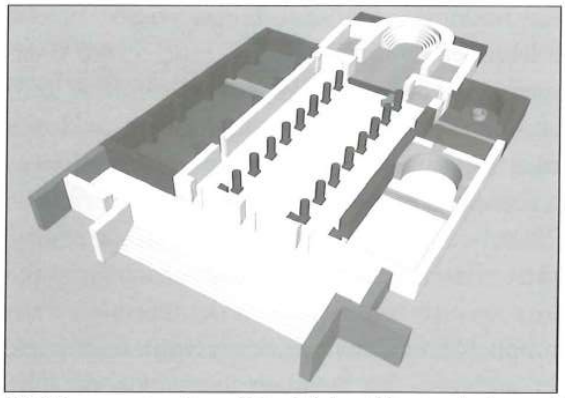
The Phase of Reconstruction of the Basilica

A new reconstruction of the entire basilica occurred during the third architectonical phase (FIG. 12). The external walls of the church were rebuilt, a new mosaic floor replaced the previous one in the *diakonikon* and the joint financial patronage of bishop Sergius of Madaba and abbot Martyrios allowed the construction of a new chapel with a baptismal font on the southern side of the basilica (597-598 AD) (Alliata and Bianchi 1998: 176-177). Chronologically, these architectural activities are dated back to late sixth century AD due to the mosaic Greek inscriptions and to the pottery sherds recovered under the preparation layer of the pavement (Piccirillo 1998: 296-300).

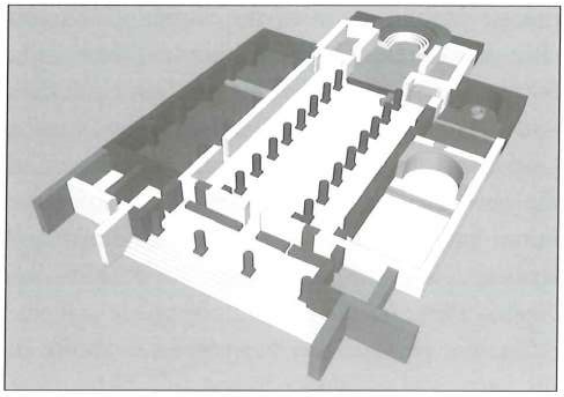
At the same time, the external wall of presbytery were rebuilt. The heterogeneity of the stone row of the apse and the archaeological records from the deep foundation cut show that a complete reconstruction occurred indeed at the end of the sixth century[7]. Finally, in the first decade of the seventh century, the bishop Leontius of Madaba and abbots Martyrios and Theodoros promoted the construction of a new chapel on the southern side of the church for the worship of the Virgin Mary (Theotokos) (Alliata and Bianchi 1998: 178-179; Piccirillo 300-304).

The Umayyad Phase

During the last architectonical phase, the two upper rows of *synthronon* and the masonry of the apse in the presbytery were restored (FIG. 13). The large amount of pottery and marbles with sharp fractures recovered in the excavation, as well as the disorderly arrangement of stones in the external apse buttress suggest that a brutal destruction occurred in the site. This catastrophic event is related probably to the earthquake of 749 AD. (Tsafrir 2014: 111-120) and this date might be the *terminus post quem* for the reconstruction of the apse. In fact, the morphology of this structure may have been affected by the geological instability of the northern slope. The second half of the eight century well agrees with the chronology of the pottery recovered beneath the upper rows of *synthronon*. Most of the sherds date indeed to the late Umayyad period, few to the Abbasid era. At the same time the two lateral doors of the façade have been closed.



12. 3D reconstruction of the third architectural phase of the basilica (end 6th century AD) (drawing by the author).



13. 3D reconstruction of the fourth architectural phase of the basilica (half of the eighth, after the earthquake in 749 AD) (drawing by the author).

Conclusion

In summary, the last excavation have provided new elements related to the architectonical evolution of the basilica of the Memorial of Moses on Mount Nebo. A crucial discovery was the identification of the Christian shrine that can be probably identified with that of the "Prophet Moses". This evidence allows to include the

7. For the architectonical survey of the basilica masonries and their state of conservation, see Marino 2004: 47-57.

coenobium of Mount Nebo within the network of the monasteries related to the worship of the biblical figures. Moreover, the review of the old data, and the analysis of the new archaeological record suggest new hypotheses on the oldest building erected on the mountain.

The exponential growth of the pilgrimage during the Byzantine period contributed to the richness and the fame of this monastery. The donation of the devotees, the bishops and the lay people have allowed indeed the expansions and decoration of the church for almost three centuries. The new Islamic rule does not seem to have affected the monastic privileges and the financial availability of the community. Archaeological data showed that even after a traumatic event, probably the earthquake of 749 AD, the monks were able to implement an important restoration of the basilica.

We hope that further analysis of unexcavated areas of the monastery and a deeper study of the Nebo region will allow us to get a clearer picture of the shape and functions of the sanctuary of Moses.

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Sites after Excavation: National Parks and Public Education

The main tasks of an archaeologist is a proper excavation of his site and finally the publication of his results. But didactic presentations of sites are helpful for future generations to make knowledge accessible to many visitors.

In the following paper I would like to give an example of an old excavation, done by my predecessor Dr. Ute Wagner-Lux in the 70s in al-Quds under the auspices of the Department of Antiquities of Jordan. The excavation became through the time inaccessible und dangerous. Therefore our institute established there from 2009 to 2012 an archaeological park. It is since then a helpful institution to give locals and international tourists access to historical knowledge. During every year we count more than 30.000 paying visitors.

1. The Muristan from the south, in the background the Church of the Holy Sepulchre, 1861.

This paper explains the research history and the results of the archaeological site itself (chapter 1). After that it presents the text and some pictures of the online presentation of the archaeological park itself (chapter 2). In the final part there will be added a short inside into two youth books just around the excavated site.

Excavations beneath the Church of the Redeemer (see FIG. 10)

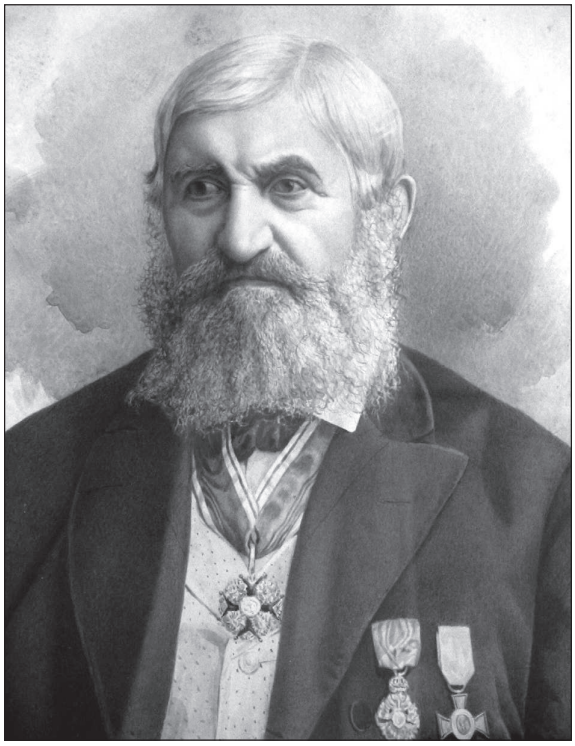
On a sunny day in October 1898, a tense quiet lay over al-Quds. Once again, the city was witness to an historical event; this time the German Protestants were celebrating the anniversary of the Reformation, and Kaiser Wilhelm II had come especially from Germany to inaugurate their magnificent new house of worship in al-Quds – the Church of the Redeemer. (FIG. 2). Its narrow steeple towered above the venerable edifice of the Church of the Holy Sepulchr, the old centre of Christianity in al-Quds. The buildings are almost right next to each other. All Christian denominations wanted

2. Handover of keys at the portal of the Church of the Redeemer, 1898.

3. East-west wall under the Church of the Redeemer in 1970, looking east.

to be as close as possible to the place where Jesus was crucified and buried – where he is said to have risen on Easter morning.

This had, however, been a subject of fierce debate among Catholics and Protestants in the preceding decades. While the Catholics trusted their received wisdom that Golgotha, the site of Jesus' execution, was just under the roof of the Church of the Holy Sepulchre in the Old City, the Protestants doubted this. According to contemporary Roman and Jewish sources, they said, the site of the crucifixion must have been



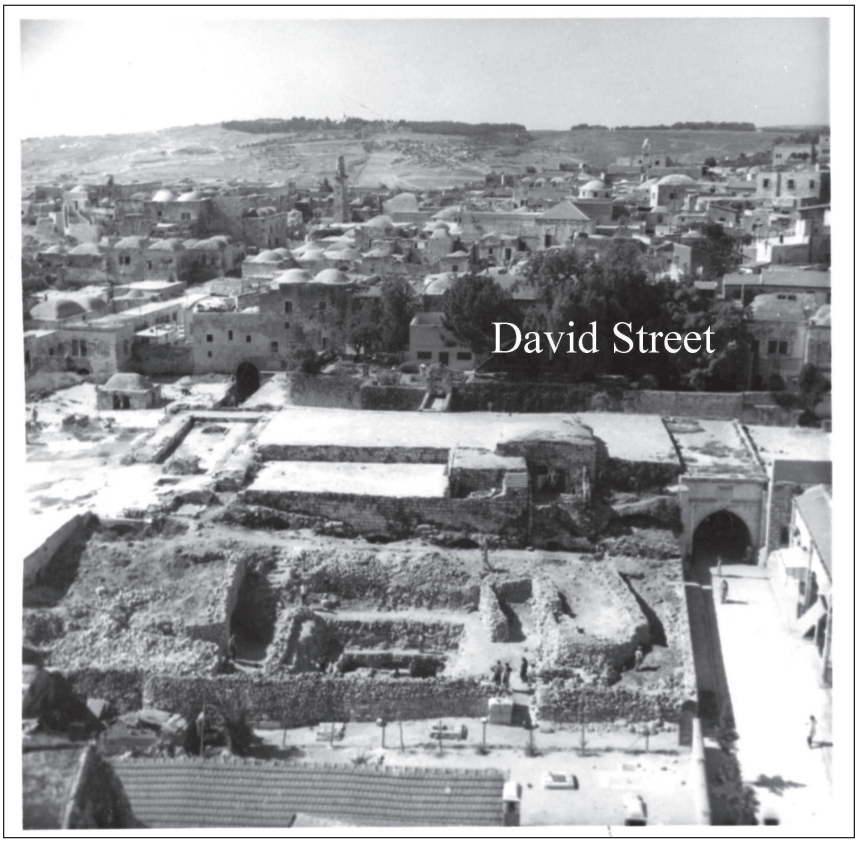
4. Conrad Schick.

outside the city, and they conjectured a certain site north of the city walls, the Garden Tomb (S. Ben-Arieh 1983: 139). So in order to reconcile the argument, it was important to find out where exactly the city walls ran in Jesus' time. While digging the foundations for the new church, the workmen made a sensational find (FIG. 3): a wall that the French Abél and German scholars identified as the Roman city wall that dated to Herods time, and which the Jewish historian Flavius Josephus had written about – the so called "Second Wall". This result is closely connected with the name of Conrad Schick – the most important scholar of the archaeology of al-Quds at the time. Conrad Schick and a new science: archaeology proclaimed since than: (FIG. 4) the site of the Church of the Holy Sepulchre was indeed outside the Roman city walls in the early 1st century, so the location of the Golgotha seemed correct, and the Protestants could inaugurate their new church in the knowledge that its foundation stone lay on the ancient city wall of Herods time. As a result, Conrad Schick claimed in 1898: "Because the

church is inside, but the crucifixion site and grave outside, the modern city, there have often been doubts as to the accuracy of the location, and a great deal has been written about it. Without wanting to go into the controversy in any detail here, it is worth noting that the results of the latest investigation seem to diminish the doubt as to the correctness of the location of the Church of the Holy Sepulchre" (Schick 1902: 5). Schick's results lasted until the 20th century.

Kathleen Kenyons Excavations in the Muristan (FIG. 5)

Sometimes chance intervenes. The test trenches dug by Kathleen Kenyon in the 1960s next to the nearby Martin Luther School show a completely different archaeological situation. "The only open area in the neighbourhood of the Church of the Holy Sepulchre is the site shown here ... some 150 metres to the south. ... The archway on the right of the view leads through into David Street. The trees beyond this archway, on the south side of David Street mark approximately the line of Josephus' 'old' north wall, which is believed to run from the Citadel of the Temple platform on approximately the line of David Street. The line that is suggested for the north wall at the time of the Crucifixion by the excavation of this site would enter this view on the extreme left edge, where the flat white roofs cut the margin of the photograph. This would therefore be the position of the Gate Genneth to which Josephus said the second north wall ran." (Kenyon 1974: 70). "As can be seen... the area available for excavation... was severely restricted (FIG. 6). As excavation was carried on down, the area was still further restricted by the necessity of leaving access staircases. As a result the area cleared to bedrock was only, 7 metres by 7 metres. ...(The material) was a fill inserted when the city was rebuilt as Aelia Capitolina AD 135. Only at the very base was there a change, with a seventh century BC fill overlying the quarried bedrock... There is therefore a very strong presumption that this area was outside the walls at that date, and



5. Kathleen Kenyon, excavation area south of the Church of the Redeemer in the 1960s.

remained outside them till the second century AD. The site of the Church would likewise have been outside the walls." (Ibid:71–72).

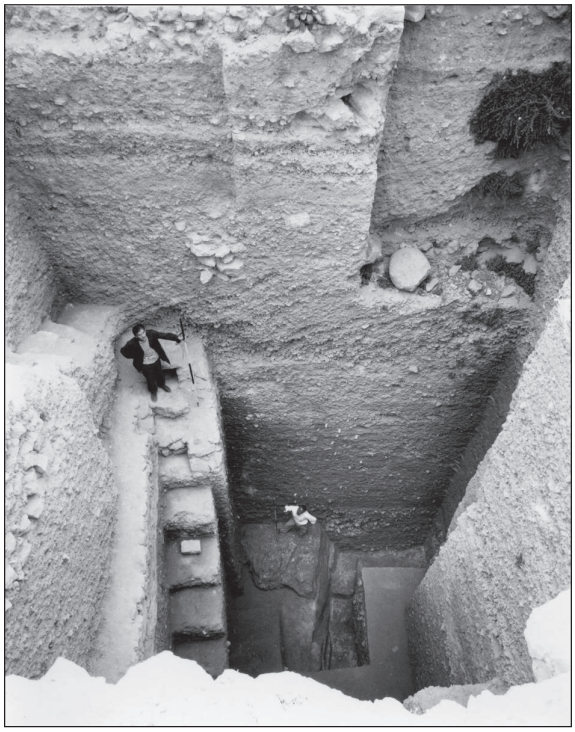
The Excavations of the German Protestant Institute of Archaeology. Research Work in 1970-1974

The 1970s saw a further development in the archaeology of the Muristan in al-Quds

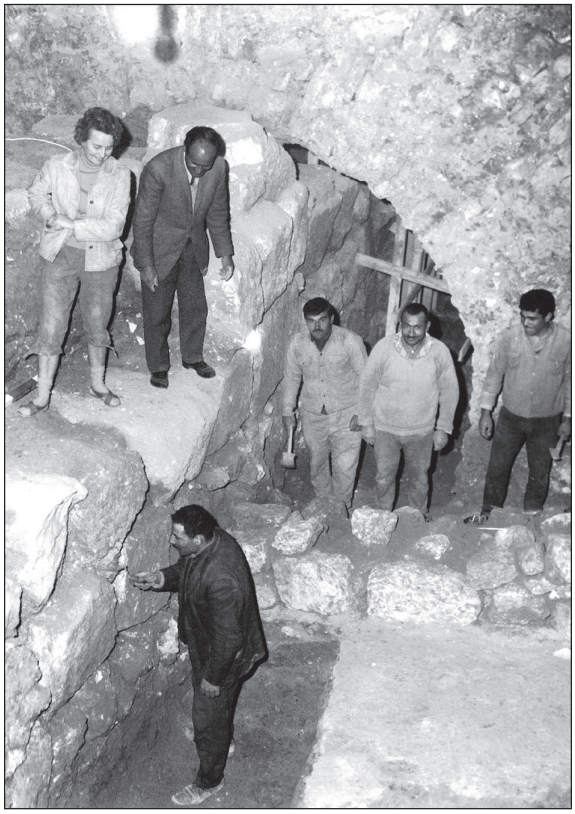
(FIG. 7) When during renovation work the floor of the Church of the Redeemer had to be taken out, Ute Wagner-Lux, the then director of the German Protestant Institute of Archaeology discovered not only the foundation stone of the church but also a Roman quarry which must have been located directly outside the city walls. By the late 1960s it was necessary to renovate the church after it had been damaged in the wars of 1948 and 1967 and by various little earthquakes. Under the supervision of Oberbaurat Ernst W. Krueger not only was the old wall plaster removed and a new reinforced concrete floor constructed, but the foundations were also looked at more carefully. In some parts that meant excavating the area belows the church all the way down to the bedrock. Under Ute Wagner-Lux the GPIA exploited this unique opportunity to check using modern methods the results of the archaeological work done in the late 19th century. From November 1970 to June 1971 the entire central aisle area under the intersection and the apse was excavated. A second excavation took place from 1972–1974 when central heating was installed in which the rest of the area under the church area was exposed. The results of both excavations were published in preliminary reports in the "Zeitschrift des Deutschen Palästina Vereins"1972 (Wagner-Lux 1972) and 1978 (Vriezen 1978) and in a monograph by Karel Vriezen in 1994 (Vriezen 1994).

The Results (FIG. 8)

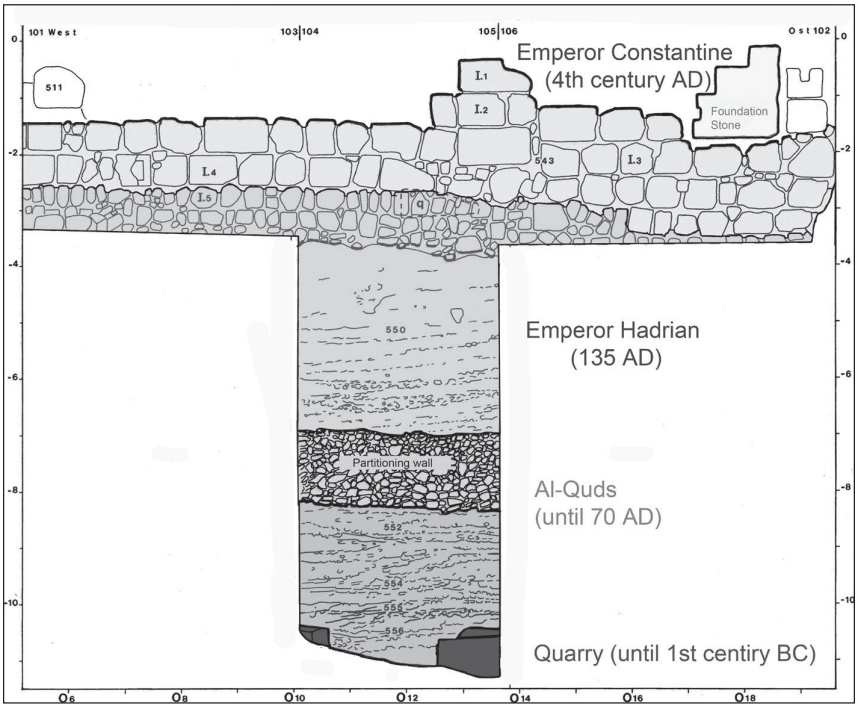
What were the discoveries of these excavations? (Wagner-Lux – Vriezen 1998). The most



6. Kathleen Kenyon, "Area C" excavated down to the quarry, looking west.

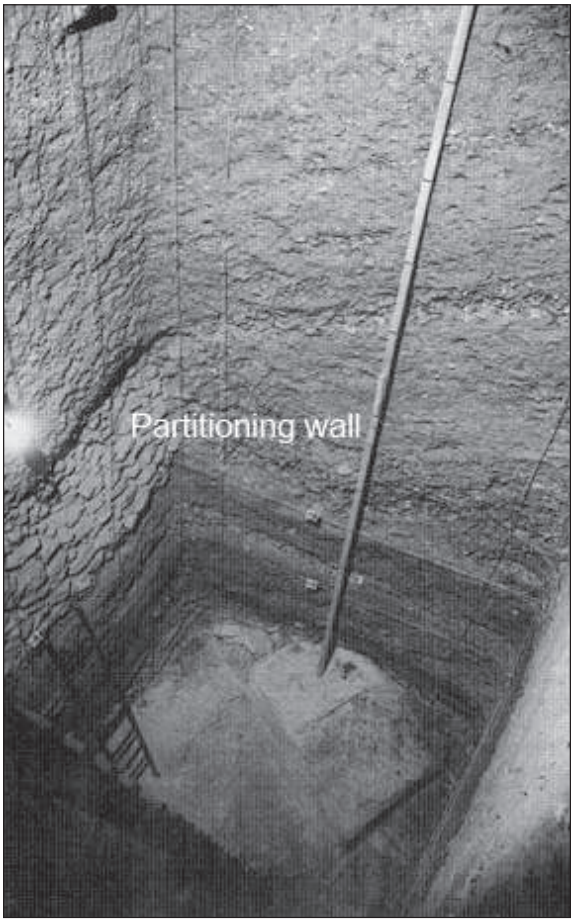


7. U. Wagner-Lux and the foreman H. Selman, East-west wall of the Church of the Redeemer during excavations in 1970.



8. East-west wall under the Church of the Redeemer, south view.

important is the above mentioned large wall, which is not the city wall, but a terracing construction from the time of Herod the great. This can be seen in the fact that the southern side has a façade while the northern side consists of poorly worked or unworked stones, which were concealed by the earth. We know that the emperor Hadrian (117–138) built a new forum and houses in the city in the vicinity of the Muristan which on its northern side was delineated by a temple terrace. Some house walls were extended upwards in the 4th cent., probably under Constantine (306–337) to make a suitable platform – a forum, a market place - for the Church of the Holy Sepulchre (Wagner - Lux - Vriezen 1998: 3f). As such, the wall has two phases: a Hadrianic phase consisting of smaller stones (the lower courses), and a Constantinian one consisting of recycled worked stone (the upper courses). The edge of the terrace can also be identified using finds from under the Russian compound to the east. A second important finding from the new excavations are the sounding until the bedrock with the remains of a quarry. The quarry was used until the end of the 1st century BC, after which the area was filled in and secured against landslide using small supporting walls (Wagner-Lux 1972: 191; Vriezen 1994: 16). The north profile (FIG. 9*; Partioning wall)* of the deep sounding contains one such wall, which may have belonged to the gardens that existed here in 'Jesus' time, as described in John 19:41 "At the place where Jesus was crucified, there was a garden, and in the garden a new tomb, in which no one had ever been laid." Flavius Josephus also mentions a garden in this location when he talks about the 'Second Wall' that went out from the 'First Wall' near the 'Gennath Gate', in other words, the 'Garden Gate' (Ios. bell. Iud. 5:146). The quarry find is important because it was located outside the city, was used to produce the stone, probably for the new city quarter and the city wall of the Herod the Great, and became a ditch in front of the wall through the removal of the stone. As such, even though the ''Second Wall' has not yet been found, it is clear that the location now known to us as Golgotha must have been outside the city wall (Vieweger, Förder-Hoff 2012). Above the quarry the fill consisted of material suitable for a garden; perhaps the area was even used agriculturally. In 70 AD, al-Quds and its temple were destroyed by Titus. The city

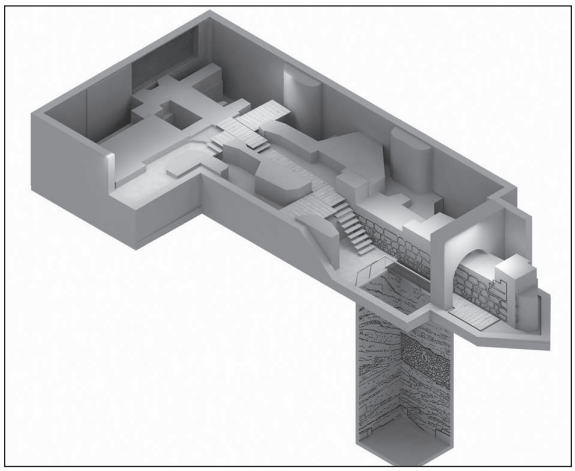


9. U. Wagner-Lux, deep cut at the Church of the Redeemer with quarry, looking east-north-east.

remained uninhabited for about 60 years until Hadrian refounded it as Colonnia Aelia Capitolina. The area of the quarry and garden, which had been integrated into the city under Agrippa, was now flattened for Hadrian's new forum. The 5.5m-thick filling above the wall dates to this period, and contained rubble and finds dating primarily to the first half of the 1st century. After the area had been flattened, as mentioned above, the northern boundary was formed by a large temple terrace. A next important discoveries are the only known remains of the crusader chapel St. Maria Latina (Vriezen 1978: 77) (FIG. 15*)*. Uncovered was a part of the floor mosaic from the southern side aisle. The tesserae are white/grey, black and red and are 1-3cm in width. They were produced industrially in the ancient period and have been used secondarily for the mosaic. Between the tesserae there were small plates of marble which would originally have been used as wall panelling and were broken up and used to pad out the mosaic material. The final important discovery of 2010 was made by the GPIA in the middle of the church under the central aisle and was only uncovered during cleaning of the old excavation in 2010. It is a small building that was built-over the top of the large wall and in some parts protrudes out from its line. It contains only one small room in which the floor was formed by the smoothed stones from the upper surface of the wall. The external walls consisted of quite large worked stones but also some re-used material. To the west a cobbled lane leads out from the small building that led down from the church plateau to the lower, southern part of the city, today called Muristan. The cobblestones consisted of small limestone rocks and lime mortar and a drainage channel was dug along the western side

The Archaeological Park (FIGS. 16a, b)

As the results of the excavations have thus only been available to a very few visitors in the past 50 years, it was deemed high time to present them to a wider audience not only in the form of a book, but also in that of a museum. The location inside the Old Town is ideal for such an attraction, as it is possible in this very place to present to the public 2000 years of al-Quds's history. Since the 1st of December 2012 the visitors will be able to 'walk through'



10. Excavated area below the Church of the Redeemer.

these 2000 years of history in a matter of minutes. The main objective of opening up the excavations under the Church of the Redeemer in al-Quds and to provide an exhibition in the medieval cloister under the head line "Through the Ages" is to create the possibility for people to experience first-hand the archaeological layers that illustrate the different historical developments of the city, and by doing so acquire a better insight into their historical and religious significance. A virtual reconstruction and a lightening system help to understand the results below the church.

The Virtual Tour

During the walk through the archaeological park the visitors interact with the excavation site itself. The following text belongs to a four and a half-minute film available for all visitors in five languages. The pictures originating from the 3D-animated film shown in the exhibition.

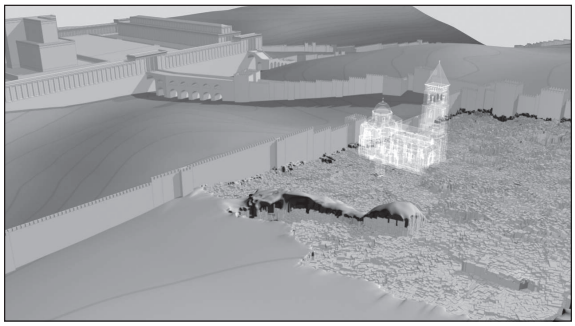
I. Quarry (FIG. 11)

"Welcome to the Church of the Redeemer! The building was consecrated on Reformation Day 1898 by the German Kaiser Wilhelm II.

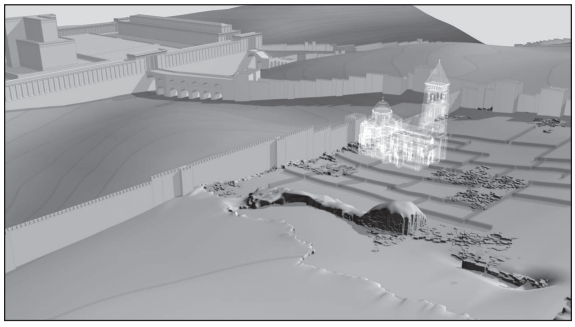
The German Protestant Institute of Archaeology carried out an excavation in the Church of the Redeemer from 1970 to 1974. At its deepest point, this reached a layer of worked rock at 14m below the present concrete floor of the church. This was part of a huge quarry that was used for the construction of the Old Testament city in the south, and later, when the city was expanded by Herod the Great, lay directly to the east of the later church. The stone material was acquired outside the city walls, as was common in those days. This created a dry moat that additionally protected the city. The new town probably built by Herod the Great enclosed an area north of the present David Street until the north wall of the ancient Temple area. The quarry area appears to have also contained soft, and as such useless rock material that was not quarried – this made the hill of Golgotha. Later, tombs were dug at the edges of the quarry.

II Silt Layers (FIG. 12)

When the quarry was no longer needed after the reign of Herod the Great, layers of silt were washed into the quarry, and gardens emerged. Four layers of the earth that show evidence of agriculture and a garden wall have been discovered under the Church of the Redeemer. For this reason, Josephus Flavius named the nearby northern gate of al-Quds Gennath Gate, or "Garden Gate". The city of al-Quds in Jesus' time did not include the current site of the Holy Sepulchre and the Church of the Redeemer. Jesus final journey –the Via Dolorosa– therefore also did not lead along the route shown today, but from Herod's former palace –where Pontius Pilate also resided on high Jewish holidays– through the "Garden Gate" to Golgotha. al-Quds received another northern wall in the forties, roughly where the northern city wall stands today. This city was besieged by Titus in 70 AD after the anti-Roman revolt. It was captured and later intensively destroyed. For 60 years al-Quds lay in ruins.



11. Quarry from the time of Herod the Great.



12. Silt layers in the time until 70 AD.

III. Hadrian (FIG. 13)

Emperor Hadrian had the former quarry site extensively filled in 132-135 AD. Here – in the midst of his new city of Aelia Capitolina – some buildings emerged, built near the imposing new sanctuary that was probably dedicated to Aphrodite. On the former Temple Mount the Roman god Zeus was now worshiped. The city of Hadrian was home to the Xth Legion Fretensis. It was not walled.

IV. Constantine (FIG. 14)

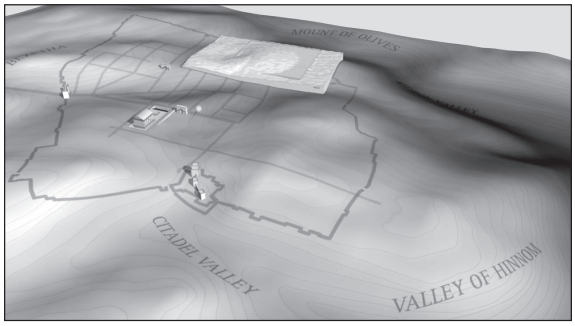
Emperor Constantine decided after the first Ecumenical Council in Nicaea in 325 to built a massive church in place of the temple of Aphrodite – the Church of the Holy Sepulchre. Under the Church of the Redeemer the remains of a cobbled street and the south wall of the *forum* – the marketplace – which was located south of the Church of the Holy Sepulchre were found. The Church of the Holy Sepulchre had a front yard toward the *cardo*, the main road, a five-aisled church hall and behind that an enclosed courtyard. Finally, a dome was built over the site taken to be the grave of Jesus.

V. Crusaders (FIG. 15)

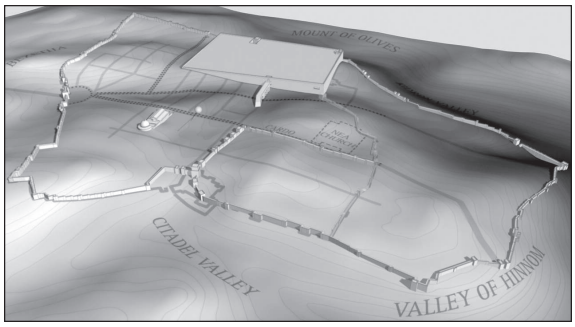
The Church of the Holy Sepulchre was destroyed in 1009 by order of the Fatimid caliph Al-Hakim. The rock-cut holy tomb, which at that time was still intact, was also destroyed. The result was the First Crusade. The Crusaders rebuilt the church in a new form. To the south of the Church of the Holy Sepulchre, the church of St. Maria Latina was established. Parts of the old mosaic floor still exist under the Church of the Redeemer. The present church stands exactly on the medieval layout – but elevated by 2.10m. The Crusader period saw two more churches erected in the Muristan. St. John's Church and the Church of the Redeemer can be visited today.

The Exhibition (FIG. 16)

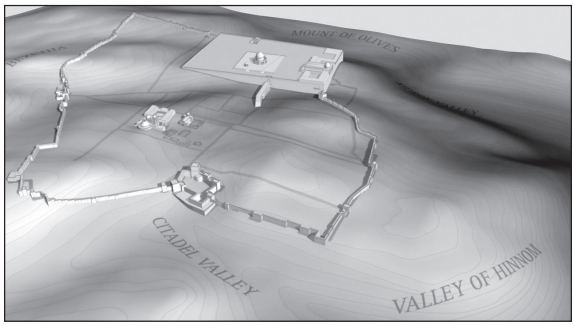
The exhibition in the adjacent medieval cloister presents exhibits from the history of the Church of the Redeemer and of the surrounding residential area, the "Muristan", and describes the relevant archaeological problems and methods. The focus of interest are the finds from the time of Herod the Great, Jesus of Nazareth and the emperors Hadrian and Constantine. A further focus is the history of the "Muristan" and pilgrim life in the Middle Ages. The tour "Through the Ages" ends with the current work of the "German Protestant Institute of Archaeology" in the present.



13. Jerusalem at the time of Hadrian the Great.



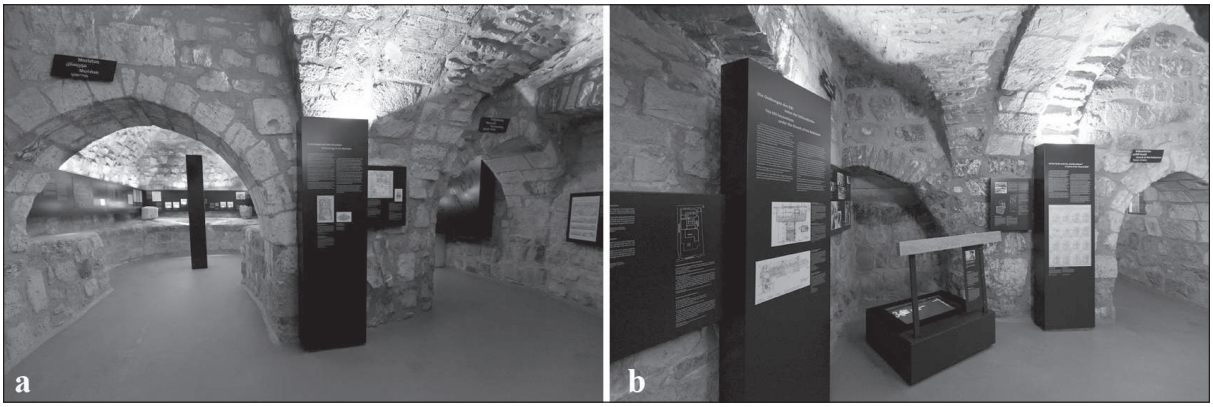
14. Jerusalem at the time of Constantine the Great.



15. Jerusalem at the time of the Crusadors.

Books Explain the Sites for Adults and Children

To maintain the educational worth of an excavation or archaeological park we decided to create an informative booklet for adult visitors

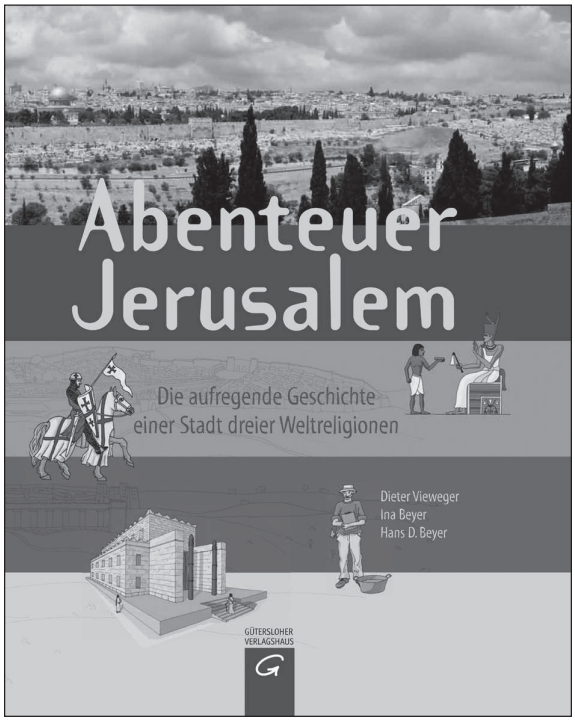


16. a/b The museum in the medieval cloister.

and to write an children's book for Youngsters (FIG. 17): This seems us one way to inspire respect towards antiquities. For children old stones are normally tedious and boring teachers or special guides are necessary – the best would be, their parents could explain them historic facts.

To learn more or for itself children need own books....designed for children's.

The book "Adventure Jerusalem" about the history of al-Quds is one of them. It helps –truly speaking– not only children to learn more about the history of al-Quds. A lot of parents read it first then relefs and understand more... The nowadays into Arabic translated version of "The miracles of a tall" is another example of our contribution to schools and parents to educate children. Many thanks to Her Royal Highness Princess Somaya for financing the translation from German into Arabic (FIG. 18). We hope this contribution could help a little bit to make the care for archaeology more to a public statement.



17. D. Vieweger, Adventure Jerusalem, Gütersloh 32017.

18. D. Vieweger, Geheimnis des Tells, Amman 2016.

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Medieval Pottery in South Jordan: The Case-Study of HMPW in ash-Shawbak Castle

Introduction (EP, RR)

Our ICHAJ 13 presentation has fallen on the thirtieth anniversary of the archaeological mission of the University of Florence of which both of the authors of this paper are members. The 'Medieval' Petra Archaeological Mission. Archaeology of Crusader-Ayyubid settlement in Transjordan, is the archaeological mission of Florence University directed by Guido Vannini, in Petra and ash-Shawbak (running from 1986 to present – Vannini 2011). The main aim of this work is to present the recent acquisitions regarding pottery consumption in ash-Shawbak Castle (Ma'ān, Jordan) during the Crusader-Ayyubid period. ash-Shawbak is one of the best preserved medieval castle in Jordan and it is very significant for the time-span that it covers, starting from pre-Crusader phases until at least the Ottoman time. This site allows us to clarify the material culture turning phases between the Crusader/Ayyubid period and the Ayyubid/Mamluk period. The special focus of this paper will be the topic of HMPW[1] and its periodization and we also offer some reflections about the interconnection of its production and the local, semi-nomadic population. It must be emphasized that this research is based on all stratigraphical data of ash-Shawbak pottery assemblages. To analyze this subject, some concepts from anthropological archaeology appeared to be very stimulating, especially O. La Bianca's works concerning Great and Little Traditions (La Bianca 2007). It must be emphasized that the research needs more stratigraphical data from other sites to compare these preliminary reflections on ash-Shawbak pottery assemblages[2] (FIG. 1).

Strathigrafic Context (EP)

Our analyses couple archaeological-excavation, following the stratigraphic method, and non-destructive 'light archaeology' methodology[3], in a comparative approach to the study of

1. HMPW (Hand Made Painted Ware) is a very common typology in all the Syro-Palestinian area. It is widespread in Jordan starting from XII century to all the Mamluk period and maybe over. This pottery can be without painted decoration or the decoration can be obtained with simple lines (dark or red) or with geometric pattern (also in this case dark or red). It interested many authors, for example, Sinibaldi 2013 and 2016; Walker 2012; Gabrieli 2015; Pruno 2016.

2. The most important amount of stratigraphic data is from Ḥisbān Project (Walker 2012, where the author discusses also the previous studies concerning the pottery remains of Ḥisbān, particularly HMPW).

3. To examine the principal guidelines of the Light Archaeological methodology see Vannini 2013.

1. The frontier of the Latin Kingdom of Jerusalem (from Vannini 2007: 13).

material records. Our main goal is to better understand political and economic conditions under which a new settling system was promoted in this peculiar area of medieval Transjordan: from the defensive system of Petra to the 12th and 13th centuries Islamic frontier, of which ash-Shawbak was a very important node[4]. The Italian mission decided to proceed with excavations at first in al-Wu'ayra, in order to better understand the forms of the first resettlement of Petra valley[5]. Only years later, after the identification of al-Wu'ayra and al-Ḥabīs as fundamental elements in the Latin settlement for the control of the routes between Syria and Egypt, the excavation of ash-Shawbak castle was started.

We were able to analyze the transformation of a castle in an Islamic city, thanks to the will of Saladin[6]. Finally, only last year we came back to Petra, opening the excavation in front of the Corinthian tomb to verify our interpretations of the post-classical setting of the valley[7] (FIG. 2).

As we said, our excavation-analyses utilize the stratigraphic methodology. In every investigated area we completed the stratigraphic column, from modern levels to the bedrock, with the collection of the entire fragments assemblage for each layer. After the excavation activities we elaborate the Harris Matrix to identify a first, necessary, relative chronology. Then, following the Harris Matrix relationships, we examine the different material culture contexts.

The aim of this presentation is to describe ash-Shawbak's medieval contexts, especially the Crusader-Ayyubid ones, and then to focus on the specific production of the HMPW, analysing the materials of the Area 35000, the so-

4. The medieval frontier is a very important topic, well studied for the Trans-Jordanian area: see Vannini, Nucciotti 2012.

5. Vannini, Vanni Desideri 1995; Vannini, Tonghini 1997; Tonghini, Vanni Desideri 1998; just now our team is working for publishing all the work concerning the medieval Petra Valley (al-Wu'ayra, al-Ḥabīs, Corinthian tomb).

6. Vannini, Nucciotti 2009, 2012.

7. During the 2015 campaign a new excavation area has been opened in front of the Corinthian tomb in order to clarify presence and nature of a potential 'new' medieval site in Petra. The existence of a potential medieval structure in this area was highlighted with the survey of 2012 and 2013 (FR 2012, FR 2013, Pp. 27-30). Evidence consist of three converging elements observed on the façade of the Corinthian tomb and in its immediate surroundings. They were: arrow-slits-like windows cut on the eastern side of the façade of the Corinthian tomb; remains of a masonry structure presenting technologic analogies with Crusader-Ayyubid buildings from Petra (al-Wu'ayra and al-Ḥabīs) and ash-Shawbak castle; retrieval of fragments of Medieval hand-made pottery shards consistent with Crusader-Ayyubid assemblages from al-Wu'ayra, Wādī Farāsa and ash-Shawbak castle. The excavation finished in December 2016, now all the documentation is being studied.

2. ash-Shawbak (a), Wu'ayra (b) and coronthian tomb area (c, 3D Plan).

called Crusader Palace[8].

Area 35000 is a substantial vaulted structure located in the "monumental" area of the castle (*i.e.* the northern half of the inner enceinte), almost adjacent to the audience hall of the Ayyubid Palace and laying on the inner ring wall of the Crusader epoch (indeed its west wall also coincides with a sector of the inner enceinte). This Area is a North-South oriented building with roughly an elongated rectangular plan (FIG. 3). The structure's masonries show building techniques of the Crusader period on the East and West walls, while the North side is blocked by a wall-plug, showing typical Ayyubid masonry patterns. This Area is therefore most likely to be a monumental building of the Crusader epoch which was also reused in the Ayyubid period, possibly within the Ayyubid palace. A "monumental" door in the East wall was opened in a second phase of the building's life. Though it is quite difficult to assess to which period it belongs, due to the extensive reuse of older ashlars in the jambs, the first hypothesis would be to include it in one of the Crusader phases. Such a possibility is based on comparisons between the jambs' masonry and that of CF5 (the fortified gate of the Crusader second ring-wall), as well as on the lack of specifically Ayyubid dressing tool marks in the jambs' ashlars. What is indeed clear is that the very same door was reused (or readapted) in the Ayyubid epoch, when the entrance was connected to a beautifully built stairway with concentric semicircular steps, showing extensive tool marks of a small pointed chisel, very similar to the one used for the dressing of the ashlars of the Ayyubid palace's audience hall[9].

The excavation area was widened to include almost all the Crusader Vaulted Room and one of the main excavation's goals was the understanding of relationships between the main occupation phases, also as regards the building' original function and its changes over time (the last phases of occupation relates to the late Ottoman period).

Because the main goal of this paper is the discussion of the Crusader-Ayyubid HMPW, we present all the excavation contexts in order to better understand the occupation phases of the period predating the building of the stairway and also the occupation phases connected to the stairway life.

3. Plan of ash-Shawbak with excavation areas the (inlcuding area 35000).

8. In ash-Shawbak Castle since 2003 we opened seven excavation areas (FIG 3): three of them (Area 4000, 6000 and 24000) are opened to examine the burgus , between the second and the third enceinte; Area 10000 and 39000 was opened to clarify the pre-existence of the Crusader second enceinte and the 34000 was useful to check the stratigraphic deposit of the Ayyubid Palace.

9. For the ash-Shawbak Ayyubid Palace see Rugiadi 2009; Nucciotti 2012; Fragai 2014; Nucciotti, Pruno 2016.

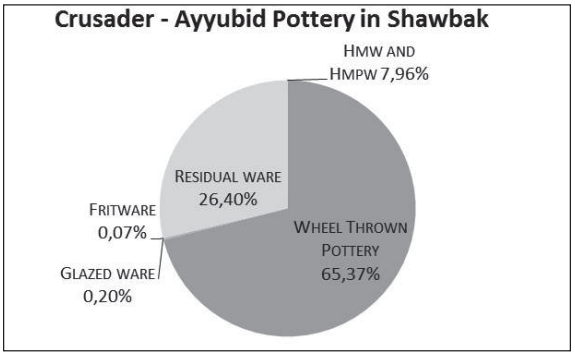
Pottery Assemblage (RR)

The pottery evidence that we examine comes from a context included between 3 chronological landmarks: the stairway of the Ayyubid period, the western wall of the crusader period, and the pre-crusader small wall (US 35632), set on the bedrock. We have identified 3 main assemblages: the first one is connected to the phases of construction and use of the stairway (phases IIIA and IIIB); the second one refers to a crusader phase of building (phase II); the third one is related to the pre-crusader period (phase I). Here we are going to deal with the medieval phases II, IIIA and IIIB.

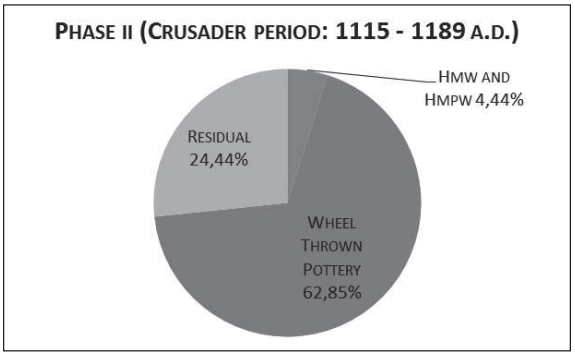
The ceramic findings from these contexts were classified according to their macroscopic technological characteristics, then according to their morphology and decoration. Concerning the quantification process we calculated the percentages taking into account the minimum number of vessels (MNV)[10]. So, the finds from the crusader-ayyubid phases here considered consist of 215 (7,96%) minimum number of vessels of HMW (including HMPW), 5 (0,2%) of glazed ware, 2 (0,07%) of stone-paste ware (fritware) and 2476 (65,37%+26,4%)[11] of wheel thrown pottery[12]. In the follow pie charts we can also see the percentages of fragments subdivided into the single phases stratigraphically recognized (FIGS. 4-7).

We can easily notice the significant presence of wheel thrown pottery (both medieval and pre-Crusader): the majority of fragments is represented by closed shapes, like in other excavation areas of the castle, mostly cooking and storage wares (and also table ware).

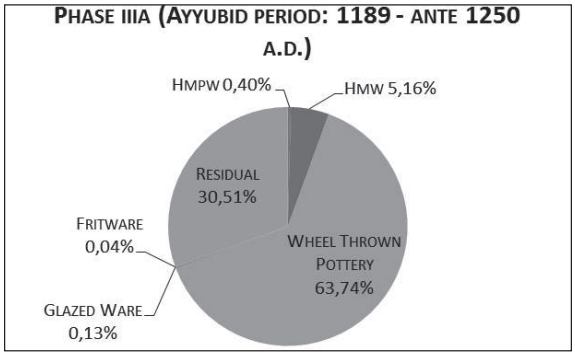
Many of these forms are comparable with other forms from other excavation areas of ash-Shawbak related to the same phases[13].



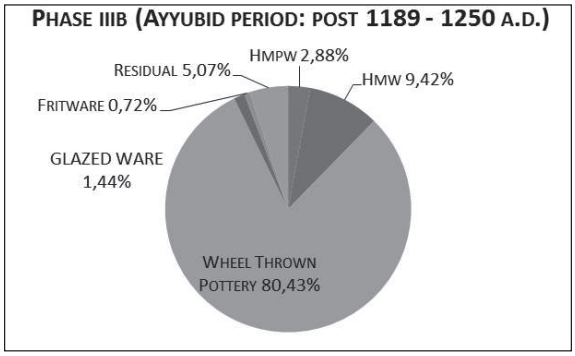
4. Crusader-Ayyubid Pottery in ash-Shawbak.



5. Pottery from the Crusader Phase (Phase II).



6. Pottery from the first Ayyubid Period (Phase IIIA).



7. Pottery from the second Ayyubid Period (Phase IIIB).

10. The assemblages in question consist of 2698 minimum number of vessels (out of a total of 7506 fragments).

11. As above mentioned, we are going to analyze in detail all the findings that can be related to production of crusader and ayyubid periods. About residual pottery, we just mention the minum number of vessels that seem most likely comparable to pre-crusader productions, without presenting here a specific typological study, that is still in progress: they represent the 26,4% of the total.

12. With Wheel Thrown Pottery we specifically refer to wheel made ware without glaze or any impermeable surface cover.

13. See Ranieri 2016, in particular chapter 4.1.3 and Pruno Ranieri 2017.

Concerning wheel thrown pottery (at least for the 12th and 13th centuries in Southern Transjordan) we have also to highlight that pottery studies have often neglected it, always (or almost always) identified as residual so the state of the research is still insufficient to have a clear picture of the chronological distribution of the typologies[14]. Glazed and stone-paste wares were found only in the stratigraphic contexts related to the ayyubid period. They rapresent a very low percentage and they seem comparable with Syrian production (see for instance some findings from Qal'at Jabar, identified by Cristina Tonghini as type intermediate and type 2)[15], related to the last quarter of the 12th century and the middle of the 13th century.

The HMW and the HMPW of ash-Shawbak (EP)

As we said, the main topic of this paper is the HMW and the HMPW of ash-Shawbak in the Crusader-Ayyubid time-span. Hand made pottery in *Bilād ash-Shām*, especially in Jordan, is a very important topic because it is present in almost all the sites archaeologically investigated (Sinibaldi 2013; Walker 2013). Despite this, the knowledge of HMW, both painted and not painted, is not yet sufficiently detailed: first of all, in our opinion, it is correct to analyze the HMW and the HMPW separately (Sinibaldi 2013). In fact, in our experience it seems that they are both present in medieval phases (at least in ash-Shawbak), but with different percentage. Concerning the HMPW, it seems possible also to try to distinguish between linear and geometric pattern in order to better classify these pottery productions though, in our assemblages, the small size of the collected fragments does not always allow this. Regarding the chronology, it is very difficult until now to define the first appearance of both of these wares (HMW and HMPW) and also the end of their production and consumptio[16]. In this paper we take into consideration just the assemblages of the Crusader-Ayyubid period, leaving to other publications the materials of the preceding and following phases.

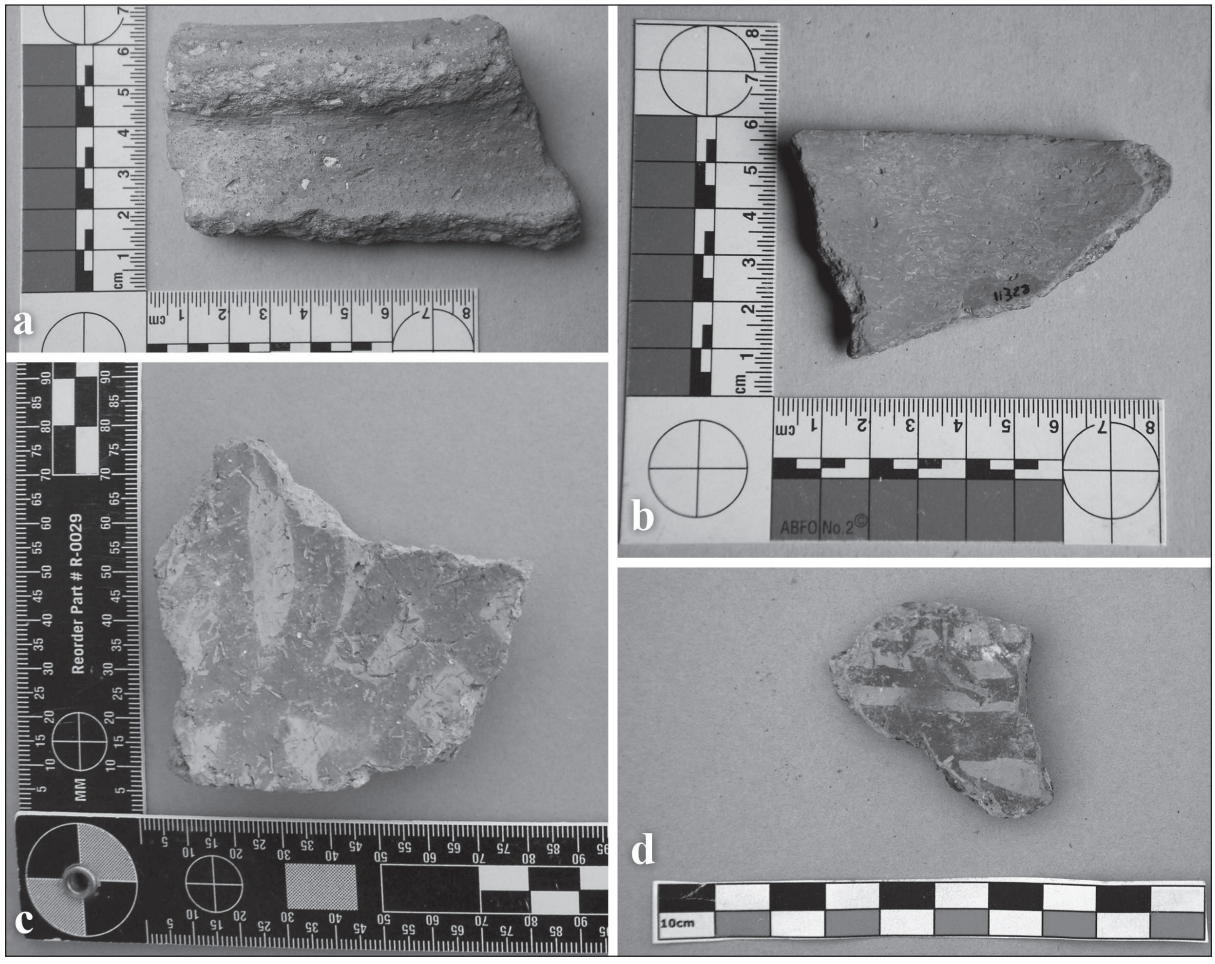
As pointed out by Sinibaldi (Sinibaldi 2013) it is important to describe the main distinctive features of these productions: fabric, manufacture, firing, surface treatment, decoration and form. None of these, considered alone, can be exhaustive, but their sum is very important to detect the different productions. In fact, in addition to the chronology, a second, still unresolved, problem is the definition of the main characteristics of these materials production. That is, if they come from an industrial production or a household one (Gabrieli 2015) and if they are regional or local manufacture. In this paper we try to add some data to this debate.

The Crusader-Ayyubid assemblages of Area 35000 considered, like we saw before, present a very low percentage of handmade ware (7,96%) in the total minimum numbers of vessels (only 158 in 6698). We classified these fragments as HMPW (geometrically or not), HMW with slip and HMW without slip: we have 15 MNV of HMPW, 74 of slipped HMW and 69 of HMW without slip. Therefore HMPW is a narrow percentage of the total of HMW (9,5%), with 15 MNV. Just one sherd (NI 9805, US 35491) is decorated with red and brown paint, one with brown paint (NI 12785) and the others with red paint (more or less dark). The difference between dark red and brown is often not easy to detect: it may be due to the firing and not to the potter's will. Few fragments show an evident decoration with geometric patterns, but many have just linear decorations. Morphologically we find both closed and open shapes. The HMW (with and without slip) is present in a higher amount than the HMPW: 143 against 15 MNV and is evenly distributed throughout the stratigraphic column. The two-thirds of HMW are represented by slipped fragments (internal

14. A PhD thesis is going to be written by one of the author.
15. Tonghini 1998.
16. Somebody says that the life of the HMPW is the 11th century until the second half of the 20th century (see bibliography in Sinibaldi 2013).

and/or external, with various colours, specially from white to red): the 25% are closed forms, 13% open, the rest, due to the high level of fragmentation, are not recognisable forms. The proportions observed for HMW without slip are mostly the same (FIGS. 8: a-d).

At this point some considerations are necessary about HMW (painted or not), which has been discussed by many researchers such as, for example, Brown, Johns, Walker, Sinibaldi and Gabrieli. In ash-Shawbak at this stage of the research, it seems impossible to individuate a chrono-typological seriation of HMPW founded on the presence of color or on different colors, and on the decoration patterns at least for Crusader-Ayyubid phases. Analyzing the published materials it is clear that this production started to have a large diffusion in the 12th century (though the first phase of its production was not clearly defined up until now). But evidence of productive activity and of production debris is still yet to be found, so it is very difficult to propose its place/places of production. It seems likely that it was very popular in the south of Jordan and in many areas of the *Bilād ash-Shām*. Southern Jordan (especially ash-Shawbak Castle) was a very important frontier of the medieval Mediterranean and represents an extraordinary osmotic environment for the transmission and processing of technical knowledge and production strategies, both among its various political 'super-powers' (or Imperial/Great Traditions)[17], as well as (most importantly for our point here) between those and (subject)



8. HMW (a, b), and HMPW (c, d) from ash-Shawbak (Area 35000).

17. Oystein La Bianca's Great and Little traditions' methods (originally developed for the interpretation of the multimillennial archaeological site of Ḥisbān).

local communities, whose daily life appears to have been heavily conditioned, in the longue durée, by what O. La Bianca called "indigenous hardiness structures" or Little Traditions. In fact, the main actors of technical- knowledge transmission in the 12th and 13th centuries, as well as before, were not exclusively exponents of the imperial Great Traditions; prominent actors were, indeed, the historical residents of the region: semi-sedentary shepherds or farmers on one side and nomadic or semi-nomadic peoples. This approach involves interaction between elite cultural traditions and local level village communities (folk), especially in the long term (So it seems very interesting concerning the HMW). At this point of our research in fact we can only stress that HMW was a widespread production (both in space and time), with many similarities in different places (for example al-Wu'ayra, in Petra), but without a real standardization. It could be possible to postulate that these productions belong to a Little Traditions (concerning the choice of raw materials and water) handed down for generations.

Conclusion (EP, RR)

The preliminary results of the Italian excavations at ash-Shawbak from the point of view of the Crusader-Ayyubid hand-made pottery seem to stress some impacts of medieval 'Little Traditions' on its technical environment. If in the 12th-13th centuries there were some productions, like fritwares, coming from Syria and Egypt, HMW was a long-life pottery very present and widespread. It is difficult indeed to identify differences during the time. What kind of ceramic productive tradition was present in the 12th century ash-Shawbak and what happened with the Ayyubid rulers? At this point of our research it is almost clear that there is certain homogeneity in the productive tradition of the HMW (including HMPW, already present in these contexts). If it cannot therefore speak for the period between both the Crusaders and the Ayyubids of different pottery contexts, we need to understand if it is possible to notice some differences on the production and market level: "Hand-made pottery is commonly considered by archaeologists to be the product of non-specialized potters, usually rural, highly conservative and consumed in close proximity to its place of manufacture. To a considerable extent the equation of hand forming with non-specialized production and restricted distribution is a 'common-sense' approach, particularly for periods and places in which hand-made industries coexist with centralized workshops using the fast-wheel. Manufacture on the fast wheel allows mass production in minimum time and high level of standardization. It also represents investment in equipment, and therefore stability. All of the above denote organized workshops, operated by specialized craftsmen. Their absence by implica- tion, would represent the opposite." (Gabrieli 2017: 131). Gabrieli introduces a very interesting approach to study the two different coarse handmade pottery from Cyprus and from the Bilad al Sham. Concerning the Levantine production, she analyzes the HMPW of the Mamluk period and proposes the presence of a high level of standardization, large scale manufacture, and wide distribution. They don't mean of course the presence of a single industry, but the presence of a large production quite similar and well realized. For the Crusader-Ayyubid period, in ash-Shawbak, we note the absence of standardization. Concerning a large scale manufacture and wide distribution it will be very important to realize petroghrapical analyses of ash-Shawbak assemblages and, at least, the same period pottery of al Wu'ayra. This is the research line that we could follow in the future.

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Mādabā and its Latin Church of Saint John the Baptist: A Synthesis

In the preliminary investigation of the church of Saint John the Baptist in Mādabā[1], we also explored the region from the perspective of its settlement history, as well as its visual and emotional impact on the nineteenth century explorers and missionaries who discovered the ancient site. Like the phoenix – the legendary bird embodying the cycles of death and resurrection – Mādabā rose from its ashes in the late nineteenth century after more than a millennium of total abandonment to become a significant place of Christian memories.

Just over one hundred and thirty five years have passed since the Christian tribes from al-Karak arrived at the collapsed and scatted ruins of Mādabā, once a thriving and important Christian town on the eastern edge of the Byzantine Empire. Until 1879, there had not been any sedentary villages between as-Salṭ and al-Karak. The entire way the explorers travelled, they saw only towns and villages in a state of total ruin. The whole country was uninhabited. However, the al-Balqā' was reputed to be the best land in Transjordan for pastures and agriculture. During the second half of the nineteenth century, the interaction between different interests and logics brought the country to modernity with the rebirth of old settlements and the foundation of satellite villages. The area known as the Mādabā Plains region that once had been a land, planted irregularly with dry crops by the various pastoral nomads who shared the plateau, had become an agricultural and commercial center of primary importance, upgrading the economic value of the al-Balqā'.

To explain the success of the new settlements in the Mādabā Plains region, we will start recounting the context, the causes, the key people, and the challenges. Then we will describe the photographic evidence that documents the steps leading to the settlement of Mādabā and the recent archaeological discoveries in the Latin Church.

The Context

The resettlement of the Mādabā Plains region can be traced back to policies that the Ottoman government set in motion during the *Tanzimat* (period of reforms) from 1839, and intensified under *Sultan Abulhamid II* (1876-1909). At this

1. É. Lesnes, R. W. Younker, The Shrine of the Beheading of Saint John the Baptist and the Origins of Mādabā (Jordan), Latin Patriarchate Printing Press, Jerusalem Beit Jala, 2013.

time, the Ottoman government decided to exert more control over its frontier zones in its Arab provinces of Iraq and Syria, including Jordan. One reason was a desire to provide more security and stability for the pilgrim routes to Madina and Mecca that traversed the Arab territories. Another reason, and perhaps the most important, was the loss of agricultural and economic resources (including tax revenues) for the Empire because of the loss of western Ottoman territories in the Balkans.

In 1858, utilizing the new land code of 1839, the Ottomans thought they might regain resources by establishing new settlements, agricultural programs and taxation policies in the province of Transjordan. But the problem with this plan was the fact that the lands were controlled by Bedouin tribes who had enjoyed virtual autonomy and freedom and were not at all inclined to settle, grow crops and pay taxes for the benefit of Ottoman authorities. The Ottomans dealt with this challenge by changing the provincial administrative system. They placed government officials in existing and new towns and they established army garrisons in important ones. Even though the land reforms had been initiated on paper as early as 1839, the Ottomans had not been able to implement them in Jordan in any serious way. At this point, the migration of the Christian tribes from al-Karak to Mādabā presented one of the first opportunities for the Ottoman authorities to implement their reform policy in the region.

In addition to the Ottoman administrative reforms, another important contextual element for the refoundation of Mādabā was the establishment and growth of Christian missions in Transjordan by the Latin Patriarchate in Jerusalem. The early Patriarchs, Archbishop Giuseppe Valerga (1847-1872) and Archbishop Vincenzo Bracco (1873-1889), multiplied the missions first in Palestine and then in Transjordan. The first Catholic mission parish of Transjordan was as-Salṭ in 1866, followed by others: al-Karak in 1876, ar-Rumaymīn and al-Fuḥayṣ in 1877, Mādabā in 1881, al-Ḥuṣun in 1885,‘Ajlūn in 1889 and ‘Anjara in 1897.

In 1876, the Patriarch Vincenzo Bracco sent a Catholic priest, Alessandro Macagno (known as Abuna Eskandar) to al-Karak who, with the help of his assistant Paolo Bandoli (Abouna Boulos), opened a mission there as requested by the Christian *al-‘Uzayzat* tribe. However, the existence of the small Catholic community became increasingly difficult because of frequent persecution by local tribes. Vincenzo Bracco, aware of the seriousness of the situation, asked for and received from the Grand Vizier of Istanbul, *Midhat Pasha*, the plain of Mādabā for the resettlement of the Catholic tribes of al-Karak. At this time, as the Ottoman administrative structure was being established in this region, the governor of the province of Damascus, which oversaw Transjordan (known as the Ottoman Syria in the south-east), was favorable to the establishment of a mission on the abandoned and uncultivated land of Mādabā. Actually, this was not the first case of emigration, since in the previous year, Muslim Circassian tribes were re-established in a number of abandoned sites of Transjordan including Jarash, az-Zarqā’, ‘Ammān, Nā‘ūr, Ṣuwayliḥ and Wādī as-Sīr.

The Causes

The Christian missionaries were one of the main reasons for the migration of the Christian tribes. The population was divided in two main tribal alliances: the *Sharqah* and the *Gharbah*. The eastern alliance (the *Sharqah*) was headed by *aṭ-Ṭarāwnah* and included the *aṣ-Ṣarāyrah* tribe. The western alliance (the *Gharbah*) was headed by *al-Majālī*, and included three Christian tribes: *al-‘Uzayzat* (who had recently converted to Catholicism in 1877), the *al-Ma‘āy‘ah* (Greek Orthodox), and the *Karadsheh* (also Greek Orthodox).

The advantage gained by certain tribes over others changed the previous balance of power, leading to the rise of internal conflicts or reinforcing previous antagonisms. However, the event that sparked the migration of the Christian

tribes from al-Karak to Mādabā was the abduction of an *al-'Uzayzat* woman (*Nejmeh*, daughter of *Salem at-Twal* and wife of *Jeries at-Twal*) by a man servant (*Mahmoud aṣ-Ṣarāyrah*, a member of the muslim tribe of the *Sharqah*). In traditional Bedouin society, the act of one of the tribe's women going off with another man (whether it is her fault or not) brings an extreme level of shame and dishonor to the entire tribe. Thus, the next morning, when they heard the news of this unspeakable act, *Nejmeh's* brother, 21 years old *Ibrahim at-Twal*, along with all the *al-'Uzayzat*, and their allies – the other Christian tribes and the *al-Majālī* rode to Kufur Rabbah where they demanded the surrender of both *Mahmoud* and *Nejmeh*.

The head of the *al-'Uzayzat* tribe, *ash-Shaykh Saleh Sawalha*, asked *Ibrahim at-Twal* how he wanted to redeem the lost honor caused by his sister's abduction. This new embarrassment was more than *Ibrahim* could bare and in his deep shame and anger he insisted on nothing less than the death penalty for both *Mahmoud* and *Negmeh*. While he was within his rights to demand such a severe penalty, *Ibrahim's* demand was nevertheless a cause for worry. The eastern alliance could not surrender one of their own without their own loss of face -thus, the practical effect of *Ibrahim's* demand was to investigate an ongoing war between the two alliances. Moreover, while the call for the death penalty was grounded in age-old Bedouin tradition, this ancient ethic collided with that of the Christian church, which called for forgiveness and mercy in this situation. As expected, the *aṣ-Ṣarāyrah* refused to give up Mahmoud, but agreed to return *Nejmeh*. At this point the Latin priest, Abouna Boulos intervened and arranged to have *Nejmeh* handed over to him; he then smuggled her to Nablus where he hoped to hide her, thus saving her life.

Meanwhile, the *aṣ-Ṣarāyrah* clan asked *Mohammad al-Majālī* to negotiate a reconciliation with *Ibrahim at-Twal*. However, *Ibrahim* refused their offer, declaring that he wanted "no gold but only blood!" Father Macagno, the Latin priest, couldn't dissuade the *al-'Uzayzat* from taking revenge for the kidnapping. The entire tribe of the *al-'Uzayzat* loyally backed *Ibrahim* and declared war on the *aṣ-Ṣarāyrah*. Assaulting the village, the subsequent killing of several men of the *aṣ-Ṣarāyrah* by the *al-'Uzayzat* created an intolerable situation in al-Karak that threatened to degenerate into broader conflict between the *Sharqah* and the *Gharabah* alliances. It was within this context that the *Shuyūkh al-'Uzayzat*, already at odds with the *al-Majālī* decided to leave the *Bilad al-Karak* permanently.

The Key People

The choice of the *tall* at Mādabā as a new home for the al-Karak Christian tribes, was the result of discussions between the Ottoman government and the Latin Patriarchate of Jerusalem and, at a lower level, local missionaries and tribal *Shuyūkh*. Agreements among these various parties were reached concerning territorial, administrative, economic and political issues.

Aware of the seriousness of the situation in al-Karak, the Latin Patriarch of Jerusalem, Vincenzo Bracco, petitioned the government for new land for the Christians. Thanks to the correspondence between the priest and the patriarch, we know about the real preoccupation with what was happening in al-Karak and his total involvement to find the right solution. Getting the Christian tribe permission to settle in and occupy Mādabā, Vincenzo Bracco publicly demonstrates the success of the missionary campaign project in Transjordan, leading to the foundation of a new, wholly Christian village under his careful guidance.

The determination to let the Christians have Mādabā was made by none other than *Midḥat Pasha*, a reformist statesman, and at the time of the al-Karak events, governor of Damascus. Since 1878, he had been engaged in developing economic activities in certain strategic places within the Transjordan territories. So, in order

to extend fiscal revenues, the issue of allowing several tribes to leave al-Karak to settle in the al-Balqā', expanding agricultural lands and settlements, was a very good opportunity.

Father Alessandro Macagno emigrated in 1880 with the Christian Bedouin families from al-Karak and founded the town of Mādabā. This emigration probably would not have been seen as permanent without his intervention. Knowing about tribal modes of conflict management, he interpreted the events in al-Karak as a conflict that he feared would degenerate into a massacre of the Christians.

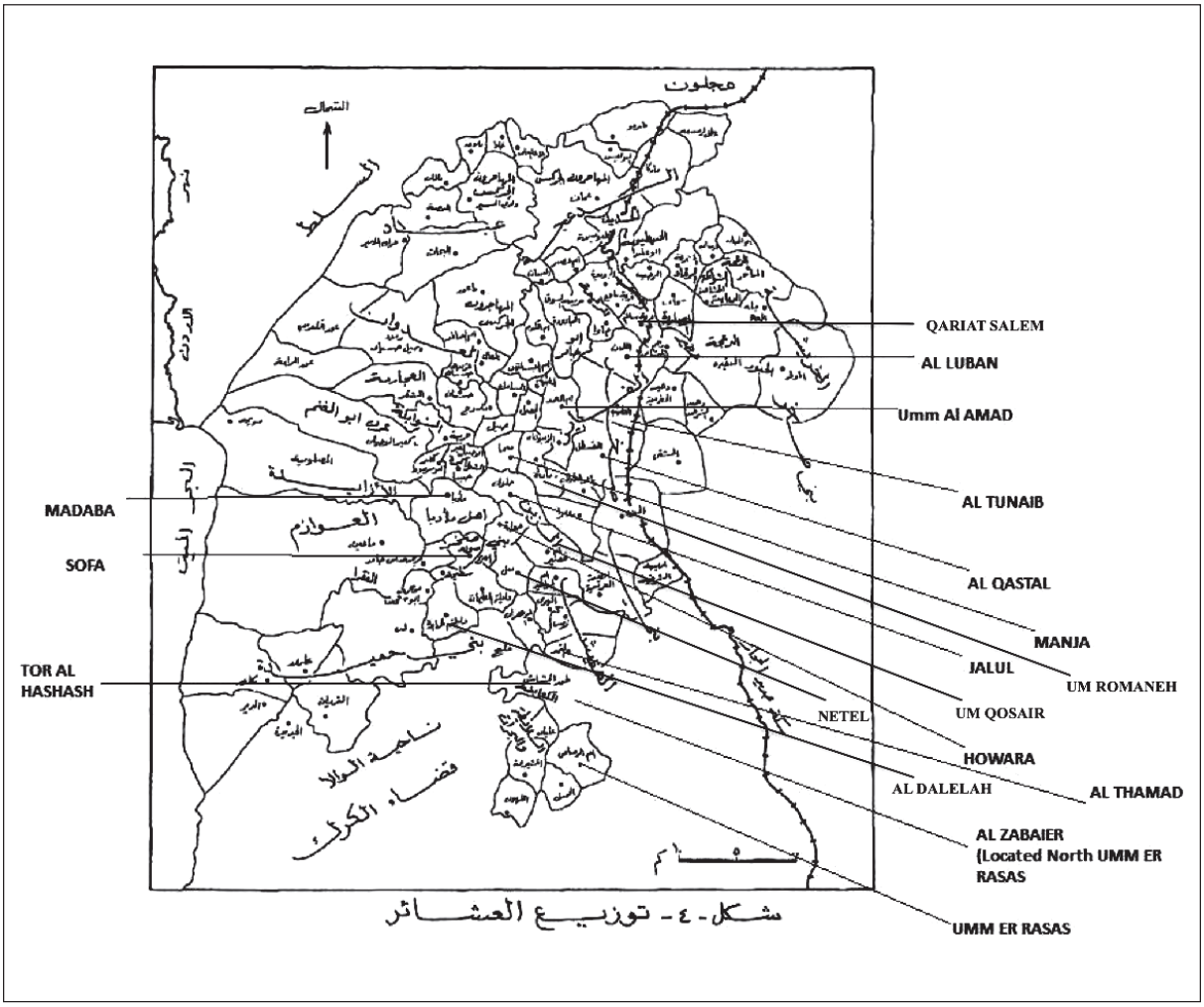
Father Paolo Bandoli went to as-Salṭ with *ash-Shaykh Saleh Sawalha* and met up with Don Giuseppe Gatti, with whom they went scouting for 'unoccupied land'. They chose Mādabā to establish the new settlement for the *al-'Uzayzat* because the tall was a strategic location for warding off and defending against attacks. The ruins of the ancient city also offered a good amount of building material ready to be used and the surrounding plain was fertile and suitable for agriculture.

ash-Shaykh Saleh Sawalha of the *al-'Uzayzat* organized the actual Christian migration from al-Karak to the al-Balqā'. The road to Mādabā was long and unsafe and went through various tribal territories where the sole protection by religious institutions and Ottoman authority was not enough. Accordingly, before moving out of al-Karak, *Shaykh Saleh* went to the *Hamaydeh* tribe, in the North of al-Karak, to request passage and place the Christian tribes under their protection. Then, for the settlement at Mādabā, he knew that the vast plain was claimed by the *Bani Sakhir*, the most powerful bedouin tribe of the region. So, to settle in Mādabā and become an *ash-Shaykh* al-autonomous, he needed to ensure that the other Christian tribes of al-Karak –the Greek Orthodox *al-Karādshah* and *al-Ma'āy'ah*– would follow him in their migration.

The Challenges

The rebirth of Mādabā was involved in internal tensions and heavy external conflicts about the Land Ownership. Without land registers until 1897, ownership was somewhat precarious and it was confirmed more by force rather than by law. The division and allocation of the lands granted by the Ottomans provoked an internal dispute between the Catholic and the Orthodox tribes about the right to occupy the top of the hill of Mādabā. The issue of property rights was more vexed because the *Bani Sakhir* tried to resist the Ottoman policies of confiscation of their land. These conflicts involved some of the fiercest clans (*Fayez*, *Zibin*, and *Hamad*) of the *Bani Sakhir* tribe who demanded financial compensation for their lost lands on the tall where the Christians had settled. There were also some bloody struggles with the *Bani Hamida* and other tribes and the Ottoman government had to repeatedly intervene by sending soldiers to protect the city from attack. In 1893, the establishment of a barracks near the village would restore some peace and stability to the mission and town. The Mādabā mission was considered, by far, the toughest and most dangerous of the missions under the Latin Patriarchate of Jerusalem. The problems eventually prompted the Ottoman authorities to send a *mudir* –a district chief– to Mādabā and in 1896 they built the *Saray*, which served as the local seat of government, on the acropolis.

The development of agriculture and the registration of the land favored the creation of many settlements. Jallūl is a good example of the development of a complex relationship between state, religious institution and tribe (in this case with *Shaykh Minawir bin Zibin*) and the understanding of new socio-political opportunities for the tribes in promoting their tribal status and possessions. Other *Bani Sakhir* families registered vast tracks of land to the east of Mādabā, including Umm al-'Amad, al-Qasṭal, Zīzyā', az-Zabāyir, and Ṣūfā (FIG. 1). Villages soon sprang up in all of these locations (FIG. 2). In 1907, there were twenty villages in the al-Balqā' that soon formed a distribution network



1. Localisation of the villages.

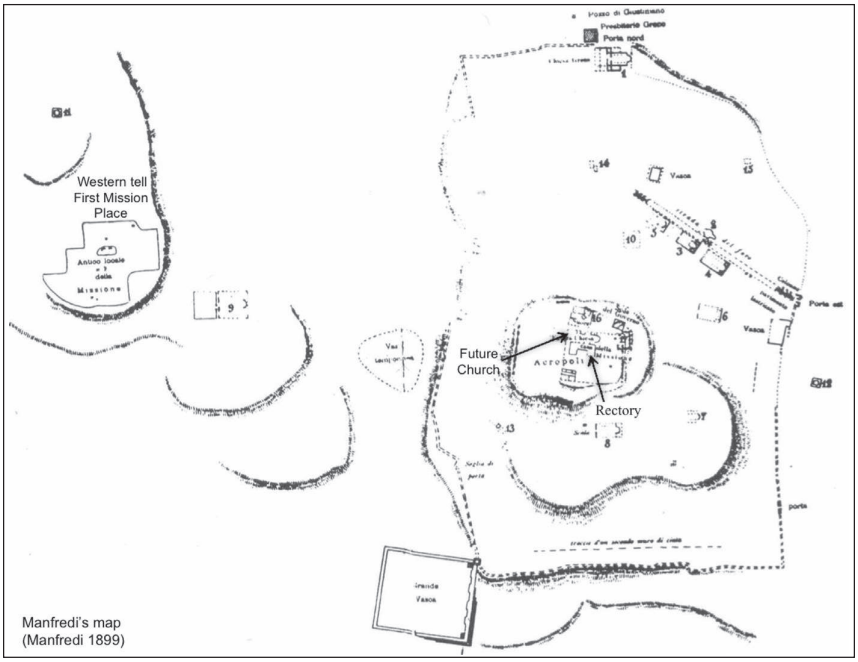
supported by the development of an infrastructure that included roads and railways (the Hijaz line). Two north-south roads were constructed that linked Mādabā to ʻAmmān. One followed the old road that passed by Ḥisbān and al-ʻĀl, (Elealeh of the Bible), and which was soon extended to Nāʻūr, a village founded recently by Circassians; the other road connected the first station on the east by Zīzyā' near Jallūl, then turned north, bordering the desert, and then ran by Qaṣr al-Mushatta. The eastern route only partially followed the Darb al-Ḥājj, the famous pilgrim route from Damascus to Mecca (which has several parallel routes) and which, in places, had been traveled by so many large camel caravans, the road was as wide as 500 meters.

The Steps to Settlement

In late summer 1880, the first emigrants of al-Karak, who arrived in Mādabā with their Italian missionary, Paolo Bandoli, began to occupy a land located west of the tell, consisting of a small rocky spur with many caves (FIG. 3). According to some explorers, these caves numbered around one hundred. The Christian Bedouins used the caves as storage areas for crops, as shelter against the weather, and as refuge against attacks from other tribes. The priest used a larger cave as a chapel and school. Despite recent and intensive urbanization, some of these western hill caves have been preserved and incorporated into new constructions. A survey in this area, still called *Dayr* which means monastery, has also led to the identification of

Villages	Owners	Families	Tribes
Al Dalelah	Ben er-Redeiny		Beni Sakhr
Um Romaneh	Talâl Al Fâïz	Fâïz	Beni Sakhr
Netel	Qama'ân Zeben	Zeben	Beni Sakhr
Um Qosair	Met'ab bin Zeben	Zeben	Beni Sakhr
Howara	Felâh bin Zeben	Zeben	Beni Sakhr
Jalul	Menawer bin Zeben	Zeben	Beni Sakhr
Manja	Qcneïan bin Fâïz	Fâïz	Beni Sakhr
Al Qastal	Sattâm	Fâïz	Beni Sakhr
Barezein	Fendy, Talal al Fâïz	Fâïz	Beni Sakhr
Umm el Araed	Sattâm	Fâïz	Beni Sakhr
Qariat Salem		Fâïz	Beni Sakhr
Satiha	Eben Hamad	Hamad	Beni Sakhr
Al Mereigmeh	Qoftân bin Hamad	Hamad	Beni Sakhr
Sofa	Dahamseh		Beni Sakhr
Al Dulayla			Beni Hamidah
Al Mereigmeh es-Sahanbeh			Beni Hamidah
Al Zebay	Qoftân bin Sahen bin Fendy	Fâïz	Beni Sakhr
Al Tunaib	Romeiheh	Fâïz	Beni Sakhr
Lubban	Romeiheh	Fâïz	Beni Sakhr

2. Villages with their owners, families and tribes.



3. Manfredi's map (1899).

a large cave which probably corresponds to the rock chapel used by the first Latin missionary.

This primitive cave system lasted three years until the settlers decided to build small houses using stones from the ruins of ancient Mādabā. Those first houses were low, partly because they were half-buried. For security reasons, they did not have any opening other than a door. Dry stone walls marked off small enclosures for keeping animals (FIG. 4).

In terms of formalizing the settlement of Mādabā, four key steps were involved: 1) Mādabā and the surrounding lands were immediately organized as a *nāḥiyah,* a sub-district in the Ottoman administration; 2) in Mādabā, the Ottoman authorities installed a *mudīr nāḥiyah*, a county head to collect the taxes; 3) they built a *saray,* the local administrative seat, and 4) they opened a land registry for the land management.

In terms of building the city, the key factors are linked to the competition between the Latin and Orthodox missions and later, the Muslims.

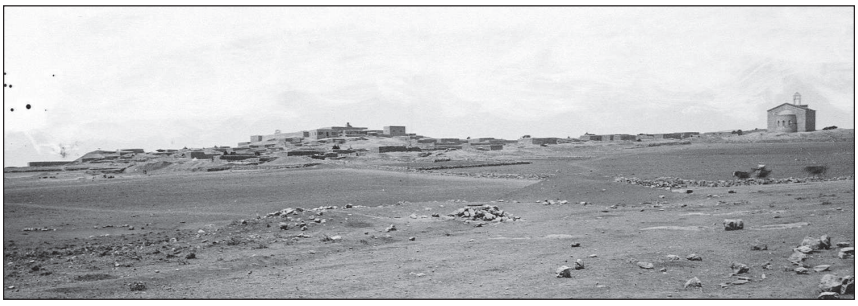
4. Primitive houses on the acropolis, from north-west (EBAF).

Religious places and schools were the pillar of both Catholic and Greek missionary strategies of expansion. They each rapidly built a chapel and a classroom where instruction was provided under the control of the missionary. Education became a marketplace where the supply had to constantly adjust itself to the demand and come to terms with the competition. The existence of two churches created two poles of attraction: one at the top of the hill for the Latin *al-'Uzayzat*, and one at the bottom for the Orthodox *al-Ma'āy'ah* and *al-Karādshah*. Between the two areas, a commercial street developed gradually. In 1935, the first mosque, with a building to lodge the imam and to serve as the Quranic School, opened on the market street, a space not saturated with Christian signs.

With the establishment of the Hashemite Emirate of Transjordan, religious spaces became increasingly affirmed around the centers of worship. Other residential areas spread rapidly across the hill and soon invaded the surrounding areas.

In the historical center of Mādabā, the old houses have become part of the "cultural heritage" with the renewed interest in vernacular architecture. Many Christian families, after abandoning their old houses in favor of more modern places, rediscovered their own urban tradition of the late nineteenth / early twentieth centuries and benefited from public funds to restore the old houses in the city. Old photos of Mādabā taken between 1897 and 1952 reveal the process of the early settlement of the Bedouin tribes (FIGS. 5, 6) and later the rapid expansion and modernization of the town (FIG. 7).

Mādabā still retains some fifteen houses dating from the late nineteenth and early twentieth centuries and some of them, identified in the old photographs, allow one to trace the stages of urban development –from the small village of modest low, half-buried houses of the first years– to the evolution of Mādabā with the establishment of stores such as the *Hamarneh* shops or the Farah shops and the large, tripartite houses like *Bayt Hamarneh* and *Bayt al-Halasa*, some public or government buildings



5. Mādabā from east, around 1898 (AC).

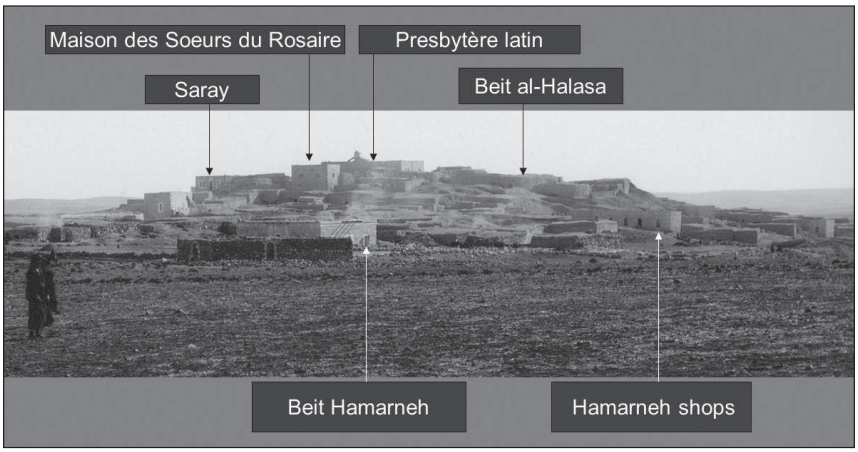
6. Mādabā from east, in 1952 (Madaba Cultural Heritage, p. 15).

7. Mādabā from east today.

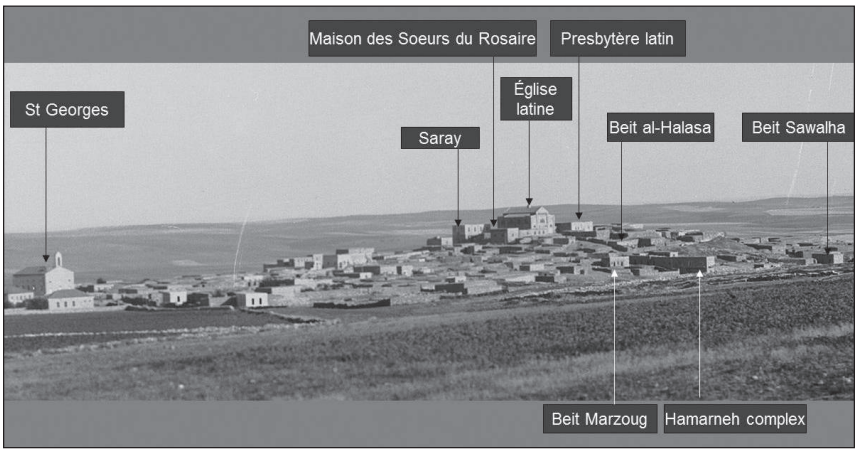
like the *Saraya* and religious structures such as St. George, St. John the Baptist, the parsonage house and the Rosary Sisters' house, all dating back to the turn of the century (FIGS. 8-9).

The location of these first houses generally reflects the religious allegiances of the owners who eventually established groupings of residential and commercial buildings that evolved into real neighborhoods identified by their surname.

The new century, of course, witnessed a dramatic growth of the small town which began to attract not only artisans, masons, stonecutters, but also goldsmiths, and silversmiths. By 1914, carpet shops had been opened near St Georges Church, thereby creating a shopping center – the *Sūq* on *al-Hashimi* Street and *King Talal* Street – between the Orthodox Church and the Latin Church, this last inaugurated on 1913. With the establishment of the Hashemite Emirate of Transjordan, religious spaces were increasingly affirmed around the centers of



8. Mādabā from north-west, between 1908 and 1910: location of the buildings.



9. Mādabā from north-west, between 1922 and 1932: location of the buildings.

worship: the Catholic church with its presbytery and schools in the burrow of *al-'Uzayzat*; the Greek Church Orthodox and Melkite with its presbytery and its schools between burrows of the *al-Karādshah* and *al-Ma'āy'ah*; and finally, the mosque and Quranic school in the district of the *Sūq*. Residential areas spread rapidly across the hill and soon invaded the surrounding areas.

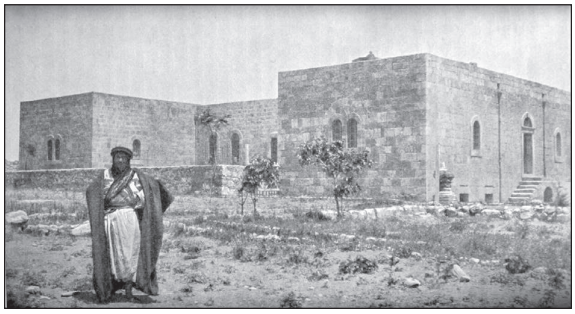
Building the Latin Church

In 1883, Paolo Bandoli erected his new chapel on the acropolis. Thanks to the description done by Giuseppe Manfredi (Abuna Yousef), priest of Mādabā from 1887 to 1904, we know that it was "a three-room building with a mud-packed walls and a roof beam, supporting reeds and topped with clay mixed with chopped straw" (Conference of G. Manfredi of the 13th of September 1896: 9), and we could interpret one of the few pictures we found in the French Biblical and Archaeological School of Jerusalem, as the first Catholic chapel (FIG. 10).

In 1887, the new priest of Mādabā, Zephyrin Biever, started the construction of the rectory (FIGS. 3, 11) and, in 1894, the chapel was inaugurated for worship by Manfredi (FIG. 12), until the construction of the church could begin.

At first, the mission of Mādabā had too few resources to support the construction of a new church. However, Manfredi was able to raise support from his hometown of Mondovi in Italy and also from Genoa because it was the city where he received his religious training.

10. The primitive Chapel by Bandoli (EBAF).

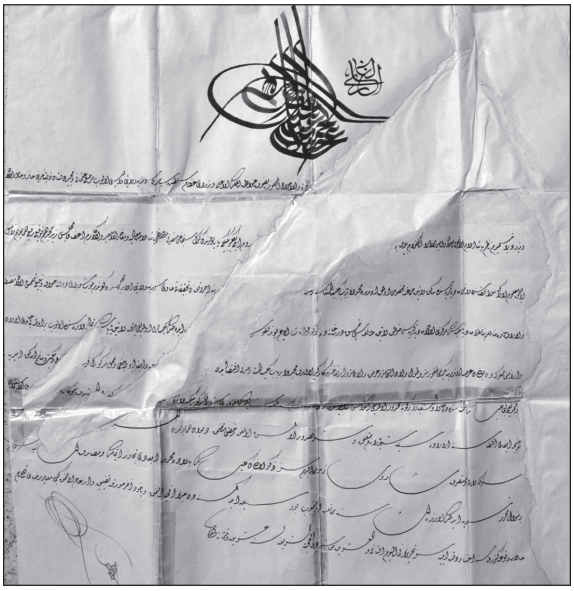


11. Biever and Manfredi's presbytery, from south-east (Musil 1907, fig. 44).

12. Manfredi's Chapel (EBAF).

His letter began with a discussion of Machaerus, where John the Baptist was beheaded, because he thought it would naturally appeal to the people of Genoa since St. John the Baptist was their city's patron. Therefore, he proposed that a chapel dedicated to the memory of St John the Baptist be established in one of the side chapels of the transept of a new church at Mādabā, which was the nearest Catholic center. It is possible that this letter contains the the premises of the name of the future church since the first idea was to dedicate the new church to the Sacred Heart, which was in vogue in the early twentieth century.

In the spring of 1903, Manfredi finally received his *furman* (the permit) (FIG. 13), and immediately began the work of building his new church, located on the site of the old "primitive" chapel, just north of the new buildings of the mission (FIG. 3). The plans of the church were made by the architect, Gugliemo Barberis. In 1910, the new priest, Jean Panfil, continued the construction work but with great difficul-



13. Construction permit from the Ottoman authorities (PL).

ty and *Antoin Abid Rabu*, the priest of as-Salṭ, had to energetically intervene in support of the church to the patriarch Camassei:

"*It is time for me to tell you something about the Church of Mādabā. How long will we drag out the construction? It's not for me to recount the moral evil which results from the delay. The local situation is such that even a religious person considers himself excused from attending Mass because of the lack of ventilation, and over-crowding. This creates an atmosphere that fosters of sin... The delay of ten years to complete the construction this church gives little honor to the patriarchy when it leaves such a large a parish without a proper place of worship. In human terms I would say it is not fair to take advantage of the presence of Panfil... So far this church has not cost much to the patriarchy. Your Excellency has said it would provide another 10,000 Francs for the church but please wait no longer. I pray V. E. that you will make a good decision and I guarantee to you that D. Panfil will complete the work, construction, plastering, roofing and the ornamentation... If you do not act now for that price, you will end up losing thirty thousand... This delay caused the deterioration of the walls that had already been built. Rain and sun are causing the lime to lose its cohesive strength. Over time, the mistreatment of this building will mean that the slightest tremor of an earthquake will cause cracks...*"[2].

On the 21st of December 1913, the church was finally inaugurated even though it was not completely finished. Glass was still needed for the large windows and the tiling and plastering of the walls needed to be finished. These would be completed later.

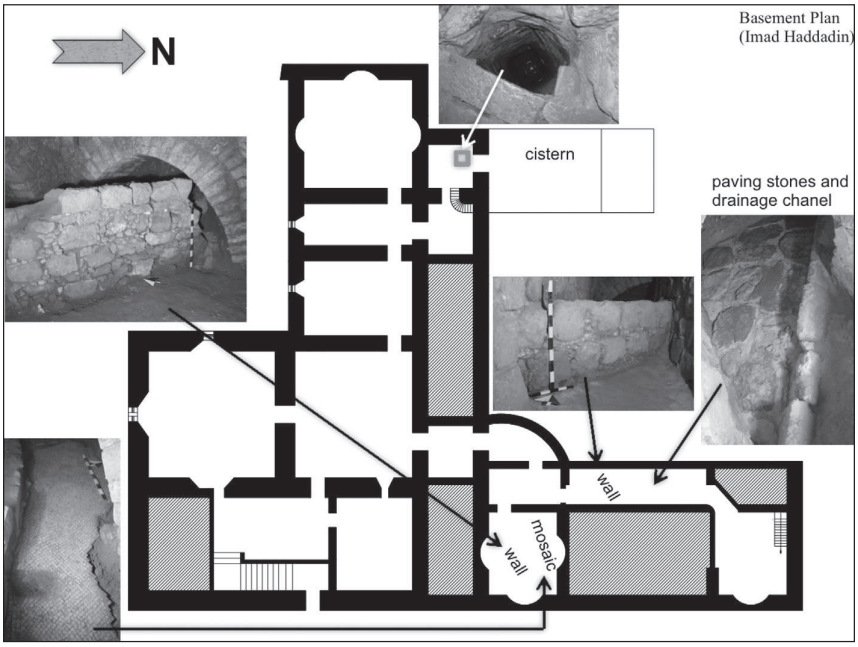
The Archaeological Discoveries

In 2010-2012, it became necessary to consolidate the church and some probes were opened under the apse of the church. In the south room, a wall was discovered as well as a portion of a white mosaic floor under the choir; immediately under the apse is located another wall with a drainage channel and a flagstone pavement (FIG. 14).

These walls could be part of the ancient structure that Father Hanna Sarena (Abouna Sarena) found in 1886, while digging on the acropolis to find building stones for the mission, and that he describes as "a thick wall providing beautiful stones that a man cannot handle alone and an ancient mosaic pavement". Also, Father Zephyrin Biever (*Abouna Daoud*), in 1887, found, about a meter underground, "large stones that only need to be touched up a little to provide very good building material."

The first wall, preserved to a height of 1.50m and a length of 3 m, has a thickness of 0.85m and consists of several courses made of two rows of larger stones with small stones at the core. The visible southwest face presents a fairly regular unit consisting of alternate courses of larger roughly cut stones alternating with smaller sized stones. Smaller stones reinforce the spaces between these stones. This structure is actually the foundation of the wall and is made up of five courses; above this can be seen

2. Letter from A. Abed Rabu to the Patriarch Camassei, 29th of July 1912.



14. Basement plan of the Latin Mission with the location of the remains.

the first course of the wall proper.

Northeast of the wall, there is a portion of mosaic that is related to the wall against which it rests. Consisting of one-color-white monochrome tesserae, this mosaic has a simple decorative pattern composed of a succession of oblique rows and an outer edge of three horizontal lines. The level of this mosaic corresponds to the first course of the wall proper. It is clear that this mosaic, partly destroyed during the construction of the foundations of the church, continues north under the floor of the present choir.

The other wall has the same architectural features but here the elevation is more visible than the foundation. It does not seem likely that the mosaic is preserved here. Interestingly, some ceramic fragments were found inserted in the gaps, along the side of the wall; based on these potsherds, the wall could be dated to the Byzantine period.

Against the latter wall, there is an open drainage channel defined by a row of raised white lime stones. The bottom of the channel is coated with hydraulic cement that goes over the top edge of the curbstones of the channel but does not cover the wall. There is a 2% graded slope that runs down in the direction southwest to northeast. This channel was probably used to direct the flow of rainwater, perhaps to a cistern. These tanks are common on the site: first, created as a stone quarry for buildings, they were then used to contain water.

Along the water channel there is a pavement made of local stone. It consists of large, flat, smooth, multicolored slabs in shades of yellow, and pinkish white. A hard white mortar fills the irregularities of the stones on the surface. The flagstones, which are laid alongside the water channel, certainly belong to the same period of construction as the other structures, especially because the level of this pavement is the same as the mosaic floor. It appears that the pavement is outside the building, probably functioning as a court, or perhaps a street.

Despite the presence of the mosaic, the orientation of the two walls (45 degrees off an east west axis) would not seem to support the hypothesis of a Byzantine basilica on the acropolis, as some have suggested. And while it is still premature to interpret these structures, it can be argued that the top of the tell was occupied by a fortress and defended by a wall within which was the seat of local government. Political power is often located at the highest point of a site, while the religious power is spread in

many parts of the city below. For the mosaic, it could be a little later realization since its simple decoration seems to be a feature of the transition period from the late Byzantine into the Umayyad period (7th to 8th century AD). Identical examples of early Islamic period were found elsewhere in Mādabā and are currently visible in the Archaeological Park and in a building from the early Umayyad period in the Islamic Village of Jallūl.

These archaeological remains, discovered incidentally during some recent works in the church, merely confirm the written testimonies of the missionaries in the late nineteenth century but they only provide us with a peek of what yet lays hidden below the surface. With good scientific support, new research could continue to pull back the curtain of history just below the shrine of the Beheading of Saint John the Baptist.

Conclusion

For Mādabā Christians, the narrative of their emigration from al-Karak has become a foundational act belonging to the past. The variants of this shared history reflect how each group constructed its identity in opposition to that of the others. At the beginning, the two Christian religious congregations, including three tribes and a few families of diverse origins, cohabited Mādabā, each in a distinct territory, rarely carrying out matrimonial exchanges with each other. It was only within the market and administrative institutions that exchange and competition occurred and that Mādabā came to constitute a village community.

For the foundation of satellite villages around Mādabā, the tribes were encouraged to settle permanently on the lands that they usually occupied only in the spring as pastures or cultivated fields. They chose farming over pastoralism and registered their land holdings, in line with Ottoman policies in the region. Leadership roles were also redistributed with the missionary acceding to pre-eminence and the new emerging Christian *Shuyūkh*.

Mādabā and these other villages, refounded during those years, are the proof of interaction between foreign missionaries, local tribes and Ottoman authorities who collaborating or colliding with each other brought Transjordan to modernity.

Abbreviations

AC: American Colony in Jerusalem.

EBAJ: French Biblical and Archaeological School of Jerusalem.

PL: Latin Patriarchate of Jerusalem.

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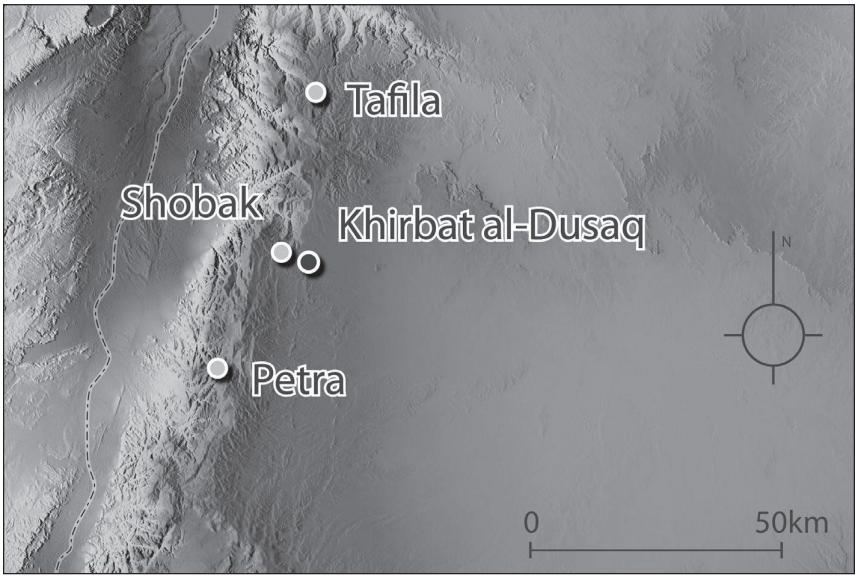
The Medieval Ḥammām of Khirbat ad-Dawsaq: An Archaeological and Historical Investigation

The site of Khirbat ad-Dawsaq is located on the summit of a hill, 1270m above sea level, and 6km to the east of ash-Shawbak Castle in southern Jordan (FIG. 1). It is comprised of three visible buildings (A, B, C), arranged in an L-shape (FIG. 2). The site was discovered by Mauss and Sauvaire in 1864 (De Luynes 1874: 154-155), but was recorded only, with no further information. In 1898, Brünnow and von Domasciewski drew a plan of the site, and published it together with a photograph (Brünnow and Domasciewski 1904: 98, 99 fig. 10). Other scholars visited the site in the early twentieth century, such as Musil in 1905 (Musil 1907: 35-37), Field in 1928 (Field 1960: 83), and the Reverend Father Savignac in 1935. Neither the purpose nor the function of the site have been explained definitively, and it remains an enigma; it has been suggested at different times by different authors that it may have been a Byzantine church (Hill 1897: 142), a caravanserai (Brünnow and Domasciewski



1. Location of the site (©Th. Fournet).

2. General view from east (©Mission Dusaq 2015/R. Elter).

1904: 98; Vailhé 1898: 107; Meistermann 1909: 39; Brunnow, Domaszewski 1904: 98), a palace (Meistermann 1909: 239; Musil 1907: 35-37), a fort (Meistermann 1909: 39; Hill 1897: 42) or even a mosque (Musil 1907: 35-37; Meistermann 1909: 239). Dr. Ghazi Bisheh described the remains in an exploration report conducted for the Department of Antiquities in the 1960's; he suggested it may have been a palace. Although the site was mentioned briefly subsequently (Mc Quitty 2001: 569; Millwright 2008: 98; Nucciotti-Hamarneh 2009: 113; Petersen 2011: 15-16), no further study was conducted until 2008.

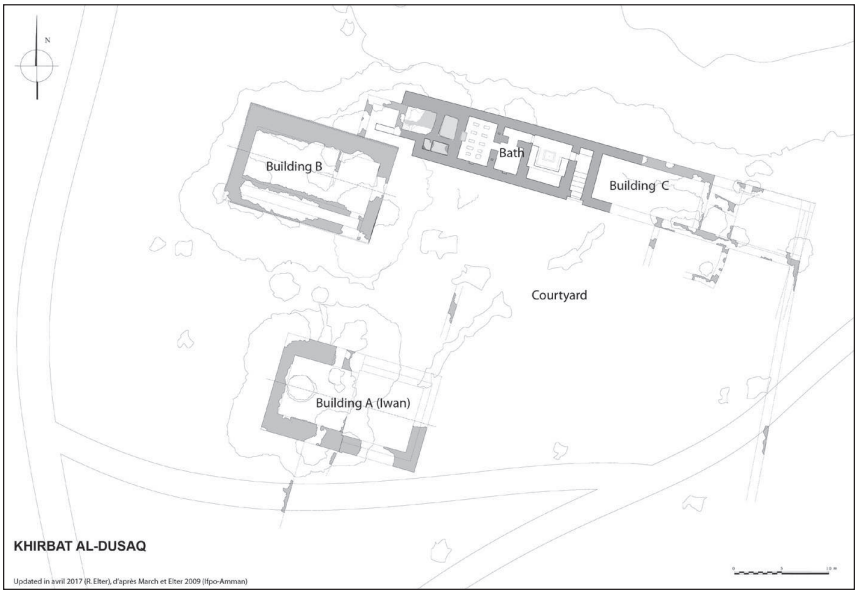
That year, a team from the French Institute of the Near East (Institut français du Proche-Orient, Ifpo) conducted an architectural survey[1] *in situ* to draw a new plan of the site (FIG. 3). Field work at this time included exploring a cavity in the north-facing wall of Building C, which opens into a metre-high space, with a ceiling supported by small rectangular pillars, and leads westwards to the entrance of an oven. It was identified as a hypocaust, hence indicating the presence of a bath. Archaeological excavations were conducted on the site in 2009[2], focusing particularly on the section overlying the hypocaust, which confirmed the presence of a bath and revealed part of its hot room. The site has since suffered considerable destruction, and part of the bath complex was destroyed by a bulldozer. Nevertheless, it was possible to conduct a field season in 2015, when the remainder of the edifice was uncovered.

Description of the Bath and its Equipment

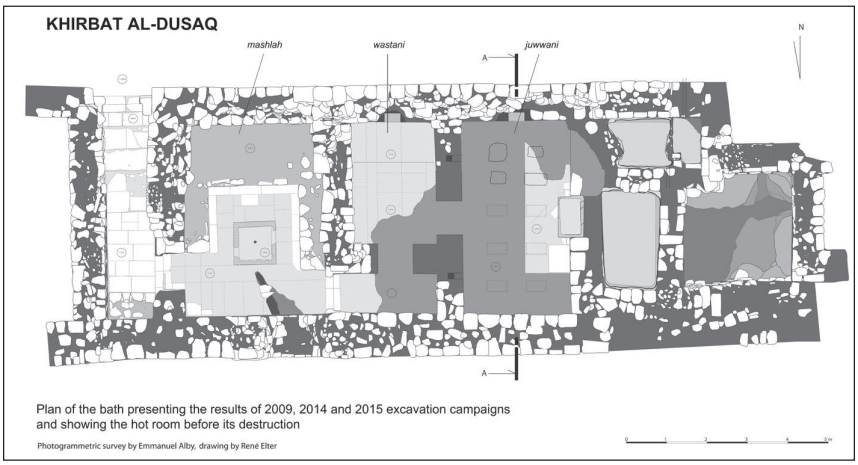
The surveys carried out in the spring of 2008 and the first excavation of May 2009 revealed and then confirmed the presence of a bath in the northern building. Three archaeological surveys and excavations followed in 2014[3], 2015[4] and 2016; it is now possible to describe it in its entirety. The bath occupies half of the North Building, also called Building C (FIG. 4). It consists of adjoining rooms which are not only related to bathing; some were probably used to provide a means of circulation, the purpose for others cannot be positively identified. They could have been used for storage, as part of the furnace operation, or other activities. It is oriented east – west, and is *ca.* 4.80m wide by 17m long. This is series of linked rooms, that is they lead into each other; there is no other entrance or exit. Due to its location on a terrace right on the edge of the hillslope, the construction was built back into the slope, thus the rear area is partially underground (FIG. 5).

Excavation reveals a chaotic stratigraphy, strongly disturbed by past and recent looting. Preserved to an average height of 2.25m, strata were comprised of building detritus related to the collapse of the bath (earth, plaster and architectural blocks). Close examination of the archaeological layers revealed that the building

1. The 2008 mission was led by Jean-Paul Pascual, Christèle March et Norig Neveu and sponsored by the "Balnéorient" program of the french National Agency for Research (AnR) this misson was led by Jean-Paul Pascual, Christèle March et Norig Neveu.
2. The 2009 mission was led by Jean-Paul Pascual, Christèle March, René Elter and Elodie Vigouroux and sponsored by the "Balnéorient" program of the French National Agency for Research (AnR).
3. The 2014 operation led by Elodie Vigouroux and René Elter, it was an emergency survey sponsored by the French Institute for the Near East (Ifpo). It aimed at evaluating the damages in order to identify the priorities of a future work.
4. That mission conducted by Elodie Vigouroux, René Elter and Julie Monchamp was sponsored by the French Institute for the Near East (Ifpo) and the French National Center for Scientific Research (Cnrs). We are grateful to M. Hani Falahat who was then the DoA representative.



3. Plan of the site (©Mission Dusaq 2017/Ch. March-R. Elter).



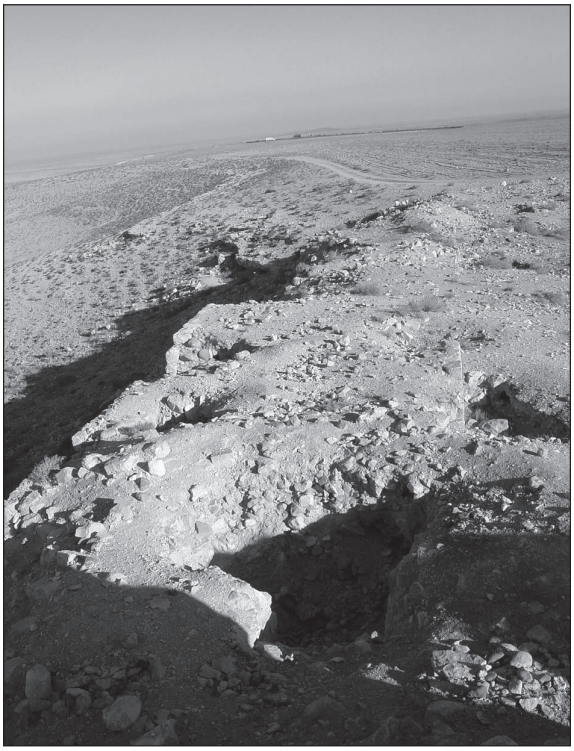
4. Plan of the bath (©Mission Dusaq 2017/R. Elter).

was re-occupied immediately after the bath complex was abandoned. The building was used successively as a shelter (it cannot be determined if occupation was permanent or temporary), a sheepfold and a necropolis until the first decade of the 20th century, as evidenced by the archaeological finds uncovered.

Entrance and Access

Access to the bath is from the internal courtyard of the complex; entry is through A 0.86m wide door, which is recessed *ca.* 0.20m from the external face of the south wall of Building C.

A 0.82m high monolithic lintel was built into the wall immediately above the door, with a 0.30m frame enclosing the side edges. It is highly probable that the top of the door ended with a pointed arch, although there are no extant remains. The door opens onto a staircase, is offset towards the east in relation to the staircase, and opens from the inside (FIG. 6). The threshold is set into the floor and is the same width as the doorjamb; there is a 0.06m high step. This design ensures the door closes tightly, thus preventing heat loss due to drafts. In the eastern corner, on the ground, the door's pivot bearing is marked by a circular recess. The staircase and the corridor which extends from it are both 1.16m wide; total length is 4.75m. The staircase is comprised of 6 steps; average tread depth is 0.54m and height 0.22m. Each step consists of two limestone blocks laid side by side. The staircase opens into and is extended

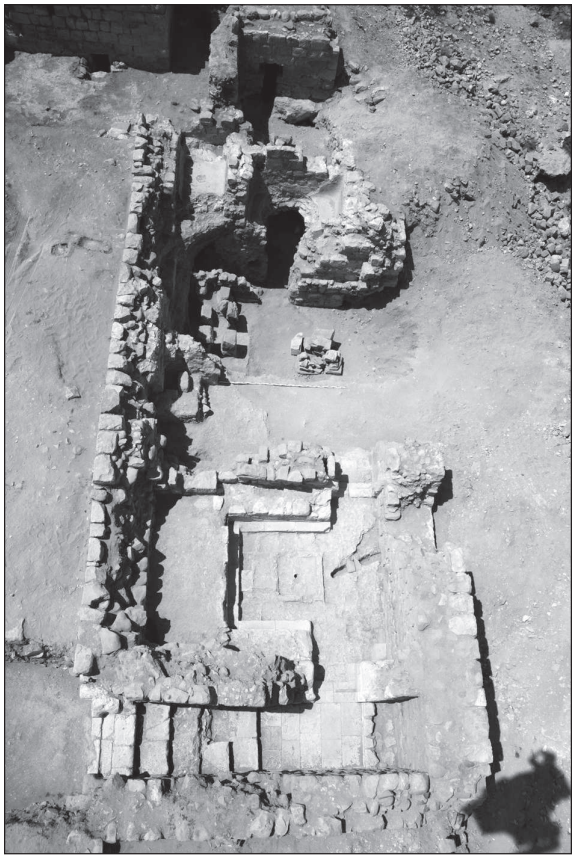


5. Building B from west before excavation (©Mission Dusaq 2008/Ch. March).

by a 2m long landing, the floor is tiled with limestone slabs. A 0.66m wide bench is located at the northern end; the seat is 0.32m above the ground. A door opens from the landing to the west onto the cold room. A low barrel vault covers the whole staircase. A plaster or lime mortar layer covered all walls of the entry area between the exterior of the building and the first room of the bath.

The Cold Room

From the landing, the "cold room" is accessed via a 0.86m wide door, and acts as the entry room to the bath (FIG. 7). It is rectangular in shape; 3.50m wide by 4.80m long, with a central 1.00m deep square basin. Benches follow three walls of the room, with a 0.12 high step in front. The largest (0.60m higher that the top of the step and 1.48m deep) extends along the entire south wall. Two smaller benches extend along both the east and west walls; all three benches are the same height, and both the east and west benches are 0.60m wide. An



6. Bath and staircase from east (©Mission Dusaq 2015/R. Elter).

7. Cold room/*mashlaḥ* from north (©Mission Dusaq 2015/ R. Elter).

arch (*ca.* 3m wide and 1.30m deep), which may have been pointed, although the top is no longer extant, covered part of the bench on the south wall. This it forms an alcove, which may have been reserved for important people, and draws attention to this section. Technically the presence of the deep arch along the south wall redistributes the space into two

distinct areas. Geometrically, the northern area encompasses a square space (each side of which is 3.5m wide), with the basin in the centre. This spatial organization is consistent with other constructions where a square room is covered by a circular dome.

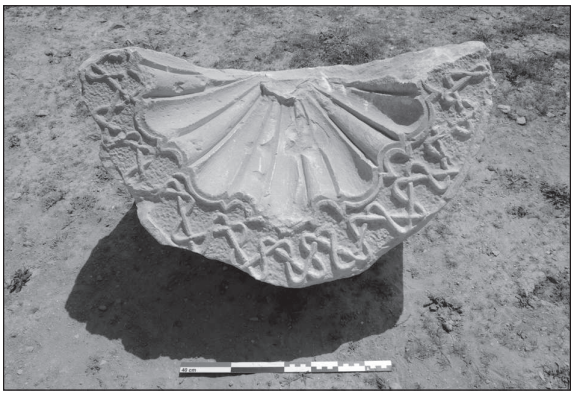
The mortar floor show traces of a regular *sectile* pavement. The basin was edged by a narrow wall (0.10m wide) and its entire base had been covered with a *sectile* pavement; this has been removed by looters. A terracotta pipe, 0.08 m in diameter, is located in the center of the basin, which supplied water to a fountain; this is no longer extant. The water for the installation was piped from the tank of cold water adjoining the hot room. A pipe is embedded in the slab which is on the north side of the basin between the basin and the wall under the pavement and then runs under the north wall of the room, this drained water to the outside of the building. The walls of the room are covered by a white lime mortar or plaster layer, the same as the staircase. The architectural blocks uncovered during the excavation of the cold room, particularly a ribbed conch (FIG. 8), indicate the architectural richness and high quality decor of the original workmanship.

The Warm Room

A door in the north-west corner of the cold room opens into a corridor (1.00m wide by 2.50m long) which leads to the "warm room". The threshold is marked by a narrow step; 0.03m high and the same width as the doorjambs. A now missing door opened from the corridor in the north-south axis of the warm room, which was 2.00m wide and 3.10m long. Architectural decoration consists only of a niche in the south wall (FIG. 9) and a regular sectile pavement. The niche is covered by a pointed arch (0.40 wide by 1.10m high by 0.25m deep at the lowest surface, which is 0.60m above floor level. It housed a basin which was supplied with water by two 0.08m diameter terracotta pipes. The floor was covered with a regular sectile stone pavement. In front of the niche, the floor is raised by a 1.00m wide and 0.10m high step, which extends the width of the room, thus forming a platform. Access into the next room, the hot room, was probably through a door in the western wall of the warm room.

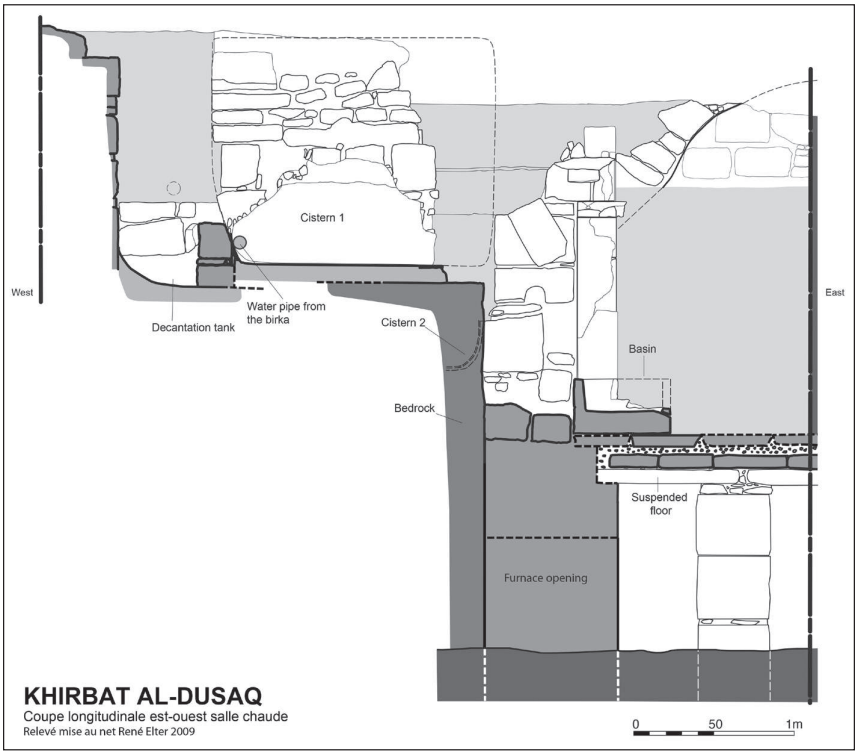
The Hot Room

The "hot room" has a rectangular plan, and was only partially excavated during the 2009 field season. It is 2.80m wide and 4.80m long. The suspended floor was located over a hypocaust system found *in situ* during the 2009 field season affirms that it was heated (FIG. 10). The south and west walls display architectural



8. Conch from the cold room/*mashlaḥ* (©Mission Dusaq 2015/R. Elter).

9. Niche in the warm room/*wasṭānī* (©Mission Dusaq 2014/R. Elter).



10. Section drawing (east-west) of the hot room/*jūwwānī* before its destruction by a bulldozer (©Mission Dusaq 2009/ R. Elter).

features. Similar to that described for the "warm room", a niche equipped with a basin was built into the south wall of the hot room. A second niche, which is more important than the one in the south wall, was centrally located in the western wall; it is also covered by an arch (FIG. 11). Its dimensions are 1.00m wide by 0.30m deep, constructed at floor level, it has a height of at least 2m at its greatest extent Regarding the architectural features of the arch, only a springer block, together with the transom on which it rests, still remain *in situ*. Carved from high quality white limestone, they both display careful craftsmanship and decoration. At the bottom of the niche, a quadrangular basin was installed directly on the floor slabs (FIG. 12). Wider than the depth of the niche, it extends 0.30m out into the room itself. Of monolithic construction, it was carved from a block of hard white limestone; its dimensions are 1.00m long by 0.65m wide and 0.40m high. The upper edges of the basin sloped inwards, to allow excess water to flow back into the interior. The bottom of the basin is sloped so as to facilitate draining the water, which flowed directly onto the floor of the room through a small hole in its eastern edge. The external sides of the basin are decorated with vegetal carvings on the lateral sides and interlacing on the main face.

The floor of the room is covered with quadrangular slabs of thin white limestone *ca.* 0.06m thick. In front of the western basin, the slabs are laid in an oblique pattern, as opposed to that for the remainder of the pavement, which are laid in an orthogonal pattern, aligned with the walls on either side of the niche. The niche and its basin are the most important elements of the room; hence, their decoration is immediately noticeable compared to that for the rest of it. This importance can also be observed for the ceiling decoration, immediately in front of the niche, where the arch intersects with the vault. The part of the room which was excavated demonstrated that a lime-based mortar skirting board followed the junction of floor and walls around the room; the lower part of the walls were plastered with a waterproof hydraulic mortar to a height of *ca.* 0.70m. The surface of the walls above the mortar was undecorated. The vault is still extant in the north-west corner of the

11. West niche and basin in the hot room/ *jūwwānī* before its destruction by a bulldozer (©Mission Dusaq 2009/R. Elter).

12. Basin in the hot room/ *jūwwānī* before its destruction by a bulldozer (©Mission Dusaq 2009/ R. Elter).

room; it is finely polished, and was probably originally colored in the same manner as other ancient stuccoes. Fragments of plaster, together with the architectural elements preserved in the backfill of the room, reveal that the vault was decorated and incised; the decoration forms interlacing foliage. A layer of natural ocher can still be discerned over the vault, which verifies that it was colored. Sculptured architectural elements (conches) made from fine white limestone are positioned where the vaults join with the rest of the room.

The Suspended Floor

Located immediately underneath the hot room, the suspended (hypocaust) floor was almost intact in 2008 (FIG.13). Structurally, the floor is supported by ten piers; two rows of five arranged in a N-S direction, each of which is comprised of thick limestone slabs; similar to a 'tas-de-charge'[5]. Each slab is on average *ca.* 0.25m wide by 0.45m high; some of them show signs of reuse, with moldings particularly noticeable. The support piers

13. Hypocaust and furnace opening (©Mission Dusaq 2008/ Ch. March).

5. This is a French language term for which there is no equivalent in English, which is used to describe the lower courses of ribs for a Gothic vault. These are laid in horizontal courses and bonded into the wall, forming a solid mass; this helps bond the ribs, vault and walls together. They generally rise about one-third of the height of the vault, and as they project forwards they lessen the span to be vaulted over.

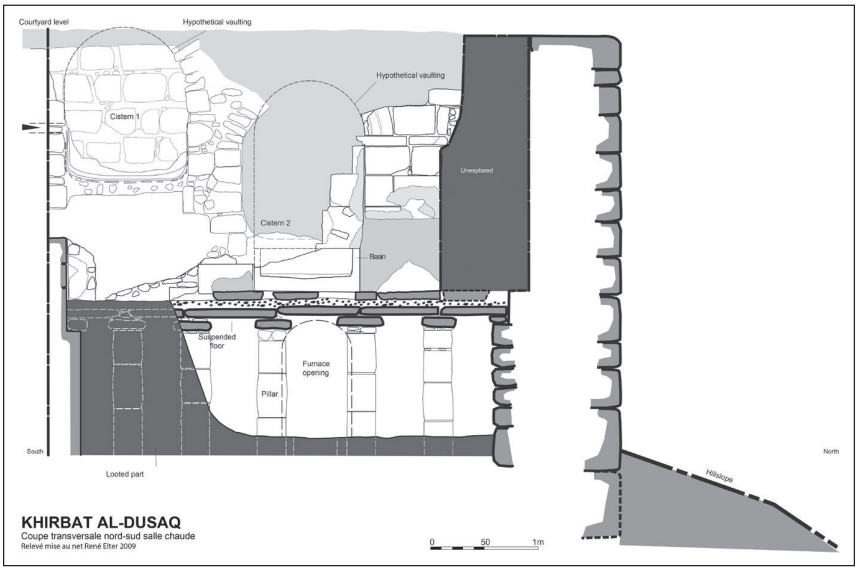
were still intact, and hence at the same height as originally constructed. They were not completely uncovered during the excavation, but remained partially buried; the maximum height uncovered was 0.90m (FIG.14). Large 0.06m thick limestone beams lie flat across the piers between the east and west walls, subdividing the room space into six parts. This strengthens the suspended floor by reducing the load borne by each beam to less than one meter in length. The floor of the hot room is formed by the slabs of the suspended floor. These slabs (*ca.* 0.30m wide by 0.80m long by 0.05m thick), are covered by a 0.06m thick lime mortar concrete. Thus, there is only 0.17m between the floor surface and the heat generated by the boiler room, which was piped to the hypocaust system by means of a vaulted heating channel constructed of baked clay bricks laid on edge. As with the observation regarding the existing mortars and plaster fragments, the study of the suspended floor reveals exceptionally fine workmanship, which has made best use of the available materials.

Water Supply System and Tanks

The various basins within the bath house, together with the fountain in the cold room, were originally fed with both cold water and hot water. Terracotta pipes embedded in the thick masonry walls supplied water from two tanks located behind the western wall of the warm room. These two tanks are situated next to each other; the southern tank is designated No. 1, and the northern No. 2. Both tanks are rectangular, and placed so that the longer sides face the wall and the shorter sides extend out from the wall. Both have concave bases and vaulted brick ceilings. The inner walls, including the roof, are covered by several layers of hydraulic plaster. In order to increase water pressure, the level at the base of the tanks is higher than that inside the bath house, so that gravity increases water flow. The large basin located 23m to the south (in the large courtyard in front of the īwān for building A) supplies water for the tanks by means of a clay pipe, 0.08m in diameter (FIG. 15). The water flows in the first instance into the rear of a small settling tank situated at the west of the southern cistern (No. 1). The water remained in this tank for some time, allowing contaminants to sink to the bottom, once the water was clear, it was piped directly into tank No. 1 by means of a short 0.08m diameter pipe; from there, it was directed either into tank No. 2 or the three bathrooms.

Cistern 1: The Cold Water Tank

The dimensions of tank No. 1 are 1.18m wide by 1.70m long; the preserved height, without the vaulted cover, which is no longer extant, is



14. Section drawing (north-south) of the hot room/ *jūwwānī* before its destruction by a bulldozer (©Mission Dusaq 2009/R. Elter).

15. Water pipes in the southern wall of the warm room/ *wasṭānī* (©Mission Dusaq 2015/R. Elter).

0.75m (see FIG. 14). The base inclines slightly (0.02m per meter) towards the east, in other words, towards the bath house, and is 1.05m higher than the bath house floor. As mentioned above, this tank received water directly from the external supply by way of the settling tank; there were then separate systems to supply water for tank No. 2 and the bath house. A single clay pipe led directly into the north tank No. 2. Two clay pipes, each of which was 0.24m long and 0.08m in diameter, were embedded in the south brick wall of the hot room; one for hot water and one for cold water, and both were protected by lime mortar (see FIG. 15). Water was piped from this point to supply cold water for the bathrooms and the fountain in the cold room.

Cistern 2: The Hot Water Tank

The second cistern is similar in nature and shape to the first. However, its base is 0.65m lower than tank No. 1, that is 0,25m above the bottom of the basin of the warm room thus gravity ensures continuous supply (see FIG. 14). Its dimensions are 1.25m wide by 2.25m long; preserved height is 1.35m. Its position over the heating channel for the hot room leads one to assume that its function was the supply of hot water for the bath.

The Boiler Room and Furnace

The boiler room was situated at the western end of the bath; dimensions are 2.70m wide by 3.40m long. There is an opening at the eastern end into the furnace channel. Due to its physical position, its aspect is more that of a "cave" or "rock shelter" than a technical room (see FIG. 4). The entrance was from outside, on the hillside north of the complex; there was no entrance into the bath complex itself. Access to this room was blocked at a later date. There is a natural rock crevice which extended 2m to the south from the boiler room; this may have been used to store fuel for the furnace. Excavation reached bedrock; several thousand pieces of the original clay used to repair the bath mortars were found in the fill. The low ceiling of the crevice accentuates the cramped working conditions for the boiler room staff. The configuration of this part indicates that excret from the latrines located above to the west and garbage from building B to the south were dumped in this area. An opening was made in the rock ceiling of the boiler room; combustible materials found in the garbage could be thrown down the channel into the boiler room, thus increasing the amount of fuel available for the boiler. The furnace duct extends from the boiler room to the east and opens out under the suspended floor; semicircular in plan, the roof can be described as more of a dome than a vault. The hot cistern is located immediately above the furnace duct, which was constructed from clay bricks and small stone squares. The furnace dimensions are 0.80m wide by 3m long by 1.80m high. Such a large size would have necessitate a correspondingly large amount of

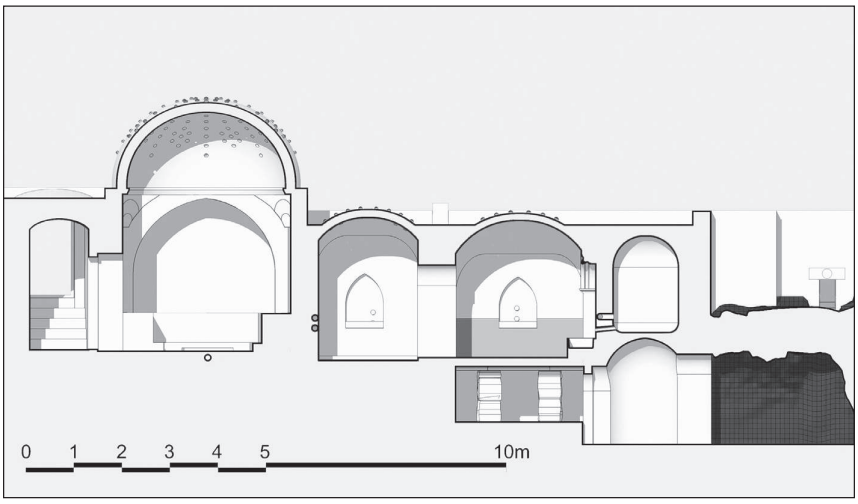
fuel; however, it also meant that maintenance and cleaning of the hypocaust space under the suspended floor would have been easier.

Typology and Dating

Excavation of the bath buildings at Khirbat ad-Dawsaq revealed a plan similar to other medieval urban models, that is, several rooms each dedicated for a special use. Comprised of three main rooms, it was a simplified and smaller version of other medieval urban baths found in the region, particularly those of thirteenth-century Damascus (Ecochard and Le Coeur, 1942: 17-25). Its scale (both in terms of the size of the spaces and the capacity of the cisterns) is comparable to that of the castle of Sadr, founded by Salah ad-Din (1193 AD/ 589 AH) in the Sinai (Mouton 2010), and thus probably served a limited clientele (FIG. 16).

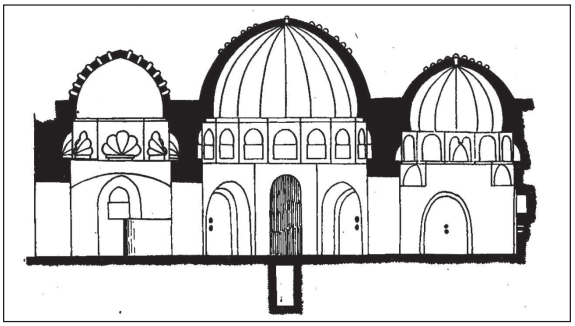
The bather undressed in the "cold room" (*mashlaḥ* in Arabic), wrapped himself in a piece of fabric, (*fūṭa*), and then entered the smaller "warm room" (*wasṭānī*; Room 4), which was positioned at a right angle to the entrance to prevent heat from escaping. There would have been both hot and cold water inlets and a basin in the *wasṭānī*; here he could wash or receive treatments such as massage or waxing. Bathers then moved to the "hot room" (*jūwwānī*), which would have been extremely hot, as heat was produced by two separate systems; the hypocaust underfloor heating on the one hand, as well as steam, which was a by-product of the overflow from the basin situated immediately below the furnace-heated water tank. After perspiring in the hot room, bathers first washed, then retraced their steps, returning to the *mashlaḥ* in order to dry off, relax and have something to eat.

The site displays great mastery of contemporary construction techniques, by adopting and optimising the capacities and possibilities of the available materials, for both the mortars and rendering, as well as the suspended floor. The bath design also demonstrates the builder's abilities, not only for efficient distribution of both hot and cold water, but also for creating a luxurious environment. Three architectural limestone blocks (0.45×0.25m×0.23m) carved to resemble a shell (conch) were found in the destruction layers of the "hot room" during the excavation (FIG. 17). The workmanship is of a high quality, and was accomplished with serrated tools, similar to those in use in the thirteenth century, notably in Damascus (Vigouroux *et al.* 2015: 193 and 203). The quality of workmanship was assisted by the composition of the limestone used, which facilitated such fine carving. Furthermore, these blocks are very similar to those used to decorate drums for the cupolas of several Damascene mausoleums, which have been dated from the late twelfth century to *ca.* 1230 (627 AH). Similar conch shell decoration is often seen in the squinches (which form

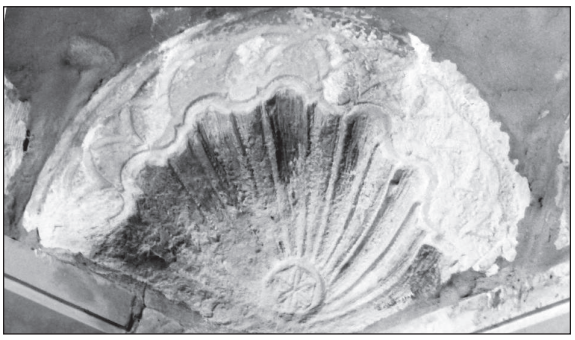


16. Hypothetical section of the bath (east-west) Mission Dusaq 2017/© Avril 2017, Maxime Santiago.

17. Squinch from the hot room/*jūwwānī* (©Mission Dusaq 2009/ E.Vigouroux).



18. Section drawing of the Hammam Sama in Damascus (Sauvaget 1930, fig.5 p. 377).



19. Squinch in Maqām Abū Sulaymān in ash-Shawbak (©Mission Dusaq 2015/ E.Vigouroux).

a transition zone from a square building to a cupola) in the Damascene baths dating to the Ayyubid era; for example, the Hammam Sitt ‘Adhra and the Hammam al-‘Umari, both of which can be dated to the late twelfth or early thirteenth century (Ecochard and Le Cœur 1942: 23-26 and 40-43; Ecochard 1940: 93-99). However, the conch shells discovered in the hot room of the bath at Khirbat ad-Dawsaq are not exactly the same as those from Damascus, as they have five ribs only. This is a rare form, the only comparison for which can be identified in the warm room of the Hammam al-Sama in Damascus, which dates to the late twelfth or early thirteenth century (FIG. 18).

The larger conch shell (0.70m × 0.45m) displaying fine interlacing patterns (see FIG. 8), was discovered in the destruction layers of the “cold room” is very similar to those which decorate the drum angles for the cupola of the Maqām Abū Sulaymān near ash-Shawbak (FIG. 19), which has been dated to the thirteenth century (Walmsley 2001: 536; Milwright 2006: 17-18; Nucciotti 2007: p. 30 and fig. 14, 31; Marahleh 2011: 227-230).

This typology and the decorative features of the bath allow us to propose the first half of the thirteenth century for construction. Moreover, the finesse of the decorative elements and the technical mastery indisputably testify to the wealth of the person who commissioned the bath, as well as to close links with Damascene architecture. Thus, it is possible to consider the raison d’être of such a bath in such a place, as well as the identity of its founder.

Raison D’être

ash-Shawbak castle was built by King Baldwin in the southern part of the Kingdom of Jerusalem in 1115 (509 AH) (Devais 2008: 28-30), and originally called Montreal. It was seized by Salah ad-Din in 1189 (585 AH) after a year-and-a-half-long siege, who then entrusted the region to his brother, al-‘Adil Abū Bakr (Humphreys 1977: 63) It was later controlled by al-‘Adil’s son, al-Mu‘azzam ‘Īsā, who was appointed Governor of Damascus province during the period his father was occupying Egypt in 1200 (596 AH) (Humphreys 1977: 125-154). According to the historical sources, the thirteenth century was an economically prosperous time for the region (Walmsley 2001; Milwright 2006: 15-19, Milwright 2008: 114-115; Hamarneh and Nuccioti 2009: 110-119; Hamarneh 201: 182-183). Consequently,

al-Mu‘azzam ‘Īsā (1227/624 AH) made adjustments to the fortress and to the village of ash-Shawbak (Brown 1988; Nucciotti 2007: 45-47; Milwright 2008: 74-75; Vannini 2011: 153-154): “he made it a city worthy in its own right and increased its defences and charms”. He also encouraged the development of agriculture, even introducing “strange” fruit trees from various regions (Ibn Shaddad, al-A‘laq al-Khaṭira: 80). ash-Shawbak then enjoyed a certain prosperity, to such an extent that medieval Arab authors lauded the town, the abundance and quality of its water, and its gardens and orchards, which they compared to those of Damascus (al-‘Umarī 1923: 133; Dimashqi 1894: 291). Traces of a 200m × 100m enclosure, which may corroborate the existence of a sizeable orchard at the Khirbat ad-Dawsaq site, only 5km from ash-Shawbak, have been identified by examining aerial photographs taken by the Wings for Science team in 2013.

The inscription discovered in 2016[6] is consistent with a construction date for the complex within the reign of Prince al-Mu‘azzam ‘Īsā (1218–1227/615–624 AH) who by this period had been invested as the sultan of the Ayyubid province of Damascus (Humphreys 1977: 155-192); thus, it could well have been part of an agricultural development programme for the region, with the residential structures used as a vacation residence.

However, an alternative hypothesis can also be envisaged. Before the Franks occupied this region in the twelfth century, Syrian caravans making the *Hajj* pilgrimage to Mecca followed the same route than the Roman *Via Trajana Nova*, which was not only secure but also provided sufficient stops to replenish water supplies; this trade route corresponds to the “King’s Highway” in modern Jordan (Petersen 2013: 21). Between 1115–1189 (509–585 AH), when the region was controlled by the Crusaders, the castles of Montreal and Karak posed a serious threat to the *Hajj* caravans, which were subject to taxation and pillage by the overlords. As a result of this, Salah ad-Din’s secretary, *al-Qāḍī al-Fāḍil* (1199/595 AH), declared that Karak was “the obstacle that strangles the throat … the ambush set up on the frequented road … it was a sin for this century … the excuse of he who neglects to accomplish the pilgrimage” (quoted by al-‘Umari Demombynes 1923: 132).

After Karak and ash-Shawbak, together with their hinterlands, had been conquered by Salah ad-Din’s armies, the *Hajj* route became more secure, because of its proximity to these fortresses and the troops stationed there. Improvements were thus needed to equip this road, which had been more or less abandoned for almost a century. However, as the King’s Highway, descending from the north, led to the foot of Khirbat ad-Dawsaq, at the junction with the road leading to ash-Shawbak, the existence of the site may be linked to a renewed frequentation of this route; if this hypothesis is correct, it could then be identified as a *Hajj* stopover site. This theory is corroborated by the fact that contemporary writers affirm that Prince al-Mu‘azzam ‘Īsā wished to install baths, wells and caravanserai at each stage along the pilgrimage route (Humphreys 1977: 191-192). According to Sibṭ Ibn al-Jawzi (1256/654 AH), he commissioned the construction of a rest house and two baths at the Ma‘ān staging post. On the other hand, it should nevertheless be stressed that the diminutive dimensions of the bath at Khirbat ad-Dawsaq, which could only have serviced five or six bathers at any one time, indicate that it was intended for a select clientele. It is thought that al-Mu‘azzam ‘Īsā himself completed the pilgrimage in 1211 (608 AH) in the company of several of his close

6. We would like to thank the DoA representative on this mission, M. Muhammad al-Marahleh (Petra Archaeological Park) for his help and support. The 2016 mission was sponsored by the French Institute for the Near East, the French National Center for Scientific Research, and the Max Van Berchem Foundation. The Max Van Berchem Foundation was founded in 1973 as a tribute to Max van Berchem (1863-1921), the founder of Arabic epigraphy as a discipline. Established in Geneva, the goal of the foundation is to promote the study of Islamic and Arabic archaeology, history, geography, art history, epigraphy, religion and literature.

confidants; perhaps this bath was intended for the prince and his retinue? Once the inscription that we discovered in 2016 has been analysed by prof. Frédéric Imbert (ifpo) it was provide more information about the date of the building and the identity of its patron.

Moreover, further exploration of the site will provide additional evidence, not only for the use of the buildings, but also regarding the water supply, without which the construction of a luxurious bathing complex in this semi-arid region would not have been possible.

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Restoration and Rehabilitation of Byzantine Basilica of Memorial Moses at Mt. Nebo, Jordan. Architectures and Mosaics by The Custody of Holy Land

Presentation Dedicated to Fr. Michele Piccirillo

Then Moses climbed Mount Nebo from the plains of Moab to the top of Pisgah, across from Jericho (Deuteronomio 34, 1-8). Mount Nebo is located about 7km west of Mādabā town, here rises to 710 meters high Ṣiyagha hill with the ancient Memorial of Moses In 1864, Duke De Luyne visited the ruins of Ṣiyagha and he gave it a first description in his book of stories, *Travel of the Duke*[1]; before the end of the century, will be of decisive importance for the definitive historical identification of the site, the Diary of the Pilgrimage Egeria compiled in 1884 and the account of the life of Peter the Iberous . In 1932, through the work of Fr. Girolamo Mihaic of the Custody of the Holy Land, the hills of Ṣiyagha and Mukhayyaṭ were purchased. The excavations in Ṣiyagha began on July 13, 1933, directed by Fr. Silvester Saller from the Studium Biblicum Franciscanum. He was later assisted by Fr. Bellarmino Bagatti. In three excavation campaigns – 1933, 1935 and 1937 – they unearthed and brought to light the Basilica and the vast monastery[2]. Fr. Girolamo greatly contributed to the success of the project together with the workers from the nearby Bedouin village, Kufayr al-Wukhyān today al-Fayṣaliyyah, whose commitment over the decades has become a tradition, that continues to these days, 84 years later. Later, the restoration of the Basilica was implemented with the active participation of the inhabitants of the village of al-Fayṣaliyyah . In 1963, after the interruption of activities due to the Second World War and the Arab-Israeli War in 1948, Fr. Virgilio Corbo launched a new phase of the project aiming at protecting the basilica by building a metal structure dressed of asbestos panels and ripping (*strappo*) of mosaic floors for further investigations. These investigations brought to light several subsequent levels of mosaic floors and various structures. With the outbreak of the Six-Day War of 1967, and the continuous political tensions through 1973, all archaeological campaigns were suspended and excavations on the Memorial of Moses were resumed only in 1976, under the lead of the late

1. M. le Duc De Luynes, Voyage d'exploration a la Mer Morte....I, Paris, 1874 Pp. 148.

2. Sylvester J. Saller O.F.M., The Memorial of Moses on Mount Nebo, I, Jerusalem 1941.

Father Michele Piccirillo.

For the following 31 years, until his death, Fr. Michele Piccirillo led several excavation seasons and maintenance and restoration campaigns. As the excavation in the summer of 1976 led to the discovery of the Ancient Diaconicon Baptisterythe site was equipped for the reception of tourists and pilgrims[3]. Over the years, the mosaics detached during the earliest campaigns have been restored and re-casted on cement reinforced with metal mesh in 2007-08 Fr. Piccirillo launched his last project for the Ṣiyagha Hill that is here described and that is the fruit of 35 years of dedicated work. All the interventions implemented over almost nine decades gave a unique identity to the Memorial, a constant job in looking for compatible solutions combining sites preservation and pilgrims and visitors use.

In 2002 a competition was announced for the study and planning of a new protective structure for the sanctuary. The evaluation committee consisted of a group of architects with the consultancy of Franciscan archaeologists and in 2004 a book about the proposed projects was published *Un Progetto di copertura per il Memoriale di Mosè*[4]. Both the competition and the publication of the book were made possible by a fund from the Italian Ministry of Foreign Affairs and the Custody of the Holy Land. Ten interesting projects were proposed and examined in the following years. Between 2006 and 2007, the implementation of the project was assigned to the architect Roberto Sabelli and the Tamaricium Studio – architects Gianfranco Micalizzi, Nicoletta Puglisi, and Associates. I would like to acknowledge here the friends that Nebo has gained during the implementation of the project, and for the great help contributed to Fr. Michele in his numerous projects.

Restoration of the Shelter

The works for the restoration of the new shelter begin in September 2007 with the rock geological analyzes and four months later the demolition of the old shelter, an iron structure and asbestos panels began by Father Virgilio Corbo in 1964. The new shelter is a steel structure supported by about 60 micro piles that reach a depth of between 6 and 10 meters. The exterior walls and roof are ventilated to regulate the heat during both summer and winter, while the interior space is made up of insulating material and lined with wood treated with fireproof product. The first phase of work included perforations to install about 60 micro–piles at the hands of a local firm, Abu Jaber, as well as the removal of the old iron and asbestos coverage. Subsequently, in 2010 the steel, wood and titanium zinc structures were installed together with the electrical system. In early 2012, the work was interrupted and the architects' firms replaced by studio Tre Erre, which formulated project variants, and concluded the work with a local firm, Whaji of Amman.

The Archaeological Restoration

The restoration began in the spring of 2008 with the recruitment of Boys from the neighboring village of al-Fayṣaliyyah who actively collaborated with the project engaged in a sort of regularly-paid yard school. In 2009 the team started producing slaked lime on site for future conservation work. Virgin lime, purchased from a local company – Arab Company for Manufacture of Lime – was soaked in water using special tanks and had to rest for a minimum period of 6 months. The production of slaked lime has been an important part of the restoration work, a product that has been used as a binder for over 2000 years and has no contraindications, such as the presence of salts. Father Michele Piccirillo and Arch. Claudio Cimino have to be acknowledged for starting such production. They launched the

3. M. Piccirillo, Liber Annus, Jerusalem 1976, Pp. 281-305.

4. M. Piccirillo, Un progetto di copertura per il Memoriale di Mosè, Jerusalem 2004.

Madaba's Mosaic School in 1992 where slaked lime was produced for the first time in Jordan to be used in restoration. The Madaba's Mosaic School continued using slaked lime under the direction of Catreene Hamarneh (2004-2007).

Such production is thousand years old and has its roots in the Roman times; Byzantines and the Umayyads used it for their beautiful mosaics.

Restoration of Original Structures

The structures of the basilica were cleaned off all modern additions occurred since the seventies. Using old excavation photos, almost all the stone blocks reused for the elevation of the perimeter walls of the basilica were removed. Cement mortar was removed and replaced with a lime-based mortar. The columns of the central nave and the small movable pieces have been structurally restored and consolidated.

Restoration of Mosaics

Mosaics previously restored with the used of reinforced cement – see above – were first removed (Some of the floor sections were placed on the walls as part of the exhibition, some others were). These mosaics were cleaned and two layers of protective fabric were applied to the surface, and then cement mortar was removed. The mosaics to be exhibited on the walls of the basilica were divided in transportable sections and casted on a new support of aluminium and lime-based mortar. A metal frame with plywood panels on the walls of the new shelter was placed to support the mosaics panels. Mosaics sections were reassembled and the joints were closed with original and new tesserae. Other mosaics were placed on the floor on a lime-based bedding. With UNESCO'S support, Dr. Anna Paolini and Dr. Gaetano Palumbo led the conservation of the ancient mosaic of the Diaconicon Baptistery which was *in situ*. The treatment was more conservative and included surface cleaning and consolidating injections inbetween the mosaic mantle and mortar bedding.

During the restoration work inside the basilica some mosaic fragments were found and treated in the same way as the mosaic of the Diaconicon Baptistery. Throughout the eight years of restoration, the work was closely followed by archaeologists of the Custody of the Holy Land: Fr. Michele Piccirillo, Fr. Carmelo Pappalardo, Fr. Eugenio Alliata, Davide Bianchi, aide and disciple of Fr. Eugenio.The archaeological restoration was carried out by Franco Sciorilli, Antonio Vaccalluzzo, with the help and support of Francesco Clemente, and the young men from al-Fayṣaliyyah: Kaled Al Wekhyan, Marwan Jammaleyeh, Hamza Moustapha, Taher Yousef, Mohammad Abadallah and many others who have contributed in recent years. The shelter reconstruction activity continued in two different phases of work, from 2010 to the beginning of 2012 by the Team of Friends of Nebo, with architect Roberto Sabelli, the Tamaricium Studio, Architects Gianfranco Micalizzi, Nicoletta Puglisi and Associates and, from the spring of 2012 onwards, by the studio Tre Erre, which includes the engineer Roberto Scotta, architects Sandro Pittin , Andrea Bozzo, and all those associated with their studio.The companies who worked for the first phase of the project are the following: for iron works, Tulino; for wood works, Davide Napoletano; for the roof, Adriano and Matteo Plaga; and for the electrical components, the Bellucci company. The second phase of the work was carried out by the Whaji Company of Amman.

Photographic References

Archivio SBF
Maurizio Villa
Carmelo Pappalardo
Franco Sciorilli
Francesco Clemente

Work Carried out by

Fr. Michele Piccirillo
Fr. Carmelo Pappalardo

Fr. Eugenio Alliata
Abu Jaber
Roberto Sabelli
Tamaricium Gianfranco Micalizzi
TREERRE Roberto Scotta, Sandro Pittin, Andra Bozzo
Wajih Amman
Giuseppe Tulino
Davide Napoletano
Matteo and Adriano Plaga
Leonardo Dimarco
Osama Hamdan
Franco Sciorilli and the al-Fayṣaliyyah Young men
Antonio Vaccalluzzo
Davide Bianchi
YMCC of Yousef Mousa

Economic Support

Custody of Holy Land
UNESCO Amman
Ass. Obelisco

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Sciorilli, F. 2008. Restayro Mosaici (Bilad al-Sham). *Liber Annus Jerusalem* 58: 529-531.
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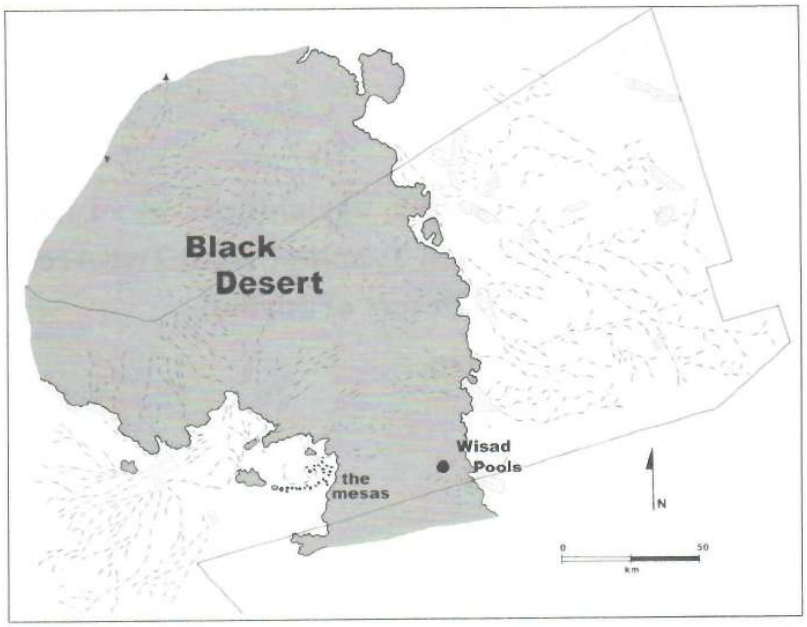
Late Neolithic Variability in Lithic Technology and Typology from Two Areas of the Black Desert of Jordan

Introduction

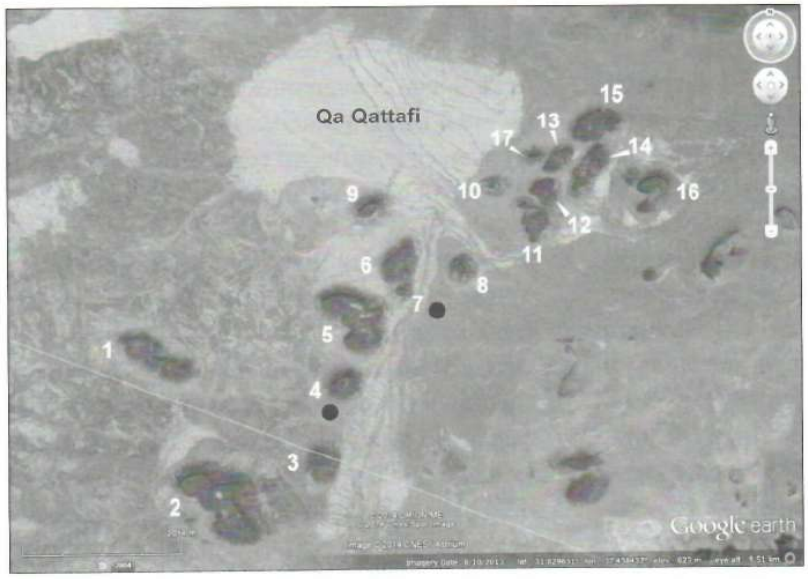
Creating things that don't exist in nature is one of the things that separate us from the rest of the animal world. What we make – and how we make them – often separate one human community from others as to what is proper in terms of group traditions. For most of human prehistory tools, and especially stone tools, were essential to acquire and process resources that were necessary for survival. Variation in specific tool types (such as arrowheads) and the techniques used to produce them (perhaps through pressure flaking) reflect either temporal change and/or technological customs of social units that pass on those "proper" forms and techniques from generation to generation. Of course, the presence or absence of specific tools probably reflects, in part at least, the resources a group may have sought, so that seasonally, plant and animal populations in a particular locale may have differed considerably, and the tools at camp sites and semi-permanent settlements will have varied in consequence. But if annual seasons and the age of sites in different parts of a given ecosystem are held constant, observable differences in typology and technology might provide clues to the presence of different social communities undertaking the same essential tasks, but undertaking them differently; in essence, different cultural prescriptions to obtain and use what a group needs.

Wisād Pools and the Wādī al-Qāṭṭafī Mesas

The eastern *bādiyah* of Jordan includes vast areas of gravelly limestone plateaus (the hamad) and the broad band of the Black Desert, an enormous flood basalt the stretches across the panhandle of Jordan from deep into Syria and on into Saudi Arabia, called the *ḥarra* in Arabic (FIG. 1). The mesas are flat-topped remnants of the original flood basalt plain that has undergone considerable erosion and earth movement over the past 14 million years (FIG. 2). The basalt layer is *ca.* 30m thick, overlying the Wādī ash-Shallāla Chalk and Umm ar-Rujūm chert limestone formations (*cf.* Rabba 2005). A similar stratigraphy occurs at Wisād Pools, although less detail has been published. Current mean rainfall is between 50-100mm during October-March/April at both locations, which characterizes this territory as a hyperarid desert. Flint occurs in the underlying chalk/limestone



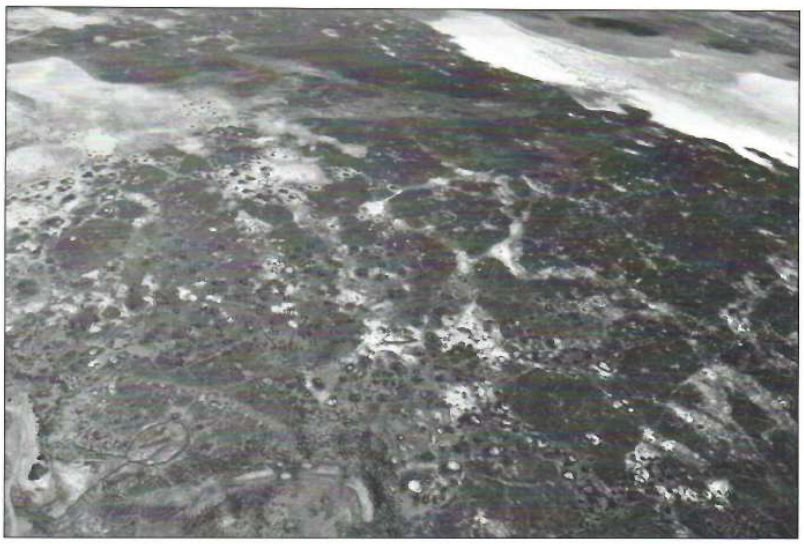
1. Location of the Wādī al-Qaṭṭāfī mesas and Wisād Pools in the Black Desert. (after Betts 2013: Fig. 1.2).



2. Google Earth view of the mesas in the Wādī al-Qaṭṭāfī.

formations, although the Umm ar-Rujūm material is of poor quality, while the chalk formation produces excellent tool stone.

As of 2015, eight seasons of survey and excavation have been undertaken at the southwestern edge of the harra on basalt covered mesas in the Wādī al-Qāṭṭafī and on the eastern edge of the basalt expanse at Wisād Pools (*e.g.* Rollefson *et al.* 2012, 2018; Rowan *et al.* 2015; Wasse *et al.* 2012). Pedestrian and drone surveys have revealed dense architectural remains in both regions, with estimates of *ca.* 600 buildings (not including animal pens) at the bases of the mesas and at least 300 buildings in the core of the huge Wisād Pools site (FIG. 3). Early Neolithic (especially Late PPNB) sites are sparsely distributed and generally ephemeral campsites with no surviving architecture (if there ever was any). It is in the Late Prehistoric period (PPNC, Late Neolithic, Chalcolithic, and Early Bronze Age) when substantial construction took place, and there are clear cases of reuse of earlier



3. Aerial photo of the core region of Wisād Pools; view to the NE.

buildings by Safaitic-speaking pastoralists. Late Chalcolithic/Early Bronze Age presence occurs atop some of the mesas, and perhaps many of the large tumuli and tower tombs at Wisād are datable to this period as well.

It is principally by chance that the excavations at Wādī al-Qāṭṭafī and Wisād Pools have only sampled PPNC and Late Neolithic structures. Two structures in the Wādī al-Qāṭṭafī (SS-11 at Mesa 4, also known as "Maitland's Mesa" and SS-1 at Mesa 7) produced radiocarbon dates from the end of the PPNC period to the later part of the Late Neolithic TABLE 1). At Wisād Pools, three structures (W-110, W-66, and W-80) were investigated, and all radiocarbon dates fall in the PPNC to earlier Late Neolithic period (TABLE 1).

Faunal remains were numerous and well preserved at Mesa 7 and at W-66 and W-80 at Wisād. Preliminary sampling indicates the residents of the two regions were hunter-herders in terms of subsistence economy, with gazelle dominating the inventory, but with domesticated caprines accounting for about 10% of the bones.

Chipped Stone Tools

(TABLE 2), provides a breakdown of the tool types from Structure SS-1 at Mesa 7 and from W-80 (FIG. 4) at Wisād Pools. Non-formal tools (retouched and utilized flakes and blades) at SS-1 were more than twice as important in the inventory (17.5%) as at W-80 (8.3%). The formal tools also show some major distinctions between the two assemblages, although the detailed tool types obscure the trends. (TABLE 3), provides absolute and relative frequencies of the prominent tool classes, and there are clear differences in the foci of activities in the two buildings. Arrowheads are a minor constituent

Table 1. Radiocarbon dates from the Wādī al-Qāṭṭafī mesas and Wisād Pools.

Site	Structure	Sample	Location in sequence	calBC, 2σ
Mesa 4	SS-11	Beta-346614	Main occupation	5,480-5,320
Mesa 7	SS-1	Beta-431871	Just above 431871	6,455-6,390
Mesa 7	SS-1	Beta-431872	Near floor	6,490-6,430
Wisād Pools	W-66	Beta-346212	Floor plaster	6,600-6,460
Wisād Pools	W-80	Beta-366675	Late in fill	5,710-5,610/5,590-5,570
Wisād Pools	W-80	Beta-395440	Late in fill	5,765-5,670
Wisād Pools	W-80	Beta-395441	Middle of fill	5,890-5,740
Wisād Pools	W-80	Beta-366677	Middle of alcove	6,000-5,840
Wisād Pools	W-80	Beta-366676	Near floor	6,590-6,580/6,570-6,440

Table 2. Chipped stone tool types from the 2015 season at structure SS-1, Mesa 7, and W-80 at Wisād Pools.

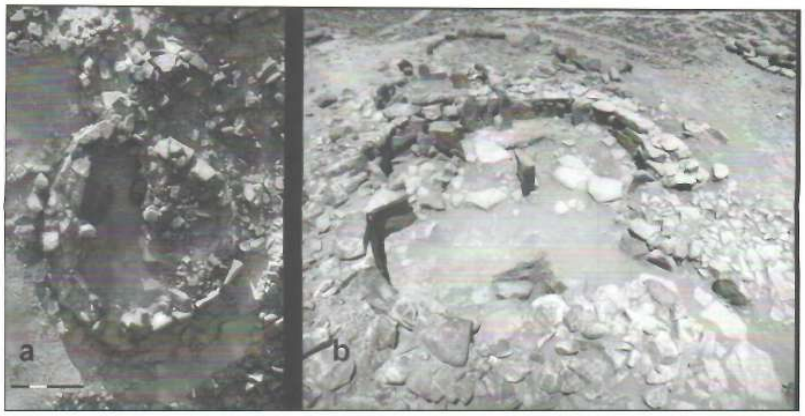
	SS-1			W-80		
Type	**n**	**%**	**%›**	**n**	**%**	**%'**
Projectile point	72	4.4	5.4	638	27.2	32.0
Sickle	1	0.1	0.1	2	0.1	0.1
Burin	644	39.2	48.4	58	2.5	2.9
Truncation	45	2.7	3.4	89	3.8	4.5
Endscraper	16	1.0	1.2	34	1.4	1.7
Sidescraper	52	3.2	3.9	136	5.8	6.8
Tabular scraper	2	0.1	0.2	37	1.6	1.9
Other scraper	0	0.0	0.0	4	0.2	0.2
Notch	98	6.0	7.4	189	8.0	9.5
Denticulate	75	4.6	5.6	200	8.5	10.0
Perforator	1	0.1	0.1	29	1.2	1.5
Awl	1	0.1	0.1	0	00	0.0
Borer	29	1.8	2.2	142	6.1	7.1
Drill	150	9.1	11.3	102	4.3	5.1
Biface	11	0.7	0.8	10	0.4	0.5
Axe/adze	2	0.4	0.2	0	0.0	0.0
Pick	0	0.0	0.0	2	0.1	0.1
Chopper	6	0.1	0.5	2	0.1	0.1
Chisel	0	0.0	0.0	3	0.1	0.2
Wedge	28	1.7	2.1	96	4.1	4.8
Unifacial knife	28	1.7	2.1	105	4.5	5.3
Bifacial knife	8	0.5	0.6	17	.7	.9
Seam knife	5	0.3	0.4	18	.8	.9
Ṭawīlān knife	20	1.2	1.5	1	.0	.1
Backed element	2	0.1	0.2	15	.6	.8
Tanged blade	1	0.1	0.1	6	.3	.3
Lunate	0	0.0	0.0	1	.0	.1
Rectangle microlith	1	0.1	0.1	0	0.0	0.0
Bladelet, retouched	11	0.7	0.8	11	.5	.7
Other	22	1.3	1.7	49	2.1	2.5
Subtotal	1331		100.4	1996		100.0
Retouched flake	39	2.4		85	3.6	
Retouched blade	100	6.1		51	2.2	
Utilized piece	148	9.0		59	2.5	
Unclassifiable	24	1.5		155	6.6	
Total	1642	100.0	100.0	2346	100.0	

of the inventory at SS-1, while at W-80 they make up nearly a third of all formal tools. But the case for burins is just the opposite, and with this class at nearly half of the tools, SS-1 takes on a character of a "burin site"; the greater diversity of burins at W-80 (40% are on truncations, while two-thirds are truncation burins at SS-1) points to a broader range of uses of burins at the Wisād Pools structure. Because burins are so dominating at SS-1, it is not surprising that the relative presence of the other tool classes are much lower compared to W-80, with

Table 3. Comparison of major formal tool classes from SS-1 and W-80.

	SS-1		W-80	
Tool class	**n**	**%'**	**n**	**%'**
Projectile points	73	4.4	638	32.0
Burins*	644	48.4	58	2.9
Scrapers	70	4.3	211	10.6
Notches/Denticulates	173	10.6	389	19.5
Drills, borers, *etc.*	181	13.7	273	13.7
Knives	61	4.6	141	7.2

* Note: Two-thirds of the burins at SS-1 are on truncations while only 40% of the W-80 burins are on truncations.

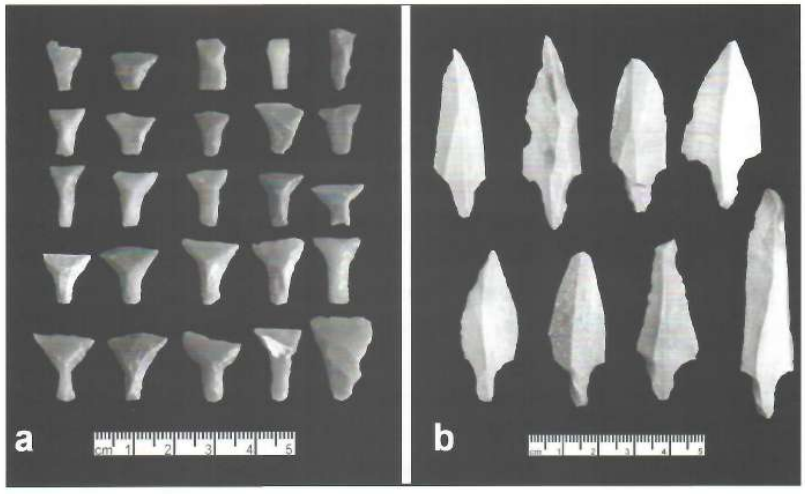


4. A. Overhead view of SS-1 at the end of the 2015 season. B. Overview of the complexity of structure W-80 at Wisād Pools.

scrapers and notches/denticulates more than twice as important at W-80, and knives (including unifacial bifacial, and Ṭawīlān versions) also much stronger at Wisād. It is only in terms of drills and borers that the two assemblages reflect equal proportions, which suggests that bead-making was practiced at similar levels of effort at both sides of the Black Desert. In summary, the tools from SS-1 indicate a highly specialized set of activities, and while the arrowheads at W-80 show an emphasis on hunting, in general the Wisād building indicates a much broader range of domestic undertakings.

Just as there is a striking distinction in the production of arrowheads at the two sites, there is also a marked difference in the kinds of arrowheads that were made. With seven-eighths of the points, W-80 obviously relied very heavily on transverse arrowheads; in contrast, not a single transverse arrowhead was recovered from SS-1. On the other hand, the much larger and heavier Bādiyah point was relatively important at SS-1, while this point type was absent at W-80 (FIG. 5). Whether these differences indicate, among other aspects, different hunting strategies or differences in the availability/preference for certain game animals must await more intensive faunal analysis.

Drills and borers were equally important in the tool kits at SS-1 and W-80, although burin spalls at SS-1 as blanks for the tools perhaps reflects the concentration on burin production at the structure (TABLE 5). The *mèches de forêt* – nominally used for drilling organic material such as wood or bone/antler – may point to some variation in local resources, as indicated by oak and tamarisk charcoal from hearths inside W-80 (*cf.* Rollefson *et al.* 2018).



5. a. Transverse arrowheads from W-80. b. Bādiyah points from SS-1. (Photos by G. Rollefson).

Table 4. Projectile point types from the 2015 season at structure SS-1, Mesa 7and from W-80 at Wisād Pools.

	SS-1			W-80		
Type	**n**	**%**	**%›**	**n**	**%**	**%'**
Transverse	0	0.0	0.0	536	84.0	87.3
Haparsa	18	26.9	38.3	34	5.3	5.5
Nizzanim	5	7.5	10.6	13	2.0	2.1
Herzliya	8	11.9	17.0	19	3.0	3.1
Bādiyah	10	14.9	21.3	0	0.0	0.0
Byblos	4	6.0	8.5	4	0.6	0.7
Other	2	3.0	4.3	8	1.3	1.3
Subtotal	47		100.0	614		100.0
Preform	10	14.9		12	1.9	
Tang only	4	6.0		3	0.5	
Unclassifiable	6	9.0		9	1.4	
Total	67	100.0		638	100.0	

Chipped Stone Technology

(TABLE 5), shows that burin spalls were more frequently used for drills and borers at SS-1, but more complete information is in (TABLE 6), where debitage selection for all of the formal tools is indicated. At the outset, it should be noted that unclassifiable debitage was three times higher at W-80 than at SS-1, and this is probably due to the emphasis on transverse arrowheads at the former site; the transverse arrowheads were made on fragments of debitage, and while bladelets and blades were probably the main resource used, the small size and absence of diagnostic aspects (especially parallel edges and parallel ridges, which identify blade/lets) resulted in the unclassifiable status.

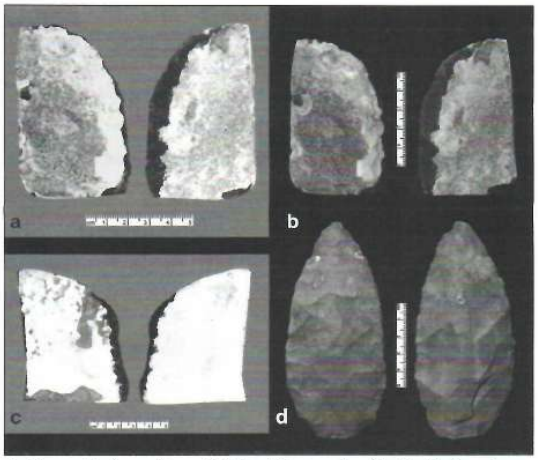
Table 5. Drill types from the excavations at M-7 Structure SS-1, 2015. And at W-80, Wisād Pools.

	SS-1			W-80		
Type	**n**	**%**	**%›**	**n**	**%**	**%'**
On blade/let, symmetrical	52	35.1	38.8	14	25.9	41.2
On blade/let, asymmetrical	25	16.9	18.7	8	14.8	23.6
On burin spall, symmetrical	24	16.2	17.9	7	13.0	20.6
On burin spall, asymmetrical	33	22.3	24.6	5	9.3	14.7
Subtotal	134		100.0	34		100.1
Mèche de forêt	3	2.0		15	27.8	
Double-ended	1	0.7		1	1.9	
Bit only	10	6.8		1	1.9	
Indeterminate	0	0.0		3	5.6	
Total	142	100.0		54	100.0	

Table 6. Debitage blanks for tools of the 2015 season at M-7 and at W-80, Wisād Pools.

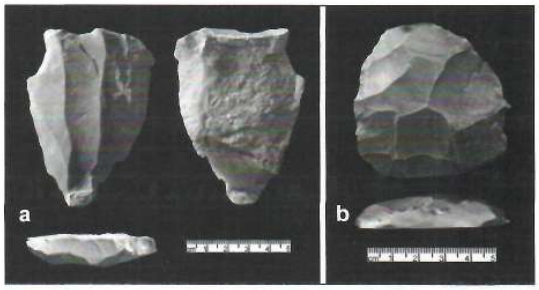
	SS-1			W-80		
Debitage type	**n**	**%**	**%'**	**n**	**%**	**%'**
Ordinary blade	684	51.5	55.7	922	39.3	50.4
Naviform blade	0	0.0	0.0	4	0.2	0.2
Unknown blade type	1	0.1	0.1	1	0.0	0.1
Bladelet	97	7.3	7.9	79	3.4	4.3
Flake	292	22.0	23.8	735	31.3	40.2
CTE	31	2.3	2.5	18	0.8	1.0
Burin spall	70	5.3	5.7	27	1.2	1.5
Microflake	1	0.1	0.1	2	0.1	0.1
Debris	0	0.0	0.0	1	0.0	0.1
Core, nodular	10	0.8	1.0	12	0.5	0.7
Core, tabular	26	2.0	2.1	17	0.7	0.9
Chunk/ thermal spall	9	0.7	0.7	4	0.2	0.2
Levallois blade	0	0.0	0.0	3	0.1	0.2
Levallois point	1	0.1	0.1	2	0.1	0.1
Levallois flake	0	0.0	0.0	1	0.0	0.1
Jafr flake	1	0.1	0.1	0	0.0	0.0
Flake of bifacial production	5	0.4	0.4	0	0.0	0.0
Subtotal	1228		100.2	1828		100.0
Unclassifiable	100	7.2		518	22.1	
Total	1328	99.8		2346	100.0	

Blades dominated both assemblages, and this is expected in view of the emphasis on burins at SS-1 and projectile points at W-80. The much higher use of flakes at W-80 is reflective of a higher incidence of scrapers and notches/denticulates, tool classes that were much less frequent at SS-1. Tools made on cores were mostly tabular scrapers and seam knives that were relatively more important at SS-1 (FIG. 6). The presence of reworked Levallois products is an interesting insight into recycling flint in these two areas where flint resources were somewhat scarce.



6. Seam knives from SS-1. (Photos by G. Rollefson).

Core types are tabulated in (TABLE 7), and the abundance in both buildings is remarkable[1]. Once again, the details of (TABLE 7) are difficult to appreciate, so (TABLE 8), presents a look at core classes. The nearly equal blade/let core frequencies at SS-1 and W-80 (FIG. 7) mirrors, in a limited way, the similar use of blade/lets for tool manufacture in both assemblages (TABLE 6). But flake cores are four to five times as frequent as blade/let cores, which



7. Blade cores from SS-1 (left) and W-80 (right). (Photos by G. Rollefson).

might seem contradictory to the information in (TABLE 6). However, iterating that flint sources are not immediately available to the people at Wisād Pools and the Wādī al-Qāṭṭafī, it is not surprising that the raw material was husbanded intensively, and that cores very likely underwent considerable changes in morphology and technical details as the nodules or tabular cores were reduced to barely manageable objects (FIG. 8). As cores became smaller and smaller, it is highly likely that what started out as blade cores eventually were worked down to the point that only short and broad flakes could be produced. With this in mind, the higher per-

Table 7. Absolute and relative frequencies of core types from the 2015 season at SS-1, Mesa 7, and at W-80, Wisād Pools.

	SS-1			W-80		
Type	**n**	**%**	**%›**	**n**	**%**	**%›**
Bladelet core	23	4.1	5.2	21	2.0	2.6
Blade core	21	3.7	4.8	15	1.4	1.9
Opposed platform non-naviform blade core	11	2.0	2.5	2	0.2	0.2
Single platform radial core	8	1.4	1.8	19	1.8	2.4
Bifacial radial core	9	1.6	2.0	23	2.2	2.9
Microflake core	18	3.2	4.1	132	12.4	16.4
Core on flake	22	3.9	5.0	75	7.1	9.3
Single platform, single face flake core	71	12.7	16.1	125	11.8	15.5
Single platform, multiface flake core	12	2.1	2.7	68	6.4	8.4
Single platform, single face blade core	78	13.9	17.7	74	7.0	9.2
Single face, multiplatform flake core	25	4.5	5.7	44	4.1	5.5
Multiface, multiplatform flake core	69	12.3	15.6	131	12.3	16.3
Pyramidal	5	0.9	1.1	3	0.3	0.4
Semi-pyramidal	17	3.0	3.9	15	1.4	1.9
90° change-of-orientation core	52	9.3	11.8	59	5.6	7.3
Subtotal	441		100.0	806		100.2
Manuport				6	0.6	
Casual core/tested piece	34	6.1		32	3.0	
Unclassifiable fragment	85	15.2		208	19.6	
Total	560	100.0	100.0	1062	100.0	

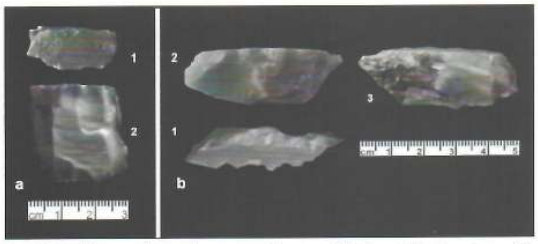
1. W-80 was roughly 6 m in diameter, and SS-1 slightly smaller at around 5 m diameter. Only half of SS-1 was excavated in 2015, so the relative abundance of cores at the two buildings is similar.

centage of flake cores at SS-1 might be more an index of intensive reduction compared to W-80. The greater importance of pyramidal cores and cores of 90° Change-of-Orientation (FIG. 9) at SS-1 is difficult to interpret at the present stage of core analysis.

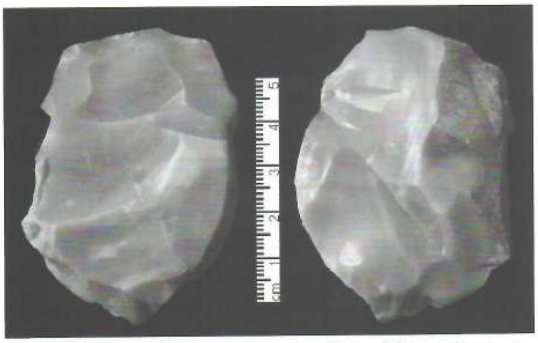
Table 8. Comparison of major core classes from SS-1 and W-80.

	SS-1		W-80	
Core class	**n**	**%**	**n**	**%**
Blade/let	55	12.5	113	13.8
Flake	294	66.7	486	59.6
Microflake	18	4.1	132	16.2
Pyramidal	22	5.0	18	2.2
90° C-o-O	52	11.8	59	7.2

A prominent disparity in cores is the 16.2% "microflake cores" at W-80, almost four times the amount at SS-1. Microflake cores are defined s pieces whose maximum dimension does not exceed 20 mm, although at W-80 many of them have maximum dimensions nearer 10 mm (FIG. 10). Many of the microflake cores from both sites resemble the small "polyhedrons" reported by Cropper (2006), who has called into question the assumption the "core" status of these artifacts. The even tinier microflake cores at W-80 might seem to lend support to Cropper's skepticism, for often the negative scars indicate that the last flakes to be removed were shorter than 10 mm. However, in view of the importance of the small transverse arrowheads at W-80, many of the microflake cores may be the final exhaustion stage of blank production of transverse points. (TABLE 9) presents the dimensions of complete transverse arrowheads from W-80.



8. Heavily reduced core from SS-1. (Photo by G. Rollefson).



9. 90 Change-of-orientation core from SS-1. (Photo by G. Rollefson).

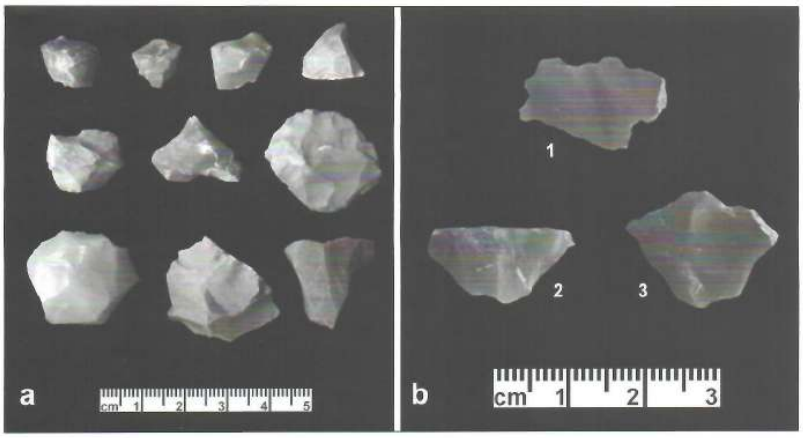
Table 9. Dimensions in millimeters of transverse arrowheads from W-80.

	n	Min	Max	Mean	S.D.
Length	532	7	29	14.9	3.6
Width	532	4	28	13.2	3.5
Thickness	532	1	9	3.6	1.3

Discussion and Concluding Remarks

The preliminary analysis of the technotypological aspects of chipped stone assemblages from SS-1 at Mesa 7 and at W-80, 50 km to the east of the Wādī al-Qāṭṭafī, reveals some strong differences in what was being manufactured and how the production of tools varied. The two structures are essentially contemporaneous, and the landscape and biotic resources on both edges of the Black Desert were probably essentially the same, although even minor differences in microhabitats may have influenced both vegetation and faunal populations; certainly, the landscapes were very different during the Late Neolithic than what can be experienced in the region today (Rollefson *et al. n.d.*).

Betts has raised the question of how many different populations of hunter-herders there were in the Black Desert during the PPNC/Late Neolithic periods (2013: 186-188). Based on details of details of core preparation, she has rejected the notion that PPNC herders from the western farmlands, including 'Ain Ghazal, were the herder-hunters of the eastern edge of the Black Desert at Burqu', located less than 100 km NNE of Wisād Pools. While that may be the case, details of the technotypological aspects of



10. Microflake cores from W-80. (Photo by G. Rollefson).

western Late Neolithic agro-pastoralists remain sketchy, and more detailed study of the material from the mesas and Wisād Pools must be carried out to compare the technotypology of these areas with the Burqu' region and with, for example, 'Ayn Ghazāl.

One thing is clear, though: our understanding of the conditions of a hunter-herder way of life during the PPNC/Late Neolithic is very different from what we had appreciated only a decade ago. The pastoral element of the colonization of the *ḥarra* and *ḥammād* was an event of major proportions Rollefson *et al.* 2014), a development that greatly increased the absolute numbers of people in a region that was much better watered and vegetated than today. How many hunter-herding groups from different "origins" there were remains to be determined.

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Walk on the Wild Side: Prehistoric Archaeology in the Deserts of Jordan

Introduction

There is little doubt that when the phrase "Archaeology in Jordan" is uttered, the first thing to enter the mind is Petra; following behind this marvelous site would be (in no particular order) Umm Qays /Gadara, Jarash, Pella, Ḥisbān, numerous tell sites in the Jordan Valley or in the Jordanian highlands, and the several Crusader fortresses. One of the common factors of all these sites is their geographic location: the western part of the kingdom where farming is possible through adequate rainfall or irrigation. Jordan's climate, topography, and hydrology have always been strong factors in how people were distributed throughout the kingdom. For the last 4,000 years or more, 90% of the country's population has been confined to only 15% of the territorial boundaries since 85% of the landscape is not suitable for dry farming or irrigation agriculture (Ababsa 2013: 64-65, 2013: Fig. I.21). Local population sizes and densities are highest where agricultural production is highest and where surplus food production can provide the foundation for labor specialization outside of the agricultural sphere (FIG. 1). Where farming is not dependable, population can't be concentrated for long periods of time under the climatic conditions of the last four millennia, and as a consequence, herding groups that convert steppe and desert vegetation to caprine meat, dairy, and wool/hair are small and mobile, leaving little trace of their presence. Under these conditions, the estimate of 15% for the steppe/desert dwellers might be exaggeratedly high, at least from time to time. The regions of Jordan that are not agriculturally dependable are called the *bādiyah*, and this territory is mostly comprised of a semiarid to hyperarid limestone plateau (the *ḥammād*), but in the northeastern part of Jordan the *bādiyah* is covered with basalt fields, called the *ḥarra*. The *bādiyah* has always played an important role in Jordan's past, which stretches back at least a million years. Stone Age hunter-gatherers moved along north-south and east-west transects following wild animals on their migrations. As early as 15,000 BC there is evidence of connections in the eastern *bādiyah* with both the Mediterranean and Red Seas in the form of marine shells that were used for adornment. Obsidian from eastern Anatolia shows up early in the Neolithic period, and flint tools from southern

1. Land-use patterns in Jordan (after Ababsa 2013: Fig. 1).

Jordan are thought to have been exported to Egypt at least 5,000 years ago if not even earlier. During the proto-historic periods there were important trade routes among Bronze and Iron Age towns and cities that crossed the *bādiyah* to Mesopotamia and to the Nile Valley. In order to understand the emergence of complex societies in the agricultural part (the 15%) of Jordan, one must examine the other 85% of the territory that supported and connected the settled areas of the Levant. But this requires that archaeological projects spend considerable time and effort in exploring landscapes that are isolated, often entirely barren, and in conditions where water and electricity are in short supply; in some circumstances, projects are limited to the summer months, when temperatures exceed 40º. Tent camps are frequently the only living accommodations, and contact with the "outside world" is limited and infrequent. Life for archaeologists in the *bādiyah* is usually not under the comfortable and pleasant conditions that a project in an urban area might afford. Instead, life in the *bādiyah* is often to experience the wild side of archaeology. What follows is a brief survey of prehistoric archaeological research in Jordan's *bādiyah*.

The Wild Side

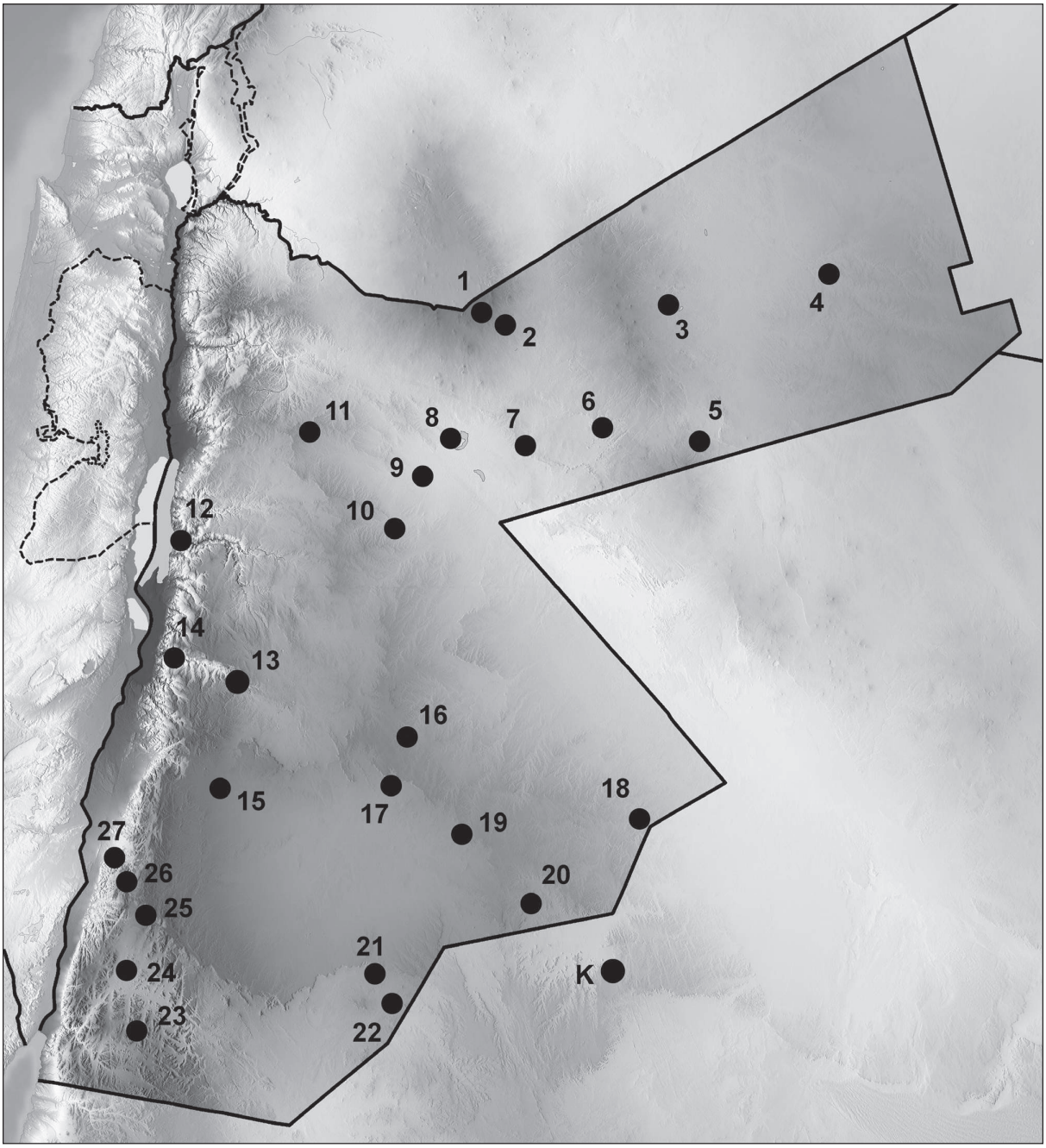
It is tempting to equate the intensity of archaeological research in Jordan with the intensity of agricultural production – that is, that 85% of the archaeology of Jordan has focused on the 15% of the land that supports farming, and that archaeology in the *bādiyah* accounts for only 15% of the time, labor, and funds expended in the entire country. That characterization may have been true for the 19th and first

two-thirds of the 20th centuries, but since the 1970s that ratio has probably changed considerably. The earliest prehistoric research in Jordan is probably the survey undertaken by Henry Field in 1925 (Field 1960), when he drove the length of the panhandle of Jordan to Baghdad. His survey was not systematic, however: Field selectively stopped when something looked intriguing, or when a tire had to be changed, the car radiator had to be cooled, or a gazelle shot for the evening meal. Another early project involved the excavation of early Neolithic settlements in the Wādī Jīlāt (FIG. 2:10) in 1938 by Waechter and Seton-Williams (1938)[1]. At about the same time a survey and excavation of sites in the Kilwa area ("K" in the lower right corner of (FIG. 2), which until 1964 was still located within the borders of the kingdom[2]) was undertaken (Rhotert 1938). In the 1940s a brief survey at Chalcolithic/Early Bronze Age Qulbān Banī Murra (FIG. 2:20) was reported by A. Kirkbride and G.L. Harding (1944) and Stekelis (1945). It was in the late 1950s that a prolonged program of excavations was begun at early Neolithic Bayḍa FIG. 2:26), just a few kilometers north of Petra (Kirkbride 1966; 1984). There was a sea change in prehistoric archaeology in the 1970s, and much of the increased intensity took place in the *bādiyah*. Henry undertook a multi-season survey and excavation project in the Wādī Ḥismā (FIGS. 2:24; 3a) that spanned the Paleolithic (especially the Middle to Epipaleolithic), Neolithic, and Chalcolithic periods (Henry 1995). Rollefson made artifact collections at the northern rim of the Jafr Basin (Rollefson 1980), a region (FIGS. 2:17, 4) that would become a full-blown, multi-season investigation by L. Quintero and P. Wilke in the 1990s and later (Quintero and Wilke 2014; Quintero *et al.* 2002) that covered a time period from the Middle Acheulian (*ca.* 700,000 years ago) through the Chalcolithic/Early Bronze Age. Other projects that arose in the 1970s included the survey and excavations by S. Helms at the walled Early Bronze Age town at Jāwā (FIG. 2:1) (Helms 1981). A. Garrard began a long-term project in the greater al-Azraq Basin (FIG. 2:8) in the Wādī Jilāt and al-Azraq town area (Garrard and Stanley Price 1975; Garrard and Byrd 2013). Betts also began a twenty-year program of survey and excavations in the Black Desert from al-Azraq to Burqu' (FIG. 2:3) that principally dealt with Neolithic camps (Betts 1998, 2013). The results of the work by Garrard and Betts determined that the earliest pastoral exploitation of the *bādiyah* began in the Late Neolithic around 6,500 BC. The 1980s witnessed a continuation of intensifying interest in the prehistory of the *bādiyah*. L. Copeland and F. Hours led a team that expanded the investigation of Garrard's survey to the west and north of al-Azraq (Copeland and Hours 1989; *cf.* Rollefson 1983), greatly increasing the known distribution of Lower Paleolithic sites in addition to later periods of prehistory. B. MacDonald carried out a survey of the south bank of the Wādī al-Ḥasā (FIG. 2:13) from 1979-1983 (MacDonald 1988) that spawned numerous follow-up excavation projects (*e.g.* Clark *et al.* 1987; Coinman 1998) that continued into the current decade (Olszewski and al-Nahar 2011a, 2014). On the north bank of Wādī al-Ḥasā, Makarewicz has excavated at al-Ḥimmah, a Neolithic site that spans the PPNA through the PPNC and into the Pottery Neolithic (*cf.* Makarewicz and Austin 2006). In recent years a 10th millennium PPNA "mortuary house" with numerous subfloor burial pits has been exposed at al-Ḥimmah (Makarewicz and Rose 2011).

In the lower Wādī al-Ḥasā, not far from its mouth above aṣ-Ṣāfī (FIG. 2:14), a MPPNB hamlet about a half hectare in area was investigated at Ḥamarāsh (Sampson 2011, 2014); the area is of very difficult access, which might explain its small size. Some distance away is the PPNA site of Sharāra, where excavations have

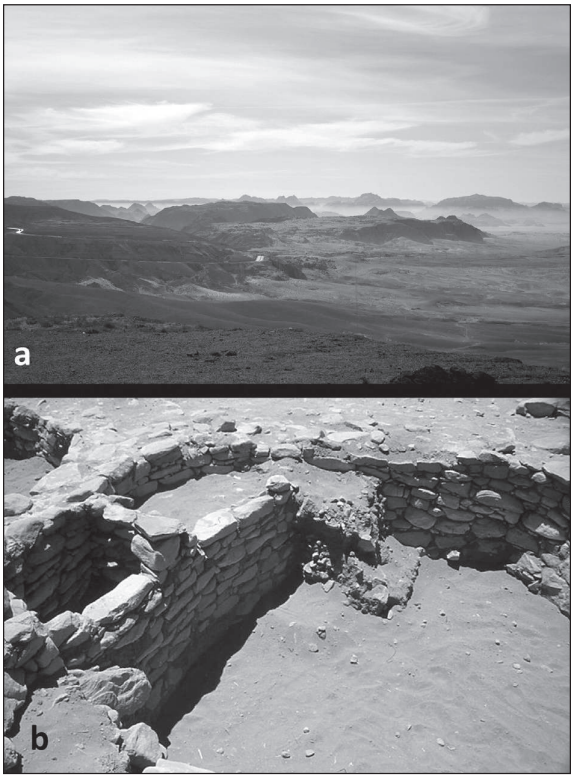
1.There appears to have been some geographic confusion at the time: the authors placed the site in the Wādī Dhubay).

2. There was a land swap between Saudi Arabia and Jordan, when Jordan increased the amount of sea front at 'Aqaba in exchange for the Wādī Tbayq region, where Kilwa was located



2. Location of steppe-desert sites areas in Jordan. 1. Jāwā; 2. ash-Shubayka; 3. Burquʻ, Tulūl al-Ghuṣayn, Khirbat Abū al-Ḥuṣayn; 4. Wādī ar-Ruwayshid flint mines; 5. Wisād Pools; 6. Wādī al-Qaṭṭāfī; 7. Jabal Qurma; 8. al-Azraq; 9. al-Kharrānah IV; 10. Wādī Jīlāt; 11. Wādī Mushāsh; 12. Dhirāʻ, Dhahrat adh-Dhirāʻ 2; 13. Upper Wādī al-Ḥasā sites; 14. Hamarāsh, Sharara; 15. Jabal Juhayra; 16. Bāyir; 17. ʻUyūn Qadīm, northern Jafr sites; 18. Wādī Ḥudruj; 19. Jabal al Khashabiyyah; 20. Qulbān Banī Murra, Wadis as-Saḥāb and al-Asmar; 21. ath-Thalīthuwāt; 22. al-ʻAwja; 23. ʻAyn Abū Nukhayla, Ṭurayf al-Marāgh; 24. Wādī Ḥismā sites; 25. ʻAyn Jammām; 26. Bayḍā, Baʻjah, Shukarat al-Masaʻīd; 27. Wādī Faynān, Fīdān, Ghuwayr, Tall Wādī Faynān; K: Kilwah.

just recently been initiated (Finlayson and Makarewicz, personal communication). A survey project in the *ḥammād* southwest of al-Azraq by M. Muheisen located a wealth of prehistoric camps in the steppe and led to an excavation of the relatively enormous Epipaleolithic site of al-Kharrānah IV (FIG. 2:9; Muheisen 1983, 1988). Excavations have recently been resumed



3. a. The Wādī Ḥismā viewed from Rās an-Naqab. b. One of the Middle PPNB dwellings at ʻAyn Abū Nukhayla in Wādī Ramm (Photos by G. Rollefson).

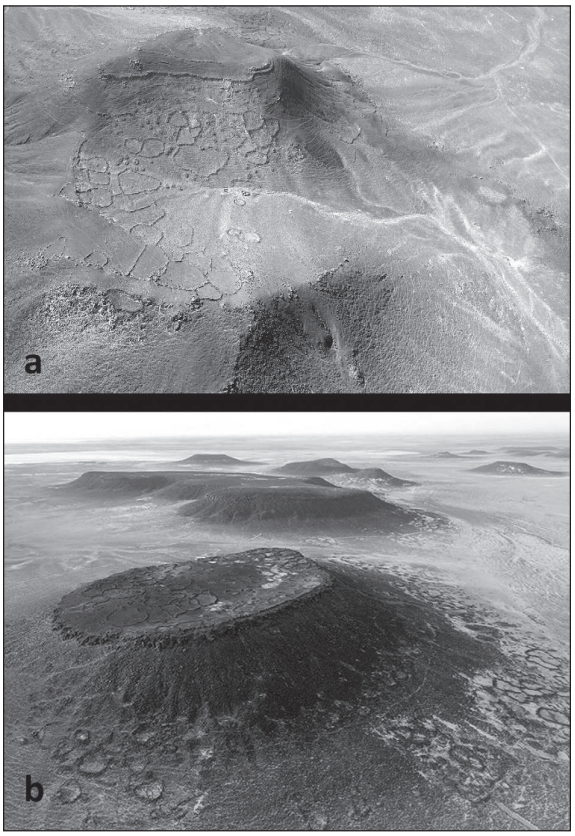
4. a. Cortical flake cores of the Jafr Industry along the northern rim of the Jafr Basin. b. a large Lower Paleolithic bifacial cleaver from site J92 in the Jafr Basin (Photos by G. Rollefson).

5. aṣ-Ṣafāwī Kite 104 near aṣ-Ṣafāwī, northeastern Jordan. (Photo: APAAME_20090928_DLK-57 by D. Kennedy; by permission).

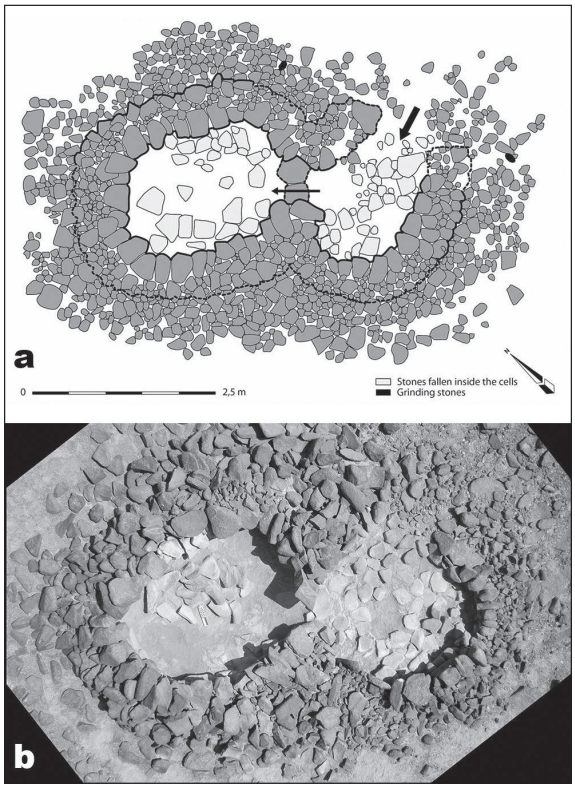
at al-Kharrānah IV (Maher *et al.* 2012) and are revealing unexpected social complexity 20,000 years ago. In the 1990s and mid 2000s three new factors greatly improved prehistoric research in Jordan's desert. In 1993 NASA finished the establishment of 24 stationary satellites to provide a Global Positioning System (GPS) that fixed the location of sites on the earth's surface (NASA 2012). While the use of GPS probably wasn't used by research teams until the late 1990s in Jordan, the devices vastly improved the mapping of survey data that, especially in topographically redundant areas, eliminated errors in plotting sites on maps, "preserving" the location for later follow-up research. Also in the 1990s, David Kennedy began his decades-long aerial photography project throughout the kingdom, the archives of which were made available to all researchers (APAAME *n.d.*). Kennedy and his team were especially important for recording features in difficult terrain, especially in the Black Desert (FIG. 5; *cf.* Kennedy and Banks 2015; Kennedy *et al.* 2014), where earlier photography by Royal Air Force pilots first recorded the "Works of the Old Men" in the

basalt fields that were virtually indistinguishable when looked at from the ground (Maitland 1927; Rees 1929). Finally, Google Earth emerged in 2005 (Anon. *n.d.*), providing satellite coverage of the entire planet that, again, was especially useful for regions such as deserts that were difficult to travel through.

All three of these "new" research tools have been especially vital for research in the volcanic fields of the Black Desert in Jordan's panhandle. Recent survey in this region by Müller-Neuhof (FIG. 2:1, 2:3 and 2:4) has altered our fundamental understanding of the Early Bronze Age in the northern basalt country. A major flint-mining industry in the Wādī ar-Ruwayshid (Müller-Neuhof 2012) has been located that rivals the Jafr Basin region (Quintero *et al.* 2002). His resumption of Helms's research at Jāwā (FIG. 2:1) has greatly improved our understanding of the agricultural base of that settlement (Müller-Neuhof 2017), and excavations at Tulūl al-Ghuṣayn, Khirbat Abū al-Ḥuṣayn, and Khirbat al-Ja'bariyyah (between FIG. 2:3 and 2:5) have confirmed three more agriculturally-based permanent or semipermanent fortified settlements of the Early Bronze Age as well (Müller-Neuhof 2014; Müller-Neuhof and Abu-Azizeh 2016; Müller-Neuhof *et al.* 2013). The configurations of the garden plots atop the three basalt prominences as well as domestic architecture are identical to the summit of Mesa 4 ("Maitland's Mesa") in the Wādī al-Qaṭṭāfī (FIGS. 2:6; 6 and 7), indicating that although Mesa 4 was not fortified, it too supported an agricultural system for a permanent or semipermanent population. Since 2008 the Eastern Badia Archaeological Project has been investigating Late Prehistoric sites in the Wādī al-Qaṭṭāfī (FIG. 2:6) on the southwestern edge of the Black Desert (*e.g.* Rollefson *et al.*



6. a. Walled garden plots in the caldera of the volcano of Tulūl al-Ghuṣayn. (Photo by B. Müller-Neuhof, by permission). b. Walled garden plots atop the summit of Mesa 4 ("Maitland's Mesa") in the Wādī al-Qaṭṭāfī (Photo by A.C. Hill).



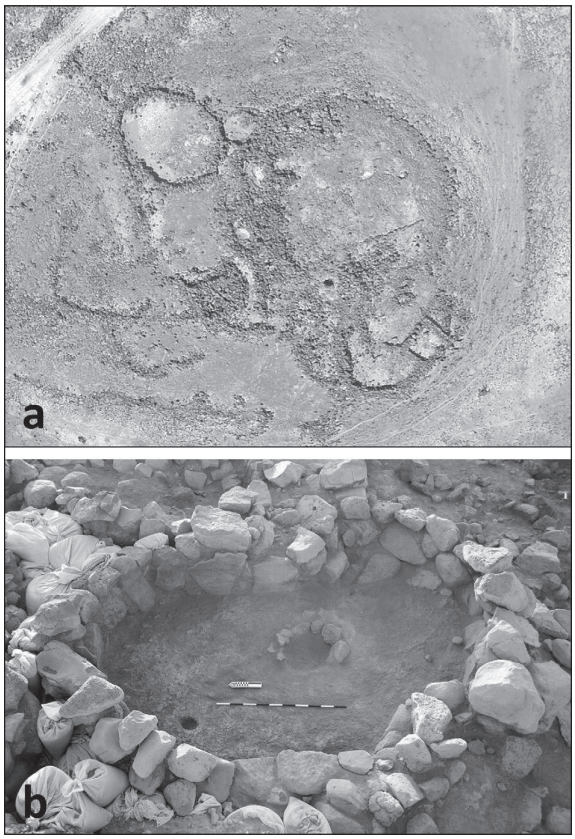
7. a. "Ghawr al-Ḥūt" from the summit of Tulūl al-Ghuṣayn (Illustration by B. Müller-Neuhof, by permission). b. "Ghawr al-Ḥūt" a top Mesa 4 in the Wādī al-Qaṭṭāfī (Photo by Y. Rowan).

2016) and at Wisād Pools (FIG. 2:5), 60km farther east on the opposite edge of the basalt desert (*e.g.* Rowan *et al.* 2015).

Hundreds of structures are located in both site areas, and thus far five structures have been excavated, all dating to the Late Neolithic period (*ca.* 6,500-5,000 BC). The density of occupation is surprising (Rollefson *et al.* 2014b) considering the hyper-aridity of the desert in these two areas, but recent analysis of charcoal and pollen has revealed that the region enjoyed much higher rainfall during the Late Prehistoric period; identified species such as bulrush/cattails and duckweed indicate marshy conditions at Wisād Pools, and Tabor oak charcoal and pollen reflect higher precipitation, as do charred fig remains from Mesa 7 in the Wādī al-Qaṭṭāfī (Rollefson *et al. n.d.*). Adjacent to the west of the Wādī al-Qaṭṭāfī is the research area of the "Landscapes of Survival" project (FIG. 2:7, Akkermans *et al.* 2014).

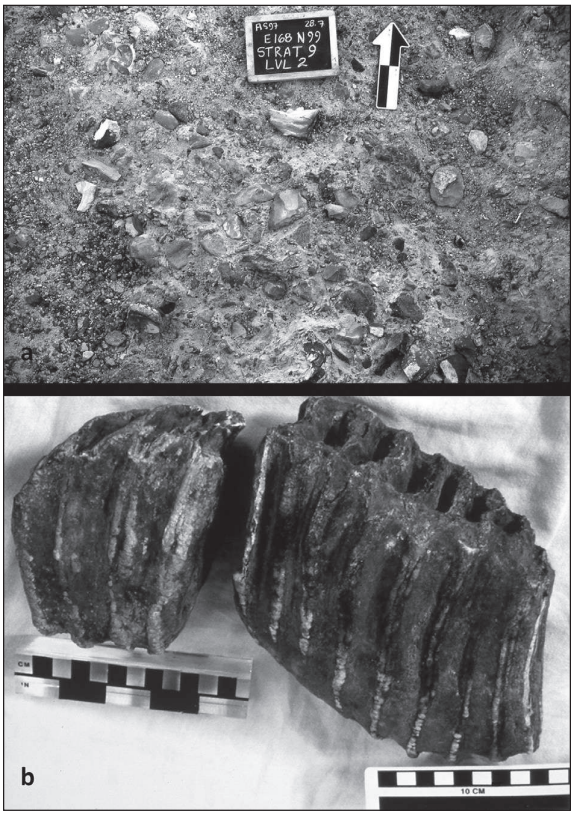
Surveys and excavations anchored in the area around Jabal Qurma have revealed large Late Prehistoric semipermanent settlements as well as extensive and intensive distributions of rock art and contemporary Safaitic inscriptions, similar in many respects to the information from the Eastern Badia Archaeological Project. The Eastern Badia Archaeological Project is a successor to the Wādī as- Sarḥān Project begun in 2002 in the Black Desert (Wasse and Rollefson 2005, 2006). The survey recovered evidence of relatively intensive use of the hyperarid desert as early as the Lower Paleolithic. Small hunting camps dating to the Middle and Late PPNB were numerous around Qā' 001 at Jabal adh-Dhurwa, and small clusters of seasonal hunter-herding groups from the Late Neolithic also appeared on the landscape. Small-scale cortical flake/fan scraper production during the Chalco/Early Bronze periods was undertaken by small pastoral groups throughout the area. The Shubayqa Archaeological Project has investigated the area around Qā' ash-Shubayka, 22km north of aṣ-Ṣafāwī, since 2012 (FIG. 2:2). The *Qā'* has a large number of structures around its edge ranging in age from the Late Epipaleolithic (Natufian) to the Pre-Pottery Neolithic A (PPNA) and into the Chalco/Early Bronze Age periods. The project is unique in that it appears to reflect the transition from the final hunter-gatherer to the first agricultural subsistence economies in today's arid desert (Richter *et al.* 2014, 2016, *n.d.*). The well preserved animal bones include many migrating birds, indicating at least seasonally marshy conditions, and charcoal from riparian tree species confirm moister conditions in the region after the Younger Dryas period (FIG. 8).

Farther to the west near Qaṣr al-Mushāsh, one of the celebrated "Desert Castles", is a newly discovered permanent PPNA settlement called Mushāsh 163 (FIG. 2:11), although the current weather pattern would make it unlikely that farming could be relied on today (Bartl *et al*.



8. a. Chalco/Early Bronze compound at the ash-Shubayka Qā'. b. Pre-Pottery Neolithic A house with interior fireplace at Shubayka 6. (Photos by T. Richter, by permission).

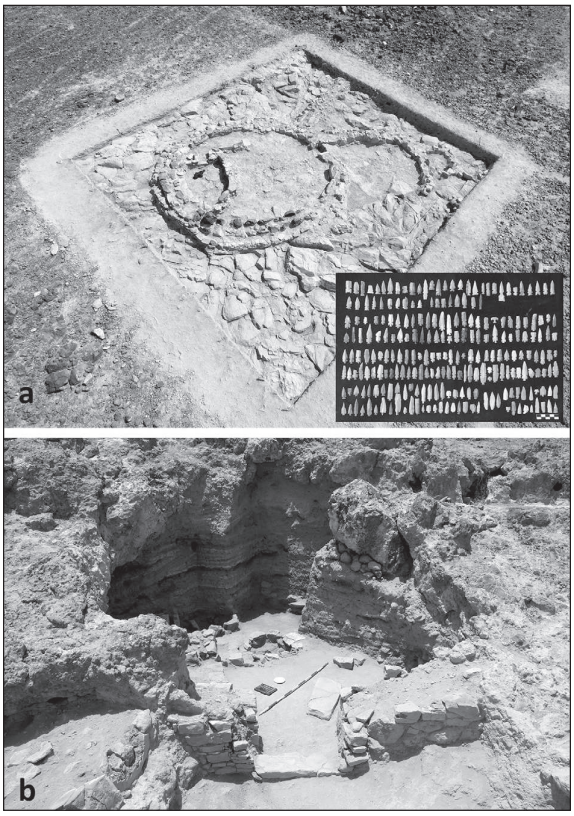
2013; Tvetmarken *et al*. 2015). Prior to the work undertaken at ash-Shubayka and al-Mushāsh, no PPNA sites were known in these presently arid areas of the kingdom. Investigations in the al-Azraq Oasis (FIG. 2:8) continued in the 1990s and into 2015. Lower and Middle Paleolithic excavations were undertaken in North Azraq ("Azraq ad-Durūz") (*e.g.* Cordova *et al.* 2009) and in South Azraq (*cf.* Rollefson *et al.* 1997). Remains of an extinct elephant species (FIG. 9) in addition to rhinoceros, wild cattle, an equid, and possibly lion were recovered, verified as food resources for the hominins by protein residue on the stone tools that were recovered (Nowell *et al.* 2016). A Pre-Pottery Neolithic B hunting camp that relied heavily on migrating birds was excavated at Bawwābit al-Ghazāl in the southern Azraq wetlands (Rollefson *et al.* 2014a). Three seasons of survey and excavations from 2004 to 2009 in the region east of Bāyir Wells (FIG. 2:16) recorded numerous pastoral camps, cairns, and animal enclosures that dated to the Late Neolithic and Chalcolithic periods, mostly along wadis and especially at the edges of *qī'ān* (Tarawneh and Abudanah 2011). Similar results were obtained by a multi-season effort in the ath-Thalīthuwāt area (FIGS. 2:21 and 10b) farther south (Abu-Azizeh 2010). It was logical that the project directors team up in continued research as the Southern Badia Archaeological Project, which located and excavated the first kite hunting trap outside of the basalt desert at Jabal al-Khashshābiyyah; excavation revealed how the trap was constructed and used during the Late Neolithic period (Abu-Azizeh and Tarawneh 2015; Abu-Azizeh *et al. n.d.*), and this will enormously aid in the interpretation of kites, which are much more prevalent in the *ḥarra*. Intensive excavation and survey at Qulbān Banī Murra and in



9. a. Dense scatter of *in situ* Late Acheulian bifaces and other stone tools at 'Ayn Sawāda (Photo by G. Rollefson). b. Molars of an extinct elephant from Lower Paleolithic layers at 'Ayn Sawāda.

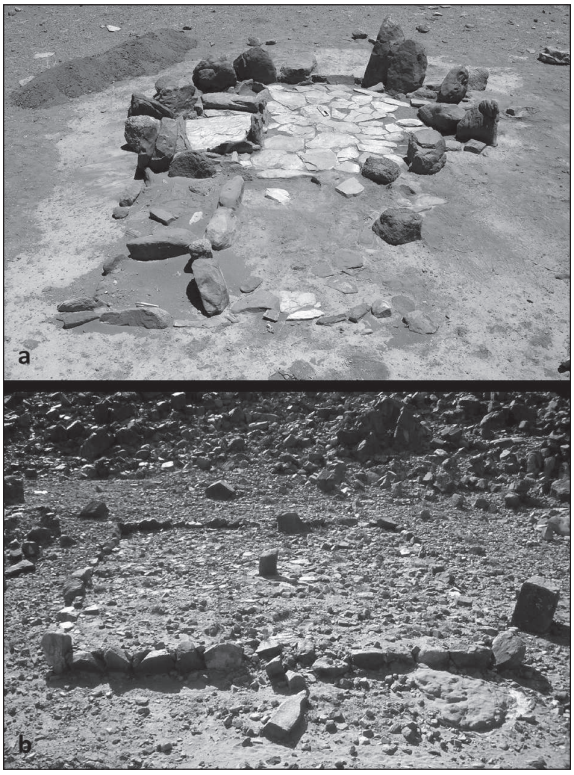
10. a. One of the long rows of tombs at Qulbān Banī Murra (photo by H.G.K. Gebel, with permission). b. The escarpment above ath-Thalīthuwāt (photo: G. Rollefson).

the Wādī as-Saḥāb and Wādī al-Asmar (FIGS. 2:20 and 10a) greatly increased our appreciation of Chalco/Early Bronze Age pastoral societies (*e.g.* Gebel and Mahasneh 2010; Gebel *et al.* 2011) when hydraulic systems of access to subterranean water sources became developed and led to hypotheses of the importance of oasis locations in pastoral life (Gebel 2015). Fujii's prehistoric field research in Jordan has concentrated in the southern and southeastern parts of the kingdom. His work at the northwestern edge of the Jafr Basin at Qā' Abū Ṭulayḥa (FIG. 2:17) demonstrated the presence of sophisticated water control in the LPPNB (second half of the 8th millennium BC; Fujii 2014). Closer to Jurf ad-Darāwīsh, excavations have exposed a well-documented site complex (FIG. 11) with cultural stratification from the Early PPNB (EPPNB) through the Late Neolithic (*cf.* Fujii 2015, Personal Communication). In the far southeastern part of Jordan (FIG. 2:22) at the site of 'Awja-1, Fujii has exposed a series of animal figurines – possibly cheetahs – near open-air sanctuaries (FIG. 12) that he thinks might date to the Late Neolithic in the 6th millennium BC (Fujii *et al.* 2013: 355). Archaeological attention was focused on Wādī Ramm (FIG. 2:23) at least 70 years ago (Kirkbride and Harding 1947), but renewed interest was resumed in the later years of the 1990s (Farès 2013; Farès-Drappeau and Zayadine 2004) that focused on Late Neolithic structures and subsequent periods of occupation. Henry turned to 'Ayn Abū Nukhayla (Henry and Beaver 2014) about four decades after Diana Kirkbride tested the MPPNB settlement (Kirkbride 1960) to note that the site was recurrently occupied by opportunistic farmers and herders. Enigmatic structures of unknown function and date (FIG. 13) were examined at Ṭurayf al-Marāgh across the *wadi* from 'Ayn Abū Nukhayla by Rollefson in 2007-2008 (Rollefson 2013). A Cultural Resource Management team surveying the route for the renewed Desert Highway discovered a Late PPNB megasite at 'Ayn Jammām (FIG. 2:25), just beneath Rās an-Naqab (Waheeb and Fino 1997). The complex architecture (FIG. 14) recalled the two-story buildings at other megasites of the second half of the 8th millennium in Jordan along with numerous arrowheads that are more reminiscent of the Negev/Naqab Desert region than areas to the north (Rollefson 2005; *cf.* Goring-Morris 1993: fig. 5). The greater Petra area (FIG. 2:26) has witnessed



11. a. Early PPNB house and projectile points from Jabal al-Juhayra (photo by S. Fujii, with permission). b. Late PPNB structure in a rockshelter at Jabal al-Juhayra (photo by S. Fujii, with permission).

12. Animal (cheetah?) outlines in stone slabs at the site of 'Awja 1 (photo by S. Fujii, with permission).

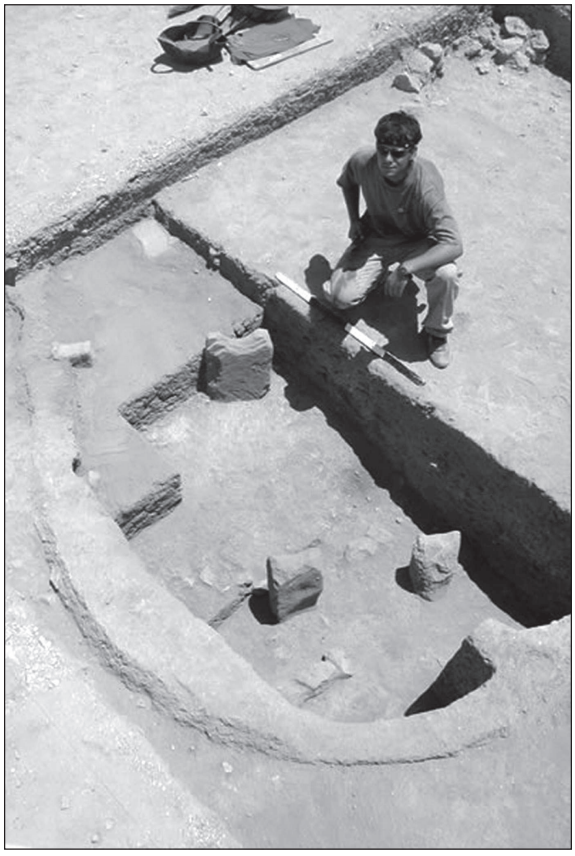


13. a. Paved circular structure of possible ritual nature in Wādī Ramm (photo by G. Rollefson). b. One of more than 200 rectangular open-air sanctuaries in Wādī Ramm (photo by G. Rollefson; *cf.* Farès-Drappeau and Zayadine 2004).

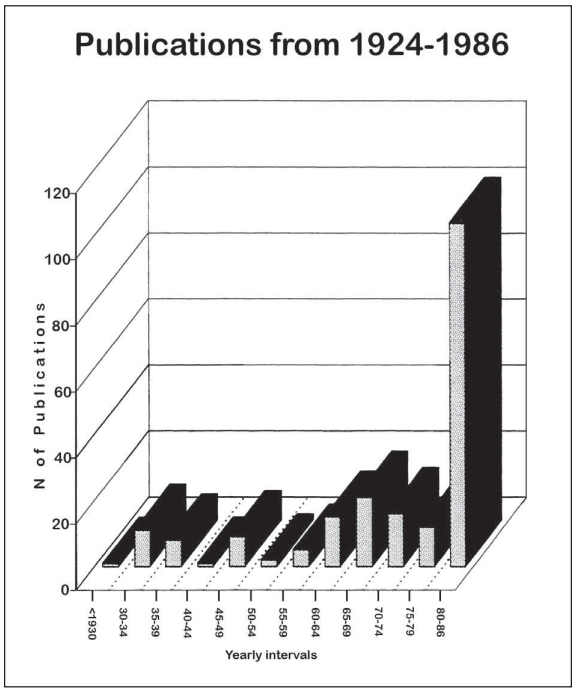
14. a. Niches in the east wall of a room in a two-story residence at ʻAyn Jammām (photo: G. Rollefson). b. View towards the west in the same building showing a doorway leading to another room (photo: G. Rollefson).

considerable prehistoric research since the 1980s. Surveys in the Wādī Ṣabrah have identified the entire Paleolithic sequence from the Lower Paleolithic through the Epipaleolithic and into the Neolithic periods; later Holocene sites have also been located (Schyle and Richter 2012). New excavations were conducted at the early Epipaleolithic site at Wādī al-Madāmigh (Olszewski and al-Nahar 2011b), a site originally tested by D. Kirkbride (Kirkbride 1958). Work at Bayḍā was renewed in the present decade to investigate a large circular MPPNB communal building (Finlayson and Makarewicz, personal communication). The curiously isolated (almost "fortified") LPPNB settlement at Baʻjah, a few kilometers north of Bayḍā, was the scene of extensive excavations during the 1990s and into the following decade (*e.g.* Gebel and Kinzel 2007); a new season of excavations was initiated in 2016 (Gebel, personal communication). The MPPNB site of Shukarat al-Masaʻīd, about 16km north of Wādī Mūsā, was first excavated in 1999, and work has continued episodically since. The site is a compact village of circular semi-subterranean houses constructed in a honeycomb fashion; Building F is intriguing in view of its obvious ritual nature based on the concentration of human burials there (Kinzel *et al.* 2015). The drainages leading from the ash-Sharāh Mountains westward to the Wādī ʻArabah are rich in archaeological sites, especially those that date to the Neolithic period. al-Ghuwayr (FIG. 2:27), a small but densely occupied Middle and Late PPNB village, is located at the mouth of the Wādī al-Ghuwayr (Simmons and Najjar 1998). Just a kilometer farther downstream in the Wādī Faynān, WF16 is an important PPNA settlement

with a huge communal building that certainly was constructed using communal labor under someone's direction (*cf.* Finlayson and Mithen 2007). And a couple of kilometers farther west is a Pottery Neolithic village called Tall Wādī Faynān; whether the pottery from this site is closely allied with the Yarmukian or the Jericho IX traditions (or something else altogether), is not certain (Najjar1992). Finally, two PPNA sites downstream from the Wādī adh-Dhirā' (just over a kilometer south of the mouth of Wādī al-Karak) excavated at the beginning of the 21st century reflect considerable differences in terms of architecture and stone tools. Dhirā' (*e.g.* Finlayson *et al.* 2003) and Dhahrat adh-Dhirā'-2 (Edwards *et al.* 2002) are separated by only a couple of kilometers and are virtually contemporaneous, yet the buildings at Dhirā' are circular or oval, while those at Dhahrat adh-Dhirā' are "C-shaped" with a wide opening on one side. One semi-subterranean structure at adh-Dhirā' appears to have been a communal storage facility (Kuijt and Finlayson 2009) set on joists supported by notched stone pillars (FIG. 15). Arrowheads at adh-Dhirā' typologically account for around 40% of the formal tool inventory (*cf.* Goodale and Smith 2001: Table 2), whereas at Dhahrat adh-Dhirā' they make up less than 1% (Sayej 2004: Table 3.3); the reasons for such disparities remain conjectural.



15. Subfloor grooved/notched stones that supported joists of the floor of a communal storage building at adh-Dhirā' (photo by G. Rollefson).



16. Growth in publications on Jordanian prehistory from 1924-1986 (after Henry 1998: Fig. 1).

Concluding Remarks

(FIG. 16) shows a major increase in publications that treat Jordan's prehistory beginning in the 1980s, an illustration that is already more than 30 years old and obsolete. Although not all prehistoric archaeology was undertaken in arid zones, it is likely that the publication record up to 2017 reflects a major enthusiasm for investigating those parts of the kingdom that today are incapable of sustaining agriculture and consequently of supporting major population concentrations. This supposition has a major implication: Although today only 15% of the territory of Jordan supports 90% of the

country's population, several thousand years ago that was not the case. Neolithic villages in the Wādī Jīlāt, Wādī Faynān, Wādī Mūsā, and Wādī al-Ḥasā provided support for populations much higher than is the case in those regions today. And even in the *ḥarra* of the eastern *bādiyah* and the *ḥammād* of southeastern Jordan, increased rainfall in various periods of the past provided rich pasturage for herds of caprines or heavily vegetated landscapes that provided the food for herds of wild animals 'harvested" by hunting groups.

The fortified Early Bronze Age settlements such as Jāwā, with the local reliance on gardens of planted food, made inter-regional economic and political transactions with Mesopotamia more reliable and productive. The collapse of various cultural entities during the long prehistoric period had important effects on the evolving social groups that replaced them, altering relationships between humans and the environment and the relationships among different human groups. To a great degree the prehistoric collapses of social organizations were due to the vicissitudes of climatic change and its influences on environmental resources. In many cases during and after the Neolithic period, environmental degradation was exacerbated by cultural demands and practices such as deforestation and pastoral exploitation, but environmental resurrection was expectable when climatic regimes returned to favorable circumstances. This appears to have been the case in the *ḥarra*, for example. Variability in local occupation seems to have had a cyclical nature of recurring drought that may have lasted for a century or more followed by periods of increased precipitation that generated vegetation for resumption of resource exploitation through hunter-herder subsistence economies. But the sinusoidal climatic variability and population decline and increase in the Black Desert, the greater Petra area, and elsewhere in Jordan may have come to a "final" end when persistent increases in the size of caprine herds and their effects on grass cover and soil conservation coincided with a drastic decrease in rainfall, perhaps around the Early Bronze and Middle Bronze Age transition (Rollefson *et al. n.d.*), from which the region never recovered.

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Managing Public Awareness and Community Engagement on Landslide Risk at the Petra Archaeological Park: The Case of the "Petra Sīq Stability Project"

Abstract

The Petra Archaeological Park, a World Heritage site since 1985, characterized by a spectacular landscape is also a fragile site facing a diversity of risks. Potential occurrence of rapid onset natural phenomena (landslides, flashfloods, earthquakes) pose a major threat to cultural heritage and the visitors. The Petra 'Sīq', a naturally formed gorge in the sandstone mountains is particularly at risk due to its narrow pathway, limited access points and recent active processes, which raised the attention to the geological conservation of the site and visitors' safety. The UNESCO Amman Office, in partnership with the Department of Antiquities of Jordan and the Petra Archaeological Park has therefore engaged in a multi-year project aimed at the analysis of stability conditions of the 'Sīq' slopes through the installation of an integrated monitoring system for the detection and control of deformation processes and the definition of guidelines for implementation of mitigation measures against rock instability. Despite the technical nature of the project, a participatory approach towards different levels of stakeholders has been adopted, conscious of how the awareness of the environmental hazards threatening the site can be crucial to ensuring that risk can be appropriately managed and mitigated. This paper aims at demonstrating the essential role that local stakeholders and indigenous communities can play in the management of a World Heritage property, in particular in relation to disaster risk reduction, and how their involvement and awareness of the issues at stake can be vital for the long term management of the property. Main focus will be put on project activities undertaken, results achieved and suggestions for steps ahead, aiming to present a useful case study for stakeholders and community engagement leading to the sustainable management of the heritage site.

Introduction

In the last decades, the number of disasters and associated losses has been progressively increasing (IFRC 2015; Munich Re 2016).

In landslide risk management, non-structural measures, as community preparedness, public awareness and communication strategies, can be successfully applied to mitigate landslide risk especially in developing countries (An-

derson 2013). Such strategies, along with the implementation of active measures for reducing landslide hazard, demonstrate the importance of involving the affected population and other stakeholders in the decision-making process for risk reduction (Nadim 2014).

According to the Hyogo Framework for Action 2005-2015, the main UN-wide policy on the subject of Disaster Reduction, increasing awareness on the importance of disaster reduction policies is a key objective to ensure the substantial reduction of disaster losses and enhance the resilience of communities to respond to disasters (UNISDR 2005).

Building on the Five Priorities for Action defined by the Hyogo Framework, the UNESCO World Heritage Committee approved at its 31st session in 2007 the Strategy for Risk Reduction at World Heritage properties having per objective to strengthen the protection of World Heritage sites and contribute to sustainable development by integrating concern for heritage into national disaster reduction policies and within management plans for World Heritage properties in their territories (UNESCO 2006).

The strategy was prepared by the World Heritage Centre, in co-operation with the States Parties, Advisory Bodies, and other international agencies and non-governmental organizations concerned by emergency interventions.

This same strategy is also reported on the Resource Manual on "Managing Disaster Risks at World Heritage Properties" produced by the World Heritage Centre in cooperation with ICCROM, ICOMOS and IUCN (UNESCO 2010).

In line with the above, in the last decade the UNESCO Office in Amman has engaged in the implementation of activities geared towards ensuring that preventive measures are in place in the main touristic areas of the site, and, specifically, in the 'Sīq', so to evaluate how the site can be best protected and preserved against natural risks and ensure that it is safe for the thousands of tourists who visit each year.

Scope of Work

The archaeological site of Petra (FIG. 1) lies in a large valley surrounded by mountain ranges. Its geology is dominated by Palaeozoic sandstone rocks that form most of the hand-carved Nabataean rock monuments of Petra. The 'Sīq' is a 1.2 km naturally formed gorge in the sandstone rocks that represents the main entrance to the archaeological site. Because of the religious niches and water management features, the 'Sīq', in its entirety, is considered as a monument of religious and historic significance, considerably contributing to the Outstanding Universal Value of Petra. The width of the 'Sīq' ranges from 3m to 15.70m. It is formed by very steep slopes with variable height from the ground level, from few meters at the entrance to several tens of meters in some areas of the path.

Petra is also a very fragile site facing a wide diversity of risks, ranging from those posed by

1. The 'Sīq' from the upper slopes, © UNESCO.

environmental factors, such as natural and geological hazards, as well as those attributed to tourism and the lack of adequate site management and emergency measures for tourist and monument safety. In recent years, natural phenomena, such as earthquakes, floods and landslides were registered as increasingly impacting the site, and most specifically the 'Sīq' posing a major threat to cultural heritage and visitors.

During the rainy season, water flows into the 'Sīq' from the surrounding wadis. In 1963, 24 tourists died as a result of a sudden flash-flood in the 'Sīq'. Water management and the hydraulic system created by the Nabataeans, protected the monuments and the people from life threatening flash-floods, however those systems are now deteriorated and no longer protecting the site or visitors. A survey of the Nabataean hydraulic network in the 'Sīq' and the areas with direct impact on the 'Sīq' was conducted from 1996 to 2002 (PNT 2003). As a result of this project, the velocity of water flow during flash floods was reduced by restoring the existing floor of the 'Sīq' to its original pavement and grade.

Despite this intervention, the risk posed by landslides is still present in the 'Sīq' due to its specific geomorphology. In the last decade, several landslide events, mostly rock falls and rock slides, with different magnitude (volumes from $<1m^3$ to $>10m^3$) have occurred in the 'Sīq' (2009, 2015) and in the core area of the site (2009, 2010, 2016).

These recent events have prompted UNESCO Amman Office, in cooperation with the local authorities, to initiate a process for analysis, monitoring and urgent and long-term mitigation of landslide risk. Awareness and communication activities on natural hazards have been among the non-structural mitigation strategies implemented.

UNESCO Petra Risk Assessment and Mitigation Strategies

Preserving Petra's Outstanding Universal Value for which the site has been inscribed in the World Heritage List (UNESCO 2016), is one of the corporate UNESCO priorities for culture actions in Jordan, in line with the UNESCO Strategy for Risk Reduction at World Heritage properties (UNESCO 2006).

Since 2009, the UNESCO Office in Amman has supported the Petra Archaeological Park and the Department of Antiquities in assessing, managing and mitigating natural hazards in Petra World Heritage site.

Within the framework of the project "Risk Mapping at the Petra Archaeological Park" (2011-2012), a strategic partnership was established with the government and several partner organizations, including national and international universities, to map and document the natural and human-made risks in the core area of the property. A proposal for risk management at the Petra Archaeological Park to identify and prioritize continuous threats with cumulative and slow effects (not disaster risks) was elaborated and handed over to the government in 2012 (Paolini *et al*. 2012).

From 2009 to 2015, UNESCO engagements focused on addressing for the first time the impact of landslides phenomena in the 'Sīq'. In 2009 a technical expertise in engineering geology was provided to the national authorities to support the consolidation of a fractured block in the 'Sīq'.

Through the implementation of the projects "Rapid Risk Assessment" (2011) and "Sīq Stability", Phase I (2009-2015) actions have been focusing on the analysis of the stability conditions of the 'Sīq' slopes based on a comprehensive documentation of the site, the installation of an integrated monitoring system for the detection and control of deformation processes and the definition of mitigation measures against rock instability (Delmonaco *et al*. 2015; Delmonaco *et al*. 2014; Delmonaco *et al*. 2013a, b).

The Petra "Sīq Stability" project Phase II (2015-2016) aims to operationally implement the mitigation of landslide risk in the 'Sīq' through the (a) application of priority and ur-

gent landslide mitigation interventions in the upper 'Sīq' plateau and on the 'Sīq' slopes to address immediate slope hazards in the short term; (b) capacity development of the national authorities to address the management of landslide risk at the site and implement mitigation measures in coordination with international experts; (c) awareness raising among different levels of stakeholders on landslide and other natural hazards occurring within the Petra Archaeological Park and specifically in the 'Sīq'.

Public awareness and communication among a broad set of stakeholders, ranging from decision makers to the local community, fall into the third project component as non-structural mitigation strategies against natural hazards and shall be later incorporated into a wider management strategy for the site.

Risk Awareness Methodology and Implementation in Petra

The local community and the tourists are generally unaware of how the geological and hydraulic processes that shaped spectacular landscapes can be hazardous to people. Informed visitors can instead assume a certain degree of risk and responsibility for their own safety when visiting natural, cultural or recreational environments. In view of this, park public safety programs shall involve the communication of site-specific hazards to visitors, education and information programs that encourage self-reliance, cooperation with other departments, non-governmental organizations, tourism operators, concessionaires, and service providers (NPS 2006).

Data gathered showed that awareness of natural risks preparedness and mitigation, mostly at the community level, can be the foundation for risk prevention in Petra. Stakeholders and local communities can play a key role in the management of a geo-archaeological site, in particular in relation to disaster risk reduction.

The approach adopted in the "Sīq Stability" project aims at supporting the Petra Archaeological Park in raising awareness on heritage management and conservation, focusing on natural risks preparedness and mitigation. Different typologies of stakeholders were identified (decision makers, governmental institutions, NGOs and UN agencies, professionals/ researchers, site business beneficiaries, tour guides, children, local community) and a set of targeted activities was selected for each of them (TABLE 1).

Overall, the strategy aims at: (a) achieving best practices on preservation and management of the site supported and endorsed by the national authorities; (b) making local communities, site beneficiaries, and other stakeholders engaged in the site with different capacities, aware of the activities undertaken in the 'Sīq' for the prevention of natural hazards; (c) ensuring that best practices are adopted by tourists

Table 1. Overview of target groups and related activities

Type of Activities ► / Target Groups ▼	Field visits Technical Meetings Workshops	Informal meetings and site visits	Informative material (ENG & ARB)	Presentations Lectures	Workshop High Level Conference	Interactive sessions
1. Decision makers					×	
2. Other Gov. Institutions	×					
3. NGOs and UN agencies	×					
4.Professionals Researchers			×	×		
5. Site beneficiaries		×				
6. Tour Guides		×				
7. Local Community		×	×			
8. Children			×			×
9. Tourists			×			

when visiting the 'Sīq' in regards to the impact of natural hazards that might occur on site; (d) making the international community and the national authorities aware of the work that UNESCO is conducting in the 'Sīq'.

In parallel to the priority landslide mitigation interventions carried out in the upper 'Sīq' plateau and on the 'Sīq' slopes from March to July 2016, as part of the project "Sīq Stability", Phase II, a number of communication and public awareness activities on geological and geo-hydrological hazards were implemented, according to the strategy developed.

While some of the stakeholders' categories could be addressed through convening meetings or field visits (decision makers, NGOs, UN agencies), some others required specific outreach methodologies because of their primary involvement during the implementation of the landslide risk mitigation works on site, as in the case of tourists, tour guides, site business beneficiaries and local communities.

At the end of the works, awareness workshops were specifically designed to address the local youth from the six communities located in the vicinity of the site in order to enhance their knowledge about the natural risks and mobilize their support for the preservation of the site.

The type of activities implemented varied in relation to the target group addressed and the timing of implementation (before or during the field works).

As for the activities implemented before or during the field missions, in order to ensure effective and efficient implementation, a comprehensive coordination and management system was set in place in cooperation with the Petra Archaeological Park in advance of each field mission and according to a preliminarily agreed check-list of actions.

Before the implementation of the field activities, community awareness workshops involving site business beneficiaries and tour guides from the local community were carried out in coordination with the project experts and the local authorities. The primary aim of the workshops was to raise awareness on the geomorphological and hydraulic hazards characterizing the 'Sīq', promote a more responsible behavior conducive to risk prevention and, thus, ensure their cooperation during the upcoming field activities. This measure would apply to business beneficiaries as horse-driven carriage riders transporting tourists unrelentingly from the beginning to the end of the 'Sīq', often at high speed and with limited interest in the surrounding environment: having them informed on the specificity of the site and possible natural hazards can enhance their sense of responsibility and produce a transfer of information to the visitors.

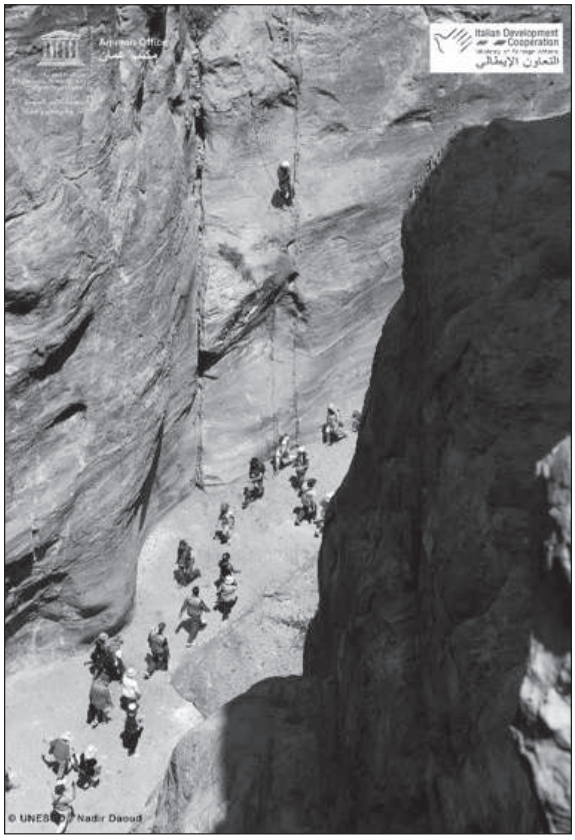
As part of the actions taken before the implementation of works, communication materials as project brochures and informative flyers were disseminated to the hotel management units within the surrounding village of Wādī Mūsā and a warning on the upcoming activities was posted on the Petra Archaeological Park web site.

During the landslide risk mitigation works (FIG. 2), awareness raising activities were performed on site and focused on public awareness with tourists and site business beneficiaries. *Ad hoc* awareness materials on the project were prepared for distribution at the Petra Visitor Centre (project flyers, FIG. 3).

The same materials were distributed to tourists in the 'Sīq', at the beginning and at the end of the work site. Access to the work area (normally about 30 m in length) was temporarily blocked for tourists by using white and red striped tape and placing project banners (FIG. 4).

Dedicated UNESCO and Petra Archaeological Park staff stood at the beginning and at the end of the work site to share project flyers and provide general information on the activities being implemented (FIG. 5). The project team could also rely on the substantial support provided by the Jordan Civil Defense, the Petra

2. Landslide risk mitigation works, © UNESCO.



3. Tourist flow in the 'Sīq' during the implementation of the landslide risk mitigation works, © UNESCO.

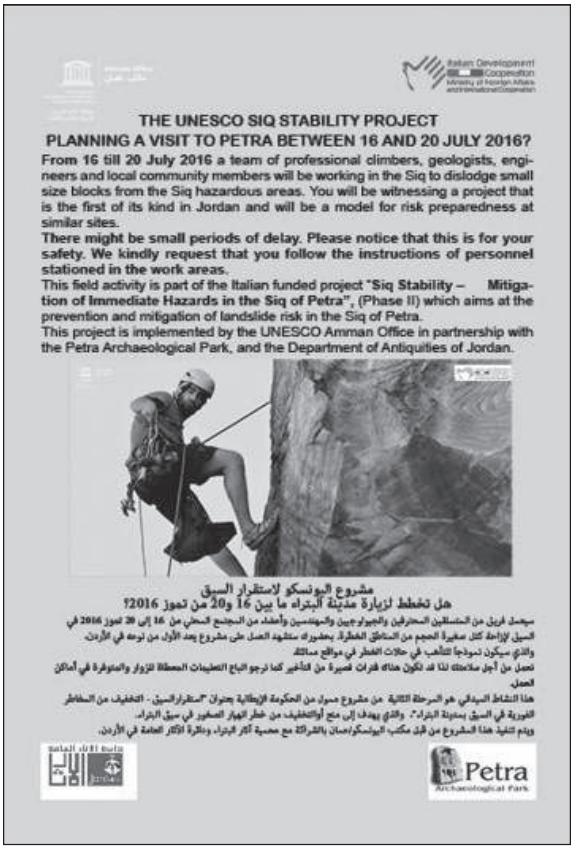
Archaeological Park rangers and the Tourism Police, whom engaged in public awareness activities with the tourists and the local community alongside their more institutional duties.

The whole project team, from the project experts to the workmen (all belonging to the local community) were involved in communicating with the general public on the risk stability phenomena present in the 'Sīq' (FIG. 6).

During the period following the implementation of the works (September-December 2016) a cycle of nine awareness workshops targeting the youth from the local communities in the vicinity of the site were organized in coordination with the Petra National Trust (PNT). The PNT is a Jordanian non-governmental organization, that aims to promote and coordinate Jordanian and international efforts to preserve Petra's unique combination of antiquities, natural environment and human traditions (FIG. 7).

A total of 150 students of different age groups (10-13, 13-15 and 15-18) coming from the communities of Bayḍā, Umm Ṣayḥūn, Wādī Mūsā, aṭ-Ṭaybah, Rājif and Dulāgha participated in the workshop series. Through three types of Youth Engagement Programs implemented, the students could learn more about the significance of the site, the geological aspects that characterize it and the value of protecting Petra's heritage. One specific programme was designed to provide an understanding of the risks the project is striving to mitigate in the 'Sīq' and the activities implemented by UNESCO to prevent landslides in the last decade. Hands-on activities were often arranged to facilitate the understanding of the concepts explained.

The activities undertaken proved successful in spreading awareness on the project at different levels and primarily within the tourists, site business beneficiaries and the local community. In light of this, it is foreseen that additional activities engaging the local youth will


THE UNESCO SIQ STABILITY PROJECT
PLANNING A VISIT TO PETRA BETWEEN 16 AND 20 JULY 2016?
From 16 till 20 July 2016 a team of professional climbers, geologists, engineers and local community members will be working in the Siq to dislodge small size blocks from the Siq hazardous areas. You will be witnessing a project that is the first of its kind in Jordan and will be a model for risk preparedness at similar sites.
There might be small periods of delay. Please notice that this is for your safety. We kindly request that you follow the instructions of personnel stationed in the work areas.
This field activity is part of the Italian funded project "Siq Stability – Mitigation of Immediate Hazards in the Siq of Petra", (Phase II) which aims at the prevention and mitigation of landslide risk in the Siq of Petra.
This project is implemented by the UNESCO Amman Office in partnership with the Petra Archaeological Park, and the Department of Antiquities of Jordan.
مشروع اليونسكو لاستقرار السيق
هل تخطط لزيارة مدينة البتراء ما بين 16 و20 من تموز 2016؟
Petra Archaeological Park

4. Flyer of the risk mitigation works 2016, © UNESCO.

5. Banner of the risk mitigation works 2016, © UNESCO.

6. Communication session on landslide mitigation works to visitors, © UNESCO.

7. Workshop participants prepare a model of the 'Siq', © UNESCO.

8. Students use colored sand mixed with plaster to create versions of the sandstone found in Petra, © UNESCO.

be organized during the following phases of the project and the final achievements of this work will be compiled and integrated in the management plan for the whole site, whose preparation is currently being developed by UNESCO and the local authorities (FIG. 8).

Conclusions

This study demonstrates the essential role that public awareness and communication on natural hazards can play as non-structural technique in the management and mitigation of landslide risk in the 'Sīq' of Petra and further support the Petra Archaeological Park in the management of environmental risks at the site.

Despite the time limitations, project related experience reported and the challenges faced in the management of the tourist flow at one of the most visited sites in the world, this initiative can be regarded as a successful example

of cooperation between the national authorities and UNESCO for the improved management of a World Heritage Site.

Similar actions shall be then integrated in a management plan for the protection of the site that is currently being elaborated by UNESCO Amman in cooperation with the national authorities.

Acknowledgments

This study has been conducted in the framework of the UNESCO, Italian funded, project "Sīq Stability – Mitigation of Immediate Hazards in the 'Sīq' of Petra" (Phase II). A special acknowledgement is, thus, addressed to the Italian Agency for Development Cooperation for having entrusted the UNESCO Amman Office with the implementation of such a strategic project at the Petra World Heritage Site.

The authors wish also to acknowledge the substantial support provided by the Government of Jordan represented by the Petra Archaeological Park and the Department of Antiquities for their continuously cooperation in the implementation of this pioneering project.

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The Archaeological Missions: For a New Cultural Approach, Beyond the Crisis. The 'Future' Experience of the European Archaeological Mission 'Medieval Petra' of the University of Florence

This paper is a reflection and a proposal for operational lines – setting origin, developments and perspectives – for the Mission 'Medieval Petra. Archaeology of the Crusader-Ayyubid settlement in Transjordan' began experimentation on how to overcome the classical structure of international archaeological missions, with their its cumbersome legacy of a colonial origin.

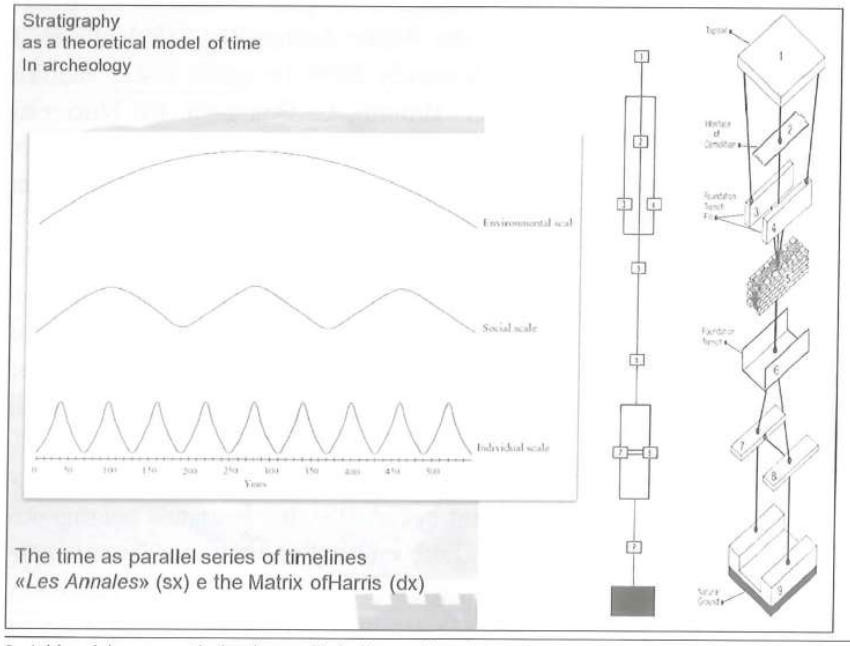
1. These brief considerations want to be a contribution to a necessary reflection on the social role of international archaeological activities and on the close relationship that should be maintained between an urgent, deep, structural review of the missions as a civil project and scientific program, for a renewed cultural setting. Among the many possible points of view, our intends to be placed between the challenges of historical dimension of archaeological research and the Italian and European experience. An approach that take inspiration from the European diffusion of a specific field of the discipline – the Public Archaeology (Schadla-Hall 1999; Bonacchi 2009; Brogiolo 2012; Vannini 2011; G. Vannini, C. Bonacchi, M. Nucciotti 2014) – and moving from the thirty-years experience of the University of Florence Mission '*Medieval*' *Petra*[1], also in terms of methodology, to propose some reflections in order to face the situation on a new basis, that needs a new cultural rethinking. Archaeology in time of 'crisis', then, but in the greek meaning of the word, between present difficulties and potential opportunities.

A crisis – Euro-Mediterranean and structural (not cyclical) – that demands courageous choices both cultural and ethical (do not seem arbitrary the combination); the same efficiency – if not feasibility – of this traditional form of scientific research ('Mission'), relevant also as eminently interdisciplinary is at stake and will be even more in the coming decades. A crisis

1. 'Medieval' Petra is the largest Italian medievalist archaeological mission operating abroad and, in collaboration with the DoA since 1986, is the oldest among international missions currently operated in Petra. Thirty years of research have brought to the attention of the international scientific community the key role played by Petra region in the Crusader-Ayyubid re-founding of Jordan, between the 12th and 13th century. Also a crucial period in the formation of todays settlement (and geopolitical) structures. A 'gym' that played an important role in the formation of four generations of young archaeologists, some of whom are still the backbone of the Florentine mission; but also a crossroads for international working groups and related Institutions that have produced a 'network' from which they have also arisen (at least five) or new missions have been formed in the Region, among the most recent of which I can willingly mention the first Polish archaeological mission (Jagiellonian University of Krakow, 2013) operating in Jordan (Petra region), directed by Piotr Kolodziejczyk.

that precisely in its most violent outcomes (as in Syria, but not only), has highlighted the central role even of the Heritage archaeological in political struggle, showing all the relevance – in our societies do not always recognized properly – for fundamental aspects of the reference communities.

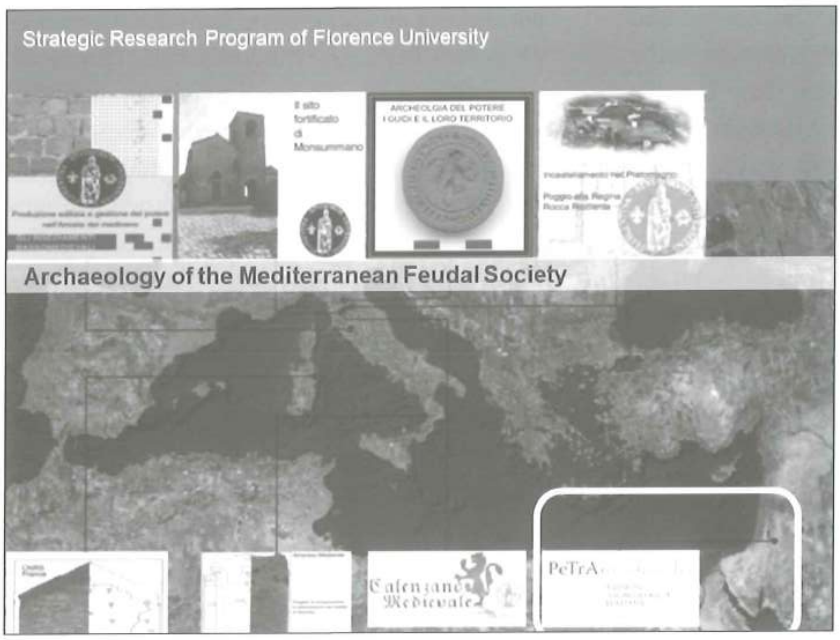
2. The recent European medieval archaeology – which represents the cultural context of our mission – it can be said that finds its scientific roots on a renewed relationship with historical research and, essentially, attempts to electively produce or reinterpret historical models, also classical ones. For example: historical structures – in 'braudelian' sense – continuity and discontinuities of settlement dynamics, *incastellamento*, history and environment) by means of specific methodological 'tools': archeology of production, stratigraphic analysis of upstanding buildings, landscape archaeology, archaeomatics (FIG. 1). Our 'case-study' presented here has been the first application – certainly in the work of an Italian mission – of this scientific point of view, in Near Eastern archeology (*i.e.*: archaeology without excavations?). It includes contributions of archaeological research, even surprising sometimes, to historiographical themes, focal, in recent years, especially for historians concerned with medieval Mediterranean settlement[2] . In that regard, the strategic role of 'light archeology' was central – already 'tested' in the Florence University's Strategic Plan in several Tuscan[3], Tyrrhenian (Vannini *et al* 2003) and Mediterranean areas (FIG. 2), and now in Armenia (Nucciotti, Petrosyan *et al* 2015) – a system that integrates the various non-invasive archaeologies: environment, building, archeomatic and focused essays. A very effi-



1. Harris' Matrix and Temporal Model of "Les Annales", theoretical modeling of the relationship between space and time in archeology (time as parallel series of timelines).

2. A historicist approach that is not dissimilar – although moving, with marked traits of originality, also from an anthropological approach – characterizes methodology and practice of the mission directed by Sten La Bianca and Bethany Walker in Tall Ḥisbān (*i.e.* see the lecture given in this Congress).

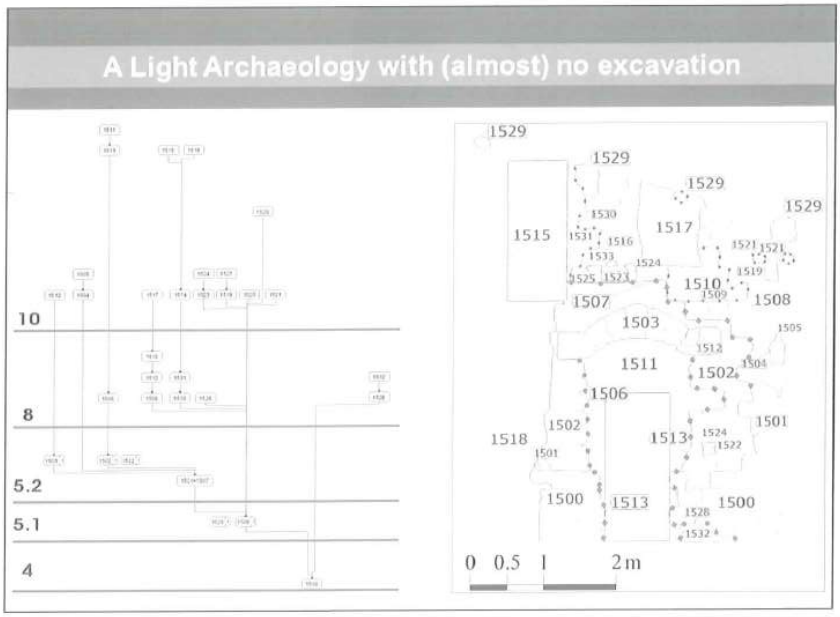
3. Like experimental territorial projects between light and public archeology, recently in Amiata areas (Nucciotti 2010) and of Casentino (Molducci, Rossi 2015). On this archaeological approach, see now Vanni Desideri, Vannini 2016; Vannini, Nucciotti 2017. This approach, 'territorial and light', has characterized the Mission from the beginning when, for example, it was necessary to explain in detail to the DoA General Director of that period (Dr. Adnan al-Hadidi) all our operational practices to obtain the necessary permissions. He seemed to be almost amused and asked me cordially what appeared to be an 'occupation'ever seen (Petra, ash-Shawbak, al-Karak, all and togheter!) because our operational practices (extensive stratigraphic surveys on territory and on the buildings) and our objectives (on historiographic themes) were be requested for 'regions' and archaeological-monumental areas and not, as usual, for a single site. "Research" permits, I specified also, and not "digging": the first essays were in fact included in the 'light' programme only in 1989, with the 4th campaign, 3 ^ official, after the 1986 survey. However, in the first decade of activity (1987-1996) this method was applied essentially in the area of Petra, after which it was systematized and progressively extended mainly to ash-Shawbak and more recently to al-Karak (since 2012).



2. Strategic Research Program of Florence Universityfor medieval archaeology. 'The Lordship of feudal Mediterranean origin. Archaeological profiles, at the origins of modern Europe': survey dedicated to the study of material and territorial structures for cultural comparative areas.

cient approach, when the aim is to investigate deductively historical 'phenomena' (and not, inductively, from the analysis of 'episodes', as more often happens in archaeological tradition) on a large territorial scale (FIG. 3)[4].

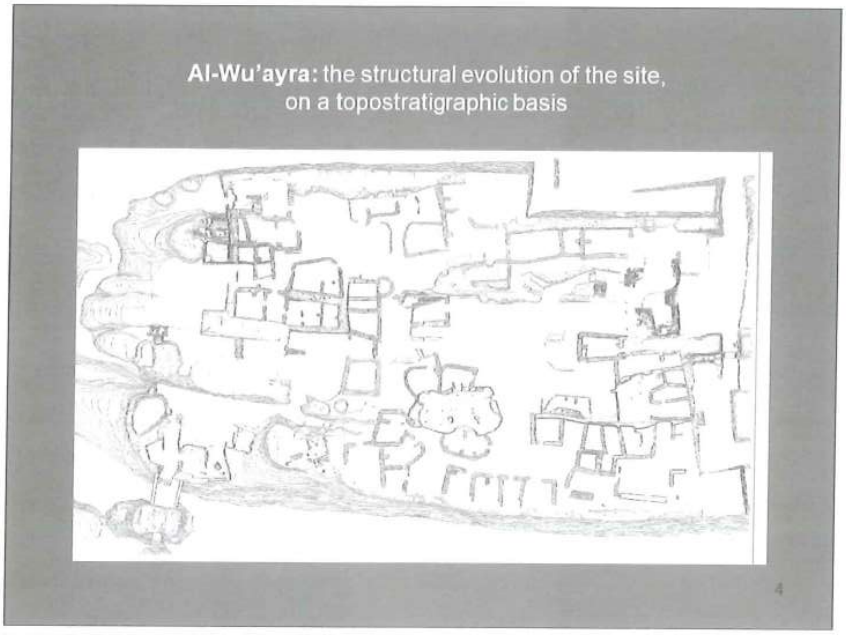
So, in Transjordan, archeology can pick up some materials "caractères originaux", structural of the first Crusader occupation in the Holy Land, where they are better stratigraphically readable, for the new situation of Ayyubid settlement established after the day of Ḥiṭṭīn (1187); essentially adopting – on subregional scale – an update, here experimental, of the classic procedures of the archeology of the 'vil-



3. A Light Archaeology (analysis of upstanding buildings, in this case) without (almost) excavation (Archive of Laboratory of Medieval Archaeology of Un. Of Florence, LAM).

4. Smith 1992; Pruno, Drap 2012; Francovich (a c.) 1987; Manacorda 2007. To represent the numerous contributions offered by the Mission in terms of methodological advancement, through often experimental archaeomatic procedures, starting from surveys to the elaboration of data in the laboratory that constitute the technological side of this 'light' archaeological approach, actually oriented to preestablish a objective documentary grid on which to support solidly founded historical interpretations, see Niccolucci 2000; Drap, Vannini 2012; Drap, Pruno, Nucciotti 2012; Drap, Vannini *et al.* 2017.

lage dèsèrtè'. The Lordship of Transjordan and its material structures as 'observatory' on the Crusader-Muslim frontier of the Holy Land[5] . In this context, the excavation is used on targets identified on different territorial scales and at variable intensity – from large scale (the Muslim-Crusader frontier between Syria and Jordan), to medium scale (the region between the Dead Sea and the Red Sea) and to the smaller scale (the valley of Petra) – qualified as 'stratigraphic observatories': al-Wu'ayra castle, tactical, in relation to Petra and its control (FIG. 4); strategic, for the control of the entire Crusader territory (the old King's Highway, between Syria and Egypt, in south Transjordan); the ash-Shawbak monumental site, about the poleogenetical function that the reactivation of the frontier in the region has produced in Crusader and Ayyubid age (FIG. 5)[6] .In addition, a specific contribution (in progress), but which presents the typical features of the material 'structure', is constituted by the precise pottery and masonry structures (FIG. 6) series, documented with high chronostratigraphic precision, for the first time ever for the twelfth century productions in the region; this is the 'product' of the methodological choice of the project as a whole. In fact the archeology of 'lost villages', in this case an entire region and a historic season (FIG. 7)[7] . These series, in fact, made it possible the identification of the settlement on the bottom-valley in the Crusader age; the main site is Wādī Farasa, thanks to the excellent analysis of the Berliner Mission direct by Stephan Schmid (Schmidt 2006; Schmidt 2012). *Inter alia* confirming the interpretation model of the Crusader settlement proposed by us few years earlier (Vanni Desideri, Vannini 1995).

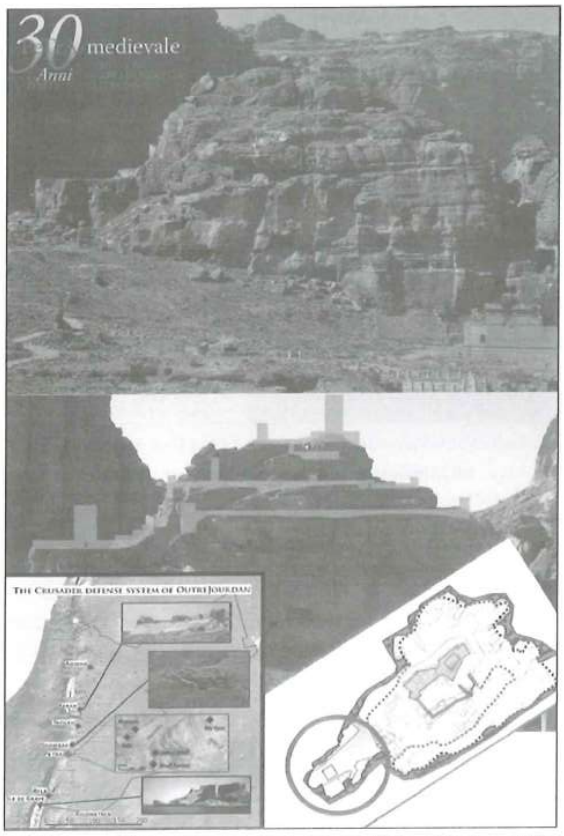


4. al-Wu'ayra . The medieval key to Petra and stratigraphic observatory on medieval settlement of the Valley. The structural evolution of the site, on a topostratigraphic basis (1994).

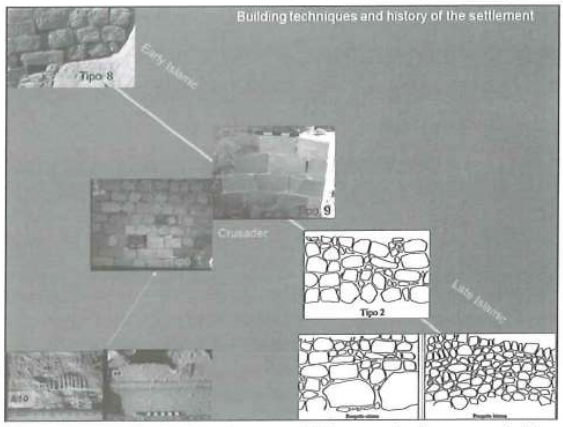
5. Exemplary essays of the historical results achievable with the different applications of the 'light archeology', are shown in these same proceedings in the other speeches referring to the our Mission: stratigraphic analysis of the of upstanding buildings ones in the context of the 'urban' type (and with a specific role entrusted to 'targeted' essays) see the of Michele Nucciotti and Lorenzo Fragai on the walls of ash-Shawbak and al-Karak; for a topostratigraphic analysis, see the essay by Andrea Vanni Desideri it will bring important updates on al-Wu'ayra site with targeted interventions of 'light archeology'on large areas, without building remains. About some of this topic see now Brown 2016: 543-560.

6. This territorial and light approach – which is substantially a variant of the 'global archeology' introduced by Tiziano Mannoni from the middle of the 1970s (exemplar remains the case of the 'Zignago': Mannoni *et al* 1978:. 273-374) – was applied for the first time (mid-80s) in consciously systematic terms on the historical theme of the 'conquest of the *contado*'of medieval Florence in the *Valdarno superiore* with the Poggio alla Regina as 'stratigraphic observatory' of the territories of reference (Vannini 2004; Cimarri, Sahlin, Vannini 2010).

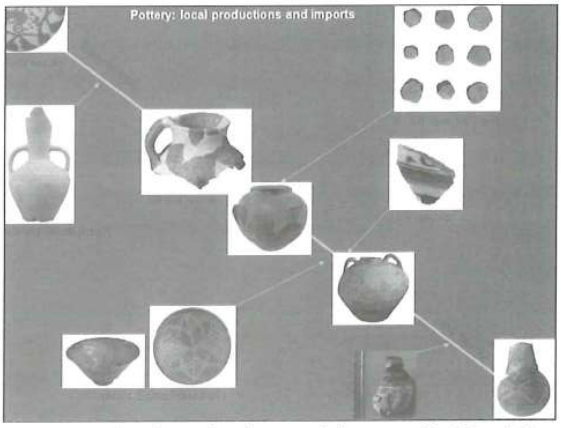
7. Tonghini, Vanni Desideri 1995; Pruno 2012; Pruno 2016; on this theme, in this volume Elisa Pruno and Raffaele Ranieri (Mission 'Petra Medievale') have communicated some of the latest results about the ash-Shawbak stratigrafies. About the archaeology of 'lost villages' (in the "longue durèe" perspective, see Mannoni 1995).



5. The regal Transjordan and the making of a Lordship (1100 – 1142). al-Ḥabīs, with al-Wu'ayra, the fulcrum of Petra Valley Incastellamento in the Middle Ages: elevation; reconstructed medieval skyline; plan and topografic analysis. Rebirth of a frontier.



6. Cronotipological Atlas: Building techniques and history of the settlement (A. Vanni Desideri).



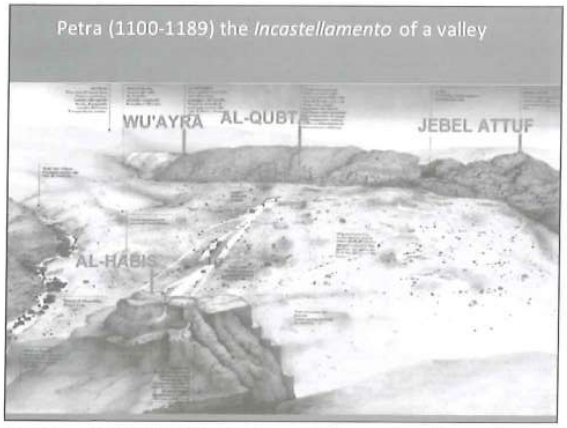
7. Pottery: local productions and imports (A. Vanni Desideri).

3. Among the scientific contributions to the history of the region, produced by the archaeological project so set (on a territorial basis), we could mention, to limit ourselves to historical phenomena in 'structural' sense (Vannini, Vanni Desideri 1991; Marino *et al.* 1991; Vannini, Nucciotti (eds.) 2012; Vannini 2011):

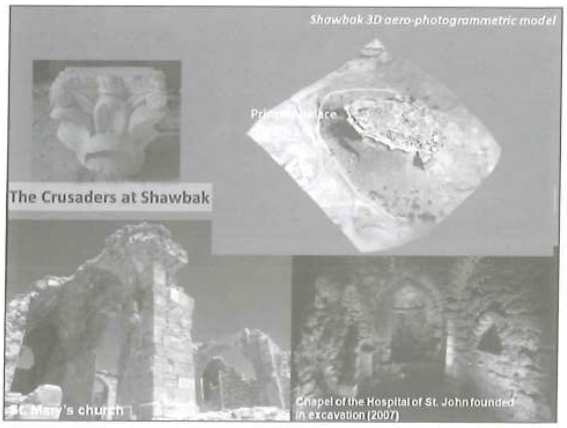
- the Crusader *incastellamento* ('castle settlement') of Petra valley as a logistics hub of Royal Transjordan and its renewed typically 'Mediterranean border' (FIG. 8)[8] ;
- in ash-Shawbak, the discovery in the excavation of the 'princely' palace of *Crac de Montréal* and the structures of the 'feudal capital' of the crusader Lordship of Transjordan, based on the imposing ruins of a monumental fort of the ancient Romano-Byzantine *Limes Arabicus*, so far unknown (FIG. 9)[9];
- the 'discovery' of a new Islamic town, ash-Shawbak (as part of the Islamic empire refounded by Saladin), risen to the rank of regional capital in Ayyubid and early Mamluk age (between the end of 12th and of 14th centuries, at least), with the identification of a real planned urban generator axis (FIG. 10), the splendid Palace of government and a large production plant, part of a real 'industrial' system (Vannini 2007; Rugiadi 2012; Mar-

8. Between break and continuity. The re-emergence in the 12th century of a historic feature of the entire region culture: the Frontier, which was significantly reinterpreted according to its medieval Mediterranean connotations; with the unsuspected role of the Valley of Petra, classically *incastellata*, that since more than five centuries, becomes again the keystone of a new (*Frankish/Latin*) settlement system (Vannini 2013; in general on the topic see Abulafia, Berend 2002).

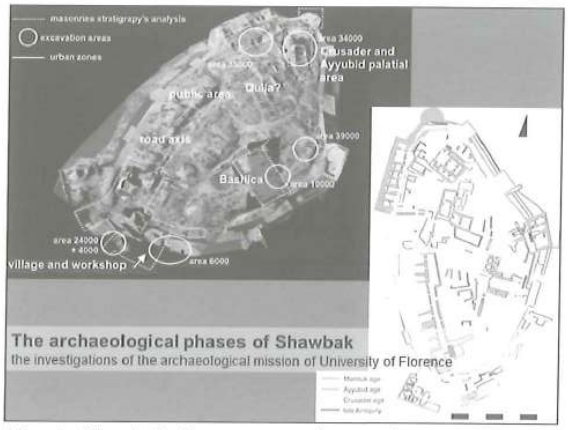
9. A situation that made the re-foundation of ash-Shawbak by king Baldwin 1st possible in only 18 days, like a latin chronicler – Alberto di Aix (Rhc-Hocc, III, 431) – writes; the remains identified both in the elevated and in the excavation, can be referred to the fortress mentioned by an Arab chronicler, always regarding the foundation of the *Crac de Montrèal* (Marmadji 112): Vannini 2011.



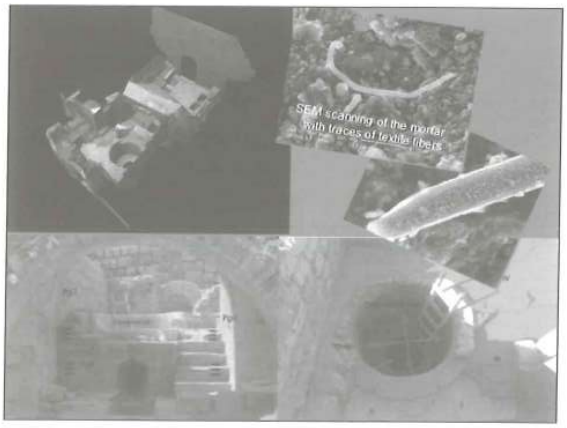
8. Petra (1100-1189) the Incastellamento of a valley. A classic feudal settlement 'system,' planned in all likelihood starting from the residence in Wādī Mūsā of the first King of the Latin Kingdom of Jerusalem, Baldwin I – just a few months after the conquest of Jerusalem – and definitively collapsed with the fall of ash-Shawbak, followed by the outcome of the battle at the 'Horns' of Ḥiṭṭīn (1187) (by "Archeologia Viva", 1991).



9. Crac de Montrèal: ash-Shawbak 3D aero-photogrammetric model (CNR-ITABC); St. Mary's church; Chapel of the Hospital of St. John founded in excavation (Photo M. Foli, 2007).



10. ash-Shawbak from a crusader castle to an Islamic city: stratigraphy of a site, reflections of a historical territory. Archaeological-monumental area and 'corpi di fabbrica' with investigated areas ('light' analysis; 'open areas' excavations); ancient (Severian-Byzantine), crusade, Ayyubids, Mamluk structures. The urbanistic road axis, documented by function, structure and chronology through 'light' analysis (topostratigraphy, both horizontal and vertical).



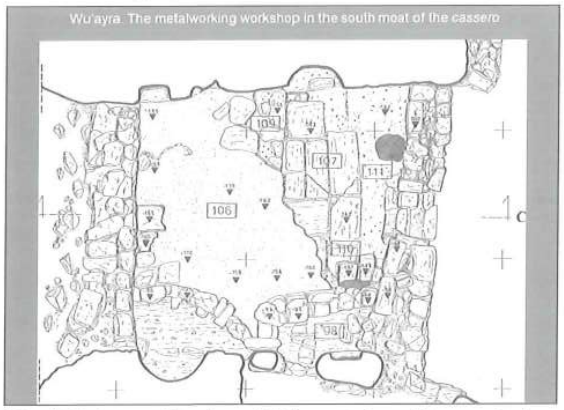
11. Archaeological analysis of the Mamluk laboratory. The monumental character of the plant (probably for the production of soap on a large scale) reflects an economic structure (of which there are traces of other sectors of similar importance) typical of an urban center, well corresponding to the quality of the government Palace, referred to the political-administrative dimension.

cotulli, Ruschi, Vannini 2013) (FIG. 11).

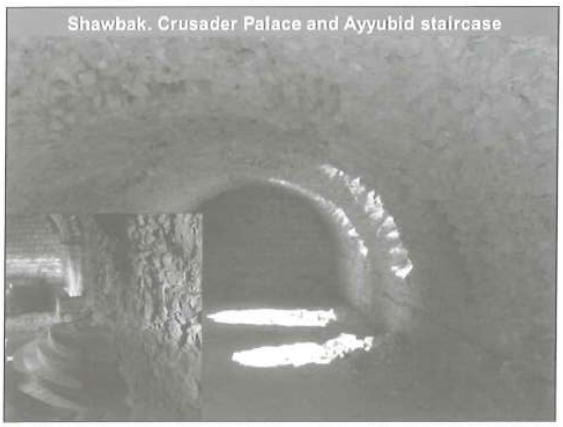
In particular, two essential elements of the long term, have emerged from research in the field, whose connection provides a model for interpreting an archaeological history of southern Transjordan, as part of 'Mediterranean Middle Ages'. Thus, on the basis of recent European research of medieval landscape archeology, is enlightening the mode of reactivation – as we will see historically anything but ephemeral – by the Crusaders, of the central role of the Petra valley in the land management of a vast area between the Dead Sea and the Red Sea, after a loss of such function of nearly half a millennium. Such a 'rural' modality – according to the typical crusader-feudal culture – which reproduced, albeit reinterpreted, the territorial and social directional function held for centuries by the ancient Nabataean-Roman-Byzantine Petra-city (Vannini, Tonghini 1997). Petra, of

course, suffered a new crisis, as a regional political center: the archaeological traces, with the de-functionalization of Petra castles, up until now, show only modest local reoccupations, as confirmed by extensive research by Patricia Bikai exposed in Florence Conference (2008) in spite of limited Mamluk settlement in Bayḍā, al-Wu'ayra and Petra (Bikai 2012) (FIG. 12). But this time the legacy will be picked up by the founder of the new Islamic empire (here on the ruins of the Crusader political construction), Saladin and the Ayyubids, that researched continuity with the Crusader season albeit, this time with a urban key, returning a territorial function to the old *Crac de Montréal* (FIG. 13). Here it was in fact founded a new capital city, ash-Shawbak, in this authentic medieval heir of ancient Petra and of its political and administrative role, at least in southern Transjordan (Vannini 2014). This is the foundation of a new historical setting for the region and beyond, that started with the coming back of urbanism in the area south of the Dead Sea – most likely on the initiative of the same Saladin (the archaeosismic readings put the foundation of the palace ante 1212)[10] As new 'capital' of this region – after the ancient Roman imperial times; but this, with a suggestive synchrony with what is happening in those decades (late XII-half XIII and below) also in the 'Christian' Mediterranean (FIG. 14). A rediscovered regional role, after centuries, recognized as essential in political and territorial balance of the large region, as evident from the negotiations relating to the 1218-1219 'Damietta war'[11] .

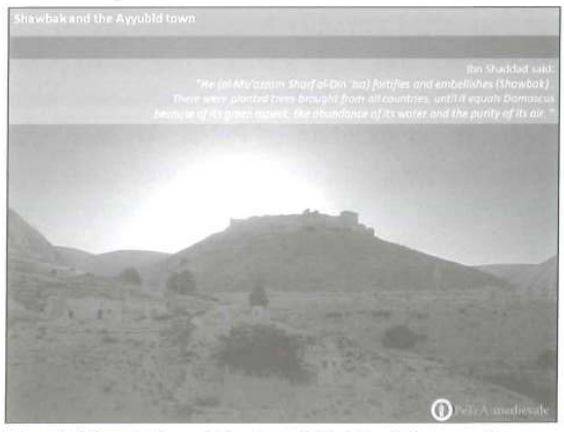
ash-Shawbak, then, a city that had lost its memory (lost by history and refounded by archaeology, we can say), and whose next eclipse



12. al-Wu'ayra . Sondage I. The metalworking workshop in the south moat of the cassero (keep), implanted immediately after the demolition of the crusader castle, entails, with its own location in a crucial point of the defensive system, the complete de-funzionalization of the pivotal site of the system of incastellamento of crusader Petra. A changing era (S. Bertocci).



13. Interior of the vaulted room identified as part of the Crusader palace and monumental staircase built in the Ayyubid age as connection with the new government building. The staircase is been founded in excavation.



14. ash-Shawbak and the Ayyubid-Mamluk town (recognized as such from coeval Arab sources), view from the west side (Photo M. Foli).

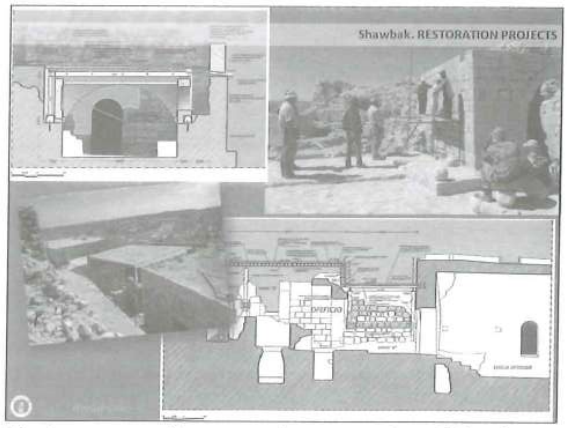
10. NUCCIOTTI In Vannini 2007: 46 and *passim*. For a specific archeosismic approach – that have a very important role in our cronological interpretation, in particular, for the walls stratigraphy in ayyubid ash-Shawbak – in view of a 'light' territorial reading, see Arrighetti 2015; Arrighetti 2013.

11. When the Caliph of Cairo offered – and the Crusaders refused it – in exchange for the evacuation of Damietta a peace that provided for the restitution of the entire territory of the Kingdom, including Jerusalem, but not ash-Shawbak and al-Karak (Richard 2012, Cap: 9).

(perhaps already in the late Mamluk age: but this will be a goal of research in the coming years, with colleagues from the PAN and Jagellonic University of Krakow of our Polish team) promises to be a possible archeological paradigm of a wider crisis of Arabic Islam, until the Great Arab Revolt, also archaeologically documented in ash-Shawbak (Vannini, Nucciotti 2009) and still current. Thus in southern Transjordan it appears a Middle Ages that determines new territorial assets between mid-twelfth and mid-thirteenth century, in a period we can also define – with a look to *longue durée* historical structure – 'Crusader-Ayyubid age'; of course beyond the contingent political intentions of its different actors, Eastern and Western ones. It is, we might comment, explicit material documentation on the continuity of function and territorial role of the site and the entire region of Transjordan, which reacquires, as 'medieval frontier', a role and a identity since then no more lost, until the Jordanian State of today; to the origin of an authentic identitarian element of the present community, regional and national. But also an entire region belonging to a common Mediterranean culture, among XII-XIV centuries and beyond.

4. It is therefore clear that all these points are connected not only with the history of the region, but also with relevant aspects of present identity of the Jordanian community: both basis for our program of Public Archaeology. Thus, this program, developed since 2006 as a contribution to the research and enhancement Agreement of the archaeological-monumental area of ash-Shawbak with the DoA of Jordan, through coordinated actions, including a series of executive restauration projects coordinated in different areas of the site (FIG. 15)[12], a integrated communication strategy and support for forms of development and local services, with positive results both in Italy and in Jordan; but with a basic criterion: to use selections of research products on archeological Heritage, and not simply starting from this. In summary, and only to exemplify our actions:

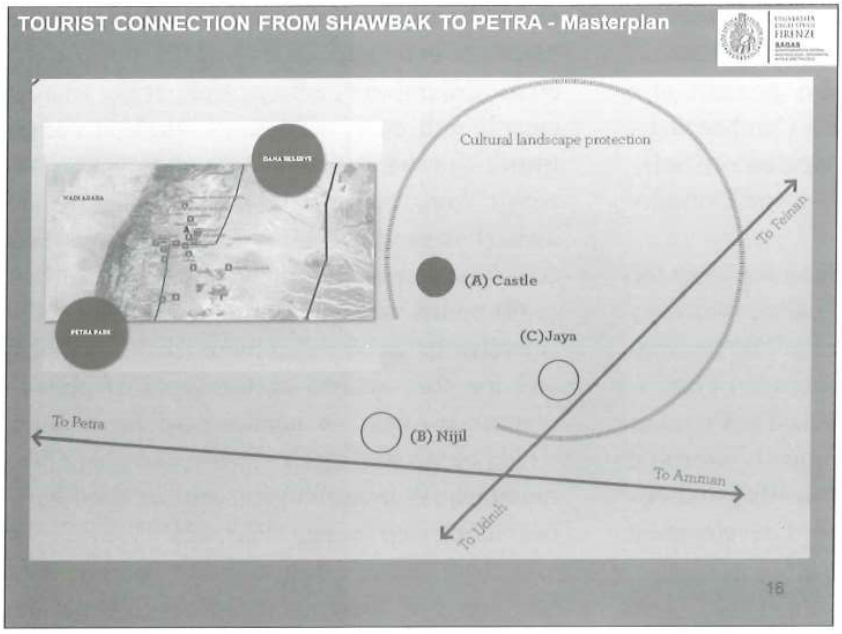
- a conservation program of the site and also enhancement of Cultural Heritage of the territory (including an experimental touristic master plan), also connect to Petra, (European project ENPI-CIUDAD), for a public, sustainable, shared, identitarian use of the archaeological Heritage, between communication and governance (Nucciotti, Segnini 2013; Vannini 2016) (FIG. 16);
- realization of the first exhibition in Italy with Public Archeology criteria, with relevant success of the international public, as well as economic and scientific (FIG. 17)[13]
- Impact on site of the activities of the 'public' program (2008-2012): tourism increase of 26%; enlargement of the local camping, for many years only accommodation provider; opening of the *Montréal Hotel*, originally built by USAID but never operated before 2011, through intense and targeted



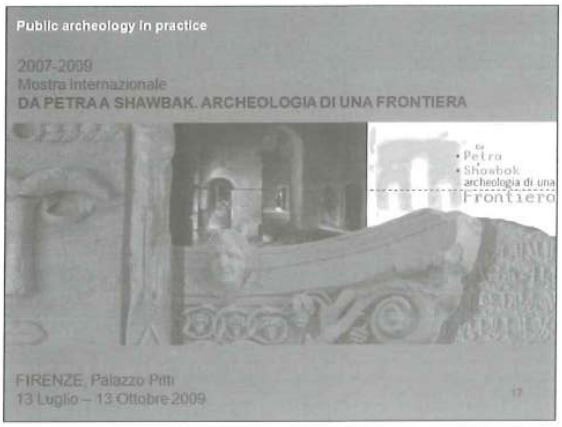
15. A program of conservative restoration of the site on an archaeological basis (P. Ruschi).

12. The main projects concern areas and structures coordinated in an integrated conservation plan extended to the entire site; in particular a safe path that includes also a suggestive re-profiling of the south curtain of the castle, the monumental access portal to the second circle of walls, the Mamluk factory, the reception hall of the Ayyubid Palace, the basilica church of S. Maria (Ruschi In Vannini, Nucciotti 2012; Marcotulli, Ruschi, Vannini 2013); Andreini, De Falco, Giresini, Sassu 2014. While a design idea for tourism enhancement, that proposes the opening of an very suggestive tourist route dedicated to the Petra valley on the traces of the Crusader settlement, was proposed by Ruschi, Vannini 2001; Vanni Desideri, Sassu 2014.

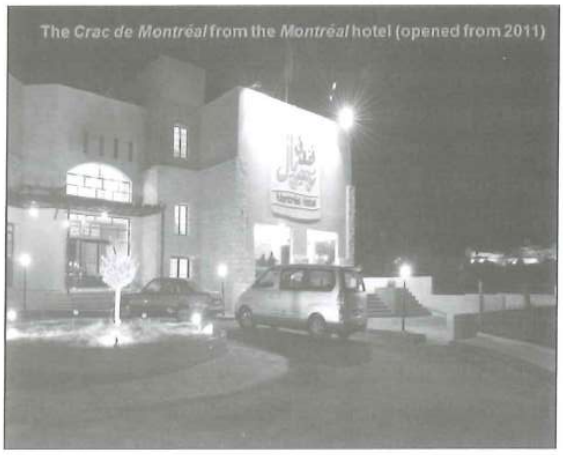
13. Florence, Pitti Palace; impact: 200,000 visitors in three months; liking measured and motivated; yield: cost € 650,000 ca; economic supply ca € 2,8 million. (Vannini, Nucciotti 2009; Bonacchi In Vannini, Nucciotti 2012).



16. Masterplan : Tourist Connection from ash-Shawbak to Petra (F. Candido).



17. Public archeology in practice: The exhibition 'Archaeology of a frontier' in Florence, Pitti Palace, 2009.



18. The Crac de Montréal from the Montréal hotel, opened from 2011 (Photo A. Marx).

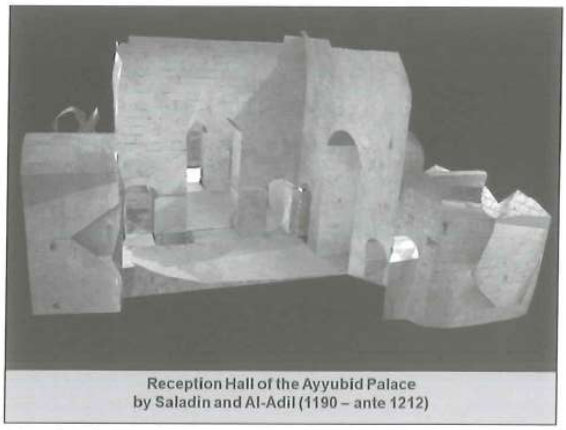
networking and marketing actions (between different institutions, in ash-Shawbak and Amman), now also used as accomodation for missions (FIG. 18); opening of a second small hotel ('Motel' ...) by local investors (FIG. 19); increase of operators in the tourism sector from 4 to 52 employees under contract in 2013 (Bonacchi in Vannini 2011).

In summary, central, in our experience (in progress), is the relationship which must be made explicit and perceivable, between a research alien at each instrumentalism and a contribution to the restarting value of identitarian elements of archaeological origin of the region-

19. ash-Shawbak and the new illumination of the road between village and 'castle': the dawn of a tourist reception system ... to be monitored (Photo A. Marx).

al community, as the national society, read as concrete and rooted in precise historical matrix: ash-Shawbak and the region as a 'product' of a 'mediterranean' meeting, with a ('archaeological') discovery of a important local role of Saladin on the one hand and in the same Crusader experience on site to another.

And so that, for example, in recent years the structures of the old Ayyubid palace was used (after centuries ...) as a place of public ceremonies (the first in 2008, on the occasion of Luciano Pavarotti memorial concert held in Petra) or for the first time, among the tourists appeared in considerable numbers local families and visiting schools (FIG. 20). Observed development

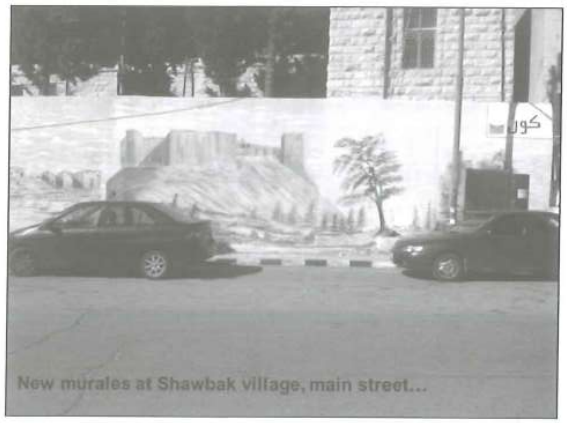


20. ash-Shawbak. Reception Hall of the Ayyubid Palace by Saladin and Al-Adil (1190 – ante 1212). Continuity and innovation of a political territorial power: now, Jordan national monument? (P. Drap).

elements are involving local entities (ie: the *Montréal* hotel also offers local dishes cooked by local families[14], who as well, enjoy a small income and everyone knows where it comes from ...; in order: from a cultural heritage, scientific work, attention to social context to the owner): in short, a chain linking Crusaders-Saladin-Residents and... shawarma (FIG. 21)[15].

Of course now promoting actions are to be activated to support also these local initiatives; and the first action, on the basis of already planned projects (of international excellence), would be the starting of a restoration plan of the monumental-archaeological area of ash-Shawbak, albeit step by step (FIG. 22)[16].

5. In a way, it's time to conceive how 'public' – or if, in this regard, we can to better de-

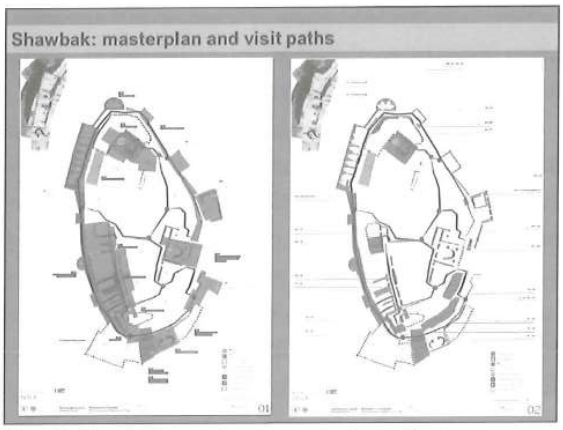


21. ash-Shawbak: The Crac de Montrèal and Saladin are back!.

14. An occasional element that can give an idea of how specific cultural approach and sensibility of a humanistic education can play a important role also for growth programs, of course set up with the multidisciplinary skills of the case, and it can here constitute an example for a circumstance that it has proved useful for setting up consequential practical actions. When local administrators (municipality of ash-Shawbak), in the face of our concerns about the perspective, in case of growth of the area following the planned actions, of possible building speculations that (would be) fatal for a landscape context of the nicety and fragility of the nearby area hilly, they described the multi-ownership structure of the land, typical of the Bedouin tribal tradition, which created a stratified and complex network (for relationships not only economic and material) among dozens of families on the same funds, often even of modest size. A description (deepening the question) that finally appeared familiar to a medievalist: it was something very similar to the "*pro indiviso*" properties usual in the documentation of the central centuries of our Middle Ages, in many areas entered into customary law, sometimes up (in case in Tuscany) to the Leopoldine reforms of the '700 Illuminist. An observation that, for example, could also played a role in the "*pro indiviso* meal for the customers of the *Montréal* hotel", realized by – a significant aspect – for the women of local families.

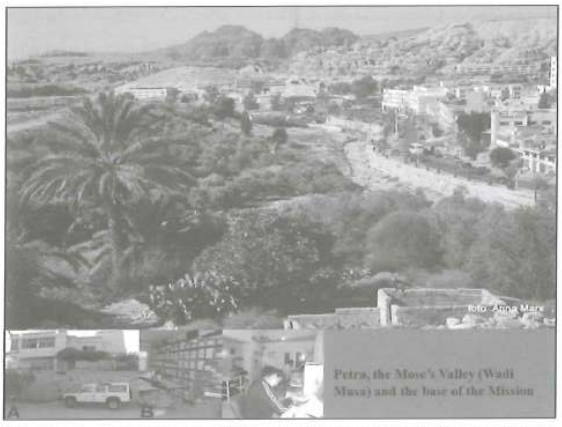
15. A sign of the effectiveness of public archeology actions can also be found over time. In the village of ash-Shawbak, at this point the relationship between local growth (economy), management of archaeological-monumental Heritage (the 'castle', at this point crusader but also 'of Saladin') consequent sense of belonging (identity) and work that is carried out on the archaeological site (research), is at all community evident. Well, since 2013, large *murales* have begun to appear on the main street of the village, representing the castle that proudly dominates the village from its steep hill ...
It is therefore possible to go beyond what was observed by Galanzeh Hejazeen 2007: "the development of tourism is funded and agreed upon by foreign "imagemakers/ investors" and state elites (Linton 1987, 6), and that, as a result, the local communities are not consulted and do not take part in the tourism development process or share the resulting benefits, even in the more developed tourist sites like Petra." (P. 28), also observing that "tourism began in Jordan after archaeological excavations, which highlighted the importance of the cultural heritage, not only for western societies, but also for the communities living near or around the tourist sites (Interview in Sept. 2004)." (P. 56).

16. See *supra* n. 12.



22. ash-Shawbak: masterplan and visit paths.

fine 'civil' – the same approach of the archaeological mission, in a more extensive, systematic and conscious of a role that, in fact original, involves all the responsibilities of a recognized form of intercultural communication (and practice). From this perspective archaeologists working in the Near East are objectively cultural mediators: mediators between the cultures of the past and those of the present and mediators between European culture (and Western), in our case, and that of their host countries (FIG. 23)[17] . The issue about archaeological missions is: for a new cultural approach, beyond the crisis.



23. Petra, the Mose's Valley (Wādī Mūsā), the Li Vaux Moises of frank sources: Bedouin village in 1986, now Petra's tourist 'lung'. A. outside / B. inside of the base and car of the Mission (Photo A. Marx).

With an oxymoron, the 'future' experience of our project. Finally, like a new beginning for our mission (and, perhaps, not only for our…).

The recent consolidation of a structural crisis that hit the Mediterranean societies of the Near East, poses also the question of how to perform more efficiently, but also in a cultural context of higher ethics, the role of international archaeological missions. The sector of the archaeological Heritage, in particular, is today at the center of an unprecedented attack that, however, dramatically demonstrates the powerful contemporary role of archaeological science. Said Benedetto Croce: if authentic, the history of any period, is always contemporary[18], and the same can be applied to archeology, as demonstrated by the martyrdom ('Witness', a term which here recovers its ancient dignity) of our colleague Khaled al-Asaad in Palmira for a world, not only archaeological, which it must be deeply reconsidered (FIG. 24). Given the current structural crisis, albeit with its Euro-Mediterranean specifics, to get out of it together, we need to propose better cultural models (more ethical-more efficient: between the two aspects, we believe, there is a consistent relationship) than those with which we entered such crisis and which show, however, also in different contexts, not to 'run' the most. In the case of archaeological missions in the Middle East (and not only), whose scientific productivity requires continuity, but in environmental conditions now critically unstable, there is the practical problem of how to redesign our activities in order to act virtuously in a new, difficult, situation, but that might reveal interesting points of view for both parties.

The same renewal of the archaeologies, started some lustrums ago, allows the planning of new programs that, in different ways, however, move the relationship between setting of

17. This is how Stefano Valentini, an orientalist archaeologist co-organizer of an interesting conference held in Florence on archeology in times of crisis, recently expressed himself (Conferenza Programmatica degli Archeologi del Vicino Oriente. Iraq e Siria. 'Il Patrimonio archeologico tra rischi e prospettive', Firenze, Palagio dei Capitani di Parte Guelfa, 16-17 Dicembre 2016); but there is still a long way to go if the activity of the archaeologists still is "focused on the elucidation of a particular time-period and the reinterpretation of that period. The culture around us was not part of our frame of reference." (Galanzeh Hejazeen 2007: 136).

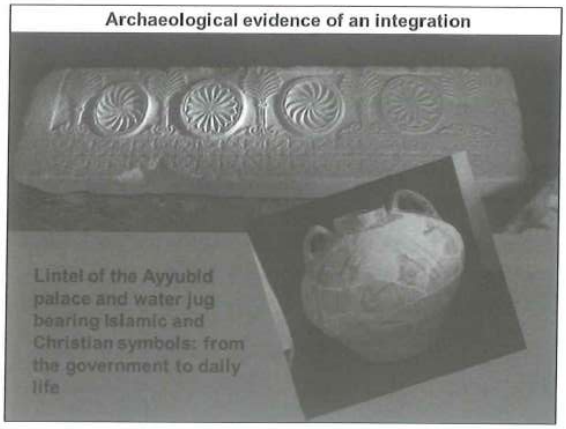
18. "… ogni vera storia è storia contemporanea …" (Croce 1938: 5).

24. European day of righteous, 2016. Rimini, 'Park of the Righteous': a tree for Khaled.

the research (including historicist methodology and 'public' guidelines of the archeology) and exploitation of results. A planning practice that proposes, for the future, to deal with the current Euro-Mediterranean crisis in terms conceptually reformulated; replanning the approach and the assets of the Missions, giving new hierarchies to the goals and setting an external projectuality – attractive (cultural identity) and income (socioeconomic development) – to be shared with the different sections of local realities. The experience of our mission (its settings, developments and prospects) – Florentine and European; Territorial, Light and Public (Vannini, Nucciotti 2012) – constitutes for us an experimental basis for a new 'civil' configuration, also favored by a convergent methodological praxis: among remodeling of archaeological readings, roles reformulation and relationships with local institutional (and non institutional) components, and the establishment of programs centered on the relationship between selection of scientific results and socially shared projects: between communication, Heritage governance, contributions to the identity of the local – and not only – communities (FIG. 25).

It comes to interpreting the current crisis in accordance with a planning that aims to overcome some conditions no longer appropriate to our times and to open perspectives, including scientific issues and 'public' subjectivity, even unexpected. So, if the collaboration will come to be truly shared with local subjectivities, also for renewed goals, also on local scientific needs (especially in the sense of locally felt), we may foresee – in the medium-long term – field research on the ground also with reversed roles, (from Jordan even in Italy, France, Poland, Spain: our partners): initiatives then on impulse also by Jordanian expertise integrated in the mission (also with interuniversity agreements and with the DoA), or alone; as it should be scientifically rational and culturally right. In other terms, the perspective of overcoming for good the classical structure of international archaeological missions, with its cumbersome legacy of a colonial origin.

Finally, what can we do, in the face of the 'politics' of Daesh on archaeological cultural heritage of the Middle East? Meanwhile this: to stay close to our local colleagues who, on this front, are courageously fighting to defend their cultural roots; which are also ours, as euro-



25. Archaeological evidence of an integration. Lintel of the Ayyubid palace and water jug bearing Islamic and Christian symbols: from the government to daily life (Photo A. Marx).

Mediterranean (at least since the time of Hector and Achilles…) and belonging to the humanity itself.

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Rethinking the Early Ottoman Period in Jordan: The Case of Tall Ḥisbān

Summary

This paper discusses the potential of an interdisciplinary approach toward the study of the early Ottoman period with reference to Ḥisbān, today a village subordinate to Mādabā Governorate. Based on features of an ongoing project on the transition period from Mamluk to Ottoman dynastic rule, the paper reflects on the perception of the unique countryside of the rural landscape in which Tall Ḥisbān and its vicinity are set. The aim is not to deliver final results but to turn scholarly attention (of both historians and archaeologists) to the study of the early Ottoman period from a transitional perspective[1].

Research on Jordan and its particular dynamics during the transition period may help us rethink conventional perceptions of the transition period from Mamluk to Ottoman rule (Conermann and Şen 2017: 13 – 32: en, 2018: 23-25). This approach, however, poses several challenges: historical Syria extends beyond the urban centers of Damascus and Aleppo to one of the least studied areas; sources for the seventeenth and eighteenth centuries are sparse; although more sources and studies are available for the sixteenth century, many unanswered questions remain such as, particularly, what the landscape looked like and how we should picture the settlement types in the countryside, as discussed recently (Walker 2017: 361 – 362).

Geography Under Examination: Present-Day Jordan

The region of present-day Jordan – small but topographically highly varied – came under Ottoman rule after the conquest of the previous Mamluk Sultanate's (1250 – 1516) realm in historical Syria along with Egypt. The question of why one should study the Ottoman period in respect to the history of Jordan is easy to answer: This period is the longest among the Muslim empires and, characteristic of Ottoman administration, it has records, *i.e.* a plethora of archival documents of retroactive relevance for study of the Mamluk period. In his prominent monograph on the late Ottoman period in Jordan, Fischbach says: "Any understanding of state, society, and land in Jordan must thus

1. This paper was developed as part of my post-doctoral research project, "Transition Period in Bilād ash-Shām: Textual and Archaeological Research on the History of Early Ottoman Jordan," during my fellowship at the Annemarie Schimmel Kolleg at University of Bonn from October 2015 to September 2016.

begin with the study of the Ottoman presence in Transjordan" (Fischbach 2000: 7). He states this in reference to the importance of land legislation in Jordan after 1851 for present-day Jordan. Even though one may argue that earlier periods may not be as significant, gaps in research remain and need to be covered. The conference also gives us an idea of the work that remains to be done because only a few papers among 200 were presented there made direct reference to the Ottoman period[2] While dynastic periodization helps us to understand and classify political history, it is less helpful in approaching complex issues such as continuity and much less helpful when it comes to a country's social history. By focusing on the transition period, we may examine and better understand the diversity and complexity of the time between the Ottoman conquest and the *Tanẓimat* reforms of the early nineteenth century. Material evidence from the Mamluk age is sometimes not readily distinguishable from that in early Ottoman sources. The late Ottoman period saw major changes throughout Bilād ash-Shām because it marked the beginning of the modern era there. The conquest of Arab lands in the early sixteenth century was of crucial significance for the Ottoman historical consciousness. From this point of view, Jordan generally and Ḥisbān specifically become part of a greater picture that involves the mental rather than geographical landscape within the Ottoman Empire.

A landscape-centered approach may offer a more comprehensive picture of the period than one focusing on a single site by asking questions relating to the use of landscape and change or continuity in rural activities as McQuitty proposes (McQuitty 2001: 544). For example, she lists fifteen excavated rural settlements in Transjordan: Irbid, Pella, ʻAjlūn, Jarash, ʻAmmān, Ḥisbān, Mādabā, Dhībān, Khirbat Fāris, al-Karak, Khirbat adh-Dharīḥ, Gharandal, Petra and ʻAqabā (2005:329, Fig.1). The Madaba Plain Project, surveying the hinterland within 5-kilometer radii of Tall al-ʻUmayrī, Tall Jalūl, and Tall Ḥisbān since 1984, covers no Ottoman survey. The Middle Eastern Geodatabase for Antiquities (MEGA), a promising tool for future research on rural sites, identifies several archaeological sites as early Ottoman (indicated as "9057 Ottoman, early"); Ḥisbān, however, is not included (http://megajordan.org). The distribution of Mamluk sites and their outnumbering of Ottoman sites can be seen in two maps (Walker 2011: 222 – 223). Considering that the countryside was the space that accommodated most of the population of present-day Jordan in the sixteenth century – 50,940 souls (Hütteroth and Abdalfattah (1977:43) – the study of rural life and activities is all the more crucial. In one of the few studies on the rural landscape of Jordan, Hind Abu al-Shaʻar (2010) notes the abundance of Ottoman written sources on Jordan and presents the development of a single village (aṣ-Ṣarīḥ) and its land ownership and debt on the basis of copious statistics based on the Ottoman cadastral survey registers of the sixteenth century. Ḥubrāṣ and Saḥam, Jordanian villages in the vicinity of Irbid in the north, were occupied between the Mamluk era and the early Ottoman period. The 2006 field season yielded a significant amount of archaeological evidence on village life at these rural sites during those times (Walker *et al.* 2007). In brief, the characteristics of life in the Transjordanian countryside were surely more complex – in terms of settlement structure (settlers and nomadic tribes), landscape (topographically and climatically), and rural sites (villages, hamlets, and others) – than we assume today.

The Significance of Tall Ḥisbān and its Vicinity

Tall Ḥisbān is a multi-period populated site nine kilometers north of Mādabā, 25km south of Amman and part of Ḥisbān village. It has been the subject of archeological studies since 1968, when the Heshbon expedition began as

2. For the program and abstracts, see the conference book, http://ichaj.org/ichaj_book.pdf

a biblical archaeology project. The expedition, started by Andrews University, developed into one of the three excavation sites of the Madaba Plains Project (including the Tall al-'Umayrī excavation in 1984 and that of Tall Jallūl in 1992) is still one of the major excavation projects in Jordan. After a long period of excavations focusing on the ancient and classical ages, the university extended the area designated for periodical research, starting with the 1996 season, to later periods of Muslim rule as the best preserved and longest (almost 700 years) political era (LaBianca 2011: 18-19). Islamic archaeology has been the major component of all post-1998 seasons, which feature the participation of Bethany J. Walker. Thus, the first two rounds of fieldwork were carried out initially on the basis of this agenda, using the food system approach as a central idea introduced in 1990 by LaBianca (1990, 1996, 2000). It was during these two seasons that the round work at the site took place (FIG. 1).

Although the Tall Ḥisbān is unique due to its non-urban context, few studies consider this aspect. Yet Tall Ḥisbān is a rural site that promises to be a rich source for understanding rural life during the transition period. Two characteristics shape its contextual uniqueness. First, its location on a highland plateau, the Mādabā Plains, lends it a distinctive agricultural landscape with several natural springs, fertile soil, and sufficient rainfall (Walker/ LaBianca 2003: 444-445). Second, its location on a centuries-old caravan route made it strategically important. Thus, Ḥisbān was ruled in the First Iron Age by the kingdoms of Ammon, Moab, and Edom and later by the Kingdom of Nabatea. Thus it was almost permanently populated through the centuries, possibly impacting daily life and material culture. The investigation of material cultures such as ceramic assemblages, farmsteads, subterranean channel systems and caves, some of which have only been partly studied, combined with future results from archaeobotanical and zoological analysis, is a hitherto untried combination of approaches. The site has a complex

1. Tall Ḥisbān seen from the western slope (Photo by author 2016).

water usage system with several cisterns, caves, and rock-cut architecture. Its water sources are the Jordan River, Wādī Majār, and Wādī Ḥisbān (Walker 2003:259); the nearest primary source of water is known as ʻAyn Ḥisbān (Abujaber/ Cobbing 2005, 134, fig. 122).

The impact of political rule is visible in the material culture of Ḥisbān, as in its pottery (LaBianca 1994: 205 – 206). Thus, the village served for centuries as a regional market center (Walker 2003: 241 – 248) and a rural administrative center for Balqā' district during the Mamluk Sultanate (Walker 2003). The Mamluk period was initially presented in the preliminary report for the 1998 and 2001 seasons (Walker / LaBianca 2003). Ḥisbān was politically and economically of interest to the Mamluks in the fourteenth century – an interest that faded in the fifteenth century amid larger changes and economical, social, and environmental decline throughout the Bilād ash-Shām (Walker 2003: 248; Ghawanmeh 1985 and 1992). The results of the earlier excavations had interpreted a sudden abandonment of the site in the late Mamluk period, when it was battered by the Black Death, other natural disasters, and Timurid attacks (Walker and LaBianca 2003: 468), whereas recent excavations have indicated continues occupation, albeit with sparse settlement (LaBianca 2011: 18; Walker 2014: 164). Topographically, Ḥisbān and its vicinity comprise four different areas that provide diversity in ecological structure and human livelihoods (LaBianca 1990: 28).

When it comes to the early Ottoman period, however – obviously the most difficult phase in the history of the *tall* and its vicinity – it seems hard to say anything conclusive due to several obstacles. Archaeological findings still fall short of those of previous periods and, insofar as they exist, their dating to this period is difficult. Below they are discussed in detail. The era at issue should be, however, considered a transition period, in which the entire sixteenth century is fused with the late Mamluk and early Ottoman periods. This may shed more light on the history of Ḥisbān.

Current research conducted as part of the Phase III project (beginning with the 2013 season) of the Ḥisbān excavation focuses on the lower portions of the *tall,* where rural life, among other things, may be studied (Walker 2014: 166). The project is being carried out under the name of the Ḥisbān Cultural Heritage Project. Current research at the site combines methods of ethnoarchaeology and environmental studies.

The Ottoman Period at Tall Ḥisbān and its Vicinity

The study of Ottoman Ḥisbān masks in its simplicity a complex combination of topographical features, settlement patterns, ways of life, and people veering between nomadic and sedentary ways of life. Ḥisbān at this time projects the appearance of "low-density power" while the site in the Mamluk era generally presents high-density settlement (LaBianca 2007a: 5).

Although the Ottoman period was not a main focus of the first excavations at the site, it was possible at least to document the related materials and architectural ruins (Walker/LaBianca 2005), so that a typology and chronology of Ottoman pottery could be developed and the writing of a cultural or provincial history of the Ottoman period could begin gradually (LaBianca 2011: 18 – 19). For the Ottoman period, the last stage of the Islamic age for Ḥisbān and also the longest, we encounter two different stages of state power: the early Ottoman period (16^{th} – 18^{th} century) after the conquest of the former Mamluk lands in 1516 – 1517, and the late Ottoman period, after the *Tanẓimat* reforms (1839 – 1876). Still, the sixteenth century also deserves attention of its own as a transitional period. Below I briefly present the latter period in Ḥisbān before I move to the main research question of this paper, which concerns the early Ottoman period.

Late Ottoman Ḥisbān

We have abundant information about the late Ottoman period, especially about tribal settlement, a powerful local family, and a cemetery: First, the area was settled by two tribes, *ʻAjarma* and *ʻUdwan*, whereas the *Bani Mahdi* of the al-Balqā' and the *Bani Sakhir* of the *Salṭ Nāḥiyat* (subdistrict) were the most prominent tribal groups in the region (Walker 2003: 255 – 256). Second, the *Nabulsi* family was present in Ḥisbān, as evidenced in the Nabulsi farmhouse (*qaṣr*) on the west slope of the *tall*. The *qaṣr* complex dates to sometime before 1890, in a rare example of early modern architecture in Jordan (Walker/LaBianca 2003; Carroll/Fenner/LaBianca 2007), and is an example of how local families such as the Nabulsis were able to attain and legitimize their control over this area (Carroll/Fenner/LaBianca 2007: 140). Recently, a plan to use the Nabulsi *qaṣr* as an off-site visitors' center has been formulated; however, neither a survey nor an excavation has been conducted in Phase III to date. Therefore, this imposing architecture and the family records still have unfulfilled potential for answering many research questions relating to the late Ottoman period. Third, a cemetery was discovered during the 1998 season in the excavation of a storeroom in the Mamluk citadel. The cemetery was dated to the late Ottoman period and the burial practices were identified as belonging to the *ʻUdwan* tribe. It is plain that villagers reused the remains of this storeroom for burials in the nineteenth century which (Walker 2001). Additionally, the excavated farmhouses within the site yielded several findings, such as storage jars and tobacco pipes dated to their last stratum, that of the late Ottoman period (Walker 2009: 58; 2014: 175 – 177) Furthermore, nineteenth-century travelers provide detailed accounts, authentic photographs, and illustrations of Ḥisbān and its vicinity in the late Ottoman period (Abujaber/Cobbing 2005). The vast literature of travelogues from that century provides invaluable information on Tall Ḥisbān and the vicinity. Most opuses in this genre are quite well-known and constitute one of the primary narratives for any area of research on Jordan in the nineteenth and early twentieth centuries. The description provided by Selah Merrill, American Consul to Jerusalem, draws a panorama of Ḥisbān: "The view from the ruins of Ḥisbān over the wide Balqā' plain is very fine. The fields are rich, the groups of tents are numerous, and in the distance are the great encampments of the *Bani Sakhir*. The mountains of Nebo, the ruins of Mādabā, Mā'īn, Zīzyā', al-'Āl, and other places, are in sight, and the size of the flocks and herds of sheep, goats, cattle, and camels is surprising" (Merrill 1881, 241). Merrill, like many others, depicts Ḥisbān as a lively place. These travel accounts are primarily used to glean knowledge of settlement pattern and urban developments but not of life in the countryside. The Ottoman provincial year books (*vilāyet salnāmesi*), first introduced for the Syrian province in 1869, are also valuable sources that should still be extensively scrutinized for the information they might provide about earlier centuries.

Early Ottoman Ḥisbān

On the early Ottoman period, in contrast, we have less information. Among the many unanswered questions that exist, we may start by asking how Ḥisbān and its region were designated in earlier Ottoman sources. Another perspective may be derived from the Ottoman cosmographical-geographical literature. The sixteenth-century traveler *Āşıḳ Meḥmed* (1555, Trabzon – 1598, Damascus) reports about Ḥisbān as part of the depiction of Amman in his *Menāẓır ül-ʻavālim* (Views of the worlds), a work that relied heavily on previous Mamluk geographers. Remarking on Ḥisbān, he says: "[…] There are great monuments, the vicinity of Amman possesses agricultural fields, and the soil is pure and nice. It is mentioned in *Kitāb al-aṭvāl wa al-ʻurūz* that the Prophet Lot, peace be upon him, made Amman prosperous. It is

mentioned in the *Lubāb*: Amman is a city of Balqa, which is one of the provinces of Sharak. […]. The capital of Balqa is Ḫusbān. [The correct spelling of the name is as Āşıḳ Meḥmed notes: 'Ḫusbān'.] Ḫusbān is a very small town that has valleys, mills, trees, and orchards. The distance between Balqa and Jericho is a march; Jericho is west of Balqa and the Dead Sea lies south of Jericho. [...]" (*Menāẓır ül-'avālim* fol. 220b, translation by the author). Relying on the previous sources, the Ottoman traveler transmits (since we do not know for sure whether he visited the region) important information about Ḥisbān: the presence of orchards there. This indicates that the location was populated and that its inhabitants planted orchards.

The administrative division of the Transjordan region changed several times after the Ottoman conquest of Greater Syria in 1516. The Balqa region, including Ḥisbān was not ruled directly by the Ottoman state; it was left in tribal hands. The *Bani Sakhir*, *'Ajarma*, and *Udwan* tribes came from the Arabian Peninsula to Jordanian territory directly after the fall of the Mamluk Sultanate (Peake 1958: 86). According to Peake, intertribal wars and raids (the Majali, Adwan, and Bani Sakhr tribes are mentioned) were the "basis of almost everything that happened in Jordan." This means, especially, that agricultural activities could not be carried out (Peake 1958: 86). The Ottoman register for the district 'Ajlūn for 1005/1596 mentions only the *Bani Mahdi* tribe, which paid taxes on its livestock (Walker 2003: 255 – 256, referring to Bakhit and Hmoud).

Within the system of Ottoman provincial administration, Ḥisbān was subordinated to 'Ajlūn. In 1596, 'Ajlūn comprised eight *nāḥiye* (sub-districts) with a combined population of over 34,000 (Bostan 1988, 327). The Law Code of Ajlun (*Ḳānunnāme-i livā-i 'Aclūn*), dating to 955 H/1548 AD and preserved in the Cadastral Survey Register [*Tapū taḥrīr defteri*, TTD], nr. 226 [525]), comprises thirteen articles. (The numbers in parentheses correspond to numbers in the code.] The applied taxes were *ḳasm*, a tax collected in goods and not in cash (1); *dimos*, a lump-sum tax (2); *ḳasm* (3); *resm-i ḳışlaḳ* (8), a tax on winter grassland; and *resm-i camus* (10), a tax on water buffaloes. The taxed plants and livestock were olives (2); Old olive trees (*kāfirī zeytūn aġacı*) (4); wine stocks (*baġ çubuġu*) (5); the young olive trees (*eşcar-ı zeytūn ki İslāmī ola*), walnut trees (*koz aġacı*), and date palms (*hurma aġacı*) (6); goats, sheep, kids, and lambs (7); goats and sheep (8); beehives (9), and water buffaloes (10) (Sen 2018: 39-40).

Considered altogether, the thirteen articles relate to different type of taxes, taxed plants and livestock, and their fiscal value. The last-mentioned features indicate that here, as in other law codes, the value of taxed plants and livestock remained stable. The articles of the code shed light on the features of the arable land, its agricultural produce, and how the agricultural taxes were applied. Article 10 amends a previous Mamluk regulation: "Before, in the Arab Land the tax on water buffalo was collected as twelve aspers and was not collected in some places. This is submitted to the Imperial New Office, the rank of the high throne. [Since] the whole Arab Province is equal, 3 *para* [coin] is fixed for each milked buffalo" (*Ve sābıḳan diyār-ı 'Arabda resm-i camus on ikişer akçe alınub ve ba'żı yerlerde hiç alınmaz imiş. Ḥāliyā defter-i cedīd-i ḫāḳānī pāye-i serīr-i a'lāya 'arż olunduḳda cemī'i vilāyet-i 'Arab müsāvī olub her sağılur camusa üçer para ta'yīn olundi*) (TTD, nr. 266 (525): 1 – 3 in Akgündüz 1994: 42 – 43). Article 11 abolishes four pre-conquest taxes: *ādet-i devre*, *himāye, mübāşiriyye* and *resm-i hasād* (TTD, nr. 266 (525): 1 – 3 in Akgündüz 1994: 42 – 43).

In the New Detailed Tax Register (*Defter-i mufassāl cedīd*) from the year 1005/1596 – 7, Ḥisbān is listed under the Ṣalt *nāḥiye* (subdistrict) of the 'Ajlūn *liwā* (district), along with seven other districts ('Ajlūn, Banī 'Ilwān, Kūra, Ghawr, al-Karak, Jibāl al-Karak, and ash-Shawbak). The holder of revenue was the sultan

(*pādişāh*), As a fiscal unit, Ḥisbān was a village (*ḳaryā*) indicated as an empty or ruined village (*ḫālī* – a word that may also denote an "unsown" area, as opposite to a sown area, which indicates that life there was semi-nomadic – probably in temporary tents or caves). Total tax revenue is given as 2,600 asper (Hütteroth and Abdulfattah 1977: 169).

To study the early Ottoman period in Ḥisbān, pottery and landscape are two components that may provide illumination. While pottery as an object of investigation for the early Ottoman period attracts much attention for Bilād ash-Shām (Milwright 2000; 2009) and for Jordan generally (Walker 2009; McQuitty 2001), it has been recovered in the recent excavations at Tall Ḥisbān, as Walker announced in her report for the 2013 season (Walker 2014). One should take a look at the ceramic assemblages of HMGP ("Handmade Geometrically-Painted" Ware, a coarse tableware) and its rich potential to explain the transitional period from Mamluk to Ottoman rule in Transjordan, as emphasized by Walker (2017: 347 – 352). Here, there is a need for deeper and more systematic investigations of this main characteristic material of daily life in rural countryside households of Transjordan. McQuitty notes that the presentation of ceramics in publications includes dates but not contexts, sometimes making it impossible to recognize assemblages for what they are (McQuitty 2005: 328).

As for landscape, we can say the following: The site was only gradually abandoned over time in the late Mamluk period; seasonal occupation continued and perennial settlement cannot be excluded (Walker 2009: 58; LaBianca 2011: 18; Walker 2014: 186). This settlement pattern was identified especially on the downslopes in farmhouses that had common facilities and were plainly reused and rebuilt in the Ottoman period (Walker 2014: 186; 2017:360) concurrent with extensive re-use of additional buildings and caves (LaBianca 2011: 19). To clarify the early Ottoman context of the site, further excavations are needed.

An important component of this landscape is the cave system at the site and caves on its slopes, since they played a significant role in the inhabitants' daily lives. Article 8 of the aforementioned 'Ajlun Code of Law mentions caves in the region: "And, in some places there are caves and stockyards where goat and sheep are wintered. As a tax on winter quarters [for livestock] for each hundred sheep one sheep or its value is to be collected" (*Ve ba'ẓı yerlerde maġāreler ve aġıllar olur ki, keçi ve ḳoyun ḳışladurlar, resm-i ḳışlāḳ deyü her yüz koyuna bir koyun veya bahāsı alına*) (TTD, nr. 266[525]: 1 – 3 in Akgündüz 1994: 42 – 43). During the 2016 field season (May 16 – June 10), I conducted a survey of the Tall Ḥisbān hinterland to investigate the multifunctional use of caves as a type of rural site and the perception of a rural landscape. The cave survey was done in conjunction with the 2016 Annemarie Schimmel Kolleg-Mamluk Archaeology Field School and 2016 Hisban Cultural Heritage Project. This survey and its results will be presented in a separate article. Subsequent cave surveys will reveal the connection between the *tall* and the surrounding area.

Conclusion

This paper addressed itself to a historically and archaeologically difficult time span – the early Ottoman period, with its transitional character from Mamluk to Ottoman rule – via a case study on Tall Ḥisbān in central Jordan. At this point, there is much we still do not know about this specific period and the particular countryside. More research on narrative sources needs to be undertaken, as well as ensuing seasons' excavations and surveys (such as the aforementioned cave survey), to answer our questions relating to the period under study. Some views on these matters may already be addressed. In terms of the material culture, however, there are still countless unstudied assemblages of ceramic, glass, metal, or lithic artifacts in differ-

ent archaeological units. All have the potential to offer valuable results. Especially, a systematic investigation of HMGP wares in various respects such as distribution and concentration has promise in shedding light on this component of the material culture.

It is necessary to amalgamate all available data and results from different disciplines. The publications of the Heshbon Expedition – pioneering contributions to the history of Ḥisbān – contain many scattered data on the period. Data scattered across published and unpublished field reports needs to be systematically investigated. The study of historical narratives needs to adopt a different analytic perspective, one that scrutinizes the rural administration and landscape; even sparse sources might tell us more.

Where written sources and archaeological evidence are not sufficient, an investigation of the landscape may fill the gaps. Therefore, an extended landscape survey in Ḥisbān and its vicinity on the basis of the earlier work of Andrew University is crucial. Such a survey, however, should not consider landscape as nothing but a topographical surface. A multidimensional perception of the landscape may yield valuable information.

Furthermore, digitalization is a growing and promising field. In addition to the JADIS (Jordan Antiquities Database and Information System), two initiatives – the MEGA Jordan project, a digital atlas specific to Jordan's archaeological sites (http://www.megajordan.org/), and the Digital Archaeological Atlas of the Holy Land (DAAHL) (https://daahl.ucsd.edu/DAAHL/Home.php) – may support the subject under study, although data on the early Ottoman period remain scanty.

To sum up, as a site populated across numerous and lengthy periods, Tall Ḥisbān has vast potential for the uncovering of multiple facets of a rural site. Focusing on the early Ottoman period opens a window onto a hitherto underexposed historical layer in which state power is not prominently displayed even if palpably present. These findings may also abet a more nuanced understanding of more prominent remains of previous political regimes. In short, the transition period from Mamluk to Ottoman rule offers a new perspective on rural life in Jordan.

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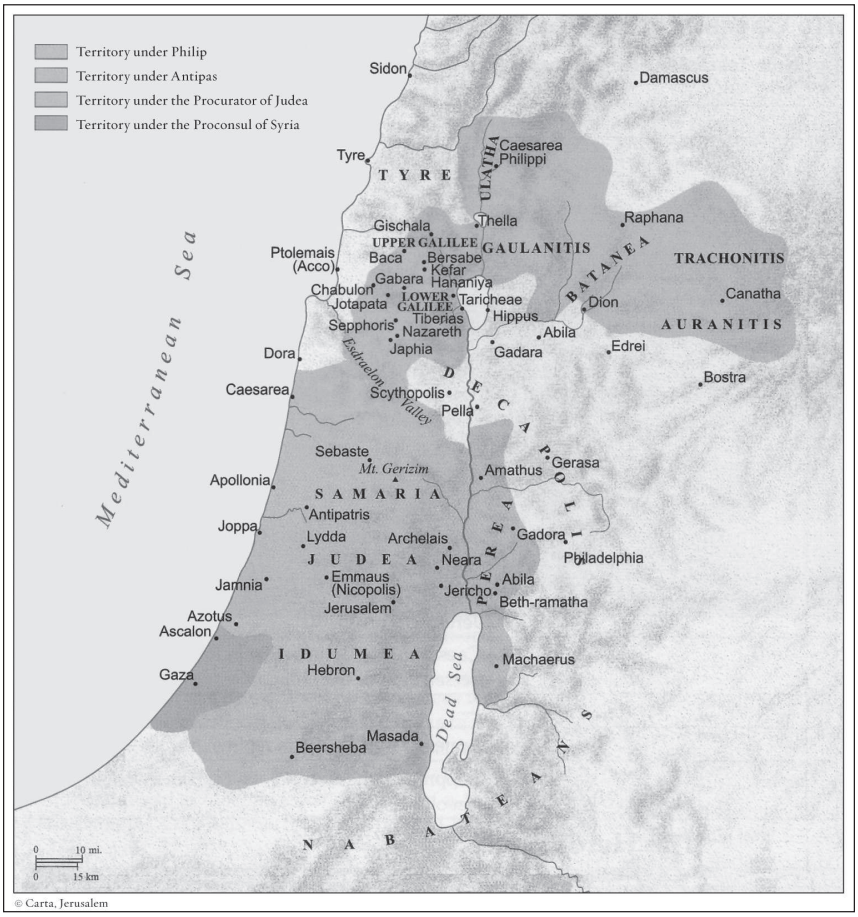
The History of the Archaeological Missions to Machaerus

Introdution

The Gospel according to John informs us that the baptism of Jesus *"happened at Bethany, on the far side of the Jordan, where John was baptising"* (John 1:28). The historical place in the Transjordan Wādī al-Kharrār is commemorated by five Byzantine churches, and called today as the "Baptism Site" that became with the wise decision of UNESCO one of the World Heritage Sites in 2015. It is not simply the historical place of the baptism of Christ, but the birthplace of Christianity as well: Jesus had collected his first five disciples on this sacred place (John 1: 35-51), the Apostles Andrew, Simon (Peter), Philip, Nathanael and an unnamed disciple. The dramatic re-discovery of the historical place after the 1994 Jordan-Israeli Peace Treaty led to the unexpected tsunami of new pilgrims, headed by the three consecutive popes of Rome: John Paul II (2000), Benedict XVI (2009) and Francis (2014). The historical place of the Baptism Site has been excavated by the Jordanian Department of Antiquities since 1996. Serious quantity of Early Roman material came to light, but their publications still not have seen the light of the day during the past 20 years. Meanwhile, there is another archaeological site connected to John the Baptist in the Kingdom of Jordan, one of the historical scenes of the Gospels: the Herodian royal castle and city of Machaerus, overlooking the Dead Sea (FIG. 1), where Salome danced and the Baptist was beheaded. The first two excavation final-report academic-monographs were published by the Edizioni Terra Santa in Milan, as Nos. 53 and 55 volumes in the Collectio Maior series of the Studium Biblicum Franciscanum in Jerusalem (Vörös 2013 and 2015).

Josephus, the official Roman historian of the first century Imperial Flavian Dynasty gave a detailed report on *"John that was called the Baptist: for Herod slew him […] he was sent a prisoner, out of Herod's suspicious temper, to Machaerus, the castle I before mentioned, and was there put to death"* (*Antiquitates Judaicae* XVIII 5,2). The historical fact of the imprisonment of John the Baptist is attested by all the Gospels, and their accounts are consistent with and complement that of Josephus. The fortified Biblical citadel and city of Machaerus in the Trans Dead Sea area were destroyed by the Legion X Fretensis of the Flavian Emperor Vespa-



1. The map of the Holy Land in the world of the Gospels, after the division of Herod's Kingdom. The Byzantine ruins at Bethany-beyond-the-Jordan can be found on the east bank of the Holy River, between Jericho and Beth-ramatha.

sian in 71 AD, and later turned into oblivion. In the meantime, the *Church History* of Eusebius in *ca.* 324 confirmed Machaerus, as the authentic and historical scene of the imprisonment and beheading of the Baptist (*Ecclesiastical History* I. 11. 4-6). However, the forgotten historical place, one of the most important scenes of the Gospels, was rediscovered only in 1968, and is being excavated under the direction of the present author of the Hungarian Academy of Arts since 2009, in an excellent collaboration with the Jordanian Department of Antiquities. The archaeological site is 1100 meters above the Dead Sea, meanwhile the Government of HM King Abdullah II Ibn al-Hussein erected a magnificent motorway in 2011-2013 to provide a direct access for the Dead Sea pilgrims to the hilltop royal castle ruins of Machaerus.

HRH Prince El-Hassan bin Talal, Founder and Chairman of the Royal Scientific Society of Jordan, wrote about the historical place of Machaerus with the following words: "*The evocative Citadel of Mukawir, or Machaerus to the ancient world, is a site that is redolent with the narrative and wonder of history and faith. It is one of those very special places that seem to exist beyond time and in its own space. It sits in a deeply imbued landscape that brings to life the resting chronicle of belief, devotion and struggle. This abandoned hilltop site with its faded but once-magnificent fortified royal palace, occupies a strategic point overlooking the Dead Sea in the modern Hashemite Kingdom of Jordan. […] This story of death for faith and for love of an ideal makes Mukawir so much more than a fascinating archaeological site. It sits in the landscape of religious memory as a testament and place of pilgrimage, not only for Muslims, but for Christians too. In our country, our beloved Prophet Yehya is Saint John*

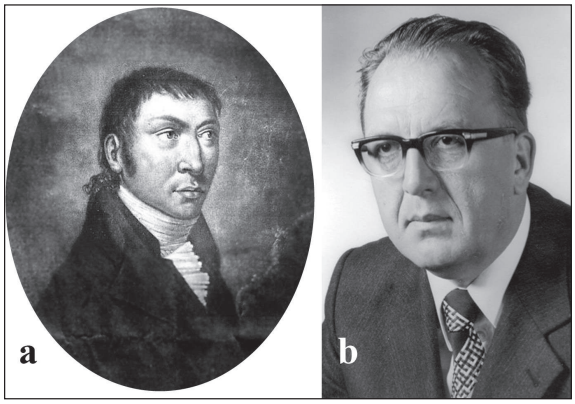
the Baptist by another name. He is the valiant predecessor of Jesus Christ and, indeed, he is rightly considered to be the Patron Saint of Jordan." (Vörös 2015: 13)

In the following study, the archaeologist-architect author will give an overview, how the archaeological researches developed during the last half a century, for the better understanding of the historical landscape and its architectural and archaeological legacies. Cardinal Gianfranco Ravasi, President of the Pontifical Council of Culture, and of the Pontifical Academies in the Vatican, wrote the following observation on Machaerus: *"those like me, who had the privilege to climb up to the Machaerus citadel to admire the magnificent and breathtaking panorama, will properly understand that King Herod the Great built a magical eagle's nest for the destiny, to become a guardian of the last hours of the last prophet, John the Baptist, who had been put to silence by a sword."* (Ravasi 2013). As in Machaerus there are no antiquities older than 90 BC, and nothing later than 71 AD, we can rightly consider the precious historical place as an ancient archaeological time capsule, the only surviving one from the scenes of the Gospels. The dramatic events in 29 AD on the Golgotha of Saint John the Baptist that are encapsulated among the remaining walls of Machaerus, will be celebrated through its bimillennia in 2029.

The German Identification and Surveys of Machaerus, and the Discovery of its Roman Circumvallation Monuments (1807, 1965-1973)

It was on 17 January 1807, after 1735 "lost years" since the 71 AD Roman siege and final destruction of Machaerus, when the German Rediscoverer of the ancient Biblical cities of Gadara and Geraza, Ulrich Jasper Seetzen (FIG. 2a) arrived to the little Muslim hamlet of Mukawir near the Dead Sea, and the name reminded him for the ancient Greek word of "Machairos" (meaning "sword", *i.e.* Lat. Machaerus, It. Macheronte). At the border of the little village he discovered an isolated hilltop, overlooking the Dead Sea, which geographical place and geomorphological formations properly fitted the ancient descriptions of Strabo, Pliny the Elder and especially Josephus, concerning the Hasmonean-Herodian royal castle of Machaerus. The limited surface ruins and the visible geographical evidences met the first century literary references. A hypothesis was born (Seetzen 1810 and 1854).

Meanwhile, the 1807 discovery had been made only with a retrospective view. The contemporary academic world was not completely satisfied, and they considered the linguistically based etymological-identification only a hypothetical one. They were right: there were several hilltops with ancient ruins in the area of modern Mukawir village, and without archaeological excavations of the mountain-top that has been visited by Seetzen, it was still a simple academic guess: a theory. Was Machaerus discovered in 1807? Yes, it was, however, it was not proved yet by archaeological evidences. There were



2. a. Ulrich Jasper Seetzen (1767-1811), German explorer, alumnus medical doctor of the University of Göttingen, who discovered and identified the ancient ruins of the Machaerus citadel on 17 January, 1807.
b. August Strobel (1930-2006), Professor of the New Testament in the Augustana Divinity School of the Lutheran Evangelical Church in Neuendettelsau (1964-1984), and Director of the German Protestant Institute for Archaeology in Jerusalem and Amman (1984-1992). He discovered the Early Roman circumvallation wall at Machaerus in October 1965, and directed its architectural, archaeological and geographical surveys in 1973.

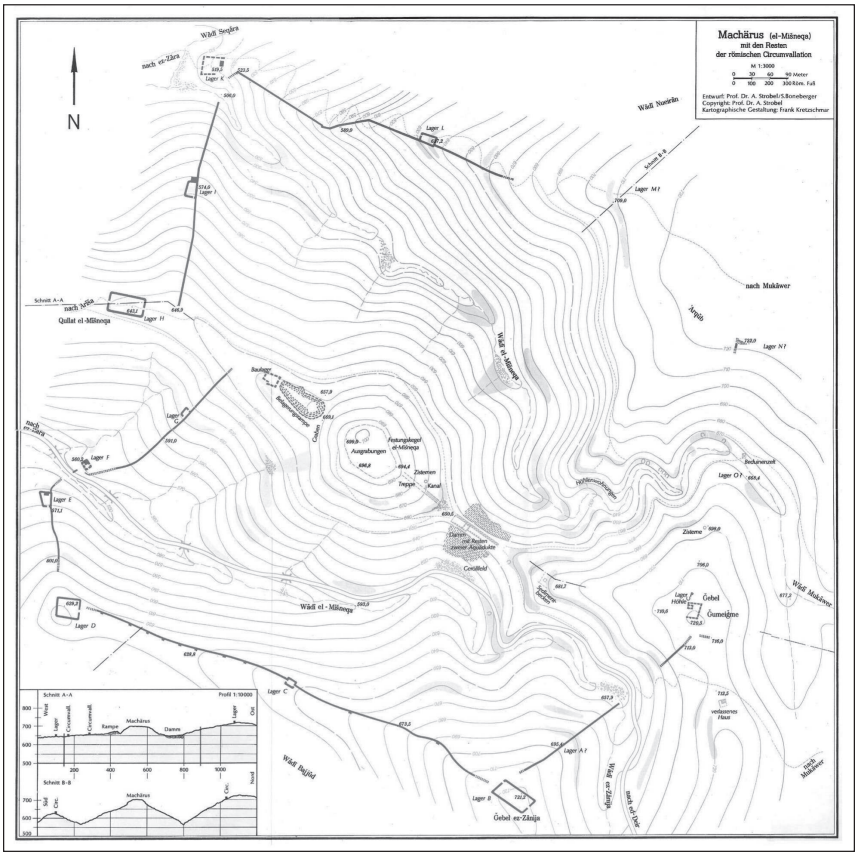
still scholars, who identified ancient Machaerus with other places in the area of southern Perea.

The *opus delicti* to identify the conical hill near Mukawir village with its hilltop ruins as the ancient citadel of Machaerus, has been discovered only 158 years later, and by another German scholar, a compatriot of Seetzen, called August Strobel (FIG. 2b). He visited the abandoned hilltop ruins near Mukawir village in October 1965, and published his academic observations in 1968 (Strobel 1968). Strobel discovered an Early Roman 3.5 kms long circumvallation wall, a very similar one than that around Masada, in fact its parallel twin-monument-structure, and arrived to the brilliant scientific conclusion that in Antiquity, the Herodian walls of ancient Machaerus had to stand in the epicenter of this long Early Roman siege wall with 16 military camps! The unfinished agger-ramp gave further evidence to identify these unexcavated ancient ruins with those described by Josephus: the 71 AD siege of Machaerus by the same Legion X Fretensis, which captured Masada in the next years. As during the Early Roman period the only military siege in the Transjordanian area was executed at Machaerus, the circumvallation wall was undoubtedly the *opus delicti* to identify the ancient site.

The scientific discovery was really extraordinary. Meanwhile, as it happened already several times in the history of scientific research and especially in the history of archaeology, there was a parallel discovery of this circumvallation wall during the same years (1965-1968), by the American-Baptist scholar, Anson Rainey, however, he published his results three years later, only in 1971. Rainey correctly acknowledged the discovery and the three years scientific publication-primacy of Strobel: "*The surface remains were noted in the vicinity of Machaerus by the present writer and several colleagues while on visits to the site during Easter 1965 and 1966, and Greek Orthodox Christmas, 1967. The similarity of these remains to the Roman siege camps and circumvallation wall at Masada led the writer to review the relevant passages of Josephus' description of the fall of Machaerus, as well as the previous literature on the site in the history of Transjordanian exploration. Credit is given to A. Strobel, who made a similar survey in October 1965, the results of which were published in 1968, though they became known to the present writer only in January 1971.*" (Erets Yisrael 1971, p. xix).

Furthermore, Strobel did not stop with his Machaerus research in 1968. Five years later he led the best Machaerus survey project ever executed on the ruins of this 3.5 kms long circumvallation wall (FIG. 3). He examined in details the 16 Roman military siege campuses as well, and published his detailed scientific results and academic evaluation in German and in English (Strobel 1974). In the meantime, we need to emphasize that Strobel has never received permit from the Jordanian authorities for the excavations at Machaerus, thus he only made professional surface-surveys. He was the great discoverer of the Roman circumvallation wall of Machaerus, and published it with high academic standards for the first time. Through his excellent scientific evidences over the comparison of the matching architectural and archaeological analogies and similarities of Machaerus with the twin circumvallation siege-monuments of Masada, he discovered the *opus delicti* confirmation for the identification of ancient Machaerus.

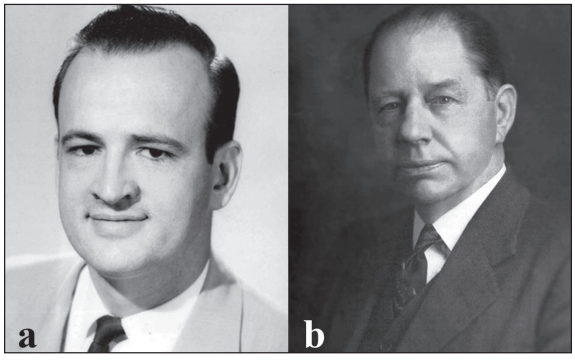
Who identified and rediscovered Machaerus for the first time after 71 AD? The German Ulrich Jasper Seetzen, on 17 January 1807, and he published his hypothesis three years later in Gotha (near Erfurt), on his map of Palestine (Seetzen 1810). And who was able to prove with an archaeological *opus delicti* for the first time after 71 AD that the hilltop ruins at the Dead Sea village of Mukawir (called in Arabic nowadays by the local villagers as Qal'at al-Mashnaqah) are unquestionably identical with the Biblical citadel of ancient Machaerus, and the 1807 hypothesis of Seetzen was right? The



3. The March 1973 Machaerus survey of August Strobel, documented the complete Early Roman circumvallation wall of the Legio X Fretensis, with its 16 siege campuses and the agger-ramp. In the center, on the top of the hill, a German word signals the 1968 American-Baptist archaeological mission: "Ausgrabungen" – Excavations.

German August Strobel, in October 1965, and he published his discovery three years later in Berlin (Strobel 1968).

Nevertheless, the unpublished American-Baptist survey drawing of Rainey, executed on the ruins of this above mentioned Roman siege wall, in an unpublished manuscript form, already in 1967, reached on the other side of the Globe the hands of the American multibillionaire press magnate, Cully A. Cobb (FIG. 4b), a 32nd degree freemason and a high profile Baptist (Vörös 2015: 124-133). He gave a handsome fortune to a Baptist Minister, called E. Jerry Vardaman (FIG. 4a), and sent him to Jordan in January 1968, with the mission to get the research concession and the excavation permit from the Jordanian authorities for the untouched and virgin archaeological hilltop site of Machaerus, overlooking the Dead Sea. Cobb had no doubts that in the center of this circumvallation wall, next to its surviving unfinished agger-ramp, they would discover the sacred

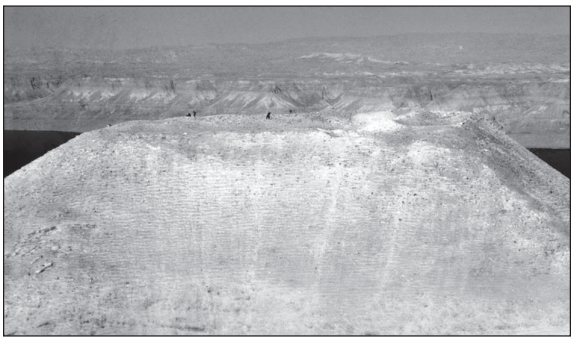


4. a. E. Jerry Vardaman (1927-2000), Professor of Archaeology and Religion at the Southern Baptist Theological and at the Hong Kong Baptist Seminaries, an ordained Baptist minister, founding director of the Cobb Institute of Archaeology at Mississippi State University. He was the first director of the Machaerus excavations, in 1968, who unearthed and discovered the ancient Herodian ruins and objects of the Biblical citadel.
b. Cully Alton Cobb (1884–1975), the Initiator and benefactor Patron of the 1968 Machaerus excavations and surveys, and Founder of the Cobb Institute of Archaeology at Mississippi State University. He was a multibillionaire press magnate, a high profile Baptist religious-society figure, and a 32nd degree freemason as well.

ruins of the fortified Herodian royal palace of Antipas, where Princess Salome danced. The Jordanians were still not aware of the extraordinary, but unpublished discovery of the 71 AD circumvallation monuments, so they gave the excavation permit for an abandoned hilltop site overlooking the Dead Sea, only "believed to be" ancient Machaerus, with very limited visible ruins on it. However, five months later, when the American-Baptists started their excavations, the royal Herodian wall-ruins with colorful wall-paintings, luxurious glass- and tableware, mosaics and imported marbles from its once magnificently decorated palace-floors came to the Dead Sea sunshine, after 1897 years...

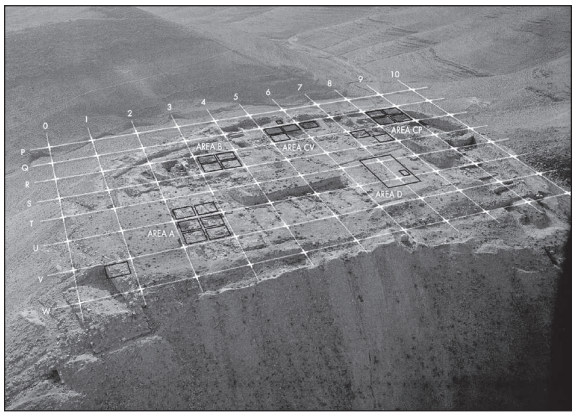
The American-Baptist Archaeological Excavations of the Machaerus Citadel in 1968

The archaeological excavations and surveys, conducted by the American E. Jerry Vardaman, in June 1968, lasted only for three weeks, but under the supervision of 14 highly professional archaeologists and a lot of local workmen (FIGS. 5-7). In the meantime, they transported all their 4,973 archaeological objects from Machaerus, with the permission of the Jordanian Government, to the United States. These Machaeriaca archaeological objects were treasured in 13 large-size unopened boxes in the basement of the Cobb Institute of Archaeology at Mississippi State University, until the present author started to study them in the company of their original and extremely professional excavation archives in 2013. The American scholars have never published a word on their very



5. The untouched, virgin archaeological hilltop site of Machaerus in 1968, just before the American-Baptist excavations began on 5 June. The average thickness of the accumulated debris above the *ca.* 5000m^2 Herodian floor levels of the Biblical citadel was *ca.* two meters. The total number of archaeological finds (including the small pottery sherds and the over 300 kilograms Herodian capitals) was around 50 000 fragments during the last close to 50 years. It is an enormous size scientific Lego-puzzle archaeological-work that resulted executed-restoration-accomplishments in different dimensions: from a small five-centimeter complete Herodian lamp, up to a colossus-size close to five-meter-high complete Herodian column as well.

6. As it is well visible on the above photograph, the American-Baptist excavations used a professional quadrat-balk excavation system, and executed first-class vertical and horizontal stratigraphical drawings as well. View from the east, the Dead Sea is visible on the left.



7. As it can be seen on this 2014 reconstruction drawing, superimposed on a 1981 aerial photograph, the 1968 American-Baptist archaeological excavations opened "windows" (archaeological trenches) into every parts of the Herodian royal palace of Machaerus.

successful Machaerus excavations that seems today, to hear it for the first time, as a mystery. What could have happened? Why could not they have been able to continue their extraordinary discoveries?

By the end of June 1968, only after the intercontinental transportation of the close-to-five-thousand Machaeriaca objects, the Jordanian authorities considered that the archaeological concession, granted to the American-Baptists, is consisting a tremendously important historical place, sacred to both: Christianity and Islam. However, in the previous year the Kingdom of Jordan lost its West Bank, including the holy cities of Jerusalem and Jericho, and the war was far not completed yet (the Arab-Israeli War has only finished in 1973). Excavating the ruins of a Herodian royal palace that had been described in antiquity as *"Machaerus was next to Jerusalem, the most strongly fortified place in Judea"* (Pliny the Elder, *Historia Naturalis,* V. 15, 16), became a real political issue. The Israeli politicians were full with patriotic feelings, and with the works of Josephus in their hands. To understand the political atmosphere of these years, we would like to give only one archaeological example. Yigael Yadin, the excavation director of Masada (during 1963-64) and the future Deputy Prime Minister of Israel (1977-1981), had special interest on the skeletons of the 73 AD "victims" of Masada. The rabbinical establishment of Israel concluded that they were remains of the Jewish defenders, and in July 1969 they were reburied as national heroes in a state ceremony. Although the Baptists planned to continue their excavations exactly during this period on Machaerus, from 12 June to 8 August 1969, the Jordanian authorities declared the Dead Sea historical site as a military danger-zone, and the excavations were stopped.

After the Arab-Israeli October 1973 War, the situation in Jordan had changed, business started to operate as usual, and the Jordanian Minister of Tourism and Antiquities in Amman, Ghaleb Z. Barakat made an official excavation-offer to Cully A. Cobb with his 20 January 1974 letter, that the American-Baptists may continue their archaeological work. However, in the prepared three-page-long contract there were two paragraphs as pre-conditions for the excavations of the Americans: *"a minimum of one million (1,000,000) American dollars, for five (5) years"* have to be invested, and *"within 40 days from the signature of this agreement, and in a Jordanian local bank, a sum of equal of ten percent (10%) of the sum defined in article (3) that is a sum of one hundred thousand (100,000) American dollars to be deposited as guarantee for the fulfillment by the 2nd party of his obligation according to this agreement"* (Vörös 2015: 253-255). As Cully A. Cobb was already in his death bed, he did not sign this unprecedentedly baffling offer in the history of the archaeology of Jordan.

The Italian-Franciscan Legacy of the Machaerus Excavations and Surveys, During 1978-1981 and 1992-1993

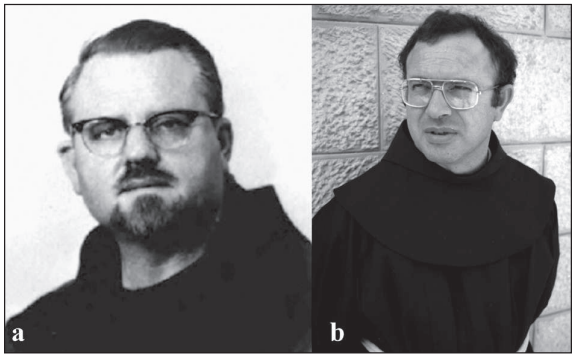
After the Americans did not accept the conditions of the contract provided to them by the Jordanian Minister of Tourism and Antiquities, the Hashemite authorities were waiting four more years. As it was the regulation of their Department of Antiquities at that time, excavators had 10 years to publish their scientific results. The Jordanians counted the 10 years from 26 June, 1968 promptly, as the Americans have not continued their excavations in Machaerus. Today, this copyright-period became only five years. Accordingly, if the excavators would run out from this timeframe, they will lose their copyrights, and all their scientific achievements will be published by the Jordanian Department of Antiquities or by its appointed academic. However, there was a serious concern with the ten-year-old cold case of the Machaerus concession for the Jordanian authorities, as the Baptists transported in 1968 the complete corpus of the Machaerus archaeological mate-

rial they excavated to the USA, with the official permission of the Jordanian Government (sic!), and they became owners of these Machaerus objects.

Consequently, the newly authorized 1978 excavator of Machaerus lost a lot of archaeological information, and had the academic risk that the Americans will not publish their serious quantity of excavated archaeological materials and information, or they will only do it after the new excavation is already published, thus having an academic position to say the last word, and correct their followers with treasurable archaeological information that was inaccessible for them. The final academic result was quite sad: the Americans never published anything, and their followers were balked in their academic plans to publish final reports on the Machaerus excavations. They all had to die before the first final-report volume of the Machaerus excavations could have appeared (Vörös 2013). The present author, as the current Machaerus excavator, received publication rights and academic appointments from both, the Americans (Mississippi State University, Honorary Senior Research Fellow) and the Italian-Franciscans (Studium Biblicum Franciscanum, Research Professor), for all of their unpublished archaeological materials.

The second and the third Machaerus excavations were led (during 1978-1981 and 1992-1993) by two well-known professors of the Studium Biblicum Franciscanum in Jerusalem: Fathers Virgilio Canio Corbo, and six months after his death, by his former student, Michele Piccirillo (FIG. 8). Although the scientific results of their excavations could not have been included in evaluative academic final reports (as they were waiting in vain for the publications of the 1968 American-Baptist mission), however they had published several remarkable preliminary articles (Corbo 1978, 1979, 1980 and Corbo-Loffreda 1981). Nevertheless, a summarizing monograph and an article were published on the 1978-1981 ceramic and the 1978-1980 numismatic inventories, by the Franciscan members of the Corbo-team, Stanislao Loffreda (Loffreda 1996) and Michele Piccirillo (Piccirillo 1980), respectively. From the architectural point of view, Father Corbo concentrated primarily on the excavations of the citadel, and his final result was a sketched layout: the first ground plan on the interior of the fortified Herodian hilltop palace.

The Corbo-headed Italian archaeological mission was also the first to prove *in publications* that the castle of Machaerus was unquestionably one of the mosaic-decorated fortified royal palaces of King Herod the Great in ancient Judea. They were also the first to confirm in preliminary reports the accounts of Josephus, regarding the Hasmonean and First Jewish Revolt presence at the citadel, by means of architectural, ceramological and numismatic evidences. (FIGS. 9-12).



8. a. Virgilio Canio Corbo OFM (1918-1991), Professor of Archaeology at the Studium Biblicum Franciscanum in Jerusalem, and director of several important excavations in the Holy Land, including the Holy Sepulcher in the Old City, and the place of the Ascension on the Mount of Olives, both in Jerusalem; he was the excavation director of Magdala, Capernaum, Mount Nebo and Herodium as well. From 1928 he lived in the Holy Land, died and was buried in Capernaum. He was the director of the Machaerus excavations from 1978 to 1981.
b. Michele Piccirillo OFM (1944-2008), Museum Director and Professor of Biblical Geography and History at the Studium Biblicum Franciscanum in Jerusalem. Director of several important excavations in Jordan, including Mount Nebo, Mādabā and Umm ar-Raṣāṣ. From 1960 he lived in Jerusalem and is buried on Mount Nebo. He supervised the Machaerus excavations and restorations during 1992-1993.

9. A helicopter shot on Machaerus from 1979: the Italian-Franciscan mission have not continued the professional quadrat-balk excavation system of the Americans, but gradually uncovered the walls, mostly on the level of the Herodian floor levels, discovered by their Baptist predecessors.

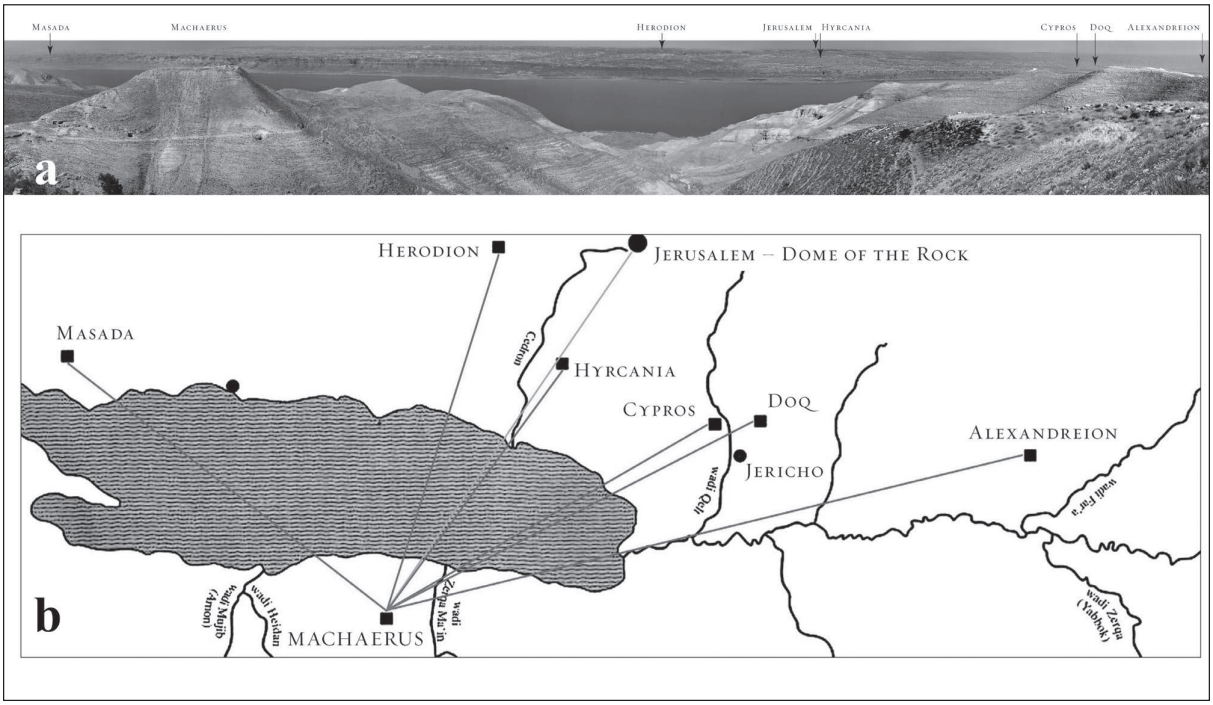
10. A moment of the 1979 excavation season: uncovering the ancient ruins of the Herodian royal bathhouse. On the left of the photograph Father Michele Piccirillo is supervising the work.

11. The physical status of the archaeological site of Machaerus in 1981, after the completion of the First Italian-Franciscan Excavations (directed by Virgilio Corbo OFM), view from the east.

12. Aerial photograph of the Machaerus citadel in 1993, after the two seasons of the Second Italian-Franciscan Excavations (supervised by Michele Piccirillo OFM), view from the north. The two previously unexcavated central parts (to the south-east and to the north-west from the Doric peristyle courtyard) were revealed, the Herodian cistern was completely emptied from its ancient detritus, and was covered with a concrete roof.

New Discoveries and the Latest Excavation Results of the Archaeological Field Work, Conducted by the Hungarian Academy of Arts, Since 2009

Eight years ago the Hungarian Academy of Arts is excavating Machaerus, the Herodian royal castle of Antipas, overlooking the Dead Sea in the Kingdom of Jordan, where Princess Salome danced and Saint John the Baptist was beheaded. The archaeological site is today a pilgrim destination for Christianity and Islam, and also an important historical place for Judaism: one of the memorable scenes of the Gospels. The royal courtyard of Machaerus gives one of the best archaeological parallels for the Herodian Lithostrotos-Gabbatha in the Jerusalem Praetorium, where, according to the Gospel



13. a-b. Panoramic photograph and map of the Herodian Fortresses of Judea, from south to north: Masada, Machaerus, Herodion, Hyrcania, Jerusalem, Cypros, Doq and Alexandreion. The photograph was taken from the hill, rising to the east from Machaerus, that is proving the direct optical connection between the West Bank Herodian fortresses and the Trans-Dead-Sea Machaerus. With the help of this illustration-pair, the words of Pliny the Elder are becoming very clear: *"Machaerus was next to Jerusalem, the most strongly fortified place in Judea"* (Pliny, *Historia Naturalis* V. 15, 16).

of John (John 19:13), Pontius Pilate made his historical judgment of a death-sentence on Jesus from Nazareth.

Josephus described in details the citadel of Machaerus and its lower city (*Bellum Judaicum* VII, 6), – the rediscovery of the previous was the achievement of the German Explorer Ulrich Jasper Seetzen (1807), and the latter of the French Dominican Father Felix-Marie Abel (1909). We should not forget though that Christian pilgrimages to the Holy Land had only been initiated by the time of the Roman Emperor Constantine the Great, and by that time, Machaerus was already a deserted place two-and-a-half centuries ago. It became a destination for the pilgrims only after its archaeological excavations in the 20th century. The memory of its geographical location had been completely lost for 1735 years.

Following the unexpected death of Father Piccirillo in 2008, the Hungarian team resumed the excavations exactly where the Studium Biblicum Franciscanum, led by two generations of Franciscan-Italian academics, had left off in 1993. As it was already mentioned above, the current author received full access to all the archaeological material and scientific archive legacies of his American and Italian Machaerus-field-director predecessors, and the Studium Biblicum Franciscanum even offered the possibility to publish the long-awaited Machaerus final-report excavations-series among its distinguished, Jerusalem Collectio Maior academic monographs.

Our excavation tools and survey facilities already included 21st century archaeological equipment and technologies. The Research Team of the Hungarian Academy of Arts, following detailed archaeological surveys and excavations, prepared the first theoretical architectural reconstructions of both, the Lower City (πόλις) and the Herodian Royal Fortified Palace (βασίλειον) of Machaerus.

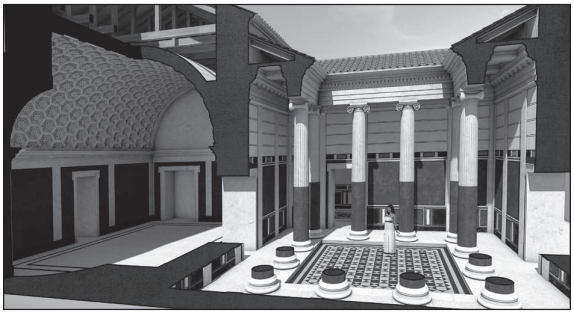
Reconstructing the Architectural Legacy of the Machaerus Herodian Royal Palace

One of the greatest results of our ongoing excavations are the discovery of the previously unexpected vertical dimension of the citadel's dead monument. For example, we unearthed the interior of the western bastion to find that its walls, previously believed to be less than 1.5 meter high, included intact walls that were 8.75 meters in height. In another case, we discovered and fully excavated the 15.5-meter-deep Hasmonean cistern of the citadel, and it can be proven that it was used even during the Herodian period. (FIG. 14) Very rich archaeological material came to light at this location as well. In total, we opened more than 50 research trenches so far, for the better understanding of the groups of monuments in Machaerus' citadel and its lower city.

Regarding our architectural surveys, one of the most important fruits of our scientific investigations, until today, were the determinations of the three historical periods of Machaerus city, as well as the detailed analysis of the architectural space development of the buildings –individually, and in the context of building-complexes– and the preparation of their theoretical reconstructions. The complete architectural descriptions of the ancient monuments (with graphic and photographic documentation) were extended as well to all those building elements that were no longer *in situ* on the archaeological site. Following the architectural surveys, we prepared three-dimensional digital monument-models, so as to provide a foundation for the later theoretical architectural reconstructions. The computer visualizations of the anastyloses reconstruction of the Doric and Ionic columns for restoration, before their technical implementations, and the illustrations on the theoretical architectural reconstructions of the fortified Herodian royal palace, may give to the Reader a taste on the nature of our modest work (FIGS. 15-17). Beside detailed building-diagnostic and archaeological-stratigraphical field- and wall-examinations of the monuments, our research method followed the so-called comparative archaeological and architectural inspections. The Machaerus castle

14. The author finishes the archaeological excavations of the 15.5-meter-deep Hasmonean cistern of Machaerus citadel. The full water-harvesting-capacity of the artificial cistern was *ca.* 110.000 liters.

15. The accomplished Ionic column-anastylosis in the context of the tentative architectural visualization: the colors are based on the archaeological evidences. The artistic vision of the Machaerus bathhouse in cutaway architectural reconstruction-model, as viewed from the north-east.



16. This 3D architectural model is not simply incorporated the surviving colors of the royal Herodian courtyard, but the Lithostrotos-pavement-stones are also authentic reconstructions of the original ones.

17. The two re-erected complete Herodian columns of Machaerus with the Dead Sea and Masada in the background. These two restored columns are the largest surviving archaeological "objects" of the Gospel scenes in the Holy Land, and the very first Herodian columns ever re-erected with complete anastyloses on an archaeological site.

had been a member of a military fortress-network aimed at the defense of Jerusalem from the east during the first centuries BC and AD. After Jerusalem itself, these fortresses (Masada, Herodion, Hyrcania, Cypros, Doq and Alexandreion) represent the closest Late Hellenistic (Hasmonean), Herodian and Early Roman architectural parallels and archaeological analogies in ancient Judea. Therefore, our research team spent extensive periods on the West Bank to conduct comprehensive archaeological and architectural examinations of these important fortifications, and studied all the other known Hasmonean and Herodian archaeological sites, so as to be able to understand the ancient monuments of Machaerus better. Subsequently, in the light of their built legacy and archaeological material-heritage, we were able to create the authentic, theoretical-architectural reconstructions of Machaerus (see FIG. 13 a-b).

The royal courtyard of this precious Gospel scene with its apsidal throne-niche in the symmetry-axis was unambiguously the most important architectural space of our Herodian castle on the east bank of the Dead Sea. The tragic birthday-party of the freshly remarried Herod Antipas was celebrated with Princess Herodias in this courtyard. Many people were invited, even from Galilee, from the northern half of his tetrarchy: *"An opportunity came on Herod's birthday when he gave a banquet for the nobles of his court, for his army officers and for the leading figures in Galilee."* (Mark 6, 21).

It is not simply the largest architectural place in the fortified palace of Machaerus, erected on the summit of the hilltop: but the only space, where the Tetrarch was able to receive the large gathering of these official guests. The royal courtyard of Machaerus had to be the very place, where, according to Josephus, Antipas made his historical judgment of a death-sentence on John the Baptist. Machaerus was the Golgotha of the Baptist, as Jesus himself put his future death in parallel with that of John the Baptist with the following statement: *"they did not recognise him but treated him as they pleased: and the Son of man will suffer similarly at their hands. The disciples understood that he was speaking of John the Baptist."* (Matthew 17, 12–13).

The archaeological remains of the Jerusalem Praetorium, where Jesus condemned to death by Pontius Pilate are probably lost. However, we have here, on Machaerus, one of the closest architectural and archaeological parallels of its courtyard, in the former palace of King Herod. On the *Gabbatha* "elevation" of the Machaerus palace even the *in situ* Herodian *Lithostrotos* "stone pavement" survived in parts in the royal courtyard. After detailed architectural and archaeological studies on the field, conducted by the Research Team of the Hungarian Academy of Arts, we were able to reconstruct the original Doric architectural space that was designed by the classical Early Roman canon with the Alexandrian-Greek module of 34.5 cms.

The architects of King Herod the Great established his Machaerus fortified palace in *ca.* 30 BC on the ruins of the Hasmonean fortress of the Jerusalem high-priest-king Alexander Jannaeus. The heart and the center of the hill-top castle became the royal courtyard. Its alignment was accomplished on the mountain-top summit-peak, by using the Pythagorean triangular set ratio of the 3:4:5 triple, for the good-angle alignment scale of the architectural space. With the same so-called *pygme*-unit, that is the Greek-forearm module (34.5 cm or 13.6 in, called Pygmaioi, from *pygmê*, the length of the forearm, much smaller than a cubit: it is only the length from the elbow to the wrist-joint of the knuckles) they designed not only the courtyard, but also the colonnade of the Doric tertastyle-porticus (1 column-base radius = 1 module). The intercolumniation on the short side was two (Systyle), on the long side three (Diastyle) column-diameters, respectively. The contemporary Vitruvius, the chief architect of Emperor Augustus in Rome warned that when columns are placed three column-diameters apart or more, stone architraves break (Vitruvius, *De architectura* III 3.4). As no architrave-stones survived on the Machaerus, most probably the Herodian builders used Lebanese cedars instead of stones.

The surviving Doric column drums were deriving from similar columns, and not only from one column. In the Doric peristyle courtyard there were originally 24 similar columns (plus the 4 heart-shape-form ones at the corners), of which 11 column-prints survived on the stylobate. Furthermore, the Herodian royal bath-house was Ionic in style, while the courtyard was Doric. It was confirmed not only by the *in situ* column-bases, but by the archaeological artifacts as well, that came to light during the excavations of the two different places in the royal castle. Inside the Apodyterium hall of the Herodian Bathhouse there could have been originally (most probably) 12 similar Ionic columns on the Crepidoma (with much smaller diameters than the Doric drums). In the meantime, from the surviving architectural elements we were able *"to Lego"* together only one-one Ionic and Doric complete columns. We re-erected in 2014 these Herodian columns on the two identical, very places, where the First Franciscan Archaeological Mission found the only two *in situ* column-bases of the castle, in 1979 and 1980 (led by the late Father Virgilio Corbo), respectively (FIG. 17).

Our complete column-re-erections are fulfilling the legal requirements of the monument-anastylosis in international conventions of monument-presentations, as we used *(i)* exclusively the original architectural elements, *(ii)* re-erected on the original places, *(iii)* as they originally appeared. Their heights fit the classical Early Roman architectural canons: the Doric column is 11 modules: 380 cm; the Ionic column 19 modules: 475 cm. We had serious difficulties during the puzzling in-space with the individual drums, because of the two column-entases. The Doric entasis is conical-shape form in the column-shaft; however the Ionic entasis is cigar-shape form (like a pregnant column). The Doric column even fit the classical 11-module-standard of the Greek pygme-unit of the courtyard perfectly: the building-module was the same horizontally and vertically in the

principal royal Herodian architectural space of the palace. Both re-erected columns were originally decorated with plaster, thus giving the finish-coat appearance as they would be white marble monoliths, like in Alexandria or Rome!

Machaerus, this very important scene of the Gospels, was always a site of imaginations for Bible, Gospel, religious- or history-book illustrators. In 2014, when the opera fans celebrated the 150th anniversary of the birth of Richard Strauss, we could also propose the historical scenery-decor presentation, instead of the imaginative stages of his "*Salome*" in the opera houses of the world, based on the text of Gustave Flaubert and Oscar Wilde, who described Machaerus in their artistic imaginations. (FIG. 15) As a result of our archaeological excavations and architectural Lego-puzzle works, the historical place and its architectural spaces were revealed by elucidating the blurred scene of this Gospel site. Among the walls of this royal castle four figures of the Gospels were living: King Herod the Great, his son Tetrarch Herod Antipas with his second wife Princess Herodias, and their daughter Princess Salome, from the previous marriage of her mother. Today, we cannot simply visit the archaeological place, but virtually we can also see the space of the Calvary of Saint John the Baptist.

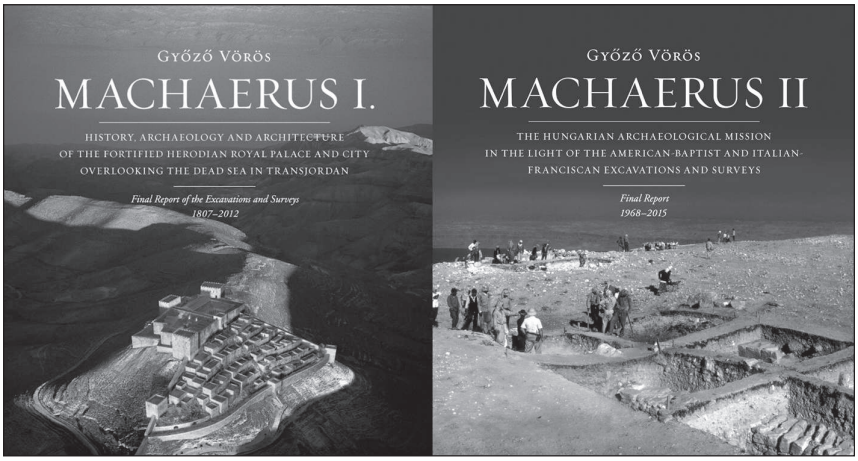
Epilogue

The archaeological mission of the Hungarian Academy of Arts is currently working on the excavations of the Lower City of Machaerus, erected in *ca.* 30 BC, where (according to Josephus) the political house arrest of Saint John the Baptist, in the company of his disciples (according to the Gospels of Mark, Matthew and Luke), historically had to happen. Among our great discoveries we uncovered the largest mikveh (a ritual plastered pool-bath with 12 steps), ever found in Jordan, inside the fourth (and "lost") fortification tower of the Herodian citadel (FIG. 18).

As it was mentioned at the beginning of this study, the present author published the first two scientific excavation-final-report academic-monographs on the history, archaeology and architecture of Machaerus as the 53rd and 55th volumes in the Collectio Maior series of the Jerusalem Pontifical Faculty of Biblical Sciences and Archaeology (known formerly as Studium Biblicum Franciscanum), and published by Edizioni Terra Santa and titled: MACHAERUS I and II (Milan, 2013 and 2015) (FIGS. 19-20).

Since the beginning of the Machaerus excavations, started by the Americans, but before the launch of the current ongoing excavations in 2009, the following seven years were dedicated to the excavations of Machaerus: 1968, 1978-1981, 1992-1993. Consequently, 2016 was the 15th excavation year of this precious Gospel scene. The scientific results and the information that came to light through these archaeological investigations on the Machaerus citadel, have been accumulated, complemented

18. The beautifully preserved royal mikveh in the previously unknown north-eastern fortification tower of the fortified Herodian royal palace of Machaerus.



19. a, b: The covers of the first two volumes of the Machaerus excavation final-report series.

20. Their Royal Highnesses of the Royal Scientific Society of Jordan, Prince El-Hassan bin Talal (Founder and Chairman), and his daughter Princess Sumaya bint El-Hassan (President) are receiving from the author *MACHAERUS II* in the Amman Royal Palace of the Kingdom of Jordan.

each other, and the academic generations are standing on the shoulders of each other, like the circus artists.

The intention of the present author unbrokenly remained the same since 2009: to elucidate this lost, blurred, but rediscovered historical scene of the Gospels, and present it as authentic as possible for the future generations. The Reader through these pages could have been convinced that since the spring of 1968, when Machaerus was still a virgin, untouched archaeological site (FIG. 5), the development of the excavation field work can be tracked consistently, the uncovered sacred monuments in the archaeological site are genuine and reliable, and all deriving from the archaeological time capsule from *ca.* 90 BC to 71 AD.

Machaerus Timeline

Late Hellenistic (Hasmonean) Period

ca. 90 BC

Machaerus fortress was founded by King Alexander Jannaeus as one of the royal treasure-houses of the Hasmonean rulers until 57 BC.

57 BC

Its demolition by the Roman general and Syrian provincial governor Aulus Gabinius. King Aristobolus II tried to seek protection for his one thousand soldiers, consequently he reinforced the walls of Machaerus, but the Romans seized and destroyed the Hasmonean fortress two days later, for the second time.

Herodian Period

ca. 30 BC

King Herod the Great erected a city on the Machaerus hill, surrounded it by walls and towers, and provided large cisterns to it. On the top of the hill, within its citadel, by replacing the ruins of the Hasmonean fortress, he built a magnificent royal palace for himself that could be reached through a road leading up within the city. As a result, "Machaerus was next to Jerusalem, the most strongly fortified place in Judea" (Pliny the Elder, Historia Naturalis, V. 15, 16). Following the death of King Herod in 4 BC.

4 BC

His son Herod Antipas inherited this fortified city together with the territories in Perea and Galilee, and according to Josephus he imprisoned and executed John the Baptist among

its walls. Mark and Matthew gave detailed descriptions on the circumstances of the imprisonment and the execution. During the confinement of the Baptist, there was a message-exchange through his disciples between himself and Jesus from Nazareth. According to Luke we can date the event *ca.* 29 AD.

36 AD

The Nabataean King Aretas IV Philopatris, the earlier father-in-law of Tetrarch Herod Antipas, defeated the troops of his former son-in-law, and destroyed the Herodian Machaerus.

Early Roman Period

44 AD

After the death of King Herod Agrippa I in 44 AD, when the ruined Machaerus together with Perea, became under the control of the Roman Prefectus Judaeae in Jerusalem, and a garrison was formed for the Roman army on the ruins of the original Machaerus citadel.

66 AD

The citadel was taken over by the citizens of its lower city, and later reinforced by the Zealot rebels. After the destruction of Jerusalem, the Romans for the third time, conquered the Machaerus in 71 AD.

71 AD

For the order of Emperor Vespasian and his son commander in-chief Titus, by the Legion Xth Fretensis, under the commandership of Lucilius Bassus, the Roman Legatus of Judea Province, and the fortress of Machaerus was destroyed and vanished into the oblivion of human history.

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Reassessment of the Building Phasing and Entrance Halls of the Umayyad Palace of Qaṣṭal al-Balqā'

Abstract[2]

This paper presents some hypotheses and a series of relevant, conclusions resulting from the research conducted by the author on the Umayyad complex of Qaṣṭal al-Balqā' (Jordan), reached after the re-assessment of existing evidences *in situ* and the review of the hypotheses produced by P. Carlier and F. Morin in 1983-5. Due to the limitation of space, we will deal only with the analysis of the *qaṣr* during the Umayyad period, presenting the research and related evidences that prove the existence of at least two construction phases during this period, which can be traced in the building techniques used and in its plan. An alternative hypothesis regarding the original vaulting system of the entrance vestibule, and for the reconstruction of the audience hall in its upper floor, is presented as well. The paper ends with a preliminary discussion about the general phasing of the complex with a *longue durée* approach.

The *Qaṣr* Plan and its Phasing

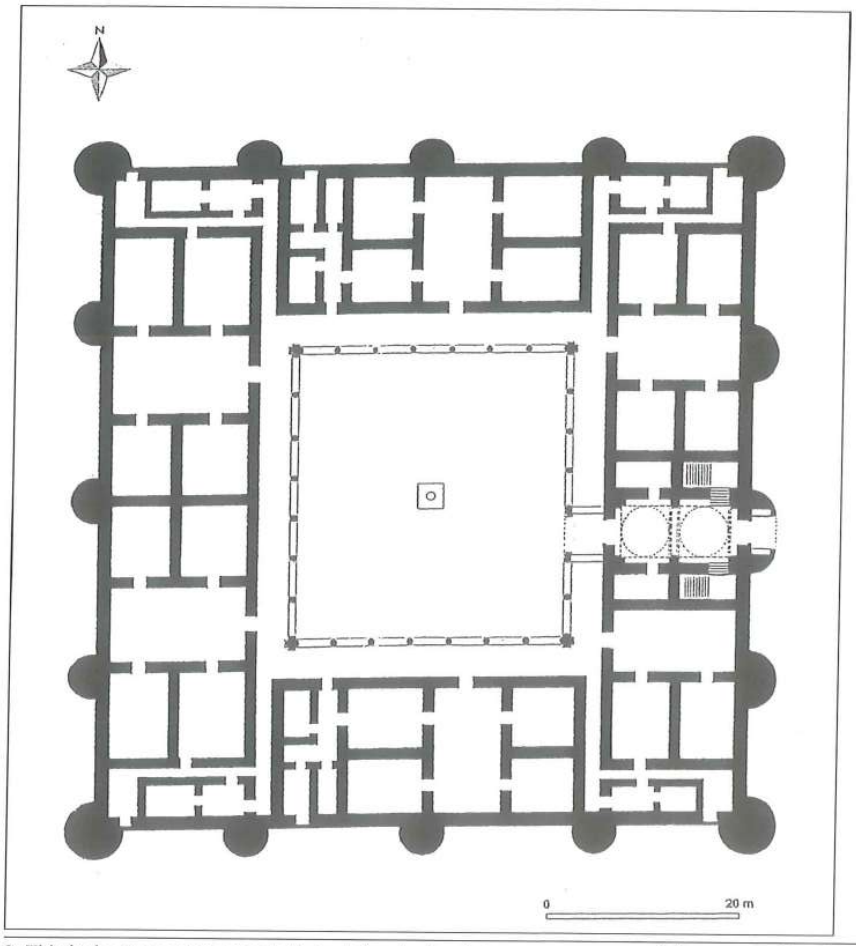
Despite its current dilapidated condition, the *qaṣr* of Qaṣṭal al-Balqā' still presents at first appearance the archetypical plan of a standard Umayyad *qaṣr:* externally it has round towers in the corners and alongside its perimeter wall (three on each side), plus a split one flanking the main entrance; internally, rooms are arranged around a central court with a perimeter portico, using as basic compositional unit the so-called 'Syrian *bayt'* (pl. *buyūt*), which consists in a main oblong room flanked by two lateral chambers in each side, which are accessed through the main one. These *buyūt* and the other rooms are set against the perimeter wall and around the central courtyard grouped in four units. The eastern and western ones run from wall to wall, while the southern and northern ones only occupy the central area, in correspondence with the central courtyard, not touching the east and west units, but leaving

1. This research has been conducted as part of the project entitled "Documentación y analisis de ténicas constructivas y tipologia arquitectónica en la transición de la tardo-antigüedad al periodo omeya" funded by the Dirección General de Bienes culturales, Archivos y Bibliotecas del Ministerio de Cultura (*programa de ayudas competitivas para proyectos arqueológicos en el exterior*).
2. *A preliminary version of the results of this research was presented at the Islamic Archaeology Session of the 10th International Conference on the Archaeology of the Ancient Near East* (10ICAANE) which took place at Vienna in April 2016. According to the DoA regulations, and for the sake of an easier accessibility to the colleagues working in Jordan, I present in this venue the updated results within the framework of the publications scheme of the Jordanian Department of Antiquities.

spaces in between them. These spaces define four "dead-end corridors" which run north-south in correspondence with the east and west bays of the courtyard porticoes (in a sort of "H" layout -see FIG. 2), and which give access to the service rooms in the corners[3]. The north and south units were composed by a single Syrian *bayt* and some service rooms added to their western ends, while the east and west units, which run from wall to wall, were composed by two Syrian *buyūt* with service rooms in both ends[4]. The entrance to the *qaṣr* is done through the entrance vestibule block, placed in the east unit, which most probably hosted an audience hall in the upper floor, which we will analyze in detail in the second section of this paper.

The Irregularities in Plan

However, the apparent symmetry and regularity in plan of the building gained *prima facie*, is belied by the position of the vestibule entrance block which is not in axe with the building nor with its courtyard, and by the different arrangement of the rooms to both sides of this entrance block: To the north of it, a complete 'Syrian *bayt*' was built, while the one built to the south of the entrance block is not complete, as it only has the two rooms from its south side, being missing the symmetrical ones from the north side (FIG. 1)[5]. As a result of this, the access to the court from the entrance block is displaced and not in axe with it, losing the assumed regularity and symmetry of the plan.



1. Qaṣṭal al-Balqā'. Reconstructed plan as built (Modified from Carlier and Morin 1984: Fig.69).

3. This is the same arrangement of circulation in plan that we can find at Khirbat al-Mafjar (Arce 2016 in press), and the urban palace from Aanjar.

4. The exact arrangement of the northwest corner is partly conjectural, although most probably correct, as it was inspected, *al-Bayt* not fully excavated, by the French team before its demolition (Carlier and Morin 1987: Fig. 9).

5. A small group of service rooms were built at both ends of this east block of rooms, which included latrines and probably a postern gate.

Thus, the eastern portico of the court had four arches to the north of the arch corresponding to the gateway (which was supported by double cọlumns), while it had only two arches to the south of it. We will try to understand the reasons behind this lack of symmetry in an otherwise very regular plan, which is noteworthy precisely because no apparent reason can be pointed out at first sight to explain it. In general, Umayyad *quṣūr* are quite regular, with an almost symmetrical lay-out. Actually, any irregularity in plan usually finds explanation on pre-existences (like the case of Qaṣr al-Ḥīr al-Gharbī due to the incorporation into the *qaṣr* of the pre-existing monastic tower), or due to a compulsory orientation of the *qiblah* (like at Khirbat al-Mafjar), or any other good reason which in this case is not evident at first sight.

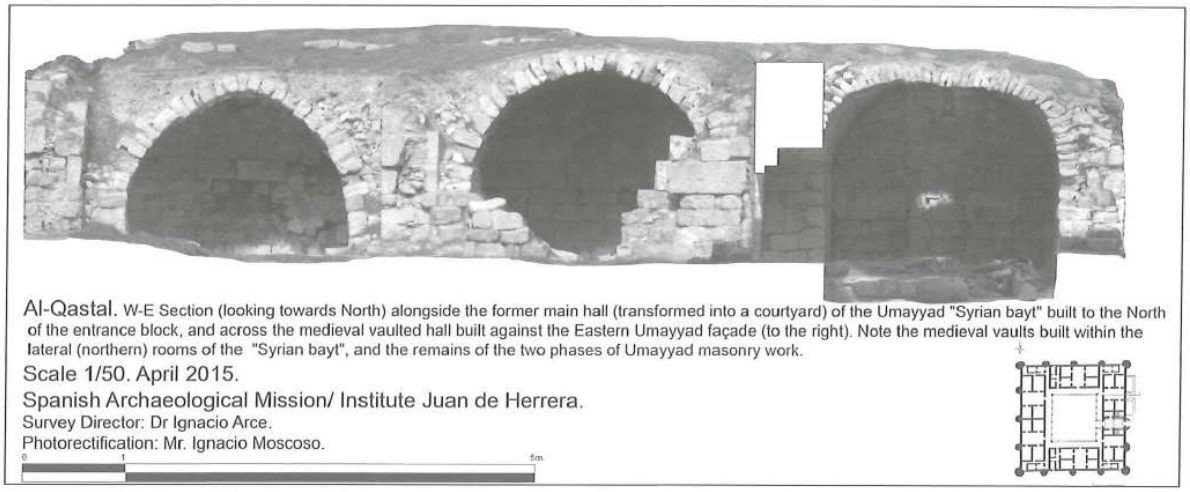
Building Phasing

According to the French mission headed by P. Carlier and F. Morin in 1983-5, all the Umayyad complex and each of its buildings would have been built in one single phase , and using the same and sole building technique: *"Le chateâu, la mosquèe, le barrage et le reservoir presentent des techniques de construction rigoreusement identiques"* (Carlier and Morin 1984: 344). However, the analysis of the building techniques actually used in the *qaṣr* denies this assertion, as at least two Umayyad phases of construction with two different building techniques and materials can be identified in this building. The walls in the areas to the north of the entrance block (the 'Syrian *bayt'* to the north of it, and the service rooms in its northernmost end) present in their lower courses a different building technique to the one used in the upper sections of these same walls and the rest of the building (FIGS. 2, 3 and 4). The masonry work in the lower sections of these walls is composed of five or six courses (in average), quite regular in height, using ashlars smaller but more regular in size than those of the upper section. It does not present apparently the combination of headers and stretchers that we find in the upper courses, nor the inclusion of any *spolia* or reused ashlars. The quality of the stone used in these lower courses is quite poor as it consists of a porous and friable limestone (clearly worse than the compact limestone from the upper courses), and as consequence, they present a higher degree of weathering and decay (FIG. 2).

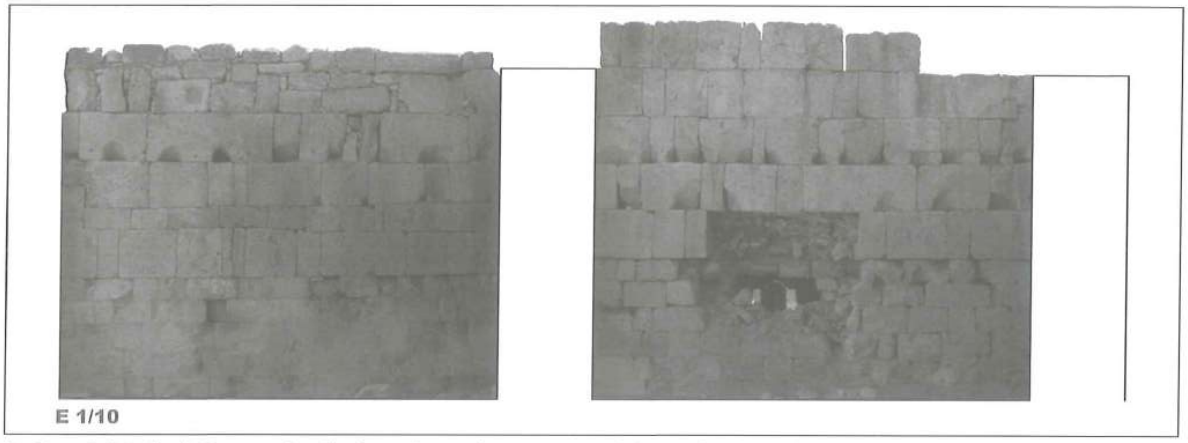
2. Qasṭal al-Balqā'. Umayyad wall from the 'Syrian *bayt*' to the north of the entrance block/vestibule (facing the court corridor), which presents two different building techniques corresponding to two consecutive building phases (both datable to the Umayyad period). The vault seen to the right, dates from Ayyubid-Mamluk period; it is built within the width of the Umayyad room, and rests on its own walls which double the Umayyad ones (see FIG. 3).

The masonry in the upper courses uses a different building technique and material. The quality of the limestone used is much better, more compact and hard than the one used in lower section, while the average size of the ashlars used is in general bigger than in the lower courses, although more irregular in shape and size, not keeping the courses a regular height either. In most courses, stretchers are alternated with headers that present a characteristic dove-tailed and "T" shape in plan, which are found in other Umayyad structures like 'Ammān, al-Mushatta, al-Manyyah, *etc.* (Arce 2007)[6].

6. This type of header, which used in a header-and-stretcher bonding pattern is characteristic of certain late Umayyad buildings in the region, will be the focus of a coming paper by the Author devoted specifically to its origins and use.



3. Qasṭal al-Balqā'. West-East Section across the main hall of the 'Syrian *bayt*' located to the north of the entrance block, and across the medieval vaulted hall built against the Umayyad *qaṣr* eastern façade (at the right -easternmost- end of the image). On the left end of the image, it can be noticed the two phases and building techniques used in the construction of the Umayyad walls in this area of the qaṣr (compare with FIG. 2). The Ayyubid-Mamluk vaults, built within the original Umayyad lateral (northern) rooms/apartments of the original 'Syrian *bayt*', rest on their own walls, which were built against the Umayyad ones. The latter would have supported the original Umayyad vaults.

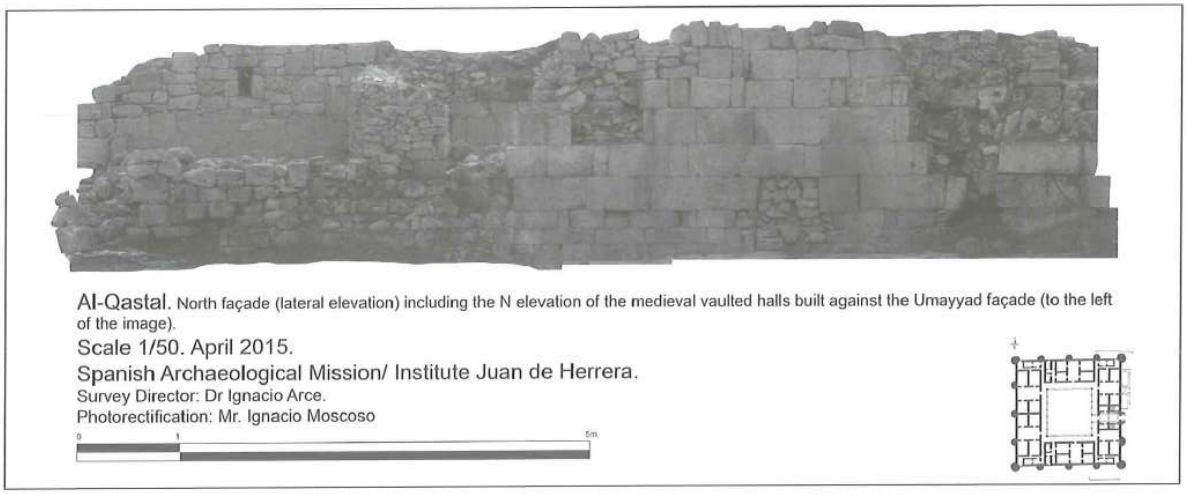


4. Qasṭal al-Balqā'. Umayyad walls from the south apartments of the 'Syrian *bayt*' built to the north of the entrance vestibule block (located right behind them). They present two different superimposed building techniques, corresponding to two consecutive phases (both datable to the Umayyad period): the lower one is composed of five-six courses of regular-height masonry built with a friable limestone, while the upper section uses bigger, although not regular sized ashlars of better quality limestone arranged in a headers-and-stretchers bonding pattern (see FIG. 6 for a detail of the building technique). On the top section of the left (east) wall, it can be seen a latter addition corresponding (together with the put-holes for rafters) to latter phases from Ayyubid-Mamluk and Ottoman periods, not discussed in this paper.

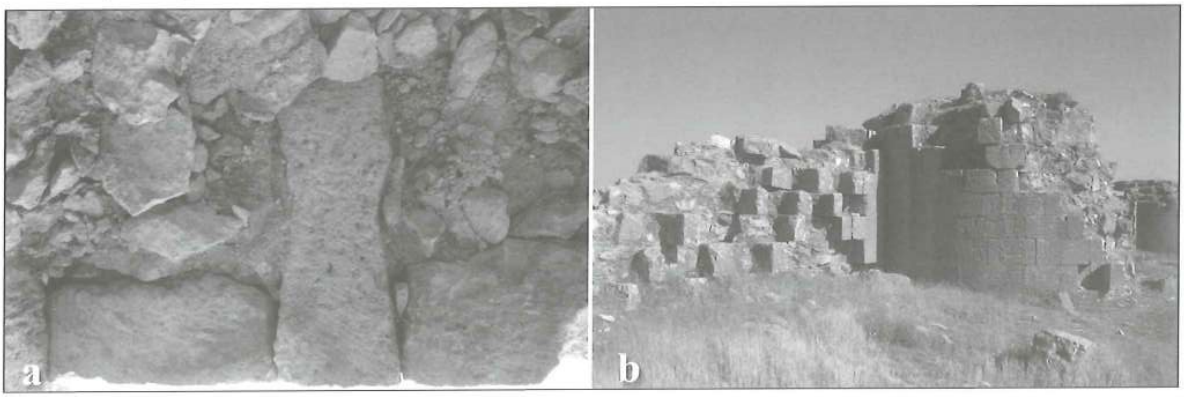
These headers link the stone facing with the core of the walls (*emplekton*), keeping also in place the adjoining stretchers (FIG. 6a).

Abundant re-used ashlars and *spolia* are found as well in this later phase, which in some cases correspond to huge blocks, probably former lintels (see FIG. 23a), although they could be also blocks extracted on purpose from the quarry which were not cut down into smaller elements (FIG. 7), to offer more strength to the masonry.

This technique and this lime mortar is the same found in the rest of the building, where huge blocks of stone and numerous *spolia* fragments are inserted. Among the latter, we can mention the elements used in the staircase



5. Qasṭal al-Balqā'. Eastern end of the North façade of the Umayyad *qaṣr*. To the right of the image can be seen the two different superimposed Umayyad building techniques used, corresponding to two consecutive phases (both datable to the Umayyad period): the lower one is composed of five-six courses of regular-height masonry built with a friable limestone, while the upper section uses bigger, although not regular sized ashlars of better quality limestone arranged in a headers-and-stretchers bonding pattern. Note: the walls seen on the left of the image, which are built with irregular masonry correspond to the medieval vaulted halls added to the eastern façade of the *qaṣr*.

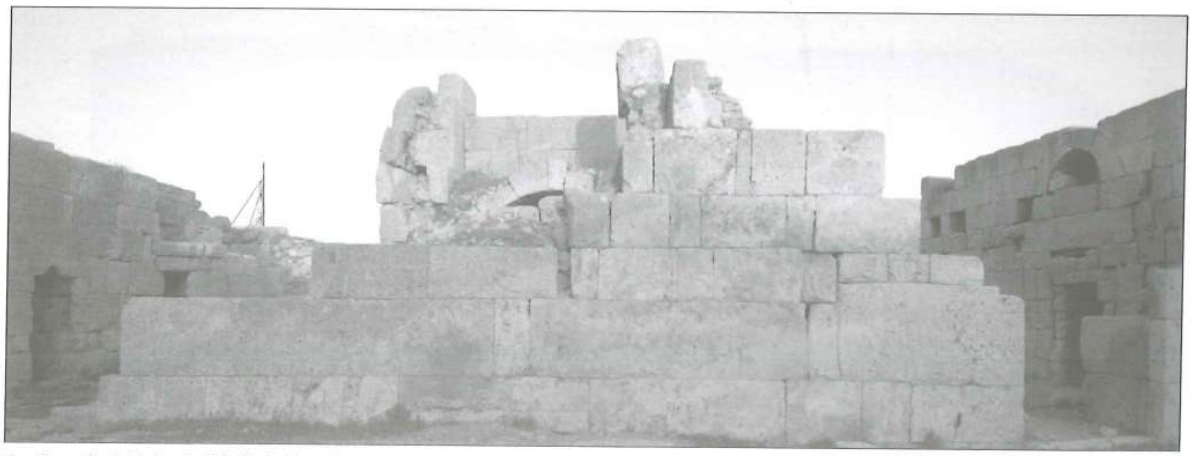


6a. (left): Qasṭal al-Balqā'. Header with dove-tailed "T"shape in plan. Notice how its 'head' is anchored into the core of the masonry, while the dove-tailed 'foot' keeps in place the adjoining stretchers (detail photo taken looking upwards in the wall cavity seen on FIG. 3). 6b. (right): al-Mushatta, external perimeter wall; notice how the stretchers have been looted while the dove-tailed headers with "T" shape in plan remain still fixed to the core of the wall.

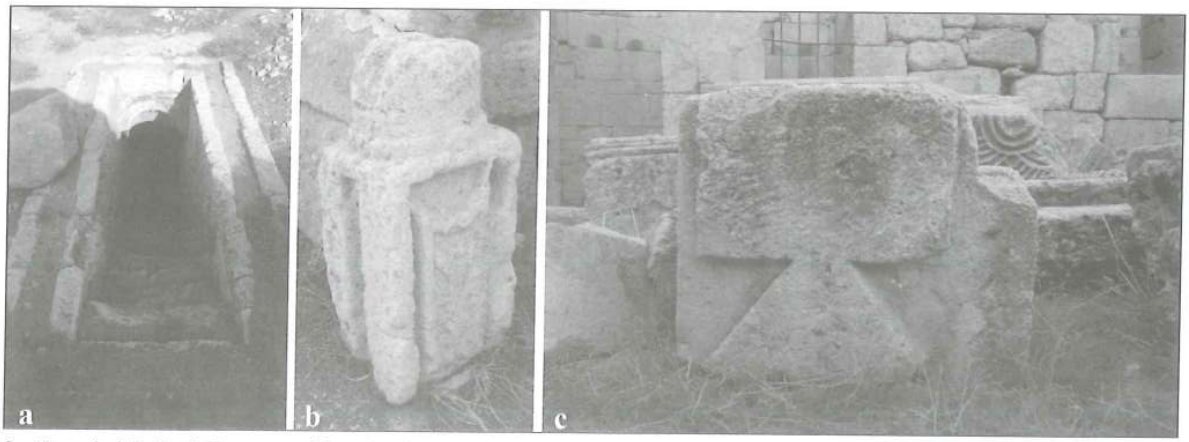
that gives access to the cistern in the court of the *qaṣr*: The curb-stones from a church chancel (FIG. 8a) are reused as a parapet around the opening of the staircase (a post of the chancel has also been retrieved from the rubble -FIG. 8b), while the head of a niche with classical scalloped decoration is reused as the lintel of its entrance door. Other noteworthy elements reused as *spolia* are two fragments of a split flat *tabula ansata* (FIG. 8c), and some unusual *voussoires* in the shape of a double-hexagon, which present a classical decoration and apparently belonged to a barrel vault[7].

The lime mortars used in both sections of the wall are also different. Although both are used in the same way, filling the core of the wall following the *emplecton* technique, and both are composed of lime mixed with vegetal ashes, their relative appearance and characteristics are quite different: The mortar from the lower courses presents a whitish/ light grey background matrix (FIG. 9a), against

7. One of the fragments of the *tabula ansata* is reused in a later wall in the SW area, and the other one was found among the fallen rubble. These unusual double hexagonal voussoires, could belong to Umayyad period.



7. Qaṣṭal al-Balqā'. Wall facing the court (corresponding to the second Umayyad phase). Notice the presence of huge ashlars incorporated in its masonry. Behind this wall can be seen the entrance vestibule (to the left), the south flight of stairs (centre), and the 'incomplete' south Syrian *bayt* (right).

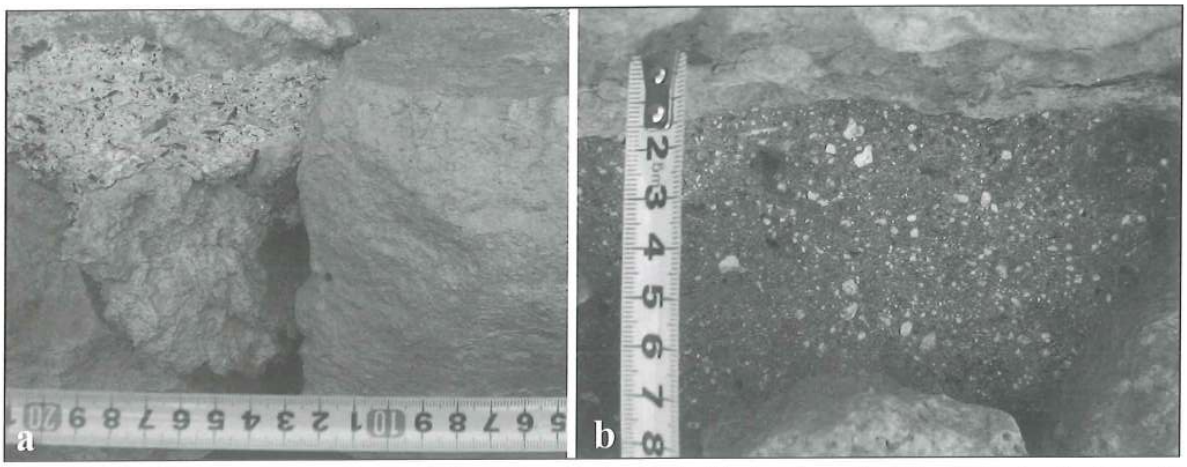


8a. Qaṣṭal al-Balqā'. Roman and late Antique *spolia* reused in the *qaṣr*: a. Base of chancel and head of niche reused in the access to the court cistern. 8b. One of the posts of the reused chancel. 8c. Plain *tabula ansata*, re-carved (the other half was found reused in a later medieval wall).

which contrast the small fragments of black vegetal ashes (a by-product resulting from the production process -Arce 2003), and those of crushed bricks intended as hydraulic agent. The mortar from the upper course appears more compact and homogeneous, and is poured more generously in the core of the wall (while in the lower section a bigger amount of small fragments of broken stones were inserted in the mortared core of the wall). It presents a mid-dark greyish background matrix spotted with tiny fragments of white lime and few others of black ashes (FIG. 9b), although no traces of crushed bricks are found in the matrix. Their respective methods for lime production probably did not differ too much, but the final result of the lime mortar itself is clearly different, due to its preparation (mixing) and different additives used (Arce 2003).

These pieces of evidence demonstrate beyond any doubt, the existence of two different Umayyad phases of construction which had not been identified nor differentiated before, and which contradict the conclusions of Carlier and Morin.

The distribution/location within the *qaṣr* of the masonry of this (up to now) unnoticed first building phase and its characteristic technique is also very relevant, as it was used in the lower courses of the complete northern Syrian *bayt* and the service rooms built to the north of the entrance vestibule block (the northeast



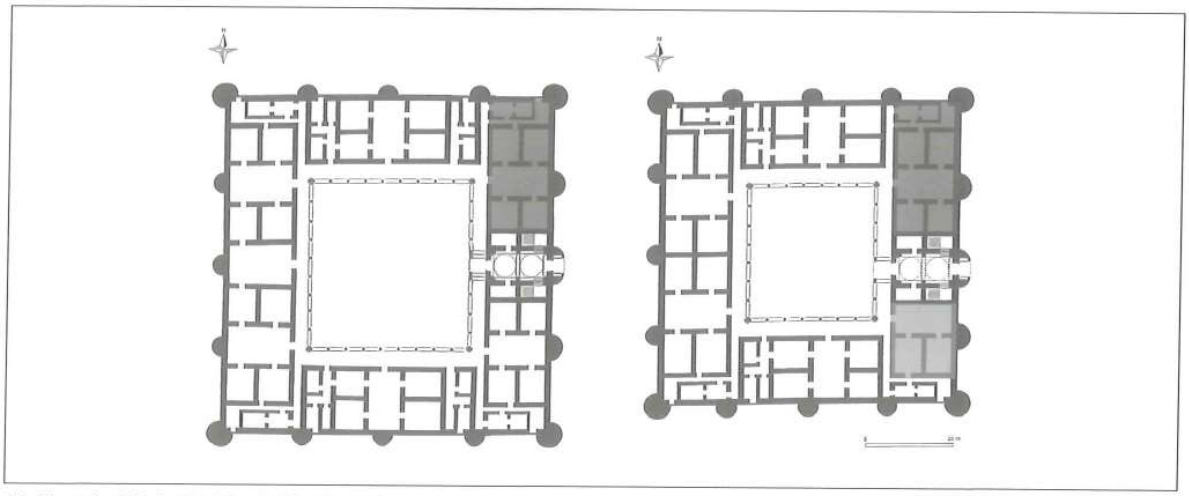
9. Qasṭal al-Balqā'. Lime mortars corresponding to the two phases identified on the walls of the Syrian *bayt* to the north of the entrance vestibule. 9a. First phase and 9b. Second phase.

quarter of the building – FIGS. 3, 4, 5 and 10b), including apparently the corresponding section of the perimeter wall (FIG. 5). No traces of this earlier masonry have been found in the 'incomplete' Syrian *bayt* built to the south of the entrance block or in the rest of the building. This distribution and location in plan of the different techniques (and related building phases) identified, would indicate that the first phase of construction of the *qaṣr* was started from this northeast corner and was soon interrupted, being resumed after an undetermined lapse of time, with relevant changes in its plan and the building techniques and materials used. At this point, we must analyze which are the changes in plan that certainly occurred after resuming the construction, and which gave as a result the irregularities in plan that we have described. Two different hypotheses can be put forward regarding the original plan of the first Umayyad *qaṣr*, the construction of which was interrupted and later resumed with the availability of more economic resources. According to the first hypothesis, the original plan that was not fully implemented, would have incorporated in its design the same entrance block that was finally built, which would have been placed symmetrically in the middle of the east section of a slightly bigger and symmetrical *qaṣr*. After resuming its construction it would have been decided to reduce slightly its originally foreseen size in plan, and to use a different building technique and better materials. This would explain the aforementioned asymmetry in the location of the entrance block, but also the '*incomplete* Syrian *bayt*' built south of it. According to this first hypothesis, if we re-draw the plan of the *qaṣr* with a 'complete' Syrian *bayt* to the south of the entrance block, we would regain a symmetric setting for this entrance block in plan, located in axe with the court (FIG. 10a). This would give as a result, a larger but regular plan, with an average side length of 77,5 meters in comparison with the 67,8 meters of the *qaṣr* actually built[8]. The arrangement of the groups of rooms (*buyūt*) in the north and south units would regain setting a symmetric with this hypothesised 'original' layout, by flanking both sides of their respective single Syrian *buyūt* with service rooms. Thus, these *buyūt* would have had their respective central room (*iwān*) located in axe with the court

8. However, this resulting dimension (77,5 m) exceeds the average ones found in other Umayyad *quṣūr*. They share several features although not always exactly the same size, which vary within certain range; (the dimensions in meters here gathered, are from Creswell and Allan 1989). Khirbat al-Mafjar: 65×65; al-Manyyah: 67×73; Jabal Sāyis 67×67; Muwwaqar: 65×39; Qaṣr al-Kharrānah: 36,5×35,5 (72 / 2×72 / 2); Qaṣr al-Ḥīr al-Gharbī: 71,5×73 (average); Qaṣr al-Ḥīr ash-Sharqī (lesser enclosure): 68×67×71,5×74; Resafa Hisham 72×72; Qaṣr Bāyir (length of remaining W wall): 70m aprox.; Qaṣr aṭ-Ṭūba: 140,5×72,85 (a double square of 72,8×72); al-Mushatta: 144×144 (internally) [72×2]×[72×2] and 147,4×147,4 (externally).

as well. Similarly, the arrangement of the west unit would allow placing a central Syrian *bayt* in axe with the entrance gate and the court. In this case, this new central *bayt* would share the small lateral rooms with the two flanking *buyūt* (as occurs in the plan of Qaṣr al-Kharrānah -Arce 2016). All this would allow regaining a regular and symmetrical plan, which might have corresponded to an original plan eventually not fully implemented. However, against this first hypothesis can be pointed three evidences, which would rule out its feasibility: firstly, the aforementioned (unusual) resulting dimensions of this hypothetical first *qaṣr* (77,5m square); secondly, the fact that this reduction in plan would have implied the anti-economical and illogical complete re-laying of the foundations of the building (according to the standard procedures, the foundations would have been laid in its entirety before any wall would have been raised above ground level); and thirdly, the fact that at the base of the walls of the existing entrance block/vestibule, no traces of the characteristic masonry that defines this first Umayyad building phase are found anywhere. Thus, the dimensional rarity of the hypothesised resulting original plan, the illogical re-laying of the foundations which this change would have implied, and the absence of the first type of Umayyad masonry at the entrance block walls, leads us to rule out this first hypothesis, which considers the current entrance block as belonging to the first phase.

Nonetheless, a second, better founded, and more reliable hypothesis can be put forward regarding the original appearance in plan of this "first" Umayyad *qaṣr*, the construction of which was interrupted and not completed as originally planned, giving as a result the aforementioned irregularities. This hypothesis would imply an original symmetrical plan as well, but in this case with the same perimeter and size of the current building (closer to the "standard" dimensions of Umayyad *quṣūr*), but without the 'entrance block' that we can see today: it would have had a simpler and narrower vestibule, consisting of a simple corridor with just benches in both sides (FIG. 11a), instead of the complex and articulated entrance block with two lateral flights of steps leading to the upper floor that was finally implemented[9] (which would be part of the plan changes introduced in the

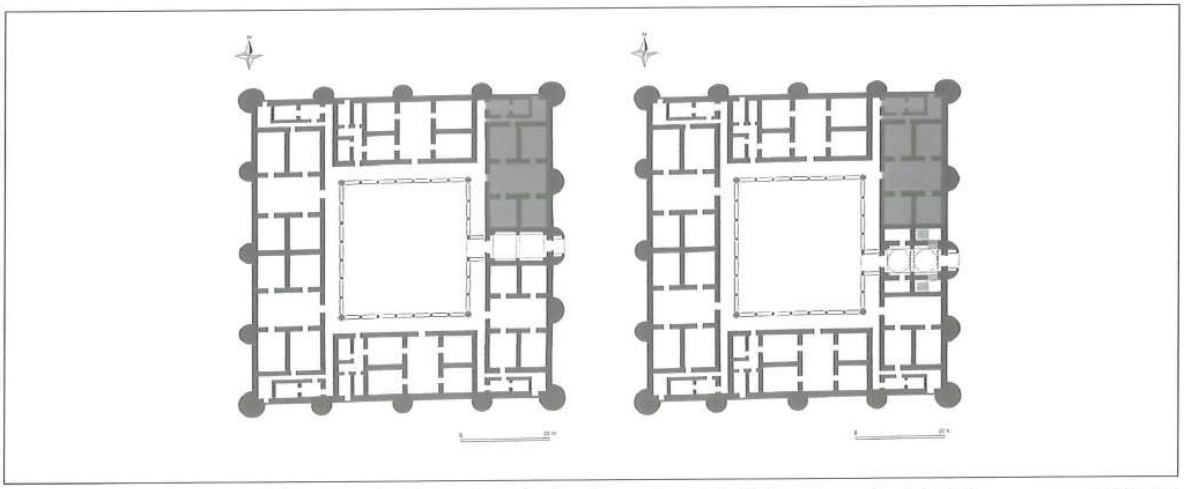


10. Qasṭal al-Balqā'. 10a (left). Hypothetical original plan (first hypothesis) of the *qaṣr* as originally intended (larger in size, completely symmetrical and with the same vestibule and entrance block that exists today) confronted with the final version actually built. 10b (right). The walls from the area in dark grey correspond to those which present in their lower courses the oldest building technique identified (corresponding to those surviving from the earliest Umayyad building phase). In light grey the 'incomplete Syrian *bayt*'.

9. In this first phase, the staircases might have been planned to be placed in the "dead ended" service corridors that separate the main blocks of rooms, like at Khirbat al-Mafjar.

second phase). This narrower original entrance corridor, being placed in the centre/axe of the building would have thus allowed the existence of two complete Syrian *buyūt* flanking it, in a completely regular and symmetrical plan. This original vestibule would have been similar to the standard Umayyad entrance corridors that can be found at Khirbat al-Mafjar, Qaṣr al-Ḥīr al-Gharbī , Qaṣr al-Kharrānah , Shuqayra al-Gharbiyyah, *etc.* The internal distribution of the original *qaṣr* would have been thus very similar, if not the same, to the one finally implemented. This would make sense because the foundations, as we have pointed, were probably already laid in the first phase, being used when the works were resumed, with the exception of the south-eastern area where the inclusion of the new and wider entrance block would have alter that symmetrical plan, creating the irregularities described, which would have implied just minor changes in the foundations in this entrance area, adding two extra foundation walls (see FIG. 11).

This second hypothesis would be also more coherent with the elicited scenario of improvement of the economic context that characterized the second building phase, which implied the availability of more financial resources and the use of better quality materials in its construction: It would be more logical that this lavish and very elaborated vaulted entrance block would have been added to the modest original plan during this new and prosperous economic context, keeping the original dimensions in plan of the first *qaṣr*, instead of reducing it in size as hypothesised in the first option (a weird change for a wealthy period, but also because it would have turn the plan asymmetrical on purpose). We have also to take into account that, as pointed, we cannot find traces of the type of masonry used during the first phase in this entrance block, with the exception of the north face of the wall shared with the Syrian *bayt* located to the north of it (FIG. 4): a wall which seems to have been doubled southwards for the construction of the staircase (FIG. 12). As mentioned, the foundations of the perimeter and partition walls for the rest of the building were most probably already laid during the first building phase and later reused. As a result, the new walls built in this second phase would have followed closely, if not identically, the original plan except in the east section where the new entrance block was incorporated. The addition of this new lavish entrance block, more complex in elevation and plan, without modifying the original perimeter



11. Qaṣṭal al-Balqā'. 11a (left). Hypothetical original plan (second and definitive hypothesis) of the *qaṣr* as originally designed (same size and internal distribution, but with a simple corridor as entrance vestibule instead of the complex entrance block, in a symmetrical plan), confronted with the final version actually built. 11b (right). Notice how due to the inclusion of the new and wider entrance block, the south-eastern *bayt* loses its northern apartments becoming thus 'incomplete', and the general plan of the *qaṣr* becomes in its turn asymmetrical.

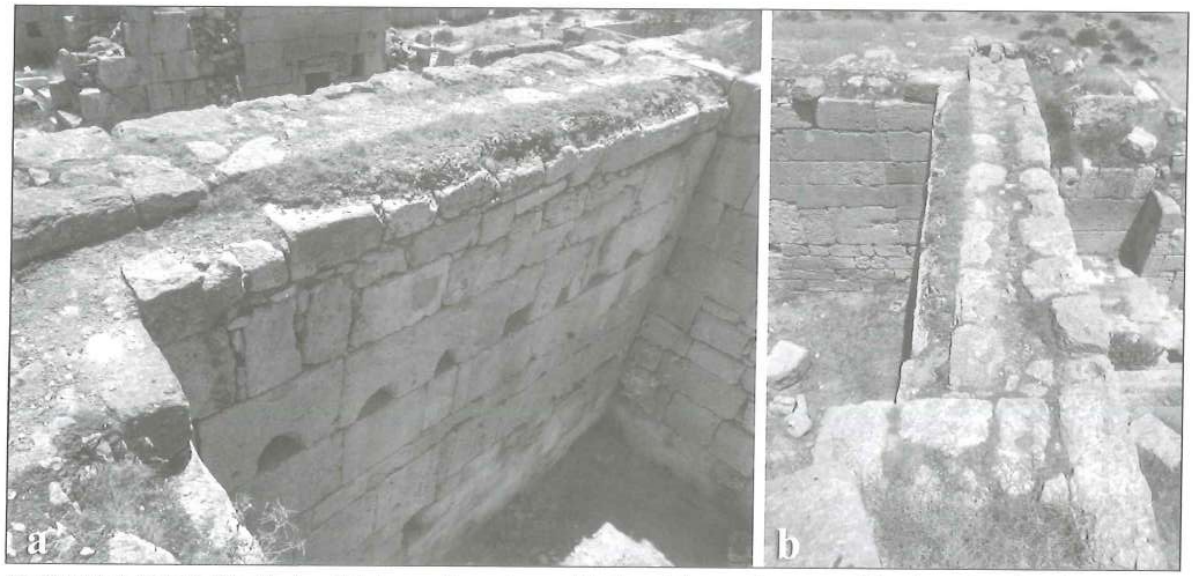
of the *qaṣr*, implied the reduction in size of the south Syrian *bayt*, eliminating the two northern rooms. This would have also provoked the asymmetry in plan of the building finally built, which would find in this hypothesis a logical and fully satisfactorily explanation, which we adopt as the most convincing one. Two final pieces of evidence would confirm that this second hypothesis is the correct one: firstly, the fact that all the entrance block/vestibule, including the lateral staircases, is built entirely using the materials and building techniques employed in the second Umayyad building phase (not being present a single course using those from the first phase); secondly, the confirmation that the wall between the entrance block and the northern *bayt* was doubled as can be seen in (FIG. 12).

The Entrance Vestibule Block and the Upper Audience Hall

The second section of the paper deals specifically with the analysis and the related hypothesis of reconstruction of the original appearance of the gateway and the vestibule entrance block, its elevation, and the vaulting systems which covered its lower and upper rooms.

This entrance or vestibule block, which we have concluded would belong to the second building phase of the Umayyad *qaṣr*, is composed by two almost square bays[10], which define a corridor that gives access from the exterior to the court. The plan of the vestibule is articulated by pilasters dividing both square bays, and from which sprang the arches that divided the vaulting in two square sections as well. These pilasters divide in two sections also the elevation of the lateral walls of this vestibule, each of which has a semicircular profile which proves that these two square bays were vaulted (FIGS. 13, 14). In principle, these material remains indicate that this vestibule could have been covered by two groin (cross) vaults, two sail vaults or a couple of domes on pendentives[11].

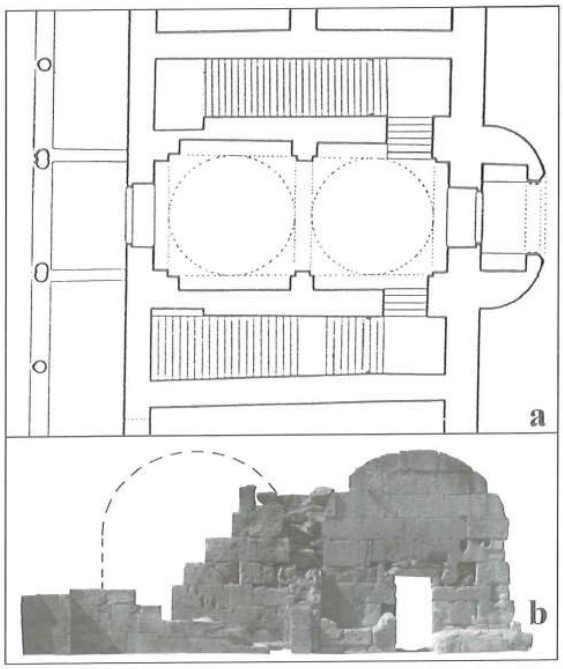
This corridor was flanked by two symmetrical



12. Qasṭal al-Balqā'. Doubled wall between the entrance block and the south rooms of the *bayt* placed to the North of the access block. 12a (left). On this side of the wall, which looks northwards (see also FIG. 4) it can be seen, how its lower courses are built using the aforementioned first Umayyad building technique, on top of which was added the later section built with the headers-and-stretchers technique (corresponding to the second Umayyad phase). On top of the latter, would have rest the barrel vault covering the room. The space left by the missing springers of the vault was replaced in medieval times by new courses of irregular masonry, seen in the photo crowning this side of the Wall.

10. The two lateral walls tapper slightly. This makes the bays slightly irregular. Thus the transversal sides of the 'square' bays oscillate between 5,16 and 5,36 meters.

11. Creswell supposed the entrance was covered by two cross vaults (Cresswell and Allan 1989:173), but gives wrong dimensions for the qaṣr ("approximately 59m square, excluding the towers").



13. Qasṭal al-Balqā'. The entrance corridor or vestibule of the *qaṣr*. 13a. Plan (Calier and Morin 1984: Fig.54). 13b. E-W section across the vestibule looking towards south (survey and ortho-rectification by I. Arce and I. Moscoso).

flights of stairs leading to the upper floor, and which were accessed from two lateral doors of the lower floor first bay, in an arrangement not seen in any other Umayyad *qaṣr*. Thresholds with pivot-holes were located not only in the main external gateway, but also dividing these two consecutive square bays. This would grant access to the reception hall in the upper floor through the two lateral flights of steps[12], while keeping closed the access to the courtyard and the residential areas in the lower one. The two small rooms under the staircases (accessed from the second square bay) were most probably used as guard rooms. Against the lateral walls are placed the typical waiting benches found in most Umayyad *quṣūr*.

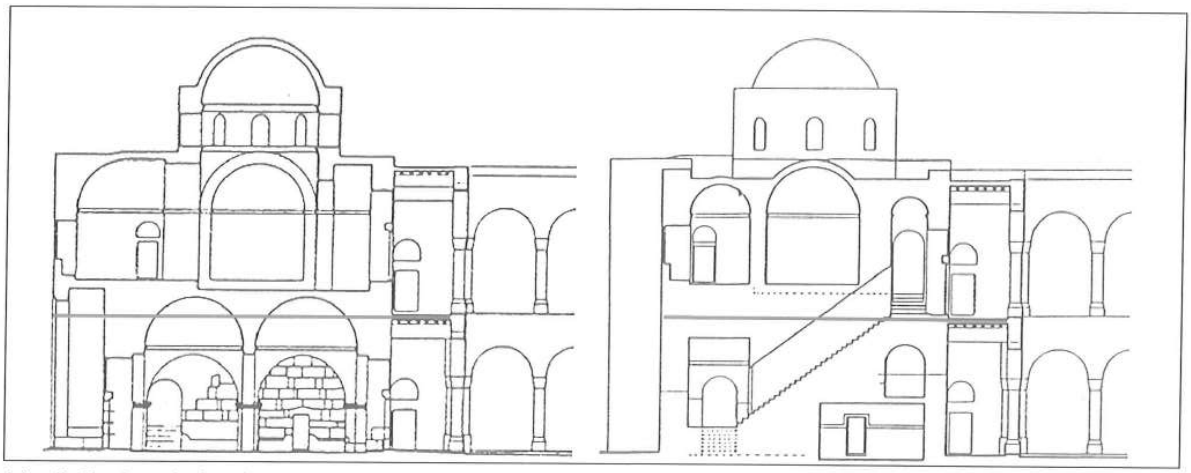
The Vaulting Hypothesis for the Lower Vestibule

The hypothesis put forward by Carlier and Morin imply that the two square bays of the lower floor vestibule were covered by two domes on pendentives. This is based on the aforementioned semicircular profile of the lateral walls, and the survival of some domical voussoires (Carlier and Morin 1984: 348). The rest of the rooms of the *qaṣr* are drawn by them as roofed with flat ceilings using beams and rafters. In my opinion, and due to the span of the rooms, they would have been roofed with barrel vaults as it is the case in most the Umayyad *quṣūr* ('Ammān, al-Kharrānah, al-Mushatta, aṭ-Ṭūba, Qaṣr al-Ḥīr ash-Sharqī, *etc*). These vaults would have been supported by the thick walls and they would have also counteracted the lateral thrust of the vaulting from the entrance block.

The Floor Levels, Plan and Vaulting of the Audience Hall in the Upper Floor

According to the hypothetical scheme put forward by Carlier and Morin, the resulting height of the audience hall in the upper floor would be 8,55meters above the lower floor level. This height is excessive and creates insurmountable problems in the reconstruction proposed. The remains of the original flights of steps prove that they would have not been enough to reach the resulting floor level of the audience hall in the upper floor, placed on top of these two domes on pendentives. Just to reach the floor level of the upper portico, it would be necessary to devise a single flight of more than 30 steps in a single row with a slope of almost 40 degrees (FIG. 14b). This also forces to raise the floor level in the lateral arms of the audience hall even further, to allow placing the staircases running underneath them. Despite this disproportionate and unlikely flight of steps, the staircases still would have not reached up to the floor level of the audience hall, which remains at a higher level than that of the upper portico: it would be necessary to add an extra flight of steps, placed inside the audience hall itself (FIG. 14b). If the floor level

12. Door jambs were built at the beginning of the main flight of steps (close to the first landing) to insert doors which would close the access to the upper floor.



14a. (left). Qaṣṭal al-Balqā'. Entrance vestibule block and upper audience hall. Reconstruction hypothesis by Carlier and Morin roofing the vestibule entrance corridor with two domes on pendentives, and placing in the upper floor a 'triconch hall' surmounted by a huge dome on pendentives placed in between the two lower domes. 14b (right). Section trough the staircase showing the awkward difference of floor levels between the upper portico (indicated by the red line) and the audience hall (Carlier and Morin 1984: cropping of Figs.59, 64)

of the upper portico would be set at the same level of the floor of the audience hall, it could not be reached by these steps, and would also give as a result a disproportionate height for the elevation of the lower portico of the court as well (FIGS. 14a, b). To disguise these evident problems in Carlier and Morin reconstruction drawings, the floor level of the upper portico is drawn more than one meter and a half below the floor level of the upper audience hall (in correspondence with the maximum height that could be reached by the flights of steps), but without a direct access between them (FIG. 14a). The access between both floor levels is not satisfactorily nor convincingly solved either: the main opening that should have been a door connecting them, giving access to the audience hall from the upper corridor becomes a sort of window, which overlooks onto the upper portico corridor, but does not offer access between them. According to their proposal, to reach the audience hall from the lateral flights of steps leading to the upper portico corridor, it is necessary to place in the western arm of the audience hall plan a supplementary flight of steps, set transversally with the extra steps required (FIGS.14a,15a). All these problems make this hypothesis not feasible nor convincing, as it does not make sense to design ex-novo such a lavish double staircase that does not fulfil properly its main purpose.

The 'Triconch Hall'

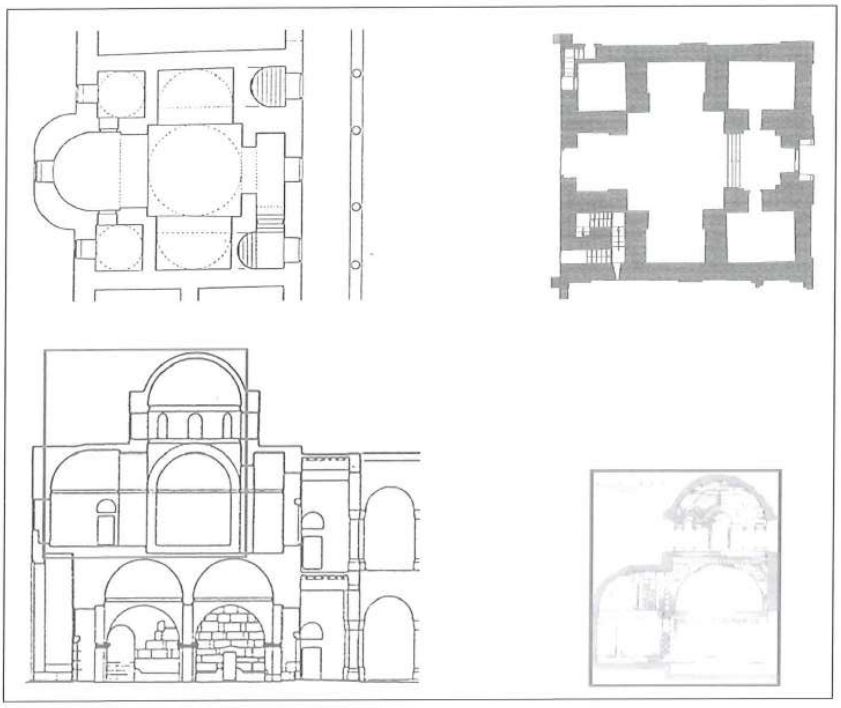
The hypothesis put forward by Carlier and Morin becomes structurally inconsistent and even more unlikely when it is suggested the existence of a 'triconch hall' in the upper floor, on top of the double-square plan of the lower vestibule, and surmounted by a huge dome on pendentives of 6,30m of diameter (Carlier and Morin 1984: 348-9). This upper dome would be placed not above one of the lower square bays, but astride in between the two lower domes on pendentives.

As a matter of fact, the hypothesised plan it is not an actual triconch, but a sort of Greek-cross plan, with a central square area with two oblong lateral arms, instead of semicircular apses and with small domes in the resulting corner spaces (FIG. 15a)[13]. The issue of the floor levels becomes even more complex and confusing, because according to their solution,

13. The plan suggested might be better described as an incomplete quincunx, *i.e* : a cruciform plan with a central dome and four more in the corners defined by the arms of the cross, similar to that of the al-Mundhir 'pretorium' in Resafa (or to the vestibule at 'Ammān Citadel which they claim has been used as a model for their hypothesis).

the floor level of these lateral arms should be higher than the one of the central hall itself, to allow the staircases (which run underneath the lateral arms), reaching the floor level of the upper portico (FIG. 14b). Thus, the floor level of the portico would remain, as we have pointed, one meter and a half below the resulting floor level of the audience hall, and almost two meters below the floor level of these lateral arms (FIG. 14b). However, the main problem with this solution results from the fact that the hypothesized dome on pendentives of this upper 'triconch' audience hall, instead of being placed in correspondence with one of the two square bays which articulate the lower space, would be placed astride between them, something that structurally does not make any sense (FIG. 14a). With this solution, this huge dome would not be properly supported, as its weight would be resting on the weakest points of the lower floor structure. The pendentives which receive the weight of a dome, concentrate the thrust at the four corners, where it should be received by the piers beneath. The problem is that according to Carlier and Morin reconstruction, the weight would be resting not on the lower floor piers, but on the fragile crowns of the twin domes on pendentives, which they hypothesise roofed the lower floor vestibule. This demonstrates that this upper domed hall, as presented, has neither structural support nor a coherent spatial relationship with the area over which it is set.

On top of this, when this hypothetical reconstruction is analysed more in detail, it can be noticed that the section (FIG. 15c) suggested for this upper 'triconch' audience hall, actually replicates the longitudinal section of the *bahū* or *dīwān* at Khirbat al-Mafjar (FIG. 15d, Hamilton 1959 Fig.25), while the plan (FIG. 15a) is an adaptation of the one from the entrance hall of the Umayyad palace at 'Ammān Citadel (FIG. 15b). The resulting combined structure is inserted arbitrarily without any spatial, nor structural logic, on top of the entrance gate and vestibule of our *qaṣr;* straddling the two lower bays, in a sort of "architectural collage". As a result, the whole solution becomes inconsistent and unconvincing. We can thus conclude that this hypothesis should be discarded as it does not have enough evidences to be supported, and it is not spatially nor structurally coherent or compatible with the remains found still *in situ*.



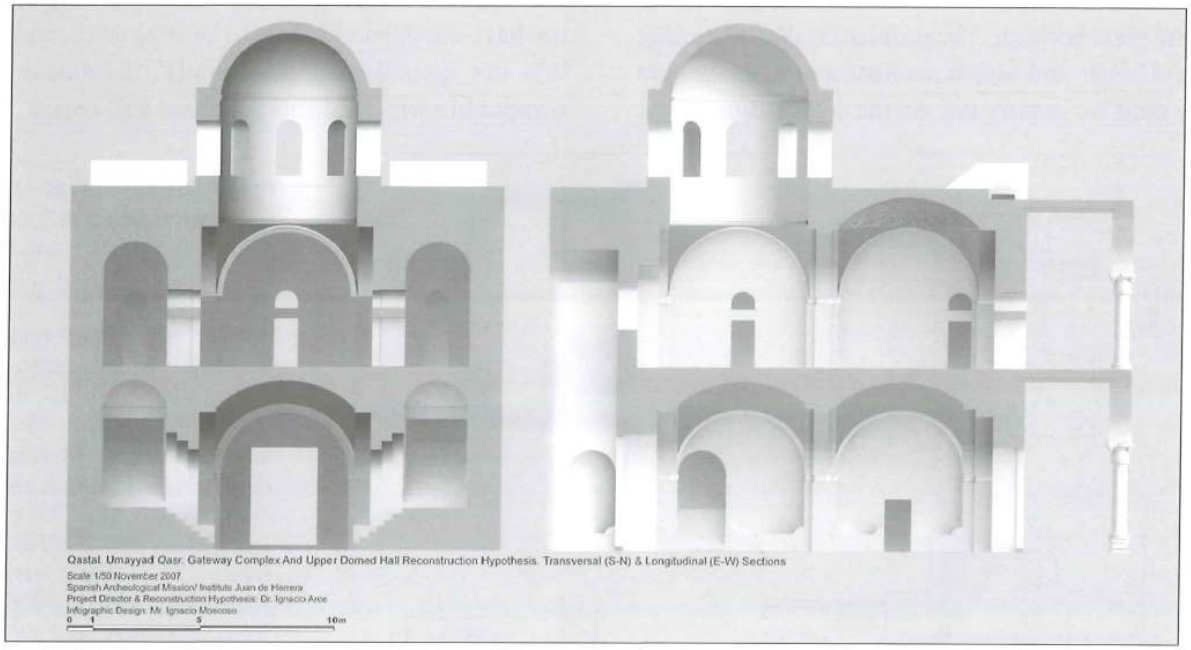
15a. Qasṭal al-Balqā'. Plan of the upper audience hall as hypothesised by Carlier and Morin (1984: Fig.55). 15b. 'Ammān Citadel, plan of the monumental Vestibule (Arce 2009), notice the similarity to the plan of 15a. 15c. Qasṭal al-Balqā'. Section of the Entrance block as hypothesised by Carlier and Morin (1984: Fig.59), notice the domes on pendentives covering the lower vestibule, and the "triconch" hall awkwardly located astride in between the two lower domes. 15d. Khirbat al-Mafjar. Section of the *dīwān* or *bahū* (Hamilton 1959: Fig.25); compare with FIG15c.

Alternative Vaulting Hypothesis

The detailed and thorough analysis of these architectural material remains, has led to an alternative hypothesis still based on the existing material evidences, but following the architectural and structural coherence required, which would sort out the problems, inconsistencies and incongruences identified. According to this proposal, the two square sections of the lower vestibule would not be covered by two domes on pendentives but by **two sail vaults** (FIGS. 16, 17, 18). We do not consider the choice of a couple of cross or groin vaults, as suggested by Creswell[14], because no single trace of the groins, or lines of intersection of the cross vaults, have been found, while we have a huge number of domical *voussoires*, which would belong to the sail vaults (FIG.17).

This solution would reduce noticeably the resulting height of the floor level of the upper audience hall, while keeping the coherence with the remaining evidences of the lower supporting infrastructure and the domical voussoires found (FIG. 17). This hypothesis would also allow regaining adequate proportions and heights for the whole structure, including the porticoes of the courtyard: Instead of +8,55 meters, the upper floor level would be just +6,04 meters above the lower floor level (as we will demonstrate below). This would also allow setting the floor of the upper portico and that of all the upper rooms (including the audience hall) all at the same height, which would be easily and comfortably reached by the existing two lateral flights of steps (not being necessary the awkward addition of extra flights of steps).

The domical *voussoires* found in the rubble (FIG. 17), which Carlier and Morin thought belonged to a huge dome in the upper floor would actually belong to these sail vaults roofing the lower floor. We will analyze now the dimensional congruency of our proposal, supporting the existence of sail vaults covering the two square bays of the vestibule in the first



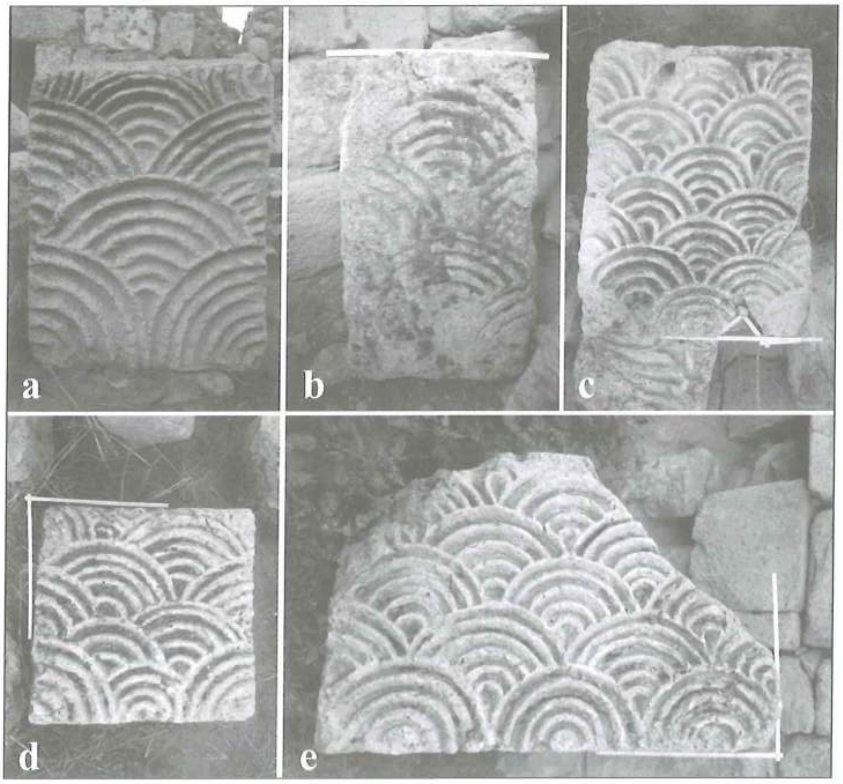
16. Qaṣṭal al-Balqā'. Proposal of reconstruction of the entrance vestibule block put forward by the author (infography by I. Moscoso). Note the lower vestibule covered by two sail vaults, while the solution for the upper audience hall is domed following the spatial and structural constrictions fixed by the existing elements in the lower floor: the resulting two bays are covered respectively with a dome on pendentives and a sail vault, placed above and in correspondence with the two square bays of the lower entrance floor (compare with FIG.14a,b).

14. Cresswell and Allan 1989:173.

floor, using these domical *voussoires*.

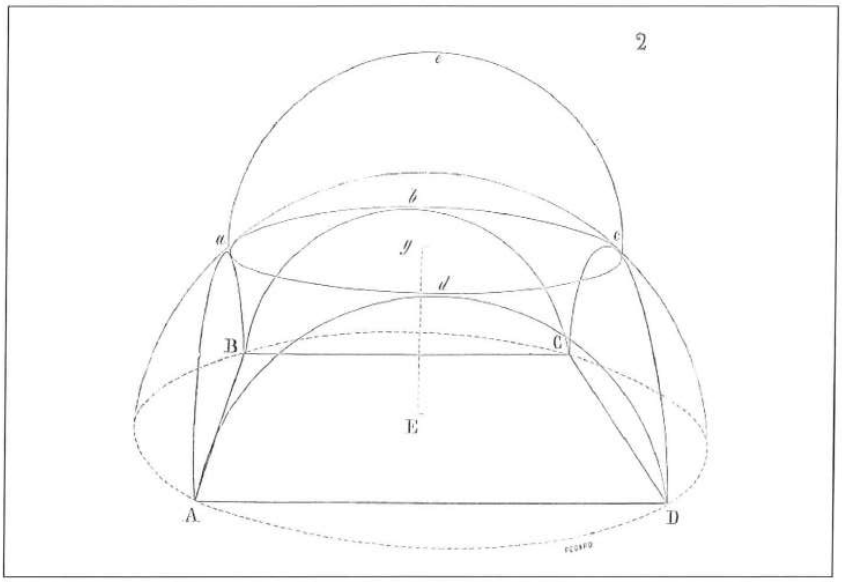
We have to take into account that the pendentives supporting a dome are actually the remaining surface of a sail vault that has been horizontally cut to obtain a circular base on which the semi-spherical dome is set (FIG. 18)[15]. The circular base of this dome has thus the same diameter of the pendentive upper circumference, which corresponds to the circumference inscribed in the square on which the dome is set in plan (which in its turn, is inscribed in the equatorial circumference of the hemisphere corresponding to the related pendentive and/or sail vault (FIG. 18)).

Thus the relationship between the Radius of the pendentive's spherical surface (R) and that of the supported dome's hemisphere (r) is square root of 2 ($R=r\sqrt{2}$), while the diameter of the supported dome equals the side of the square in plan on which it is set and built (FIG. 16b). Accordingly, the total height (from the springing line) of the crown of a dome on pendentives equals the diameter of the supported semi-spherical dome (twice its radius $=2\times r$), while the height of the crown of the corresponding sail vault would be just the radius of the hemispherical dome multiplied by square root of 2 ($r\sqrt{2}= 1{,}4142\times r$), almost a third less than the previous one (FIGS. 16, 19). Thus, if the resulting height of the upper floor of the audience hall supported by the twin domes on pendentives was +8,55 m above the lower floor level, the resulting height if it would have been supported by the twin sail vaults would be of just +6,04 m above the lower floor level. This dimension of the radius of the semi-sphere of the sail vault, corresponds to that of the big *voussoires* found in the site (FIG. 17), which would belong to these sail vaults in the vestibule entrance, and not to the huge semi-dome that Carlier and Morin hypothesised for roofing the upper floor.



17a-e. Qasṭal al-Balqā'. Domical voussoires corresponding to the sail vaults covering the bays of the first floor, which have a spherical radius of 6m approx.

15. The sail vault and the pendentives are both spherical surfaces resulting from cutting away sections of the same semi-sphere: In the case of the sail vault the semi-sphere is cut by four vertical planes corresponding to the square inscribed in the equatorial circumference; in the case of the pendentives, this spherical resulting surface (the sail vault) is further cut by an horizontal plane on which the actual dome will be set.



18. Formation of a pendentive. Eugène Viollet-le-Duc 1856. Notice the resulting sail vault (with the same radius of the pendentives 'R') in case the semi sphere is not cut horizontally to place on it a semi-spherical dome.

19. Qasṭal al-Balqā'. Umayyad qaṣr. Entrance vestibule. Reconstruction hypothesis. 19a. Present condition of the remaining elements. 19b. Composite view with the infographic reconstruction of the two sail vaults (Reconstruction hypothesis by I. Arce; infography: I. Moscoso).

Parallels and Antecedents

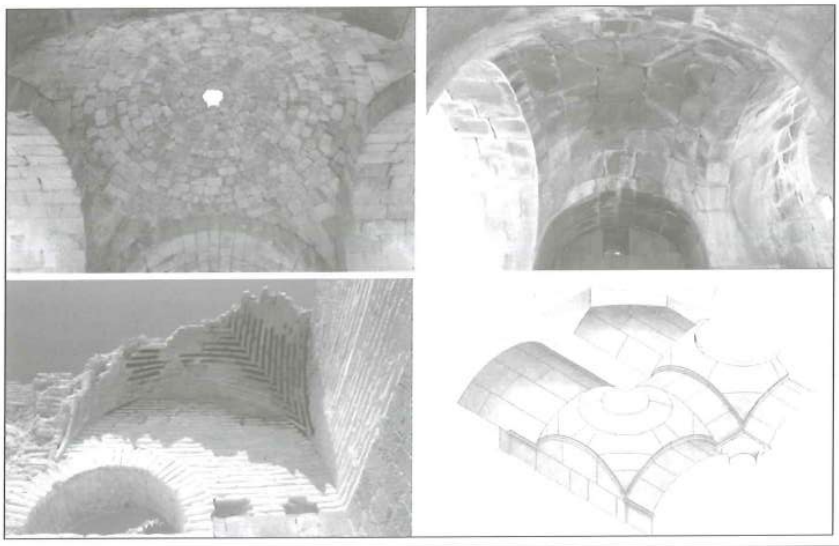
We have numerous samples of antecedents for the use of sail vaults in the region from Roman epoch and throughout the Byzantine and Umayyad period (Arce 2006 and 2007): In the south baths at Jarash (Jordan -FIG. 20a), and in the funerary mausoleum in Nuayyis ('Ammān -Jordan), both dated in the 2nd century AD, or at the theatre of Shahba-Philippopolis (South Syria), dated in the 3rd century AD (FIG. 20 b); at Qaṣr ibn al-Wardan (North Syria), 6th century AD (FIG. 20c), or in Jerusalem, at the Double (FIG. 20d) and Golden gates in the *al-Haram al-Sharif*. The latter ones represent the antecedent of a recurrent use of sail vaults in Islamic period gateways, which would become almost customary in later periods, like at the Fatimid period gates of Cairo of *Bab al-Futuh* and *Bab al-Zuwaylah* (Creswell 1978).

The Vaulting of the Audience Hall in the Upper Floor

The space distribution and vaulting of the hypothesised audience hall of the upper floor[16], as we have seen, should follow and be coherent with the structure existing in the lower floor. Accordingly, we suggest that the two square bays should be replicated in the upper floor exactly above the lower ones (FIG.16). One of these bays (probably the easternmost one), would have been roofed by a dome on pendentives (maybe with an intermediate drum pierced with windows), while the other bay could have been covered by one sail vault, (or even by a barrel vault placed in axe, E-W, and connected with the dome's pendentives. In order to keep the maximal structural coherence, we have chosen and drawn the solution with the sail vault, which would have the same dimensions and radius of the lower ones (and of the upper floor pendentives).

The Dating of the *Qaṣr*

According to the hypothesis put forward by Carlier and Morin, the *qaṣr* and the whole Umayyad complex would have been built in a sole single phase, and in quite early date. Their early dating is in part based on their hypothetical reconstruction of the upper domed chamber as a triconch hall, claimed as evidence of '*archaism*'[17] of its design, while the single phasing was based on the supposed existence of a sole and single building technique used throughout all the complex, hypotheses which



20. Sail vaults from antique and Late-antique buildings in the Levant. 20a. South baths at Jarash (Jordan), 2nd century AD; 20b. Theatre of Shahba-Philippopolis, 3rd centuryAD; 20c. Qaṣr ibn-Wardan (Syria) 6th century AD; 20d. al-Haram al-Sharif, Jerusalem. Double gate, 7th century? AD.

16. We would assume the existence of an audience hall taking into account the general design and the existing antecedents and parallels at Qaṣr al-Kharrānah, Qaṣr Minya, Qaṣr al-Ḥīr al-Gharbī, Khirbat al-Mafjar *etc.*

17. "L'etude typologique des sailes d'audience umayyades montre également l'archaisme des dispositions du triconque de Qaṣṭal" (Carlier and Morin 1984: 244). Our research points, on the contrary, to the conclusion that the entrance block would have been part of the second phase of construction of the complex, with a different structural and spatial solution.

we have demonstrated are both wrong. Their dating would be also based on the hypothetical early *qiblah* towards Jerusalem that they claim was used and they would have identified at the site (Carlier and Morin 1987: 242-4)[18].

Actually, this hypothetical *qiblah* towards Jerusalem was inferred from the general orientation of the buildings of the complex the walls of which are set in parallel to the compass directions (E-W and N-S). Most Umayyad *quṣūr* built *ex novo*, follow however this standard orientation (even if this results in some minor deviation from the proper alignment of the *qiblah* towards Mekka)[19]. The claim of the use of this *qiblah* towards Jerusalem would be also incompatible with the assertion that all the complex (including the mosque) would have been built in one sole phase because the mosque is not oriented towards Jerusalem, but due south, following the same 'cardinal' orientation of the *qaṣr*. This idea of an early *qiblah* towards Jerusalem would be also supported by the discovery claimed by Carlier and Morin of some 'Islamic tombs' in the cemetery oriented according to this *qiblah*. Due to the inconsistence of the other alleged evidences we might consider the possibility that this 'weird' orientation for Muslim tombs could be explained by the fact that they might be not Muslim tombs, but pre-Islamic and Christian ones belonging to an earlier settlement, which certainly existed in the vicinity of the Umayyad *qaṣr* as the written sources and the material evidences (*spolia*) prove. Carlier and Morin mention the finding at Tall Zabayir al-Qasṭal, 800 meters to the southwest of the Umayyad complex, of remains of a late antique (pre-Islamic) settlement, located by a Roman road. This dating and phasing of the complex (and the area) should be thus thoroughly reviewed: firstly, because as we have proven, the *Qaṣr* was built in two phases with the inclusion in the second one of pre-Islamic *spolia* (the Mosque might have even been built as part of a third building phase, or during the second one); secondly, because the dating claimed on the base of the archaism of the building type of the triconch audience hall cannot be taken into account because it is impossible that the audience hall would have had such shape; and thirdly, because the orientation of the complex according to an early *qiblah* oriented towards Jerusalem does not seem to be proven.

Alternative Phasing of the Complex: Continuity of Occupation and the Longue Durée Logic of the "Genius Loci"

According to our hypothesis, the first structure built in the site (nearby, not on the same spot) would have corresponded to a Roman fort or similar military installation, which was completely looted, which would have given name to the site (Castellum > al-Qasṭal), and probably located at Tall Zabayir al-Qasṭal. This would have belonged to the chain of forts from the *limes Arabicus* linked by a secondary road (a *via militaris*)[20] running north-south from 'Ammān in parallel and to the east of the *Via Nova Trajana*, and with a major stop at Zizyā, where still survives the huge cistern and traces of the roman fort dismantled to built several and successive military posts (the latest one dating from the British mandate still re-uses Roman *spolia*). The existence of this "outer road" between 'Ammān and Udhruḥ that bypassed the *wadi* systems to the west (and which forced the *Via Nova* to sort out the deep canyons of Wādī az-Zarqā' and Wādī al-Ḥasā) is accepted by both Benjamin Isaac and Thomas Parker (FIGS. 21a ,b). There is extensive evidence of

18. According to the tradition, the *qiblah* originally faced the *al-Haram al-Sharif* in Jerusalem. This *qiblah* was used for over 13 years, from 610 AD until 623 AD, till "Prophet Mohammad" changed it towards Mecca. This *qiblah* towards Jerusalem would have been re-instated as a result of the war between Abd el-Malik and Ibn Zubayr, who had seized Mecca. During this period it was not possible to perform the Hajj to Mecca (it was even banned by Abd el-Malik to prevent the propagandistic influence). This would have been the reason for Abd el-Malik to change temporarily the *qiblah* from Mecca back to Jerusalem even to develop a new pilgrimage centre (Carlier and Morin 1984: 245).

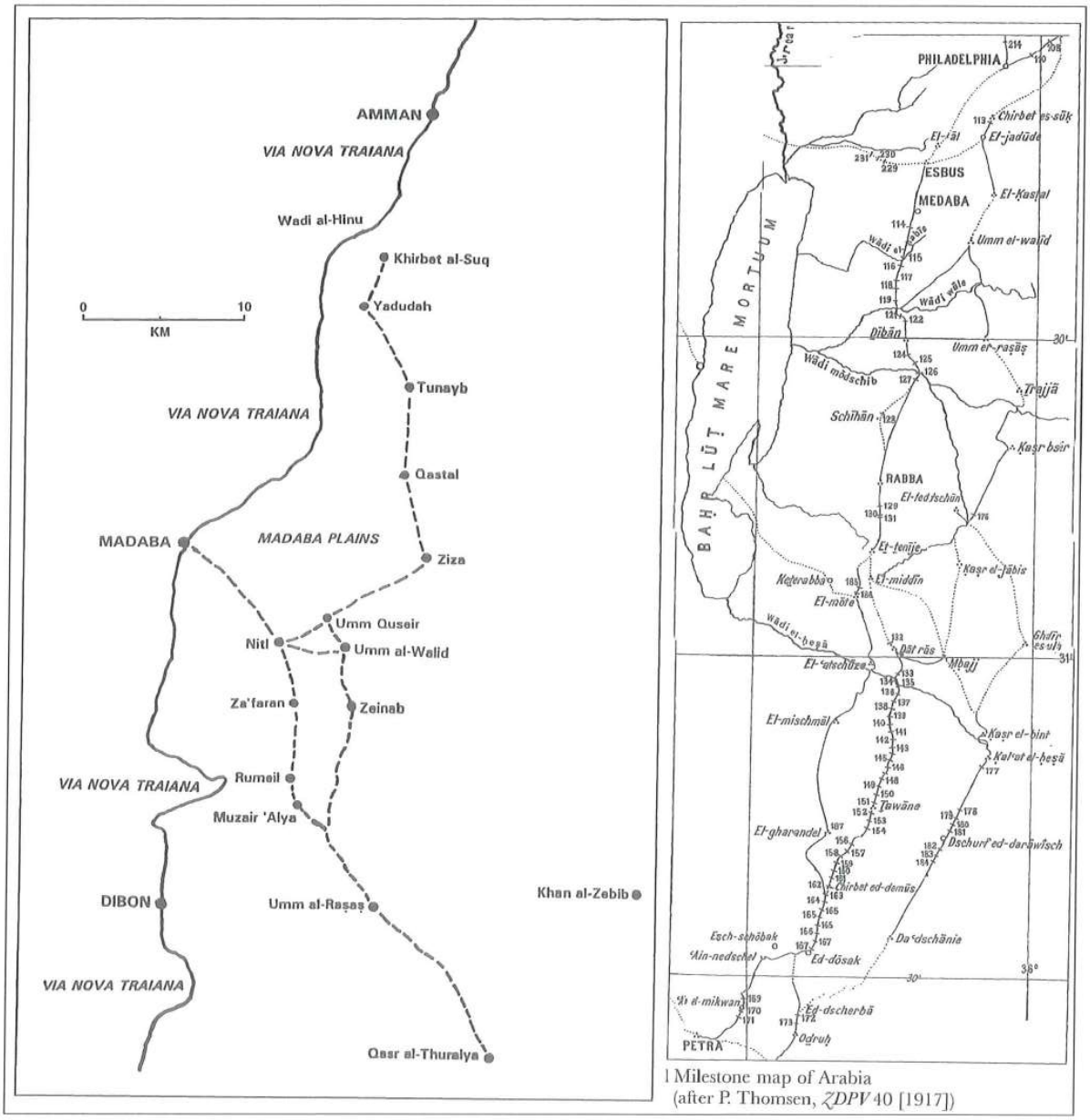
19. Arce 2015-2015.

20. B. Isaac has acutely observed that the road system is the raison d'etre for the forts, not the reverse (Isaac 1988).

the abandonment of Roman forts from the *limes Arabicus* in the region during the 5th century AD, many of which were re-occupied by monastic communities. This would have been the case of al-Qasṭal as well. References to a *'Dayr al-Qasṭal'* (*the monastery of Qasṭal*) are found in different written sources: A verse of the Umayyad poet *Jarir*, in an elegy on the *caliph Al-Walid I*, news of whose death in 715AD reached the poet while he was at al-Qasṭal, speaks of *Dayr al-Qasṭal* (Jarīr, Dīwān, (ed.) N.M. Ṭāhā, Cairo: Dār al-ma'ārif, 1969: 242/33 and Shahid 2002:188). This monastery would be also mentioned in the *List of Hamza* and the *Letter of the Archimandrites* (Shahid 2002: 188).

Umayyad Qasṭal

This monastery could have been one of those seized by the Umayyad elite, like the case of Haliarama, which became Qaṣr al-Ḥīr al-Gharbī, or the one at al-Ḥallābāt , which



1 Milestone map of Arabia (after P. Thomsen, *ZDPV* 40 [1917])

21. Plans of the via militaris linking forts to the east of the *Via nova Trajana*.

occupied together with a palace, the premises of the former Roman fort during the 6th century AD (Arce 2015). The new Umayyad *qaṣr* of Qasṭal would have been built close to this previous building(s), probably while it was still used as a monastery, or after its seizure, following a *'parallactic*[21] *model'* of settlement, and adopting the toponomy. This might explain the use of the term *Qasṭalain* ('the two Qasṭals') used by Kuthayyir 'Azza to describe the site as a double settlement[22]. Later, in coincidence with the second building phase of the Umayyad *qaṣr* that we have identified, this pre-Umayyad building (probably a fort transformed into a monastery) would have been completely dismantled and part of its material reused as *spolia* in the works of the second phase of the Umayyad *qaṣr;* in a moment with more financial resources available. Different scholars have pointed that the term "*Qasṭalain*" ("*the two Qasṭals*") here may "refer to al-Qasṭal and al-Muwaqqar just as 'al-'Iraqayn' (the two ' Iraqs) refer to Kufa and Basra, or 'al-Qaryatayn' for Mecca and Medina"(Bisheh 2000). The association is done between al-Qasṭal and al-Muwwaqar due to other poem by Kuthayyir 'Azza which relate them to the same owner. But this term could make reference instead to the existance side by side of two different settlements or structures at al-Qasṭal itself: One pre-islamic (probably a Roman fort which could have been transformed into a monastery after its abandonment in the 5th century AD, and later looted and dismantled), and another one built *ex-novo* by the Umayyad elite beside or in the vicinity of the previous one. This hypothesis would be coherent with the "*parallactic model*"of settlement adopted very early by Muslims settlers. The cases of Raqqa and Rafiqa (*Raqqain*, the two *Raqqas*) set successively beside the Roman Callinicum, or those of Fustat founded ex-novo besides the Roman fort and settlement of Babylon on the Nile, or Jabiyya outside Damascus, would be clear parallels of this procedure. Closer and more similar to our case would be the settlement founded by Hisham south of Resafa-Sergiopolis, or Qaṣr al-Ḥayr al-Gharbī , founded on the premises of a monastery (Haliarama) patronized by the Ghassanids and seized by the Umayyads.

The question posed now is if we can associate these phases to any precise patron. Written sources associate Qasṭal al-Balqā' firstly with the Ghassanid *phylarch* Jabala ibn Harith (al-Isfahani in his Annals)[23], and later with the Umayyad caliphs *al-Walid ibn 'Abd al-Malik* (65–86/685–705), *Yazid ibn 'Abd al-Malik* (101–105/720–24) and *al-Walid ibn Yazid* (125–26/743–44)[24]. The association of these patrons with any structure, surviving or demolished, can be only conjectural and is based on these few surviving texts (and their meagre information), and on the material evidences retrieved.

A Third Phase Patronized by Walid Ibn Al-Yazid?

Despite the destruction inflicted to the *Qaṣr* in 1984, it was possible for the French team to explore the remains of the north area where some floor mosaics were miraculously found. It was noted a clear difference between the

21. "Parallactic" model (in opposition to "palimpsest" model) makes reference to the construction of a new structure or a city beside an existing one, and not on top of the pre-existing one or growing concentrically. The use of this term to describe this characteristic of many new Islamic urban settings was already used by Paolo Cuneo in "Storia dell'urbanistica II Mondo Islamico" Roma 1986. See also Patrizio A. Cimino, G. Matteo Mai, Vito Redaelli (2010) "Dizionario di storia urbana", Maggioli Editori, Santarcangelo di Romagna. P.129.

22. In a panegyric verse addressed to Yazid, the poet Kuthayyir 'Azza (dead in 105: 723) mentions al-Muwaqqar and al-Qasṭal in a context which indicates that both belonged to the same patron: 'May God bless the quarter (family) whose abode is in Muwaqqar (and extends) to Qasṭal al-Balqā' of the elevated *maḥarīb*', or 'where the *maḥarīb* are' (Kuthayyir 'Azza, Diwân, (éd.), H. Pérès, II: 133). In another poem composed by the same poet in praise of Yazid, mention is made of the two Qasṭals (*bi-l Qasṭalayn*): 'May God reward a quarter in Muwaqqar with pleasant life, and may the thunder clouds let fall copious rains with the abounding clouds and pouring showers, he was bestowed in the two Qasṭals with abundant boon'.

23. "Jabala ibn Hârith, king of the Ghassanids, order to build *Adraj* (Udhruḥ), *Canathir* (Umm al-Walīd) and Qasṭal" al-Isfahani Hamza al-Hasan: Annales, Petropoli 1844: T. I. P. 117; T. II, VII, P. 92.

24. Jarīr, Dīwān (ed.), N. M. Ṭaha (Le Caire : Dār al-ma'ārif 1969): Pp. 233-242; Kuthayyir 'Azza, Dīwān (ed.), I. 'Abbās (Beirut: Dār al-Thaqāfa, 1971): Pp. 340-349; al-Ṭabarī, Tārīkh, II: 1784.

22a. Quṣayr 'Amra, alcove floor mosaic, dated to the time of Walid ibn al-Yazid (Walid II). 22b. Qaṣṭal al Balqā', mosaic floor from the north portico with the same pattern consisting in a double superimposed net of entangled polychrome circles (Carlier and Morin 1987: Pl.XL.2).

richness and complex patterns found in the floor mosaics from this north portico and its apartment (using tiny and richly coloured glass *tesserae*), contrasting with the simpler patterns and lower quality observed in the mosaics from the eastern and southern porticoes (with a simple pattern of circles and squares alternated, using coarse big-sized stone *tesserae*). The peculiar pattern of this richer mosaic floor from the northern portico (FIG. 22b) consisted in a double superimposed net of entangled circles executed with small glass tesserae with a rich combination of hues. This pattern, plus the size and material used, are exactly the same ones found in the mosaic floor from one of the lateral alcoves at Quṣayr 'Amra (FIG. 22a). The latter can be dated as coeval with the mural painting decoration, which has been recently proved that was implemented under Walid ibn al-Yazid[25].

This distinctive decoration of the north apartments at Qaṣṭal could have been carried out by the same artisans, and commissioned by the same patron of Quṣayr 'Amra. The use of identical patterns in both mosaics, combined with the use of the same kind and size of glass *tesserae* in the north block at Qaṣṭal and in the lateral alcove at Quṣayr 'Amra, would indicate that both floors are coeval, and quite late in date (both would date from Walid II epoch), in contrast with the older and coarser mosaic floors from the other areas of Qaṣṭal, which present simpler patterns, and stone tesserae of much bigger and coarser size. This would reinforce the idea of a more complex sequence of construction and/or execution of its decoration (which in this north section might belong to a third phase). This hypothetical latest Umayyad phase (these later and richer mosaics) could be thus coeval to that of the decoration of Quṣayr 'Amra, *i.e.* corresponding to the caliphate of Walid ibn al-Yazid.

Conclusions

All these evidences lead to the conclusion that the Umayyad *qaṣr* at Qaṣṭal was built in at least two phases (maybe even three, not taking into account latter medieval transformations), corresponding probably to two different economic and political contexts during the Umayyad period, with a clear improvement in the prosperity and availability of resources for its construction in the latter phase. The first phase would have foreseen the construction of a *qaṣr*, completely symmetrical and regular in

25. The hypothetical coeval dating of the paintings and the mosaics in 'Amra would be confirmed by the finding of big amounts of freshly cut mosaic *tesserae*, ready to be applied on the semi-domes of the *caldarium*, which have been recently discovered in a service room excavated by the author at Quṣayr 'Amra. This would indicate that the decoration scheme of the bath house (at least the wall mosaics) was not finished, probably due to the death of Walid II in 744 AD.

plan, with a simple corridor as vestibule, which was not completed. Its construction was undertaken using cheap materials, and a simple building technique, not usual in other Umayyad buildings[26]. This first *qaṣr* was started from its northeast corner, building apparently at the same time the external perimeter wall and the internal partition walls[27]. The construction of this 'first' *qaṣr* was interrupted at a certain point, being resumed later[28] with relevant changes, which included the addition of an elaborate and complex entrance hall to the south of the only remaining Syrian *bayt* built in the first phase, and the general improvement of the quality of the building materials used in this second phase. The new lavish entrance vestibule, composed of two square bays, was flanked by two symmetrical staircases, and roofed in its lower floor most probably with two sail vaults. The upper floor of this entrance block would have hosted an audience hall, divided also in two sections, one of them covered by a dome on pendentives and the other one by a barrel or sail vault. This second phase is also characterized by the systematic use of *spolia* from Roman and Christian buildings (chancels of a church, and other Classical elements, like the niche head or the big plain *tabula ansata*). This indicates it was built during a different socio-politic and more prosperous economic context, with the availability of more economic resources and the possibility for the new Umayyad patrons to dismantle and reuse *spolia* from pre-Islamic structures existing in the vicinity. A further third phase could be hypothesized, which would involve the addition of rich decorated glass-mosaic floors in the north portico and its corresponding *bayt*. Our hypothesis would also help clarifying the discussion on the existence of a Roman fort in the area which would have given name to the site (and the Umayyad palace itself: *Castellum* > *Qaṣṭal*). It would explain also the presence in the area of a palace and a monastery patronized by the Ghassanid *phylarchs* (*Dayr al-Qaṣṭal*) recorded in the *List of Hamza* of Ghassanid-supported monasteries (Shahid 2002, 187)[29], and recorded in the *Letter of the Archimandrites* as well. According to these sources, Qaṣṭal would have been built (or refurbished) by Jabala ibn al-Harith (Shahid 2002, 326). The niche, the chancel base and the post reused by the Umayyads in the access to the subterranean cistern in the court might have come from the monastic church, while the *tabula ansata* might have come from the Roman military installation (possibly reused as palatine/monastic venue, like at al-Ḥallābāt)[30]. In this case we would have at Qaṣṭal al-Balqā' another sample of the sequence we have identified in other Umayyad sites, where abandoned Roman forts were reoccupied and refurbished as monasteries (and in some cases also as palaces), before being transformed into Umayyad *quṣūr* (Arce 2012, 2015). In our case the Roman fort, which might have been transformed into a monastery (Dayr al-Qaṣṭal in the written sources) was probably dismantled and its material used as *spolia*. It was located probably near the current *qaṣr* at

26. A similar technique can be found in the eastern façade of the Umayyad palace of Shuqayrah al-Gharbiyyah.

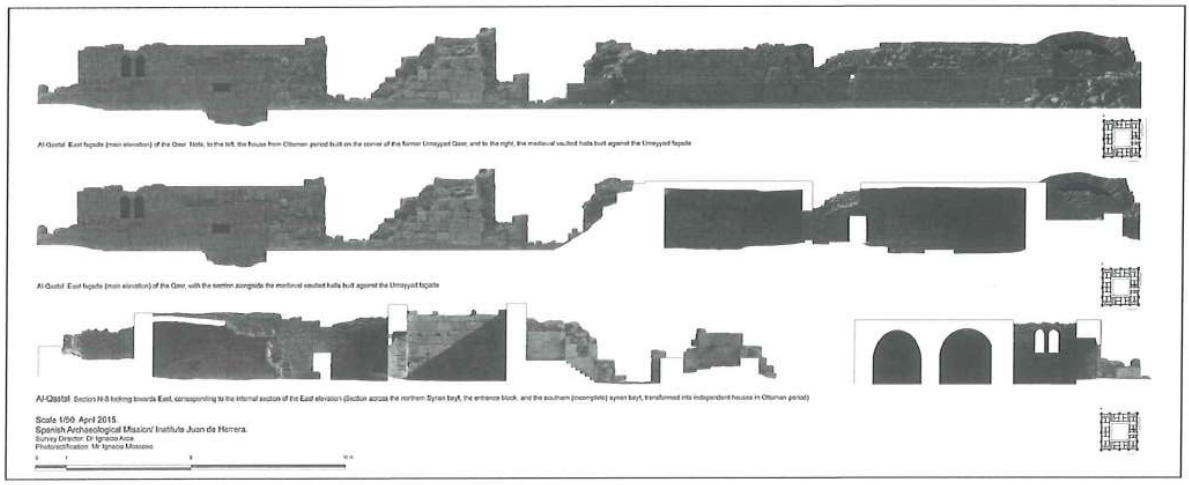
27. This fact is unusual, as it would contradict the normal procedure of construction which we can identify in many other Umayyad *quṣūr* (Khirbat al-Mafjar, al-Mushatta *etc*). According to this standard procedure (of Roman Military origin), the perimeter wall was built first. Later, all the internal partition walls were built against it (usually bonded to protruding stones left on purpose projecting out of the perimeter wall to link the partition walls to it -Arce 2016). An explanation to this unusual situation found at al-Qaṣṭal , would be that the remaining sections of the perimeter wall (if any) built in the first phase with such a poor material were dismantled and rebuilt a *fundamentis*.

28. It is not possible to know if this interruption and change of plan was a small lapse of time or a long period, although the higher level and the pattern of weathering of the first phase masonry could have been not only the result of the worse quality of the stone used, but also because of a long exposure to the elements during the interruption, before the works were resumed and completed.

29. A verse of the Umayyad poet Jarir, in al elegy on the Caliph Al-Walid I, news of whose death in 715 AD reached the poet while he was at Qaṣṭal, speaks of Dayr al-Qaṣṭal (Shahid 2002: 188).

30. Hamza in his Chronicle or *Tarikh* (77 *Quoted in Shahid* 2002: 326) states that Jabala ibn al-Harith "built (*bana*) *al-Qanatir*, and Adruh and al Qaṣṭal". The three of them in present-day Jordan : Qanatir would be Umm al-Walid, Adruh would be the former Roman camp of Udhruḥ and Qaṣṭal would make reference to our site. Shahid quotes Noldeke pointing that the term bana used by Hamza could make reference to the refurbishment of pre-existing structures (Shahid 2002: 327), something that would make sense in the case of reusing pre-existing Roman installations from the limes, like *Udhruḥ* and Qaṣṭal itself.

Tall Zabayir al-Qasṭal (identified as the "ancient settlement" -Carlier and Morin 1987: 222 and fig. 1), where pre-Umayyad remains and a cemetery were found, in an area located by the Roman road that runs southwards to the Roman Fort of Zīzyā. The strategic location, the hydraulic infrastructures available and the advantageous conditions of Qasṭal in many other aspects, explain why the site, occupied at least from Roman times would be continuously inhabited after the fall of the Umayyads, during the Abbasid, Ayyubid-Mamluk, Ottoman and the Mandate period, till present times (FIGS. 23 , 24).



23: Al-Qasṭal al-Balqā'. Orthorectified photographic documentation of the complex. 23a. East façade of the *qaṣr*. Notice on the left (southern) end of the elevation, the dismantled Umayyad circular corner tower, and the Ottoman house built in the SE corner of the complex (with a *geminated* window); in the central area can be seen the remains of the collapse of the central block which apparently was never rebuilt after its collapse during the 748-9 AD earthquake; meanwhile in the right section (northernmost end of the elevation), it can be seen the extramural vaulted halls built in Ayyubid-Mamluk to shelter (and reuse) the Umayyad extramural cisterns built alongside this eastern façade of the *qaṣr*. 23b. East elevation of the *qaṣr*, including the longitudinal section along the aforementioned Ayyubid-Mamluk vaulted halls; 23c. South-North section (looking towards East), across the northern Syrian *bayt*, the entrance block, and the 'incomplete' southern *bayt;* on the right section (southernmost end of the section) can be seen the medieval vaults built atop the Umayyad walls, and the internal elevation of the Ottoman house, with the mullioned geminated window and its access gate, opened in the southern façade

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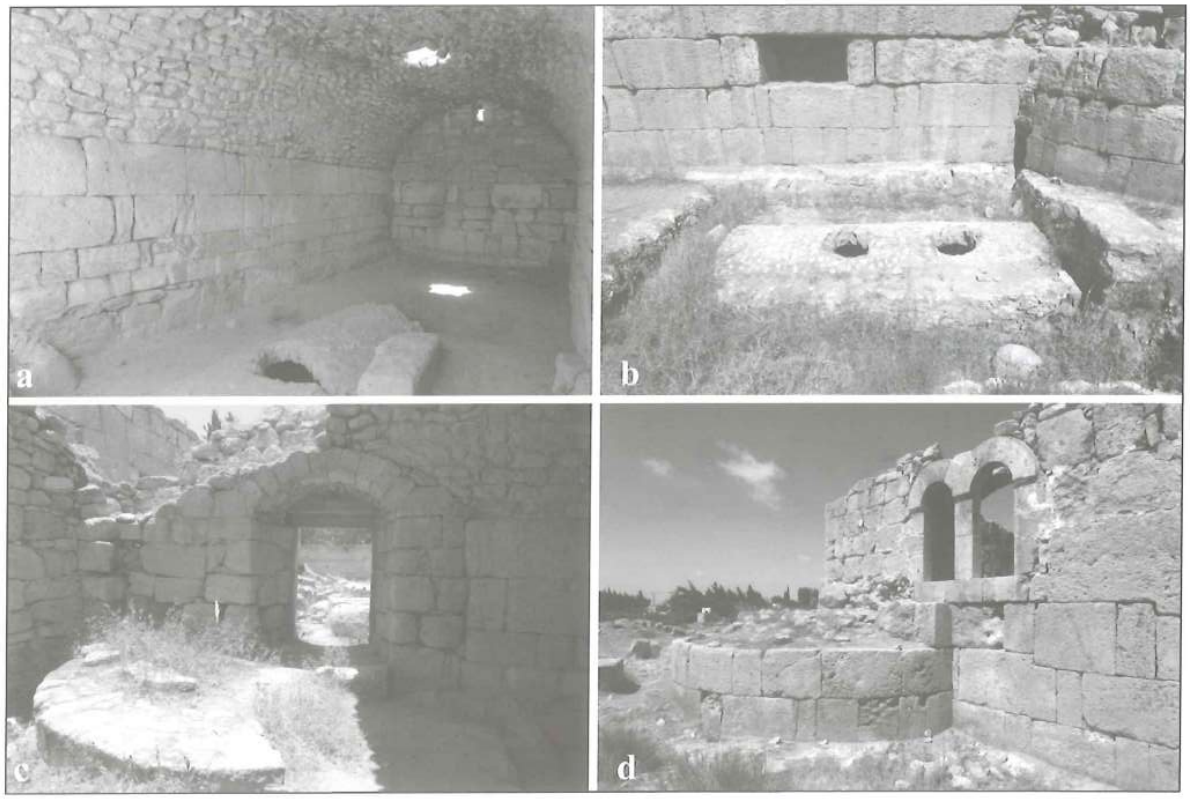

24. Qasṭal al-Balqā'. Adaptive reuse throughout the centuries: the relevance of the *Gen*ius Loci; 24a. Ayyubid-Mamluk vaulted hall built against the east façade of the Umayyad *qaṣr* to make use of the extramural Umayyad subterranean cisterns (note how the medieval vaults spring from the Umayyad masonry; 24b. Detail of one of the Umayyad cisterns which justified the continuous re-use of the structure; 24c. Ayyubid-Mamluk gate opened on the east façade of the Umayyad *qaṣr*, dismantling one of the semicircular towers of the façade, to give access to the new vaulted hall seen in FIG. 24a; 24d. Ottoman House with a characteristic mullioned geminated window, built on the SE corner of the former Umayyad *Qaṣr*, once the corner tower was dismantled.

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Ina Kehrberg

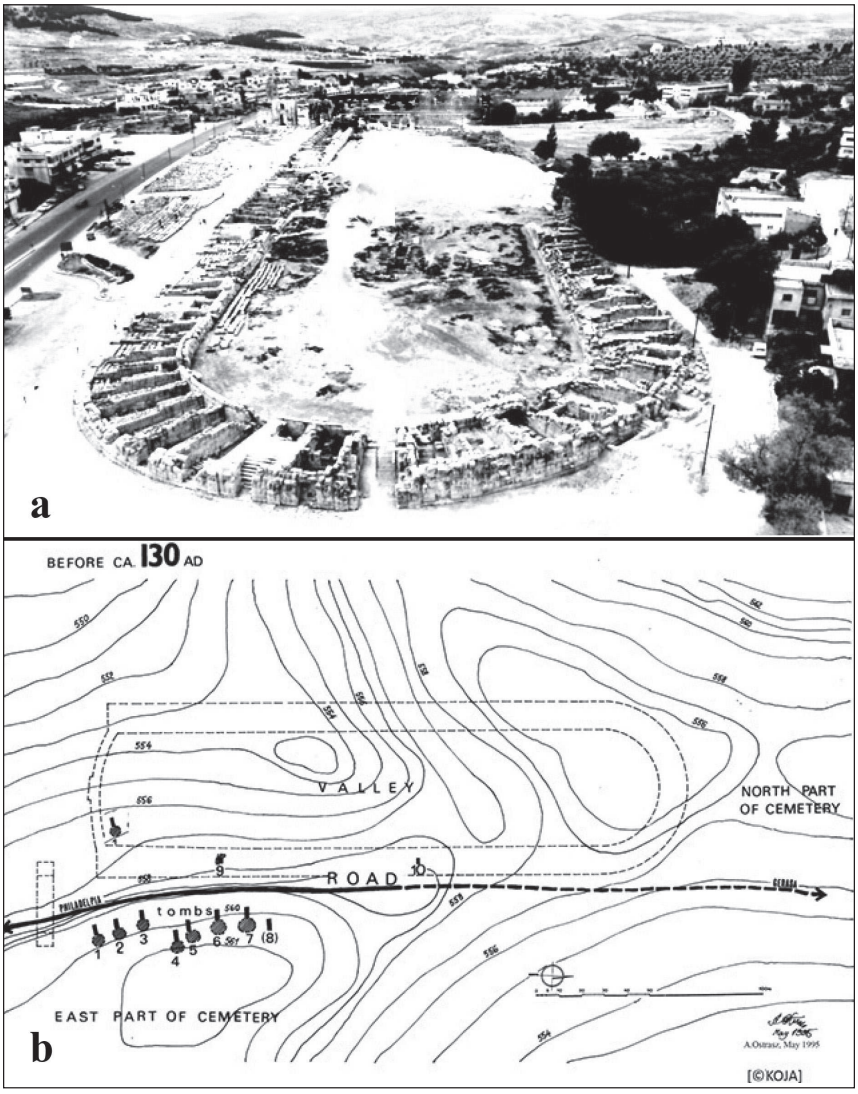
Pottery and lamps from the Foundation- and Upper Walls Constructions of the Gerasa Hippodrome: Excavations 1984-1996 by Antoni A. Ostrasz

Introduction

This paper concludes the series of discussions Antoni Ostrasz and I have published in preliminary reports covering many years of our work and research at the hippodrome: in the main its architecture and archaeological contexts comprising the occupational history and changes of the hippodrome and the site[1]. Salient architectural evidence for the original building process of the Gerasa hippodrome has already been introduced by Antoni Ostrasz allowing for omitting references already cited in his published reports[2]. Nor are the site and our work unfamiliar to *ICHAJ / SHAJ* participants and readers. Lastly this paper does not set out to review, compare and contrast copious corpi of ceramics. All pottery and lamps are standard forms representing Gerasa pottery of the Late Hellenistic, Early Roman and Roman periods discussed in various preceding papers[3]. We are fortunate to have abundant material evidence to ascertain dates of manufacture and commerce of the pottery and lamps; even transitional cultural phases of production are relatively easily discernible to ceramicists backed by solid quantitative and corroborated data at Gerasa and other Decapolis cities.

The paper aims at rounding up and adding new evidence since our earliest publication (Ostrasz 1989a, 1989b; Kehrberg 1989) by presenting a concise illustrated account of the site during construction, *i.e.* archaeological data from foundation contexts and some of the original hippodrome building seen on (FIG. 1a) The photo taken by Antoni in 1995 (from a crane) shows the cavea and arena excavated by Antoni from 1984 on and his restoration in progress. I was -and still am- in charge of the study of the archaeological material finds, but not infrequently engaged in fieldwork after the tumbled remains had been plotted and systematically removed by Antoni and we had reached contexts which required *minuti* excavation like in chambers W2 and W3, the mass burials of the mid-7th century plague victims and the strata below[4]. I might mention here that all burials of the hippodrome phases, not those of the necropolis phase, and their archaeological contexts are

1. I wish to thank Bob Bewley for having presented my paper on 22nd May, 2016, Amman.
2. See Ostrasz 1989a, 1989b, 1990, 1991, 1995a, 1995b; Kehrberg and Ostrasz 1997.
3. See *e.g.* Kehrberg 1989, 2004, 2006, 2011b.
4. Assisted by Mark Kehrberg-Ostrasz in the excavations and finds assemblages; see also cited references in Kehrberg and Ostrasz 2017.



1a. Hippodrome aerial view facing south (1995, A.Ostrasz). 1b. Necropolis and topography of the site with projected plan of the hippodrome (May 1995, A.Ostrasz).

published by Antoni (posthumously) and myself in *ADAJ* 58 (Kehrberg and Ostrasz 2017).

A brief explanation of the copyright *'© KOJA'* (Kehrberg and Ostrasz Jarash Archives) cited on (FIGS. 1-10) is warranted: In recognition of our work at Jarash the Australian Government, in affiliation with the University of Sydney, awarded a large amount of permanent e-storage for *KOJA* on their digitalised database site, e-RDSI (Research Data Storage Intersect). The site has been created to protect and preserve major archaeological and historical archives for future research.

Contexts and their Archaeological Finds

As pointed out in the introduction, this paper completes the published series of phases of use and reoccupations at the hippodrome (*e.g.* Ostrasz 1989; Kehrberg 1989; Kehrberg and Ostrasz 1997) concluding with samples of the rich archaeological finds deposits, in the main from the 1989-1996 excavations, dating the foundation, – construction – and original use phase of the hippodrome as an arena for chariot racing (Ostrasz 1990).

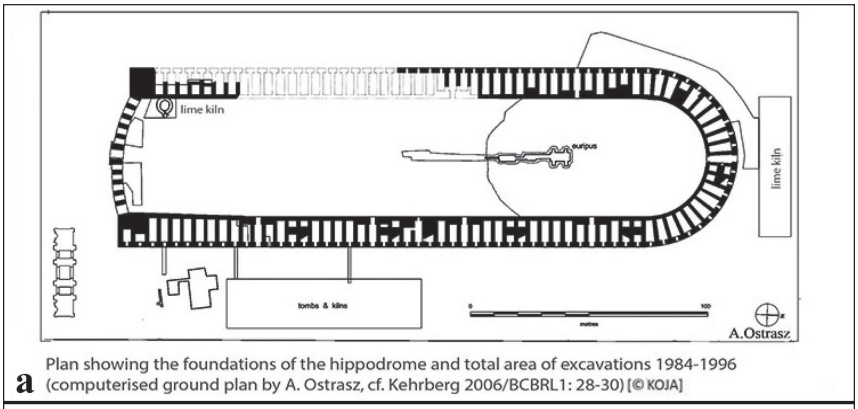
The plan on (FIG. 1b) maps the topography and known or excavated hypogean tombs of the said necropolis, and locates precisely where the circus was to be. Like the other plans and sections by Antoni, it has been published in a previous paper (Ostrasz 1995) sufficing here to illustrate them as a recall for the figures con-

cerning the foundation contexts presented here.

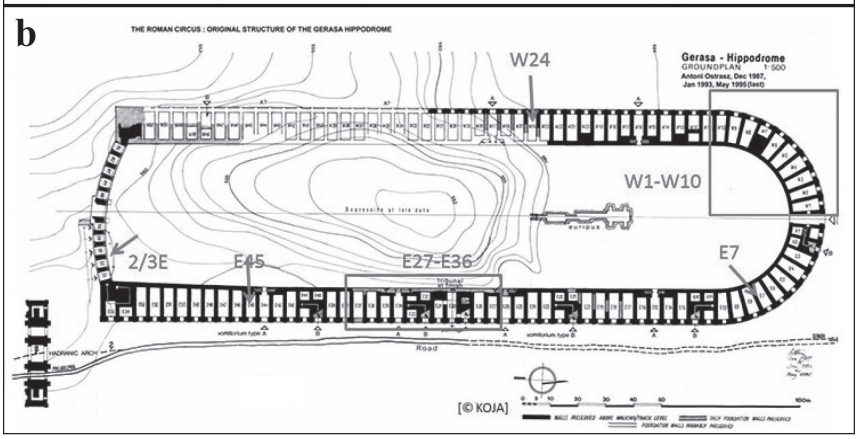
The date range for laying the foundation of the cavea seen on (FIG. 2a) is bracketed within the first half of the second century AD by archaeological data corroborated by numismatic evidence presented on (FIG. 6). The most telling contextual evidence is the closure of the S-W precinct of the necropolis or its hypogean tombs and the annexed quarry. This occurred before or latest by 129/130 AD in preparation for building Hadrian's Arch dedicated in 129/130 AD; the date of the inscription of the arch is equally backed by contextual finds of the structure's core (Seigne and Morin 1995) and the subsequent building of the circus dated by contextual finds from foundations and upper building levels occurring shortly after.

The ground plan on (FIG. 2b), (Ostrasz 1995) marks some of the excavated contexts showing the spread of the loci and their deposits; they are representative of many more find spots giving an overview of their homogeneity; one has to remember that we excavated almost the entire hippodrome and its periphery from 1984-1996. Construction methods of cavea foundations and chambers and podium walls illustrated on (FIGS. 3a, 3b) (Ostrasz 1989 and 1991) also serve to show where some of the contextual artefacts were found, that is, in the fills of wall constructions and collapsed wall and/or seating segments. The hypogean tombs and quarry cuts (FIG. 3b) were part of the foundation of the east cavea chamber E45 exposed during excavation.

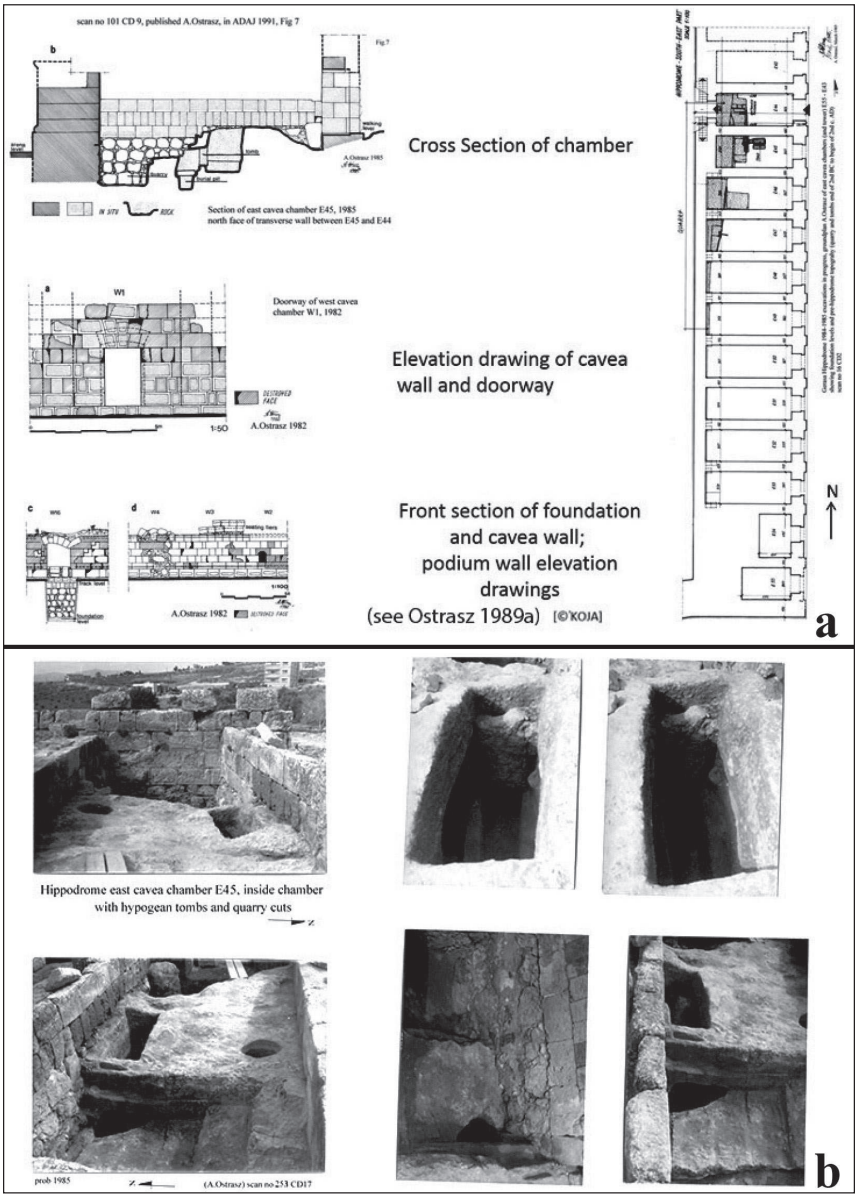
The same applies to sketches on (FIG. 4) showing rare examples of 'dirt layers' *in situ*, preserved through careful excavations which also confirmed how the lowest courses sealing the foundation or ground level of the cavea were built: layers of small stone chips with finer dust particles from chipping – a whitish-grey layer – prove that final dressing of blocks occurred after being put on the wall course; the stone chips were then covered by another dirt layer embedding the 'planned "floor" level'. Once identified by Antoni, I recognised the same construc-



a Plan showing the foundations of the hippodrome and total area of excavations 1984-1996 (computerised ground plan by A. Ostrasz, cf. Kehrberg 2006/BCBRL1: 28-30) [© KOJA]



2a. Ground plan of extant remains of the hippodrome after excavations 1984-1995 by A.Ostrasz. 2b. 1995 Ground plan with areas of foundations and construction contexts.

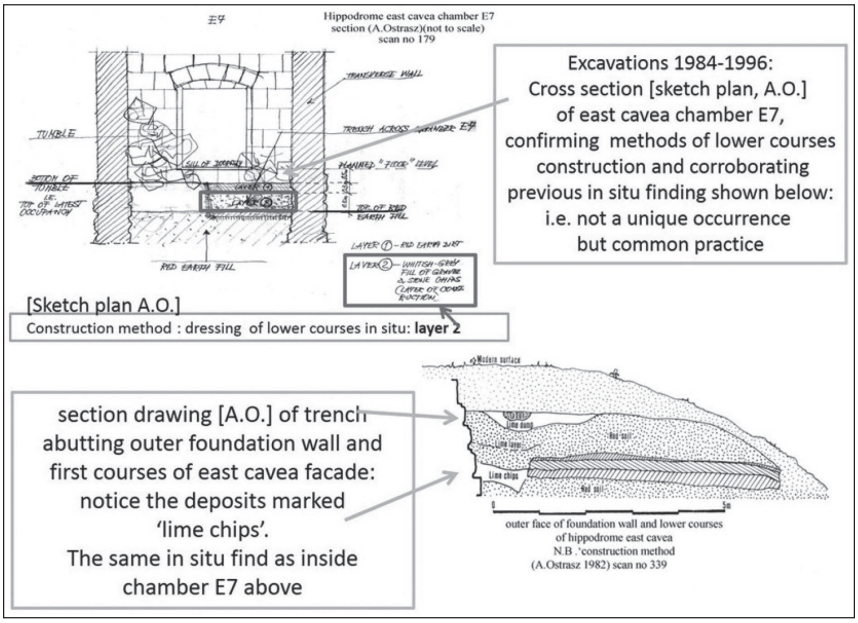


3a. Examples of foundations and building methods (A.Ostrasz 1989). 3b. Rocky foundations of the east cavea: hypogean tombs and quarry cuts.

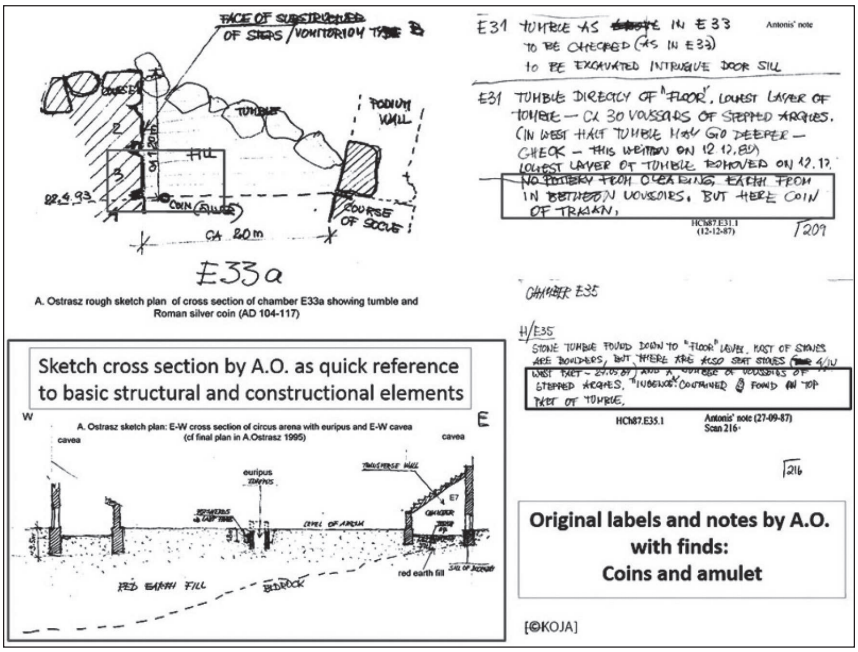
tion method evidenced at other excavations. It is important to note that the chip layer or 'layer of construction' (FIG. 4:2) was sterile, *i.e.* there was no time for accumulation of residue before the chip layer was covered, yet more evidence for the building method. At another find along the east cavea chambers were unused and unfinished building blocks still aligned *in situ* in the foundation trench, clearly not having been needed when completing the lowest courses of that transverse wall and covered with fill up to the floor level in the chamber.

The sketches on (FIGS. 4, 5) provide another glimpse of Antoni's in-field sketches and labels accompanying each excavated find or deposit. Depending on the quantity of a deposit there may be any number of labels for the same find spot and numbered, for instance "1 of 5" with identical description or sketch per label. It is this meticulous method of recording which enabled accurate calculations of total assemblages from the excavated areas.

The main purpose of showing the coins on (FIG. 6) is to provide some of the numismatic evidence as collateral confirming the date range of the ceramic finds in the same or similar con-



4. Examples of construction methods of lower courses of the cavea.

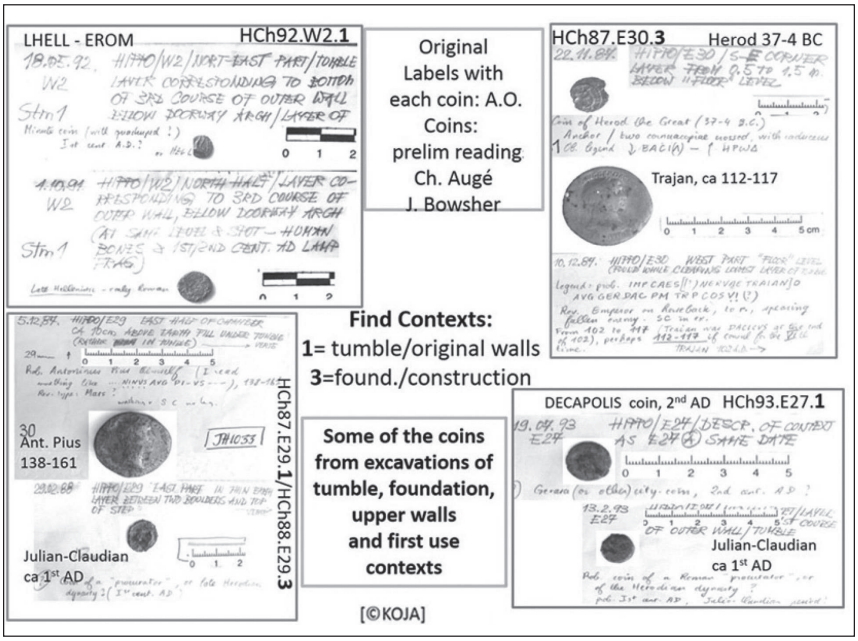


5. Sketches and notes on site: fieldwork in progress by A. Ostrasz.

texts[5]. These coins, among others come from contexts of foundation levels, upper walls construction and tumble of original upper strata of the cavea. As with the early lamps and pottery, the majority of the coins date to the necropolis phase of the site. Some examples from the east cavea chambers E27 and E29 date either the foundation and / or construction phases of the circus and corroborate the ceramics finds like the Gerasa Lamps. Christian Augé and Julian Bowsher studied the coins and their contributions will appear together with Antoni's coin inventory listing the find spots, contexts and loci.

As the coins the ceramics give a concise overview of the material evidence attesting the beginning or building and first use of the circus. Some of the lamps and early pottery shown on (FIG. 7) are known from previous

5. I must apologise for the poor quality of the photos on fig. 6; they were taken for record's sake before handing over the entire coin collection of the hippodrome to the DoA, with Antoni's labels as shown here.

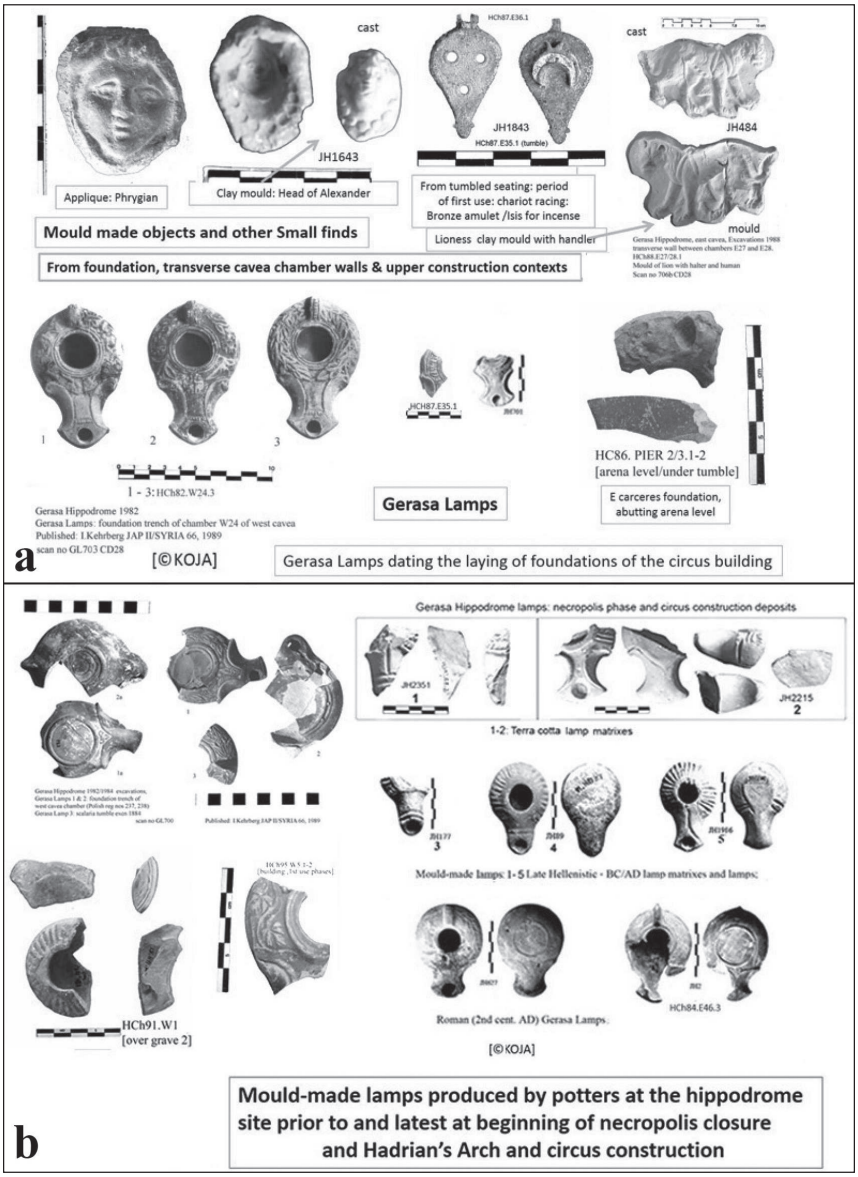


6. Coins from foundation and construction contexts with labels by A.Ostrasz.

papers (*e.g.* Kehrberg 2011) and introduced in our first articles on the hippodrome (Kehrberg 1989), together with Borkowski's study of the inscribed altars related to chariot racing victories (Borkowski 1989). The inscription on Hadrian's Arch and the altars have provided a solid bracket within which the circus was built and subsequently used for chariot racing, fitting well with the ceramic and numismatic evidence.

The objects on (FIG. 7a), or especially their types are traditionally used to date contexts; they, especially the lamps are defined by their iconographic and form styles associated with cultural periods of production, *i.e.* Late Hell, BC/AD, Early Roman or Trajanic, Roman and Late Roman, Byzantine *etc.* I have been able to demonstrate that mould-made objects are not always 'safe' to use for dating a context: hippodrome potters reused earlier moulds and lamps to make new moulds (Kehrberg 2001, 2011a). However, this becomes apparent once one examines and correlates quantitatively the whole deposit or assemblage – a holistic approach to chronological typology. Here we see the classic Gerasa Lamps*:* their primary productions dating from the end of the 1st to mostly first half of the 2nd century AD as established by Iliffe (1945) stands firm; our lamps are the original product – not 'compromised' by above mentioned later reproduction. Other finds, especially pottery and rarer items like coins, the bronze amulet, the moulds of a lion and cameo head of Alexander the Great shown here as well as the appliqué head of probably a Phrygian on a rim of a rather fanciful bowl all fit within the period of construction of Hadrian's Arch and the hippodrome which was probably planned already during the building of the arch as shown on Antoni's pre 130 AD plan of the site. There is no space to go into details but I have discussed planning aspects of Roman Gerasa in a previous paper (Kehrberg 2011b).

Some of the lamps on (FIG. 7b), as those on (FIG. 8a), are representative samples evidencing Late Hellenistic to 1st century BC/AD potters having been active at the necropolis site catering for burial gifts. Although the two, and quite unique clay lamp matrixes nos 1-2 were found in Late Roman pottery workshop waste dumps they affirm the same activity prior to the hippodrome. This is indeed corroborated by other lamps finds of the earlier or pre-Gerasa Lamps period, the BC/AD types like the examples shown on (FIG. 7b) coming from contexts of the east and west cavea. I have discussed most of the lamps shown here, and their con-



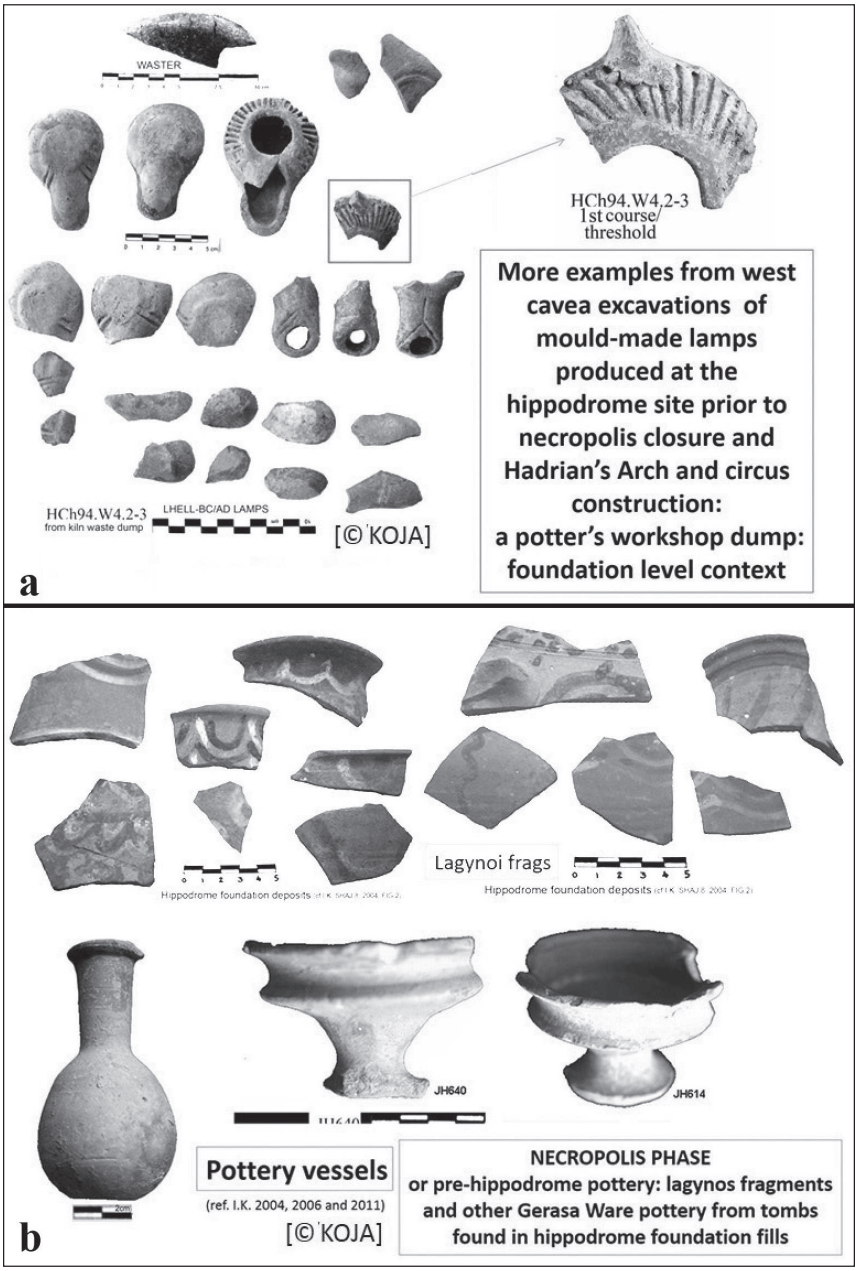
7a, b: Lamps from the necropolis phase and the construction phase of the hippodrome.

texts in previous papers (*e.g.* Kehrberg 2011a).

Whilst some of the Gerasa Lamps appear to have been placed at the very foundation of the cavea chambers as a *quasi* votive offering, (FIG. 8a) shows some examples and further evidence of BC/AD lamps coming from potters' waste dumps incorporated in the foundations of the hippodrome.

The waster, a fragment of a standard carinated bowl or cup and one of several examples, was found with the lamp fragments and highlights the nature of the foundation deposits being that of pottery workshops waste dumps. The lamp type is again the common variety current in the first centuries BC and earlier AD. Detail of the unusual and messy attempt of attaching a knob-like 'handle' may suggest poor workmanship or, more likely experimentation as this early lamp type is not known to have had a handle in Gerasa; more importantly, these examples were probably made in the first century AD rather than BC. Knob-lug handles become part of the late 1st-2nd century AD repertoire of Gerasa Lamps and their descendants (FIG. 7).

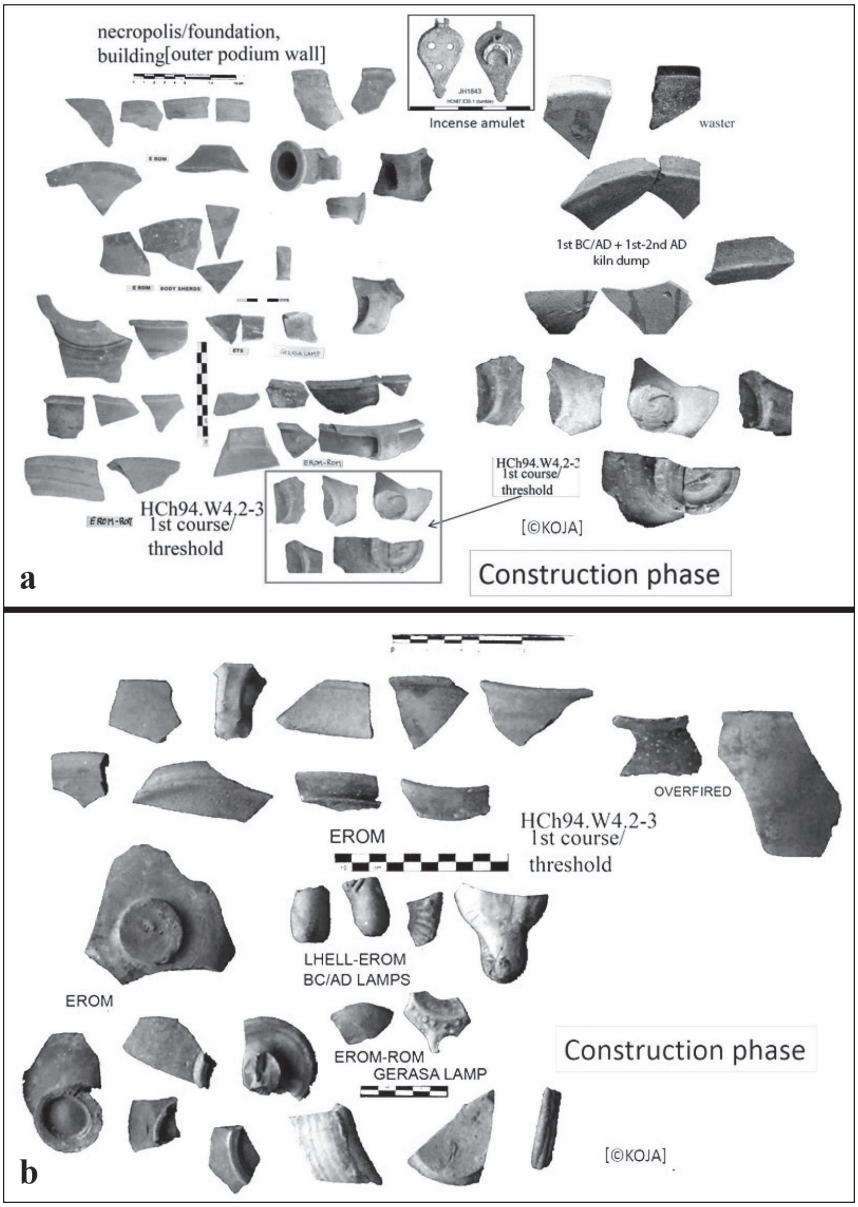
(FIGS. 8b, 9) present some of the pottery finds that either accompanied the lamps shown here or were found without lamps; clearly not every waste dump had the same composition of



8a, b. Lamps and pottery from the necropolis phase in foundation fills of the circus.

discarded objects, nor would the circus builders be 'selective' but rather avail themselves to dirt found at hand and underfoot as it were. This is another point I noted during other excavations I took part in and remarked upon in articles: *in situ* evidence clearly shows that builders used materials lying underground or nearby, whether stones or dirt fill carrying the material remains of that particular lot or locality with it. The hippodrome is no exception and the builders availed themselves to whatever could be retrieved from the site itself as seen on (FIGS. 8b-10).

As noted above with the lamps, the pottery shown on (FIG. 8b) is associated with the hypogean tombs or necropolis at the site. While the phial is a typical example of the 1st BC, and the cups are usually associated with burials of the 1st century BC/AD, the painted pottery fragments can be associated with the burials dating from the later 2nd to 1st century BC. After far reaching research I identified and named the pottery '*Early Painted Gerasa Ware*' and



9a, b. Pottery from west cavea construction and first use phases of the hippodrome.

discovered that it had to be associated with the lagynos jug and the *lagynophoria* burial cult of that period. I have discussed this new Gerasa ware in a number of publications together with the lagynos and other objects of the Late Hellenistic Tomb found in the 2001 season of the 2000-2003 city walls excavations project[6].

Suffice it to say here is that these locally made examples or copies of imported lagynoi (Kehrberg 2004) come from the tombs at the hippodrome site and were found with foundations deposits, the cavea chamber either incorporating a hypogean tomb or a tomb lying within vicinity shown earlier and thus also employing a potter's or necropolis dump. The same can be said for the east carceres foundations in part incorporating a tomb underneath the arena in front of the stalls (FIG. 1b). It allows us to pinpoint the beginning date of the necropolis being more or less contemporary with or even earlier than the earliest lamps shown in this paper (see especially the matrixes on FIG.7b).

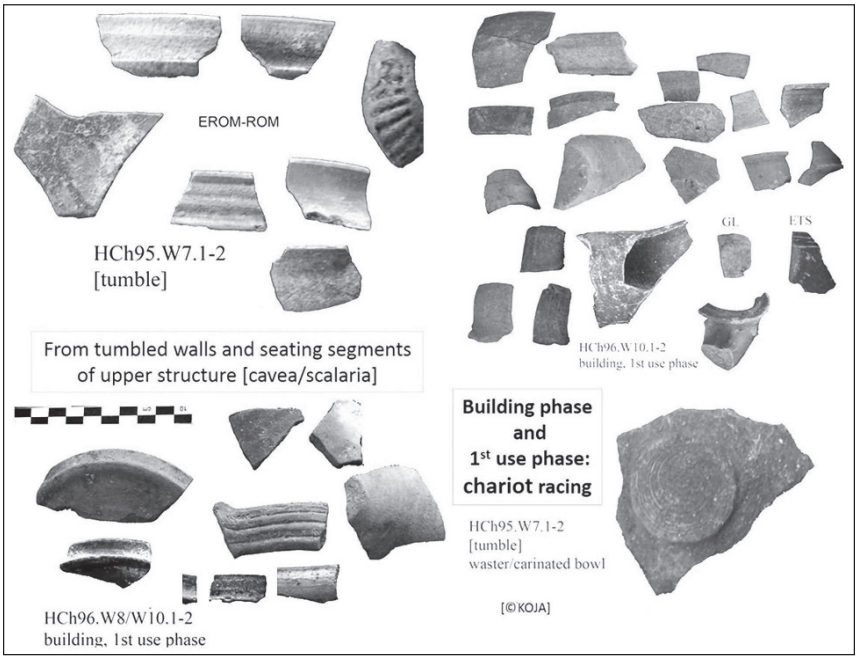
6. Jarash City Walls Project: see Kehrberg and Manley 2001, 2002, 2003; on the lagynoi and lagynophoria see Kehrberg 2004 and 2006, and cited literature.

The pottery and lamps on (FIGS. 9 and 10) come from contexts of the west cavea; most forms, including the wasters, are the same as at the east cavea associated with the 2nd century AD and are contemporary with the Gerasa Lamps. As in the east cavea the deposits include some 1st century examples. And as the waster fragments show we are again dealing with a pottery waste dump rather than residual randomly accumulated artefacts.

The concentrated quality of fragments and clusters are an indicator that we are dealing with waste dumps of pottery production at the time of closure of the necropolis site and commencement of constructions of Hadrian's Arch and the circus in the second century. They are wasters and examples of misfired pottery many of whose types we are familiar with from tomb finds of the second, and indeed some being still produced in the early third century. What narrows down the laying of the foundation and also building the above ground construction of the hippodrome are the numerical ratio between the types and the wasters in particular which fit comfortably within the first half of the second century AD.

As stated above, some forms, especially the carinated bowls are produced throughout the second century, their precursors having started in the first century (see Braemer 1986), mostly local copies of the imported sigillata variety, as the Late Hellenistic potters had copied contemporary imports. Most of the pottery on (FIGS. 9-10) came from upper structures of either tumbled courses of transverse cavea walls, the podium wall and of seating tiers (scalaria). Antoni also found fragments still *in situ* as part of the masonry fill when he had to carefully dissemble segments or blocks from standing courses in order to remove and replace original eroded or corrosive blocks to consolidate the still standing wall. This is how we retrieved the lion mould shown with the other moulds on (FIG. 7a). Included in the core of the walls in part made up of dirt were other pottery fragments seen on (FIG. 10).

Careful excavation of tumbled remains covering the cavea and arena for plotting and then removal of blocks for subsequent restoration enabled Antoni to piece together not only the matrix of the lower scalaria and the east carceres for restoration; it enabled me to study the finds within the original contexts of that particular building part. Being able to excavate and study each element thoroughly over fourteen years of permanent fieldwork allowed not only



10. Pottery from west cavea dating the building and first phase of use of the hippodrome.

meticulous recording and study and restoration by Antoni of these building parts, but it also provided me with the means for the archaeological reconstruction of the building phases, that is, dating the construction phase and in rare instances also the phase of the circus when it operated as a chariot racing course. The bronze amulet worn by a spectator, no doubt a woman (FIG. 9a) came from such a context, a dense and compact and undisturbed layer of seating tumble, a lost trinket during the excitement of the race, fallen into a crack or onto the floor of the seating tier as so often happens at shows with big crowds.

The ceramics on the last two figures, as indeed on all figures serve to illustrate that while being only a small representation of the actual quantity of finds, they convey the homogeneity of types and date-range. As aforementioned, each assemblage or deposit of finds was accompanied by labels including a sketch of the find spot which enabled me to reconstruct the locus and level for each separate deposit.

To conclude, the last two figures sum up what has already been observed on the material shown in the previous figures from other contexts: the building incorporated artefacts from the necropolis period of the site and pottery and lamps dating the beginning of construction and most likely its completion as we have material evidence belonging to the first use of the circus. The ultimate proof that chariot racing did take place was in the altars placed on the top of the east carceres (Ostrasz 1989; Borshowski 1989), found with the collapsed carceres on the arena floor and protected for almost two millennia by the tumbled remains of the stalls. Antoni's careful excavations made possible the complete reconstruction of the east carceres north façade which had collapsed like a house of cards onto the arena. One of the altars had been dedicated to Julia Domna (Borkowski 1989). This means that chariot racing was in full swing by the 3rd century, in other words racing had begun in the second century, most likely in the latter part of the second half of that century judging by the latest pieces of pottery and lamps found within the wall structures or their tumbled but otherwise undisturbed remains.

Abbreviations

JAP I and II JAP I: Jerash Archaeological Project, 1981-1983, Vol. I, edited by F. Zayadine, DoA: Amman 1986; JAP II: Vol. II 1984-1988, in SYRIA 66/1-4, Amman-Lyon 1989.

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New Data on the Epigraphy of the Northern Decapolis (North-Western Jordan)

Our work in Jordan is part of the Inscriptions de la Jordanie Project (Greek and Latin Inscriptions in Jordan), conducted under the supervision of Dr. Pierre-Louis Gatier (CNRS Lyon) and Prof. Nabil Bader (Yarmouk University), in agreement with the Department of Antiquities of Jordan. The basic goal of the project is to gather published and unpublished material together, as well as examining Greek and Latin inscriptions in order to bring new discoveries to light. This article provides the first results of a fruitful cooperation which began in 2013, and has since then experienced new developments. For the sake of simplicity, the Inscriptions de la Jordanie Project has divided the northern part of the country in smaller zones to achieve quicker results.

The present authors (Prof. Nabil Bader and Dr. Jean-Baptiste Yon) have responsibility for the North-Western area of the project, including the hinterland of modern-day Irbid and the ancient cities of Abila, Gadara and Pella; the latter three included in the Graeco-Roman Northern Decapolis. We shall commence with a general overview of the epigraphic documentation, with examples of relevant material, and then present some new results from our work, specifically an inscription from Capitolias/ Bayt Rās.

The Greek cities of modern North-Western Jordan belonged in antiquity to an ill-defined group of settlements known in the literature as the Decapolis (Ten cities). They are referred to in two documents, one by Pliny the Elder (*Natural History* V.74.1) and the other by Ptolemy the geographer (*Geography* V.15.22–23); however, each of them includes more than ten cities. As is evidenced by the map (FIG.1), the list should be supplemented by many sites and villages. Inscriptions have been found from at least fifty sites.

Our main objective is to produce a catalogue of all previously known inscriptions, taking the great diversity of material into consideration; for example, the painted text found in a tomb at Abila, published by one of the project supervisors, P.-L. Gatier (Gatier 1994: 37, nr.1, fig.1 = *SEG* 44, 1379). Gadara has so far been the most prolific site, with more than fifty texts, most of which have been published in *Gadara Decapolitana*, by Prof. Thomas Weber (Weber 2002). At Gadara, as at other sites, a

1. Map of North Western Jordan.

variety of inscriptions have been found, such as mosaics from churches, official or public texts, testimonies on the impact of the Roman army, and dedications to emperors, all of which contribute to our knowledge of Jordan in antiquity. A very important category provides evidence of religious or cultic practice, both pagan and Christian; for example, a dedication to a celestial Arabic god found at Pella (*SEG* 41, 1567). As usual, funerary inscriptions are the most frequent, either on wall paintings such as those found in the tombs of the Necropolis at Abila, or engraved on tombs or funerary stelas, which are ubiquitous in other parts of the Near East. A particularly interesting funerary mosaic, due to its rarity, is from a Christian tomb found at Gadara, which includes the names of three members of a family (?), who were buried there (Weber 2002: 302, nr.IS 47).

All in all, with the major exception of Gadara, no site is exceptionally rich in inscriptions. It is true for both Pella and another of the Decapolis cities, Capitolias, a few kilometers north of Irbid. Until major archaeological excavations took place in the 1980's and at the beginning of the present millennium, its coinage was almost the only extant evidence for the ancient city (Lenzen and Knauf 1987; Bowsher 2011). Capitolias is not mentioned in the list of Pliny, but is included in that of Ptolemy, which concurs with what we know of the local era. The foundation of the city of Capitolias was either 97 or 98 AD, as evidenced by its coinage, at some point between Marcus Aurelius and Macrinus. Its name, Capitolias, attests it was a Roman foundation. The most important recent

discovery has been that of a theater, excavated in 2002, situated on the eastern edge of the modern village of Bayt Rās. The site has been extensively dug, and structural remains of the monument are impressive. On the eastern side, one of the corridors (a *parodos*) was blocked during secondary usage, using the entrance of a tomb, together with its lintel and doors. Even more interesting are the remains of a Greek inscription in a *tabula ansata* high above ground level. This inscription was badly defaced soon after its discovery almost fifteen years ago and has never been published. This paper for the 2016 *ICHAJ* Conference is the perfect setting to rectify this, thanks to a copy kept by Nabil Bader in his archive. Even at the time of the discovery, the inscription was not completely preserved; a tentative reading is proposed here:

Ὑ[π]ὲρ [σω]τηρίας καὶ νείκη[ς]
το[ῦ] κυ[ρίου] ἡμῶν Γαλλιηνοῦ.
[Σε]β(αστοῦ) ὑπατ̣ε̣[ύο]ντος Νουμηρίου
4 Σεου[ή]ρου ἐργοδ̣ιω̣κ̣[τοῦ]ντος
Α<ὐ>ρηλίου Ἀνδρομ̣άχου *vac.*
τοῦ κρατί̣στου καὶ λογιστοῦ
vac. ἐκτίσθη, ἔτι ρξγ΄. *vac.*

"For the salvation and the victory of our Lord Gallienus Augustus, when Numerius Severus was governor and Aurelius Andromachos, *vir egregius* and *curator*, oversaw the work, (this) has been built, in the year 163."

As the local era began either AD 97 or 98, the adjusted date would fall between 259 and 261. As Gallienus' reign started in 260, 259 can be excluded. A provisional date of 260/261 can be proposed.

Our inscription is very similar to other texts from the same period found in the province of Arabia; for example, an inscription found at Adraha (modern Dera'; see *IGLS* XIV, 13-17), or another found at Irbid, which is even closer to Capitolias. The inscription, which was discovered at an unspecified location near the modern city of Irbid *ca.* 1905, related to the construction of a city wall: Irbid. Limestone block 56×66×8.5cm.

Whicher and Clermont-Ganneau 1906: fig. 1 (*AE* 1907, 67; Pflaum 1952: 315-316; Meimaris *et al*. 1992: 168, with fn.27). *cf.* Pflaum 1952: 307, fn. 2; *IGLS* XIV, *ad* nr.17.

Ἀγαθῇ Τύχῃ.
Ὑπὲρ σωτηρίας τοῦ κυρίου ἡμῶν αὐτο-
κράτορος Μάρκου Ἀντωνίου Γορδιανοῦ Σεβ(αστοῦ)
4 ἐπὶ Δομιττίου Οὐαλεριανοῦ τοῦ λαμ(προτάτου) ὑπατι-
κοῦ, ἐφεστῶτος Καλ(πορνίου) Σατορνείνου χειλιάρχου,
προεδρείας Θεοδώρου Βάσσου, ἐπισκοπευόν-
των Αὐρ(ηλίων) Σαβείνου Νεαγίου καὶ Σαβείνου Βάσ-
8 σου τῶν βουλευτῶν, καὶ Ζηνοδώρου Ἀπολινα-
ρίου συνβ(ουλεύοντος), διαταγῇ Φλ(αουίου) Οὐήρου ἐκ δημοσίου
πήχ(εις) ρλ΄. ἔτ(ει) ρλγ΄.

"To the Good Fortune. For the salvation of our Lord the Emperor Marcus Antonius Gordianus Augustus, when the illustrious Domitius Valerianus was governor, under the direction of the tribune Calpurnius Saturninus, during the proedry of Theodoros son of Bassus, with the councillors Aurelius Sabinus son of Neagios and Aurelius Sabinus son of Bassus (serving) as inspectors, and the advice of Zenodoros son of Apolinarius, according to the testament of Flavius Verus, with public funding. 130 cubits. Year 133."

According to the era of the Provincia Arabia, 133 can be interpreted as AD 239 (133 + 106), which fits perfectly with the reign of Gordianus III (AD 238-244). This would not be the case if dating was calculated from the foundation of Capitolias, as the date would fall during the reign of Severus Alexander (AD 222-235).

Similarities with the text of Capitolias are self-evident: for the salvation of the emperor a building was constructed under the supervision of a governor and with the work of local magistrates or notables. At Adraha,

the construction was a city wall. At Capitolias, it is difficult to state definitively if the stone with the inscription was later reused in a wall. Alternatively, it could be evidence for the transformation of the theater into a part of the defensive wall of the city at the time of Emperor Gallienus.

The significant difference between Capitolias and Irbid is the use of the era of the province of Arabia. Gadara and Pella were already included in the Roman province of Syria-Palaestina in the third century, and Capitolias belonged to the province of Palaestina II in the fourth century. This difference could be used as evidence that Capitolias was not part of Arabia in the period following the annexation of the former Nabataean Kingdom (after 106), and that Irbid did not lie within the territorial boundaries of Capitolias, since the chronological framework used there does not correlate with the foundation in 97-98.

Indeed, one of the main problems with the Decapolis cities is to determine the extent of their civic territories. The use of different eras is a very useful criterion for that purpose. It has been argued, with good reason that the inscriptions found at al-Mazār (Bader and Habash 2005: 191-192, nr.1), Ṣamad (or Khirbat Banī Mālik, Meimaris *et al.* 1992: 170, nr.31) and al-Ḥuṣun (*SEG* 47, 2064) could be dated according to the era of the province of Arabia, thereby proving that these localities were not located within the territory of Capitolias. As Capitolias is roughly located between Abila and Gadara in the north, with Irbid and the *provincia Arabia* to the east and south respectively, one could argue that its territory extended to the south-west in the direction of Pella. Indeed, there are some indications that this is correct; at Bayt ʾĪdis, a few kilometers east of Pella, but farther from Irbid, a mosaic inscription from a church was dated to the year 507 and Indiction 7 (Melhem and al-Husan 2001: 47; *SEG* 51, 2060). If calculated according to the era of either the *provincia Arabia* or that of Pella, there is no agreement between the year and the indiction. However, if the chronological dating relating to Capitolias, which was founded in AD 97 or 98 is used, the adjusted date would be AD 604, which is in agreement with Indiction 7. In this case, Bayt ʾĪdis would have belonged to Capitolias, whose territory encompassed a rather surprising extension towards Gadara and Pella in the west.

Another important point to note is that Numerius Severus did not appear in the lists of Roman provincial governors, neither in *provincia Arabia* nor in Syria Palaestina (the latter a likelier location for Capitolias). As a matter of fact, very few of the governors for these two provinces can be identified during this period (Thomasson 1984: 326; Davenport 2010: 351). As for the *curator* Aurelius Andromachos, one Andromachos was *dioiketes* (that is, the chief financial official) in Egypt (*P.Oxy* 10.1264, dated AD 272; *cf. PIR*^{2} A587). He had the same rank of *egregius*, or *kratistos* in Greek, and could possibly be the same individual.

Taking the evidence presented above into account, initial results from our collaborative research contribute to a better understanding of the region in antiquity, particularly with regard to the territorial boundaries of the cities of the Decapolis in the Roman Period. Surprisingly, the territory of Capitolias, present-day Bayt Rās, extended far to the west, whilst the eastern border extended to the immediate vicinity of Irbid. With the help of the Department of Antiquities, further fieldwork is bound to enrich the corpus of Greek and Latin inscriptions in this area, and our knowledge of the history of Jordan during the Greek and the Roman Periods.

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The Ancient North Arabian Inscriptions from Wādī Ramān in the Ḥismā Desert

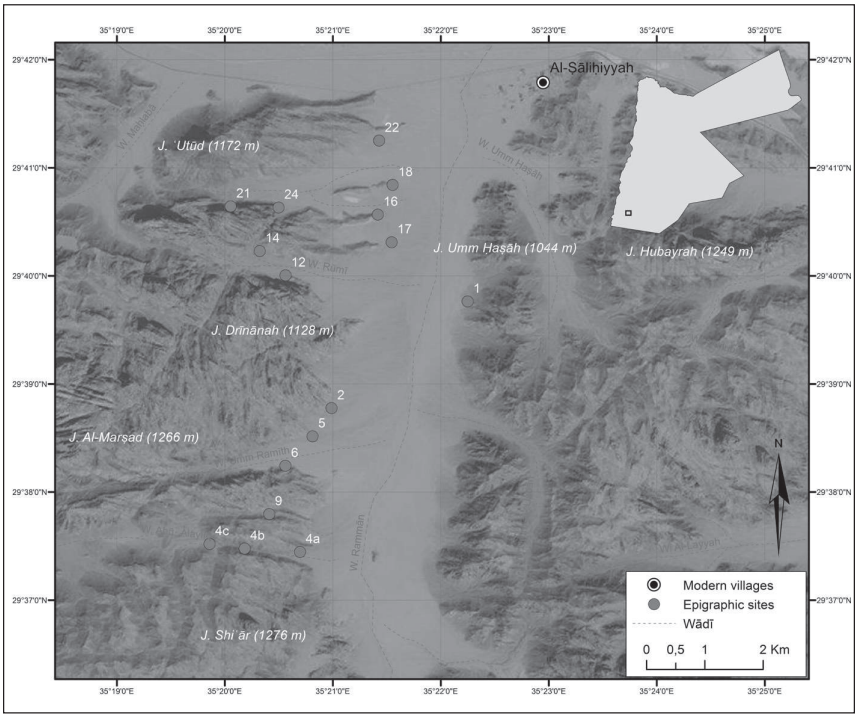
Introduction

During antiquity, the sandy desert of the Ḥismā, around Wādī Ramm (ancient Iram) in southern Jordan, was inhabited by various groups of camel-breeding nomads who left thousands of drawings, tribal marks (*wusūm*) and graffiti on the cliff-faces and stones of the region. Most of these inscriptions are in a language classified as a form of old Arabic, expressed in a local Ancient North Arabian (ANA) script formerly called "Thamudic E" and nowadays labelled "Hismaic" (King 1990). A handful of graffiti in other varieties of ANA are also found in the area, including some Safaitic, Thamudic B, Thamudic D and Dadanitic texts, certainly produced by travellers coming from central and northern Arabia. All of these texts are of considerable importance, not only for the study of Arabic's pre-Islamic past, but also because they contain religious and socio-historical information about their authors, peoples who lived on the borders of the great early empires, between the Arabian Peninsula and the Levant.

This paper is an edition of thirty-six ANA inscriptions which were recorded in Wādī Ramān during the 2014 field campaign of the Wādī Ramm project led by Saba Farès (Université de Provence)[1]. To these a text is added which was discovered in the same wadi by the late William Jobling in 1981 that is nowadays kept in the Amman Museum (no. 37 = AMJ 2). Wādī Ramān (or *Wādī Ramān*) is a valley of about 16km in length which is situated to the south of the village of aṣ-Ṣāliḥiyyah and immediately to the west of the Wādī Ramm corridor (FIG. 1). All the inscriptions under study are new, with the exception of two texts. These are no. 19, which was published by Jobling in the early 1980s (AMJ 1); and no. 36 which Saba Farès and Fawzi Zayadine edited in the preliminary report of the sixth campaign of the Wādī Ramm project (2004: 362-363)[2]. The distribution of the texts, which are found in great concentration in the western tributaries of the Ramān valley (Wādī Abū al-'Ulaylīq 1-2, Umm Ramīth,

1. The Jordano-French archaeological project at Wādī Ramm, directed by Saba Farès (Université de Provence, HSICANT-MA), is supported by the French Ministry of Foreign Affairs and is part of the program "De Pétra au wadi Ramm" which is led by Laurent Tholbecq (Université libre de Bruxelles).

2. Editorial sigla and symbols: { } encloses doubtful letters; {/} indicates alternative readings of a letter or a word; [ ] encloses restored letters; {.} indicates a non-identified letter; --- indicates a damaged area; PN: personal name; DN: divine name; ANA: Ancient North Arabian.



1. Satellite view of Wādī Ramān, with positions of the sites on which the inscriptions were recorded (Map: J. Norris 2017).

Wādī Rūmī and Wādī Shurayyif), is almost certainly a reflection of the geological conditions of the wadi (FIG. 1), its eastern side providing very few suitable rocks for carving in contrast with its western side.

Site 1: Jabal Umm Ḥaṣāh

Inscription no. 1

The text is carved left-to-right in the Hismaic script on a sandstone block lying on the slope of the massif (FIG. 2). Length: 50 cm; average height of the letters: 6 cm.

w mṭr bn ḫlf

And Mṭr son of Ḫlf

The text begins with the conjunction *w* instead of the more common *lām auctoris* particle (*i.e. l PN* "By PN"), an alternative way to introduce the author's name which is frequently encountered in Hismaic (King 1990: 54-55). Interestingly, five other texts of the present collection begin this way (nos. 2, 6, 13, 36, 37). The two personal names are known from Safaitic and Hismaic (HIn: 227, 551; King 1990: 395, 463). *Ḫlf* could probably represent one of the names transcribed as *Ḥlpw* and *Ḥlypw* in Nabataean Aramaic, both of which are attested in the Wādī Ramm area (Savignac 1933: no. 3; Farès-Drappeau *et al.* 2001: 214).

Inscription no. 2

Immediately to the right of no. 1: a little Hismaic text running diagonally (FIG. 2). Length: 15 cm; average height of the letters: 4 cm.

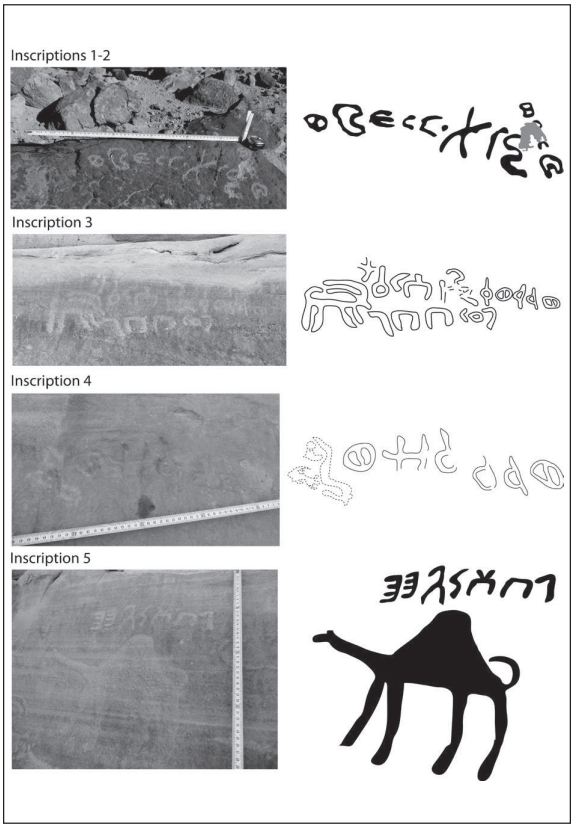
w ---rm

And ---rm

It is the same type of text as the previous one, namely a signature introduced by *w* but without patronymic in this case. An abrasion on the stone prevents the reading of the personal name. From what is discernible, the initial letter seems to be formed by a little circle, which may correspond to a ʿ or a *y*. However, no reliable restoration appears possible.

Site 2: Umm al-Ḥimlān

The texts from this site are carved next to each other on a panel which stands two meters above the ground which we can access easily by climbing a slight slope. Some of these graffiti are almost entirely destroyed by the effects of time.



2. Inscriptions nos. 1-5 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

Inscription no. 3

Besides the drawing of an ibex (FIG. 2), two lines in the Thamudic B script written right-to-left. Length: 40 cm; average height of the letters: 5 cm.

wdd wq{.} {.}s¹ry{t}
l ʻrbbl
Wq{.} loved {.}s¹ry{t}
By ʻrbbl (?)

This inscription is in an extremely poor condition because of erosion, especially the upper line which seems to contain a formula of the type *wdd PN¹ PN²*. Whereas the word *wdd* could either be a substantive, a verb in the suffix conjugation, a passive or an active participle (*cf.* Tsafrir 1996: 141-148; Stokes 2016: 37-38), its position as the first element of the sentence and the absence of the element *f* suggest that it represents here a verb. If this is correct, the inscription would conform to a VSO word order as is the norm in Safaitic and Classical Arabic (Macdonald 2004: 524-525). On the other hand, one could ask if whether the *w* which follows *wdd* is not in fact a comitative *wāw* (*cf. wāw al-maʿiyyah*) instead of the first letter of the personal name. If this is so, *wdd* would instead be a nominal formation "love, greeting". An alternative interpretation of the text would therefore be *wdd w q{.}{.}s¹ry{t} l ʿrbbl* "greetings be with Q{.}{.}s¹ry{t}. By ʿrbbl"[3].

I am unable to read the personal(s) name(s) following *wdd/wdd w* of which only the letters *q*, *s¹*, *r*, *y* are certain. The lower line, introduced by the *lām auctoris*, certainly consists of the author's signature. As far I know, if correctly read, the name *ʻrbbl* has not been found before. Compound names with the word *ʻrb* are only represented in the Arabian milieu by *ʻrb{ʼ}l* which occurs once in Safaitic (C 3998) and by *ʻrbs²ms¹ᵐ*, attested once in Sabaic (HIn: 414). Very tentatively, I would suggest that *ʻrbbl* could be a theophoric compound composed with the element *ʻrb* "to enter" and the name of the Babylonian deity Bēl. Compare the Akkadian name *Ērib-ilāni* "the one who enters [into the presence of] the gods" (*PNAE* 1: 403). However, we would have to admit that the compound of *ʻrb* + *bl* happened without an assimilation of the first consonant of the divine name to the preceding *b*, which is not necessary unlikely (*e.g. bnnʻm* < *bn* + *nʻm*, CH.R703.6). Another difficulty is the source language from which this name would come given that the representation of *ʻ* excludes an Akkadian origin and that the *ʻrb*-compound names are not attested in North-West Semitic onomastica. Nevertheless, note that a theophoric name containing Bēl has been found in Safaitic (*s²ʻbl* "companion of Bēl"; *cf.* Al-Jallad 2015: 58)[4].

3. The re-interpretation of the wdd f PN-formula as "greetings be with PN" was recently proposed by Ahmad Al-Jallad in an excellent paper entitled The Thamudic C (wdd f) Inscriptions given at a conference in Austin 14 February 2016.

4. A second way to interpret this line would be to read l ʿr b bl "By ʿr son of Bl". However, the n-assimilation in unstressed position and the writing of b for bn "son" are characteristic features of Taymanitic which have not been found in other ANA varieties (Kootstra 2016: 83).

Inscription no. 4

To the left of the previous text, one horizontal line written right-to-left (FIG. 2). Heavily weathered, it is difficult to say whether this is a Hismaic or a Thamudic B inscription. Length: 34 cm; average height of the letters: 7cm.

wdd {y/q}{n/s²}{t}{w/ʿ}{ġ}

Another *wdd* formula, either of the type *wdd PN* "PN was in love" or of the type *wdd PN[1] PN[2]* "PN[1] loved/greeted PN[2]".

Inscription no. 5

To the left of the previous text, a Dadanitic inscription written right-to-left above and in association with a drawing of a she-camel facing left (FIG. 2). Length 29cm; average height of the letters: 6cm.

lb'n ḫṭṭ

Lb'n is [the] carver/has carved

Although it consists of a simple artist's signature, this text is of great significance. On the one hand, it brings the number of Dadanitic inscriptions so far known in the Jordanian Ḥismā to three, which represent the most northerly examples of the use of this alphabet (Graf 1983: 555-560; Farès-Drappeau 1995). Secondly, it exhibits an interesting combination of Hismaic and Dadanitic features. Whereas the script is clearly Dadanitic (*cf.* the shapes of *ḫ* and *ṭ*), the formula and the word *ḫṭṭ* are rather characteristic of the local dialect expressed by the Hismaic inscriptions (King 1990: 53-54). Indeed, this contrasts with the usual ways attested in the texts of al-ʿUlā to record the action of writing or claiming the authorship of an engraving (*e.g. tqṭ b'ṯ* "B'ṯ has carved/B'ṯ's signature", D 35; *s¹lmh / bn 's¹d / mrh / f'l* "S¹lmh son of 's¹d [of the family of] Mrh made [the drawing]", Nasif 1988: 86).

Placed after the name, the word *ḫṭṭ* possibly represents a verb in the third person masculine singular of the suffix conjugation */ḫaṭṭaṭa/ "he inscribed, drew", since the SVO word order is the norm in Dadanitic (Macdonald 2004: 524; Farès-Drappeau 2005: 76). However, if one posits that this was written by a Wādī Ramm native whose dialect apparently had no definite article (Macdonald 2000: 45), the word would more likely be an active participle */ḥāṭṭiṭ/ "carver, inscriber". Outside south-western Arabia, the name *Lb'n* is attested in Dadanitic (D 134), Safaitic (KRS 2684, *etc.*) and Hismaic (unpublished).

Site 4: Abū al-'Ulaylīq 2

The texts recorded in Wādī Abū al-ʿUlaylīq 2 are engraved on boulders and stones which stand on three different points in the valley, from east to west, sites 4a, 4b and 4c respectively (FIG. 1).

Inscription no. 6

On a boulder at the entrance of the *wadi* (site 4A), a Hismaic text running vertically above a modern Arabic graffito (FIG. 3). Length: 27 cm; average height of the letters: 7cm.

w 's¹lh

And 's¹lh

Simple authorship text introduced by *w.* The theophoric name *'s¹lh* "gift of Lh" (*cf.* Arabic *Awsallāh*; CIK: 215-216) is attested in Safaitic and Hismaic (HIn: 45). In Nabataean Aramaic, it occurs with four different spellings: *'wš'lhy*, *'wš'lh*, *'wšlh* and *'wšlhy*, (Negev 1991: 10-11).

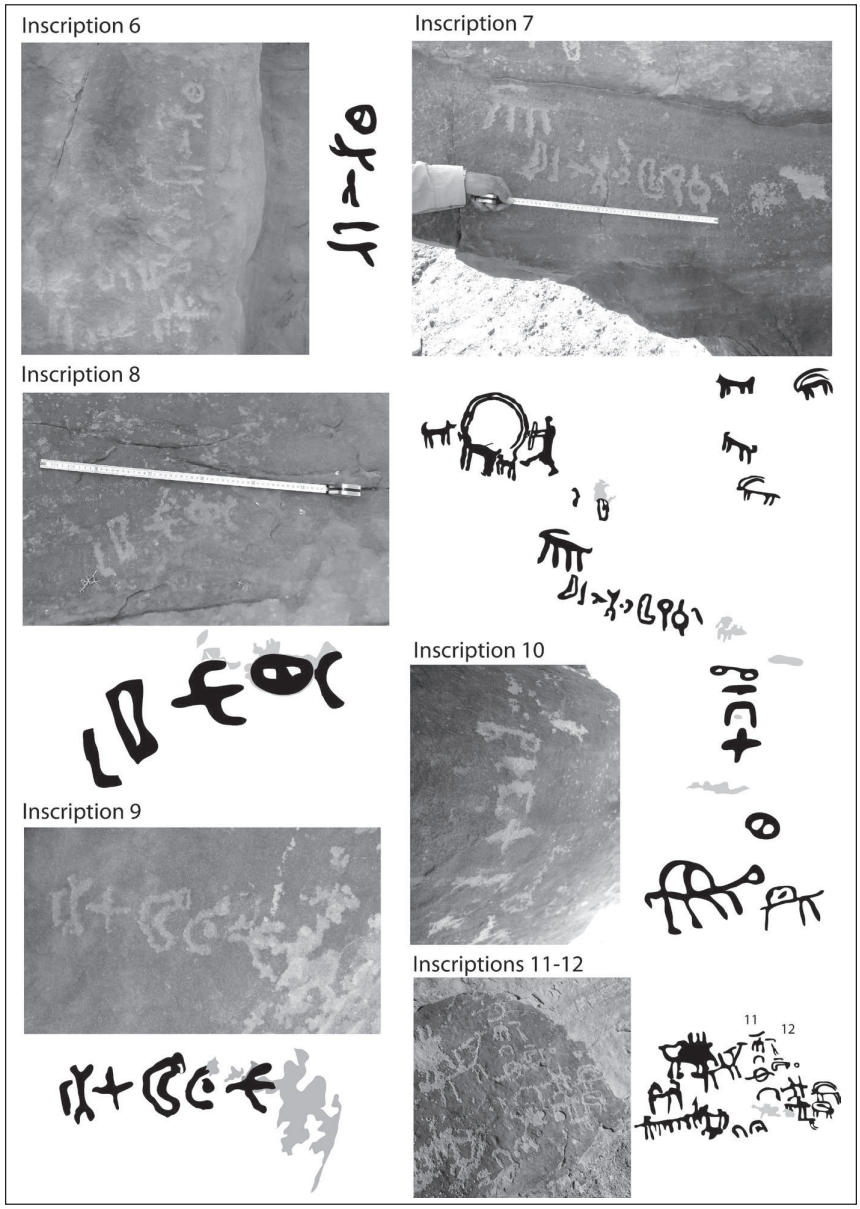
Inscription no. 7

A few meters away from the previous boulder stands another block, which has a Kufic inscription, a hunting scene and a Hismaic graffito written right-to-left (FIG. 3). Length: 50cm; average height of the letters: 12cm.

l qym bn 's¹lm

By Qym son of 's¹lm

The scene depicted consists of an ibex facing left that is surrounded by two dogs and a man holding a bow. The archer is in the act of shooting arrows, one of which has already struck the animal. To the right of this stand two dogs and two stick-figure drawings of ibexes, perhaps produced by another artist. It is unclear



3. Inscriptions nos. 6-12 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

whether the inscription has a relationship or not with these drawings.

The personal name *Qym* (*cf.* Arabic *Qayyim*) is known from Safaitic, Hismaic and Nabataean (HIn: 492; Negev 1991: 58). Note that, in Dadanitic, the word *qym* is used as an official title "manager" (D 13, 22). The patronym, *'s¹lm* (*cf.* Arabic *Aslam*; CIK: 197), is a name of the *'f'l* elative form, attested in both Ancient North and South Arabian (HIn: 45), as well as in Nabataean Aramaic with the forms *'šlm* and *'šlmw* (Negev 1991: 15). On *'šlmw*, see no. 12.

Inscription no. 8

In the middle part of the wadi (site 4b), a Hismaic graffito written left-to-right on the upper face of a boulder (FIG. 3). Length: 29 cm; average height of the letters: 8cm.

l mḥwr

By Mḥwr

A simple signature. *Mḥwr* is a name of the *mf'l* passive participle form. Not very common, it has only been found in Hismaic and Safaitic (HIn: 532; King 1990: 460), without parallels in the Nabataean onomasticon or in the genealogy of the Arab tribes.

Inscription no. 9

On a block standing next to the boulder where the previous text is situated, a Hismaic graffito written left-to-right (FIG. 3). Length: 35cm; average height of the letters: 7cm.

l ’tm bn ḥ[r]

By ’tm son of Ḥ[r]

The name *’tm* occurs in Safaitic (HIn: 19), Hismaic (*cf.* King 1990: 353; Bikai and Al-Khraysheh 2002: 219), Dadanitic (D 108), Taymanitic (Ph 279p1) and Thamudic C^{2} (WHI 181). Also known in Nabataean Aramaic (Negev 1991: 16), *’tmw* is interestingly found twice in the Wādī Ramm area (Farès-Drappeau and Zayadine 2004: no. 4; Hayajneh 2006). An abrasion on the stone obscures the patronym. From the space available, it seems probable that this is a bi-radical name. If one admits that no. 28 of the present collection was carved by the same author, then this would have to be restored as *Ḥ*[*r*] (*cf.* the Arabic names *Ḥūr* and *Ḥurr*; CIK: 333-334), which is a well-known name in Hismaic (*cf.* King 1990: 387).

Inscription no. 10

On a rock in the western part of the *wadi* (site 4c), a text written vertically which is difficult to assign to a particular script (FIG. 3). Length: 12 cm; average height of the letters: 6 cm.

{g/ṯ}{l/n/s²}bt

The absence of an introductory particle makes interpretation of this kind of text very uncertain, but one could suggest that here we are dealing with an isolated personal name. The reading depends on the values of the first two letters. If the text is written in the Hismaic script, then this would read *gs²bt* which is so far unattested in the ANA corpora. However, the root exists in Arabic “rough, gross” (Lane: 426b-c) from which probably derives the Nabataean name *Gwšb* (JSNab 193). If, on the other hand, the text is in another script (Thamudic C?), then this could read *glbt*, *gnbt*, *grbt*, *ṯlbt*, *ṯrbt* or *ṯnbt*, of which the first five represent possible personal names.

Inscription no. 11

On a second boulder at the same location, a Hismaic graffito carved vertically next to several figures of ibexes, camels and horse-riders (FIG. 3). Length: 26 cm; average height of the letters: 6 cm.

l {ḥ/ṭ}rq

By {Ḥ/Ṭ}rq

It is difficult to say whether the little line on the upper part of the second letter is extraneous or not to the text. For this reason, both readings, as *ḥ* and *ṭ*, are possible. The name *Ṭrq* (*cf.* Arabic *Ṭāriq*; CIK: 557) is attested in around twenty Safaitic inscriptions of the OCIANA corpus and in six Hismaic texts from southern Jordan (TIJ 141, 294, 469; CH 07-0001-02.6, 07-0001-03.2, 07-0024.1). If, on the other hand, *Ḥrq* is the correct reading, the name is known only from a doubtful context in Safaitic (Is.R 145). However, we can compare it with the Arabic names *Ḥarrāq* and *Ḥurāq*, the latter being also that of a tribe (Banū Ḥurāq) in the time of the Prophet.

Inscription no. 12

Immediately to the right of the previous text (FIG. 3), a Hismaic graffito written vertically. Length: 17cm; average height of the letters: 4 cm.

l s¹lm

By S¹lm

S¹lm, which is of course very common and attested in all the categories of ANA inscriptions (HIn: 325), appears in 54 Hismaic inscriptions of the OCIANA corpus. According to Savignac, the form *Šlmw* occurs in one Nabataean text from ‘Ayn al-Shallālah (Savignac 1933: no. 14), but the correct reading is in fact *’šlmw* (*dkrt ’lt ḥnynw bny’ br ’šlmw w ’šlmw* “May ’lt be mindful of Ḥnynw the builder son of ’šlmw and ’šlmw”).

Site 6: Umm Ramīth/Umm Ghaziyyah

Inscription no. 13

In the south-eastern part of the *wadi*, a flat

stone packed with several *wusūm* and a Hismaic graffito carved *boustrophedon* (FIG. 4). The text starts right to left on the upper line, turns to the right on the second line and then curves back on itself from right to left on the third line. Length: 70 cm; average height of the letters: 7cm.

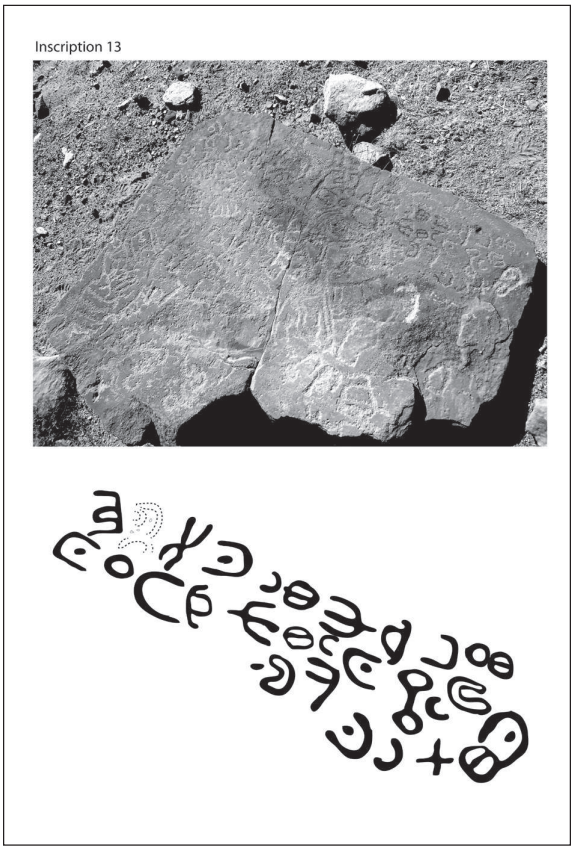
w ʻbdḥwr bn ḫ{.}d bn ʻbdḥwr
bn grm bn wtr bn kmn
And ʻbdḥwr son of Ḫ{.}d son of ʻbdḥwr
son of Grm son of Wtr son of Kmn

Erosion has affected the stone, but most of the letters are clear with the exception of the eleventh one. This is probably a *l*, but not enough is visible to make it virtually certain. Although it is a simple signature, this text is of interest since it contains a developed genealogy, which, unlike Safaitic, is quite rare in Hismaic. *Grm*, *Wtr* and *Kmn* are common in Safaitic and Hismaic. By contrast, the compound name *ʻbdḥwr* was so far only known from the inscription from W. Ramān published in 2004 (Farès-Drappeau and Zayadine 2004: 362-363), no. 36 of the present collection. Three Hismaic inscriptions from Wādī Judayyid and Wādī Ḥafīr contain the forms *ʻbd'ḥwr* (KJC 757; CH.07-0028) and *ʻbd'l{'}[ḥ]wr* (KJC 202), but whether *ḥwr* and *'ḥwr* represent the same thing remains to be proved. For a discussion on this issue, see Zayadine 2007: 11-12.

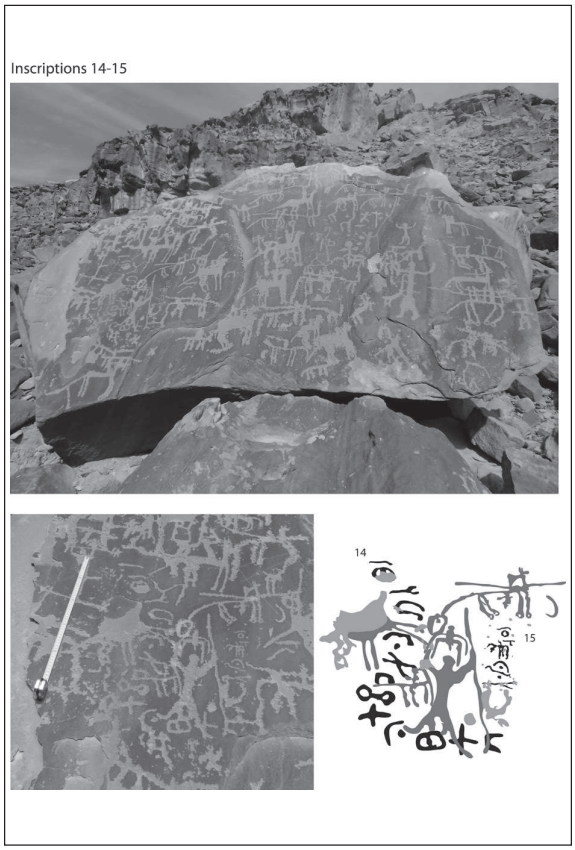
Site 9: Abū al-ʻUlaylīq 1

Inscription no. 14

On the mid northern hill slope of the *wadi*, a block measuring about 1.90 cm high and 3.20 m wide that is crowded with cavalrymen armed with long lances, persons on foot who hold their hands in the air, ostriches, camels and two Hismaic graffiti (FIG. 5). A photograph of this panel had already been published by Jobling, although without reading or comment of the texts (1981a: pl. XXIX, fig. 1; 1983: 32, fig. 7).



4. Inscriptions no. 13 (Photograph and tracing: J. Norris; Wādī Ramm archaeological project).



5. Inscriptions nos. 14-15 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

On the left part of the block, the first graffito is written between the figure of a camel (?) and that of a foot soldier armed with a spear who is lifting his arms upwards. It starts vertically and then turns to the right below the soldier. Length: 70 cm; average height of the letters: 10 cm.

l whbl bn ḫrgt bn wtr

By Whbl son of Ḫrgt son of Wtr

The two lines before *bn* are not letters, but the legs of the animal depicted to the left whose body is obscured by an abrasion. Therefore, the author's name reads *Whbl* and not *Whblh.* This is of course a variant of *Whb'l* with an elision of the glottal stop, a form already attested in Hismaic (TIJ 230; KJC 581) and Mixed Safaitic-Hismaic (WHI 42). Note that in Taymanitic, the loss of the /'/ in Ēl-based theophoric names is very frequent (Kootstra 2016: 82-83). The name *Ḫrgt* (*cf.* Arabic *Khārijah*; CIK: 344) is known from Safaitic and Hismaic. *Wtr* (HIn: 633) has been found in no. 13 above and it recurs in nos. 24, 30 and 35.

Inscription no. 15

Immediately to the right of the previous graffito stands a second Hismaic text, carved vertically alongside the spear of the man on foot (FIG. 5). Length: 20 cm; average height of the letters: 6cm.

l 'hḏ bn {f/s²}n{'/h}

By 'hḏ son of {F/S²}n{'/h}

This text is written in crudely shaped letters, making the reading of the patronym extremely difficult. We are perhaps dealing with the name *Fn'* or *S²n'*, but these can be no more than guesses. *'hḏ* is a new name, though it is presumably a variant of *'hd* which is known from Safaitic, Hismaic and Nabataean (HIn: 446; Negev 1991: 49; King 1990: 441), given that the root √'hḏ is not found in the Semitic languages. The sound change *d* > *ḏ* in personal names is an attested phenomenon in Hismaic, as illustrated in TIJ 109: *rḏ'l* < **rd'l*, KJA 318: *w'ḏ* < *w'd* and RTI A: *tm'bḏt* < *tm'bdt* (*cf.* King 1990: 41).

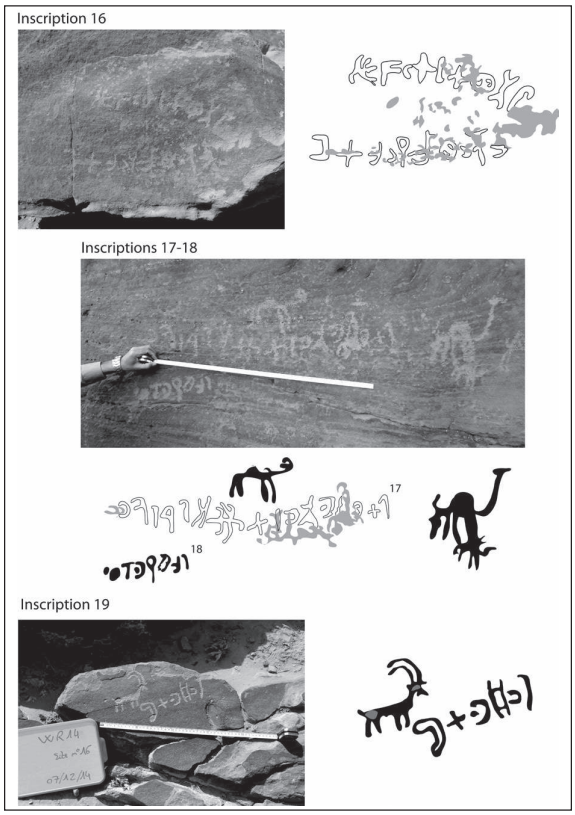
Inscription no. 16

A few meters down from the previous panel, at the base of the hill, is a block which has a Hismaic graffito on its lower part (FIG. 6). Written *boustrophedon*, the text runs left to right and then turns and runs from right to left. Length: 45cm; average height of the letters: 6cm.

ḏkrt lt w'l --- w {ġ} {y/h} r k t b

May Lt be mindful of W'l --- and ...

This text and no. 29 are the only prayers that we have recorded in Wādī Ramān. Unfortunately, only the first line of this graffito is in fully legible condition. If the reading of the letters *{ġ}*, *{y}*, *r*, *k*, *t*, *b* at the end of the text is correct, then I would tentatively suggest that this could represent a personal name, *{Ġ}{y}rktb* */Ġiyyār-Kutbā/, comparable to *Ġyr'l* which is common in Safaitic. The Hismaic inscriptions of southern Jordan attest of several theophoric formations based on the divine name *'l-Ktb'/ Ktby/Ktb*, such as *Tmktb* (TIJ 28; Farès 1999: nos. 1-2), *Tmktby* (TIJ 285), *Tmktb'* (SIAM 43)



6. Inscriptions nos. 16-19 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

and *Mr'ktb* (KJC 442; CH.R702.1, 718.06).

An alternative possibility would be to take *Ġyr* as a one-word name followed by the active participle *ktb*. Thus, *ḏkrt lt w'l --- w ġyr ktb* "May Lt be mindful of W'l --- and Ġyr is [the] writer". If so, this text would provide an interesting variant of the usual formula *w ḏkr(t) DN PN1 w PN2 ḫṭṭ* "and may DN be mindful of PN1 and PN2 is [the] carver" (KJC 202, 711; AMJ 46, 137, 148). I should repeat that this interpretation and the one formulated above are no more than tentative suggestions.

Site 12: Wādī ar-Rūmī

Inscription no. 17

On a cliff-face of the southern bank of the wadi, a Hismaic graffito running right to left next to a group of *wusūm* and two schematic drawings of camels (FIG. 6). Length: 97cm; average height of the letters: 10cm.

l t--- bn {'}{r}{s²}t ḏ-'l ys²k{r}
By T--- son of {'}{r}{s²}t of
the lineage of Ys²k{r}

The dark desert varnish of the rock is heavily cracked, which makes it difficult to distinguish the letters from the chips in the stone. The patronym, if the reading is correct, occurs in twenty-two Safaitic and four Hismaic inscriptions of the OCIANA corpus. The last letter of the text looks like a *m*, but the small curve which one would take as its inner line has in fact a slightly lighter patina and so is presumably extraneous to the text. Unlike *Ys²kr* (*cf.* Arabic *Yashkur*; CIK: 592), *Ys²km* is moreover unknown. A lineage of *Ys²kr* is attested twice in Safaitic (CSA 1.2; HaNSB 351), but there is very little chance that the three texts refer to the same social group.

Inscription no. 18

Below and to the left of no. 17, a Hismaic text written right-to-left (FIG. 6). Length: 35cm; average height of the letters: 8cm.

l kmy bn ẓ'n
By Kmy son of Ẓ'n

The penultimate letter has been infilled, but there is no doubt that this is a *'*. We can compare this with the shape of the same letter in KJB 115. Both names are known in Safaitic and Hismaic (HIn: 392, 505; King 1990: 426, 455).

Site 16: Jabal Maḥlabā

Inscription no. 19 (= AMJ 1; Jobling 1981b: 98, fig. 1; 1982: 202, n. 6, pl. LVII, fig. 4; 1983: 32, fig. 8)

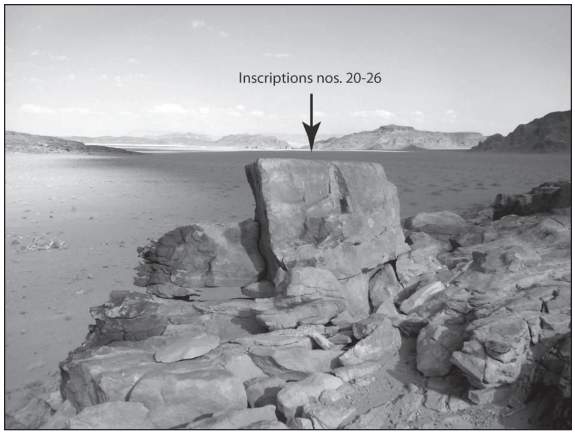
On the top of the northern foothill of Jabal Maḥlabā, a Hismaic graffito carved right-to-left on the ground next to the drawing of an ibex or a wild Bezoar goat (FIG. 6). Length: 16cm; average height of the letters: 6cm.

l rṯ bn tm
By Rṯ son of Tm

Rṯ (*cf.* Arabic *Rayṯ*; CIK: 484) apart from in this text has only been found once in Hismaic (MZH 1), though the compound *Rṯ'l* is a well-attested name in Safaitic (HIn: 269). The hypocoristic name *Tm* is of course well-known in all ANA categories.

Inscription no. 20

A few meters from the position of the previous text is a block which has on its upper face the eight Hismaic inscriptions which follow (FIGS. 7-8). The first of these texts runs from left to right and then turns diagonally upwards. Length: 41cm; average height of the letters: 5cm.



7. Position of the inscriptions nos. 20-26 on Jabal Maḥlabā (Photograph: J. Norris; Wādī Ramm archaeological project).

l kmy bn ẓ‘n bn ḥbb

By Kmy son of Ẓ‘n son of Ḥbb

There is the same combination of name and patronym as in no. 18 from Wādī ar-Rūmī. This suggests that both texts were carved by the same individual, but, alas, the absence of the grandfather's name in no. 18 prevents us from confirming this hypothesis. The name *Ḥbb* (*cf.* Arabic *Ḥabīb*; CIK: 287-289) is found across the ANA corpora (HIn: 172).

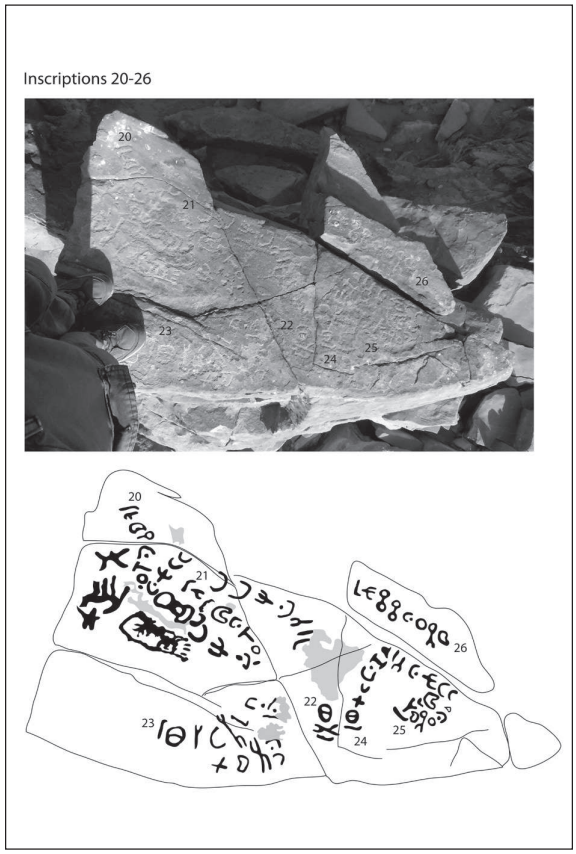
Inscription no. 21

Immediately to the right of no. 21 (FIG. 8), this inscription is written *boustrophedon,* starting from left to right on the upper line and then running from right to left on the lower one. Length: 40cm; average height of the letters: 7cm.

l s¹lm bn ẓ‘n bn ḥbb

By S¹lm son of Ẓ‘n son of Ḥbb

The author of this text is the brother of the individual who carved no. 21 and perhaps no. 18. Note that we have already encountered the name *S¹lm* in no. 12.



8. Inscriptions nos. 20-26 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

Inscription no. 22

To the right of nos. 20 and 21, this text is carved from right to left along the edge of the face (FIG. 8). Length: 54cm; average height of the letters: 7cm.

l ’w---{.}lh bn ḥbb

By ’w---lh son of Ḥbb

This is the signature of an additional grandson of *Ḥbb*. The fracture on the rock surface does not allow us to fully read his patronym, but it can be seen that this is presumably a theophoric compound based on the divine name *Lh.* The author of this text is the cousin of *Kmy* and *S¹lm*, and his father, the brother of *Ẓ‘n*.

Inscription no. 23

This text is carved below no. 21 and no. 22 (FIG. 8). It starts from left to right and then curves down diagonally to avoid the crack on the stone. Length: 48cm; average height of the letters: 6cm.

l whb’l bn {s¹/r}n{.}{.} bn rḫmt

By Whb’l son of {S¹/R}{.}{.} son of Rḫmt

The patronym is almost entirely obscured by an abrasion on the stone. Traces of the initial letter and the penultimate letter can be seen along the edge of the abrasion, but not enough of each glyph is visible for us to be able to suggest a reliable interpretation. The authors omitted the *r* of *Rḫmt* and inserted it below the line. *Whb’l* is a famous theophoric name attested in both Ancient North and South Arabian (HIn: 651), appearing in around seven Hismaic graffiti of the Wādī Ramm area (KJB 182, 392; TIJ 84, 234, 235, 239, 451). *Rḫmt* is known from seven Safaitic inscriptions of the OCIANA corpus and three Hismaic inscriptions (KJC 572 and two unpublished texts).

Inscription no. 24

To the right of the four previous texts, one line written right-to-left which curves along

the crack and the edge of the block (FIG. 8). Length: 51cm; average height of the letters: 8cm.

l wtr bn zdlh bn ḥbb

By Wtr son of Zdlh son of Ḥbb

This is the signature of another kinsman of *Ḥbb*, which offers additional information about this family group (FIG. 9). *Wtr* is the cousin of *Kmy* and *S¹lm*, and his father, *Zdlh,* the brother of *Ẓ'n*. One may ask whether *Zdlh* is not in fact the patronym which occurs in no. 22, given that both names have the same *-Lh* ending. If this is so, *Wtr* would be the brother of the author of no. 22. Although likely, this remains of course unprovable. Similarly, it may be tempting to link this text with an inscription from Wādī Ḥafīr, 20km north from site 16, which reads *l wtr bn zdlh* "By Wtr son of Zdlh" (CH.R310.15). Both texts can indeed represent the signatures of the same individual at two different places of the Ḥismā, but, once again, this is purely speculative in the absence of a detailed genealogy. *Zdlh* (*cf.* Arabic *Zaydallāh*; CIK: 604) is known from Dadanitic, Safaitic, Hismaic and Nabataean Aramaic (HIn: 297; Negev 1991: 26).

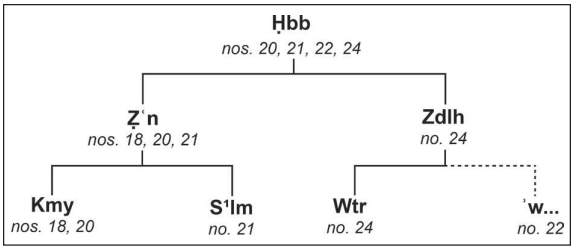
Inscription no. 25

Immediately below no. 24, carved *boustrophedon* on two lines (FIG. 8). The text starts left-to-right and then turns and runs right-to-left. Length: 21cm; average height of the letters: 7cm.

l s¹{r}m bn 'ṣm

By S¹{r}m son of 'ṣm

There is a mark before the word *bn*, which looks like a *n*, but in view of its remote position from the *m*, I would say that this is certainly a natural pit in the rock. Otherwise, one would have to read *S¹{r}mn*, an unknown name in contrast to *S¹rm* which is attested in Safaitic and perhaps in one Hismaic text (TIJ 198). *'ṣm* is known from Safaitic and Hismaic, previously attested five times in the Jordanian Ḥismā (TIJ 39, 242; KJC 212; AMJ 6; CH.R337.1).



9. The family tree of Ḥbb according to the inscriptions of Jabal Maḥlabā.

Inscription no. 26

Above the previous text, carved horizontally left-to-right on the slab which breaks away from the main block (FIG. 8). Length: 40cm; average height: 7cm.

l ḥgg bn 'ṣm

By Ḥgg son of 'ṣm

The rock surface is very eroded, but the letters are sufficiently clear and well written to make the reading certain. The author of this text is possibly the brother of the individual who carved the previous graffito. The name *Ḥgg* (*cf.* Arabic *Ḥajjāj*) is found in virtually all the categories of ANA inscriptions.

Site 17: Western Part of Wādī ar-Rūmī

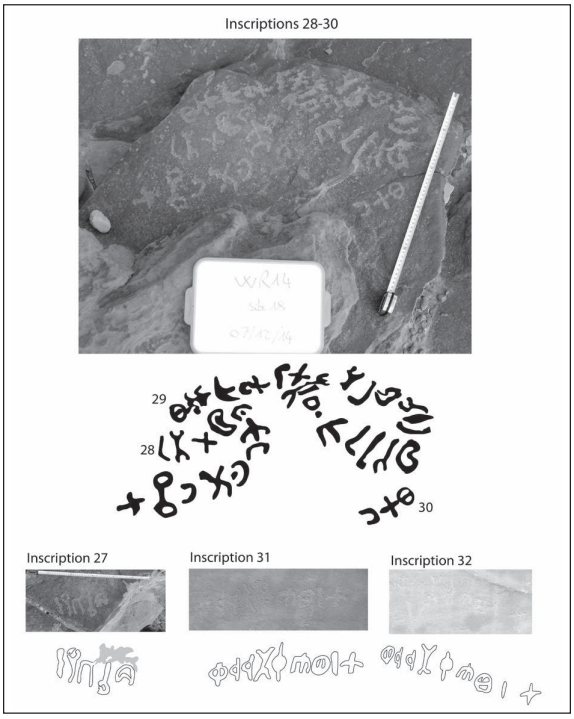
Inscription no. 27

On a rocky hill situated in the northwest part of Wādī ar-Rūmī and in front of Jabal Maḥlabā, one line written right-to-left in the Thamudic B script (FIG. 10). Length: 20cm; average height of the letters: 10cm.

my {b/k}yn

{B/K}yn drank water (?)

This is a short but complex text. The third glyph has a shallower line on its upper right part giving it the appearance of a *k*, which makes it difficult to be sure of the letter value knowing that both *Byn* and *Kyn* are attested names. The word *my* (*cf.* Levantine Arabic *mayye*) occurs in Safaitic with the meaning of "water" (Al-Jallad 2015: 329). From the context, one may cautiously suggest that this could refer to the action of "drinking water", but I should emphasize that this is purely a suggestion. Another way of interpreting the text could be to read from left to right *nyk ym* "Ym had sex repeatedly". In-



10. Inscriptions nos. 28-30 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

deed, the verbs *nk* and *nyk* are recurrent in the Hismaic inscriptions of the Wādī Ramm area (King 1990: 69-71), lending support to such an interpretation.

Site 18: Wādī Shurayyif 1

Inscription no. 28

On the rocky hill which dominates the entrance of the *wadi*, a Hismaic graffito carved *boustrophedon* (FIG. 10). The text runs left to right in the first line and then curves back on itself and continues from right to left in the second one. Length: 73cm; average height of the letters: 11cm.

l ’tm bn ḥr bn ḫrgt

By ’tm son of Ḥr son of Ḫrgt

As mentioned above, the author of this graffito is possibly the same person who engraved no. 9 in Wādī Abū al-‘Ulaylīq 2 (site 4), though there is no way to prove this. On the name *Ḫrgt*, see no. 14.

Inscription no. 29

Immediately on the right of no. 28, a second Hismaic text carved *boustrophedon.* The text starts left to right on the lower line and twists along the best surface of the stone after which it turns upwards and continues right to left on the upper line (FIG. 10). Length: 50cm; average height: 10cm.

w ḏkrt lt ’s²‘-n kll-hm l s²kmlh

And may Lt be mindful of our companions, all of them. By S²kmlh

All the letters are clear. The plural of the word *s²‘* “companion” (*cf.* Classical Arabic *šay‘*) occurs here as *’s²‘* instead of the expected *’s²y‘* (*cf.* KJA 36, KJC 641, CH.R701.5). This unusual spelling is found in four other Hismaic inscriptions (KJC 641; CH.07-0005.5, R677.1, R716). Also attested in Safaitic, Ahmad Al-Jallad has recently suggested that this form could reflect attraction to the plural pattern of the geminate roots $C^2 = C^3$, */’aśā‘‘/ rather than */’aśyā‘/ (Al-Jallad 2015: 63). The structure of the text is also interesting. Usually, the *ḏkr(t) DN* formula always follows the authorship section (KJA 36; KJC 42, 202, 641, AMJ 46, *etc.*). As far I know, this is the first instance in which the invocation precedes *l PN.* The theophoric *S²kmlh* “recompense of Lh” is only attested in Hismaic and in Nabataean Aramaic (King 1990: 420; Negev 1991: 63).

Inscription no. 30

Immediately below no. 29, a short Hismaic text written diagonally downwards (FIG. 10). Length: 12cm; average height of the letters: 5cm.

wtr

This could either represent the same personal name encountered in nos. 13, 14, 24, written here without an introductory particle, or be a signature introduced by *w*, *i.e. w tr* “and Tr”. The name *Tr* is found once in Hismaic (KJA 122).

Site 21: Wādī Shurayyif 2

Inscription no. 31

In the south-western part of the wadi, on a

boulder which is at the base of Jabal Maḥlabā, a Hismaic text running horizontally from left to right (FIG. 10). Length: 70cm; average height of the letters: 7cm.

wdd ʾqḥ ws²t

ʾqḥ loved Ws²t

The names, if the reading is correct, have not been found before. The former is presumably an elative *ʾfʿl* form of the root √qḥḥ, which means "pure, mere, genuine" in Classical Arabic (Lane: 2787c). I would suggest that the latter is a simple variant of the common name *ws²yt* with a loss of the glide, perhaps */waśāt/ < */waśayat/. These are only suggestions, of course, and there may well be other possible interpretations of these names.

Inscription no. 32

Immediately below no. 31 is an exact duplicate of the sentence *wdd ʾqḥ ws²t*, which is carved using the same technique (FIG. 10). Length: 110cm; average height of the letters: 9cm.

Site 22: Wādī Shurayyif 3

Inscription no. 33

On the top of a rocky hill in the north-western part of the *wadi*, a Hismaic graffito carved on the upper face of an elongated rock segment (FIG. 11). Length: 85cm; average height of the letters: 7cm.

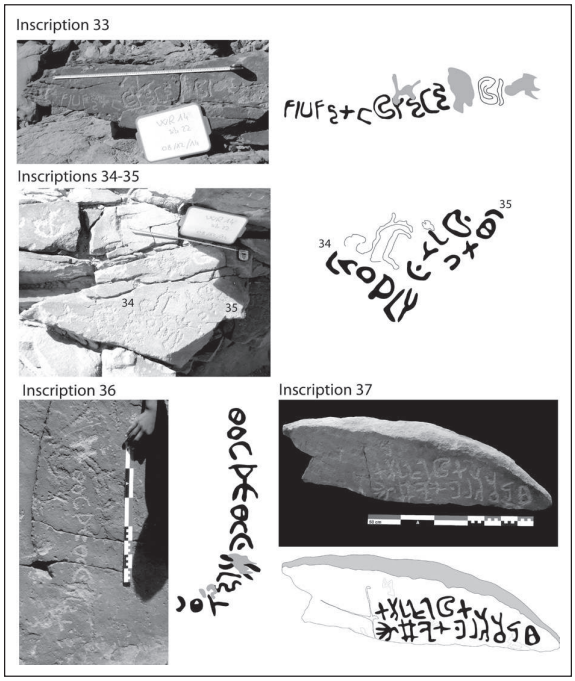
ks²{b}{k}ftbm{l/s²}fbf m{l/s²}

Although the graffito at first gives the impression of being well written, I am unable to interpret this. One might ask whether this is not a writing exercise of or an attempt to write made by a non-literate person (?).

Inscription no. 34

Just a few meters away from the position of the no. 33 is a slab with a flat upper surface which has two Hismaic texts (FIG. 11). The first of these starts diagonally to the right and then turns upwards. Length: 40cm; average height of the letters: 9cm.

l s¹ʿdlh bn s¹lmn



11. Inscriptions nos. 33-37 (Photographs and tracings: J. Norris; Wādī Ramm archaeological project).

By S¹ʿdlh son of S¹lmn

This text is in good condition. Both names are well-known. *S¹ʿdlh* (*cf.* Arabic *Saʿdallāh*; CIK: 497-498) occurs in all the varieties of ANA, as well as in Nabataean and Palmyrene Aramaic (HIn: 319; Negev 1991: 66). *S¹lmn* (*cf. Salmān*; CIK: 509) is attested in Safaitic, Hismaic, Dadanitic, Taymanitic, as well as in Nabataean and Ancient South Arabian (HIn: 326; Negev 1991: 64).

Inscription no. 35

Immediately below no. 34, one line carved right-to-left (FIG. 11). Length: 20cm; average height of the letters: 8cm.

l wtr

By Wtr

On the name *Wtr*, see nos. 13, 14, 24 and 30.

Site 21: Wādī Shurayyif 4

Inscription no. 36 (= Farès-Drappeau and Zayadine 2004: 362-363)

In the middle southern part of the *wadi*, a Hismaic graffito carved vertically on the lower left part of a boulder which has several engrav-

ings of ibexes and cameleers. Length: 50cm; average height of the letters: 5cm.

w ʻbdḥwr bn ḫlf

And ʻbdḥwr son of Ḫlf

Three signs occur horizontally after *Ḫlf*, which look like the Hismaic letters *ẓ/h*, *ʻ* and *r*. I have not taken this to be part of the text. On the compound name *ʻbdḥwr*, which occurs twice in no. 13, see the commentary of the present inscription in Farès-Drappeau and Zayadine 2004: 362-363. On *Ḫlf*, see no. 1.

Unknown Provenance from Wādī Ramān

Inscription no. 37 (= AMJ 2/J.14202)

This Hismaic text is housed in the Jordan Archaeological Museum of Amman, registered as J.14202. It was discovered by W.J. Jobling in 1981 on an unknown site of Wādī Ramān. It is carved *boustrophedon* on a sandstone slab, starting right-to-left on the lower line and then turning to the right on the upper one. Length: 42cm; average height of the letters: 6cm.

w fṣ'l bnt ġṯ ḏt-'l ġlmt

And Fṣ'l daughter of Ġṯ of the lineage of Ġlmt

Fṣ'l and *Ġṯ* are known from Safaitic and Hismaic. To the best of my knowledge, *Ġlmt* has so far not been found as a lineage name, though it is attested as an anthroponym in both Safaitic and Hismaic. The significance of this text lies in the fact that it has been carved by a woman, which is quite rare, and that it contains the first attestation of the feminine form of the relative pronoun *ḏ* in Hismaic, occurring here as *ḏt* (*cf.* Classical Arabic *ḏāt*). For a detailed study of this text (see Norris 2017).

Acknowledgements

I am most grateful to Dr. Monther Jamhawi, Director General of the Department of Antiquities of Jordan, as well as to Aktham Oweidi, Director of Excavations and Surveys, for their support and for having granted the work permit. I owe special thanks to Khaled Al-Tarawneh (DoA) for his friendship and invaluable collaboration in the survey of Wādī Ramān. I would also like to thank Ahmad Lash (DoA) and Zuhair al-Zoubi, Director of the Amman Citadel and the Jordan Archaeological Museum, without whom the study of AMJ 2/J.14202 would have not been possible. Finally, many thanks are due to Saba Farès, Director of the Wādī Ramm project, for her constant support and for having allowed me to study these inscriptions.

Sigla

AMJ	Hismaic inscriptions recorded by Jobling which are gathered and coherently numbered in King 1990
C	Safaitic inscriptions in *Corpus Inscriptionum Semiticarum. Pars V. Inscriptiones Saracenicae continens, Tomus 1. Inscriptiones Safaiticae*. Paris: Imprimerie nationale (2 volumes), 1950-1951
CH	Hismaic inscriptions in Corbett 2010
CIK	Caskel 1966
CSA	Safaitic and Mixed Safaitic-Hismaic inscriptions in Clark 1984-1985
D	Dadanitic inscriptions in Farès-Drappeau 2005
HaNSB	Safaitic inscriptions in Ḥarāḥišah 2010
HIn	Harding 1971
Is.R	Safaitic inscriptions from al-ʿĪsāwī published on OCIANA
JSNab	Nabataean inscriptions in Jaussen & Savignac 1909-1922
KJA, KJB, KJC	Hismaic inscriptions from sites A, B and C in King 1990
KRS	Safaitic inscriptions recorded by G.M.H. King during the Basalt Desert Rescue Survey and published on the OCIANA
Lane	Lane 1863-1893
MZH	Hismaic inscriptions published in Al-Manaser & Alzoubi 2016
OCIANA	Online Corpus of the Inscriptions of Ancient North Arabia. http://krc.orient.ox.ac.uk/ociana/index.php

Ph	Thamudic inscriptions recorded by H.St.J.B. Philby and published in Van den Branden 1956
PNAE 1	Radner 1998
RTI	Hismaic inscriptions in Rölling 1987
SIAM	Safaitic inscriptions in Macdonald 1980
TIJ	Thamudic and Safaitic inscriptions in Harding & Littmann 1952
WHI	Thamudic inscriptions published in Winnett 1973

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The Trajanic Auxiliary Fort at Ḥawara (Modern Ḥumayma), Jordan

The Roman fort at Ḥawara, modern al-Ḥumayma, was founded soon after the conquest of the Nabataean kingdom by Trajan in AD 106, and the establishment of the Provincia Arabia. (FIG. 1) Like the *Via Nova Traiana*, the initial phase of fort construction and staffing probably was completed between 111 and 114 (Oleson 2010: 59; Abudanah *et al.* 2016: 391), and work may well have commenced immediately after the conquest. (FIG. 2) This complex, one of the best preserved principate period forts in the Near East, was designed to accommodate an auxiliary unit, probably a *quingenary ala,* detached from one or more of the legions stationed in the region after the conquest. A third-century inscription found in a shrine in the associated civilian settlement mentions the Legio III Cyrenaica, but units from the Legio VI Ferrata may also have cycled through the fort (Oleson *et al.* 2002: 112-16). The walls, one gate, and many of the internal structures were excavated by the author between 1993 and 2005 (Oleson 2009; Oleson *et al.* 1999, 2003, 2008; Sherwood *et al.* 2008a-b), with supplementary work by M. B. Reeves in 2012 (Reeves *et al.* 2017).

The first two volumes of the *Ḥumayma Excavation Project Final Report,* published in 2010 and 2013 (Oleson 2010; Oleson and Schick 2014), concerned the history and water-supply system of the site, along with the Nabataean campground and necropolis, Byzantine churches, and Early Islamic farmhouses. Preparation of the final report concerning the fort, to appear as volume three, has lead to new or refined conclusions concerning the design, construction, layout, history, and function of the fort, as well as its relation to other military architecture in the region. This paper will present some new results and highlight some remaining questions.

On-going study of the ceramics, coins, and architecture has improved our understanding of the phasing of the fort. Yvonne Gerber has just begun her final detailed analysis of the ceramics, but we have important preliminary results.

Summary of the Phasing of the Fort

Phase I: Pre-Roman Nabataean ceramics, without any known structural remains (first century AD).

Phase II: Construction of the fort, interior buildings, and water-supply system, with subsequent piecemeal alterations (*ca.* 106-110 to *ca.* 285). Construction of military bath in the *vicus.*

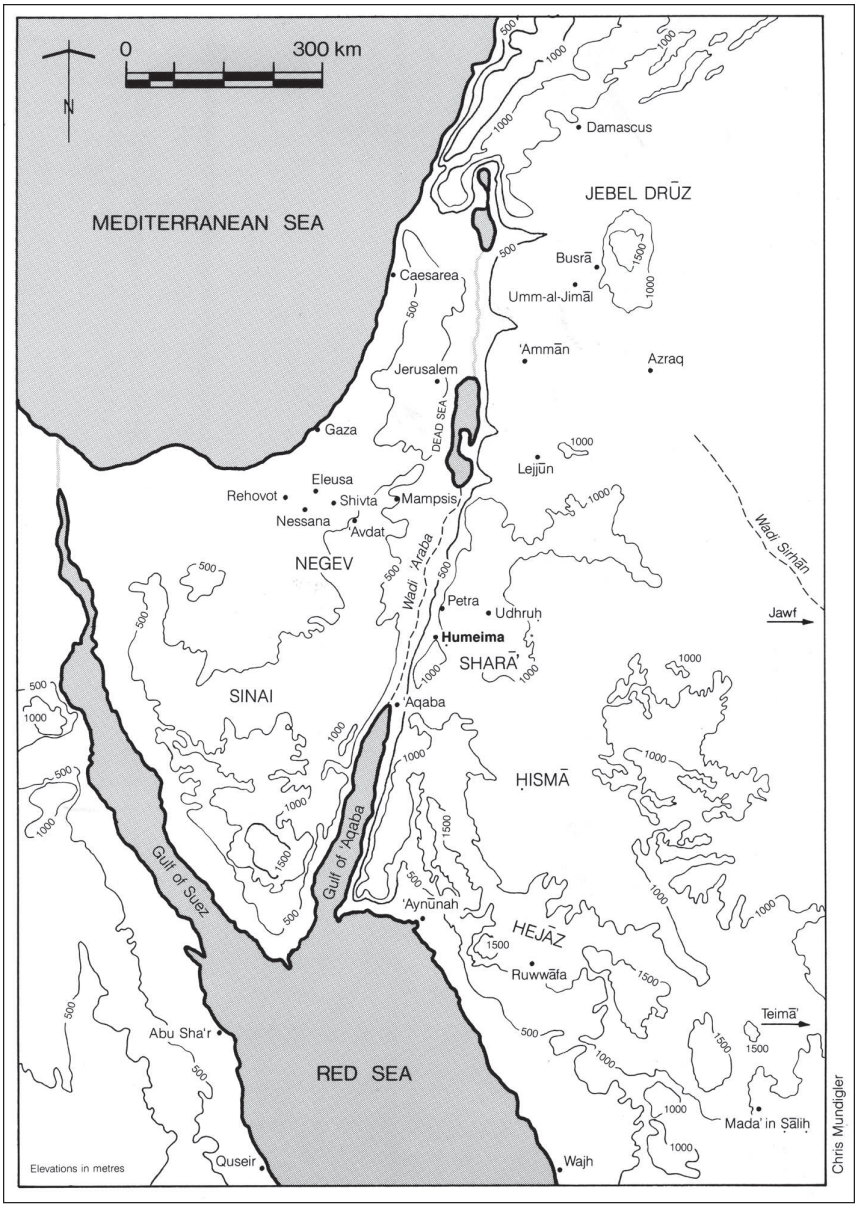
Phase III: Possible abandonment of the fort, either as a result of destruction by Zenobia's army in 270 or as part of Diocletian's reorganization of the frontier in the 290s (late third to early fourth century).

Phase IV: Renovation or reoccupation of portions of the fort (*ca.* 320 to 363), including units of *Equites sagittarii indigenae*. Ends with destruction by earthquake of 363 or events associated with the revolt of Queen Mavia in 375-378.

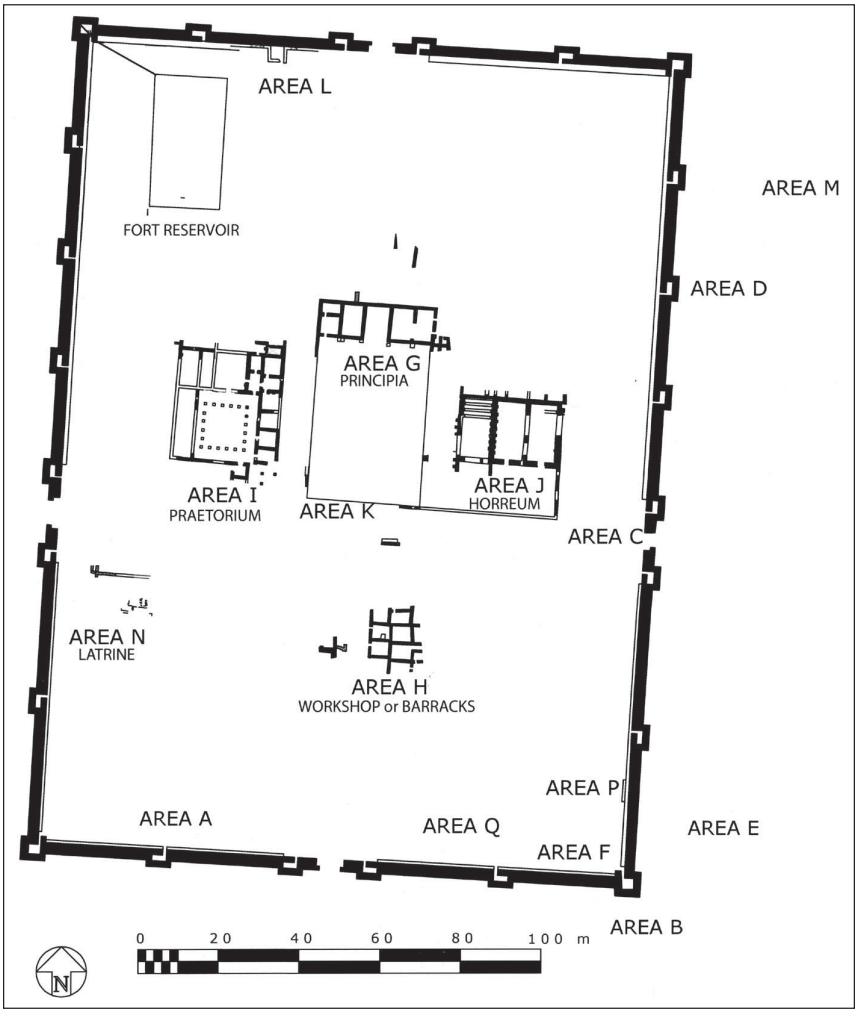
Phase V: Renovation of portions of the fort for military and civilian occupation, and dumping of debris in many abandoned rooms (*ca.* 363 to early fifth century).

Phase VI: Abandonment of the fort (early fifth century), removal of building materials, and gradual burial of the walls by wind and water-born soil (fifth to eighth century).

Phase VIA: Small-scale, temporary occupation of Area L (mid-sixth century).



1. Location map.



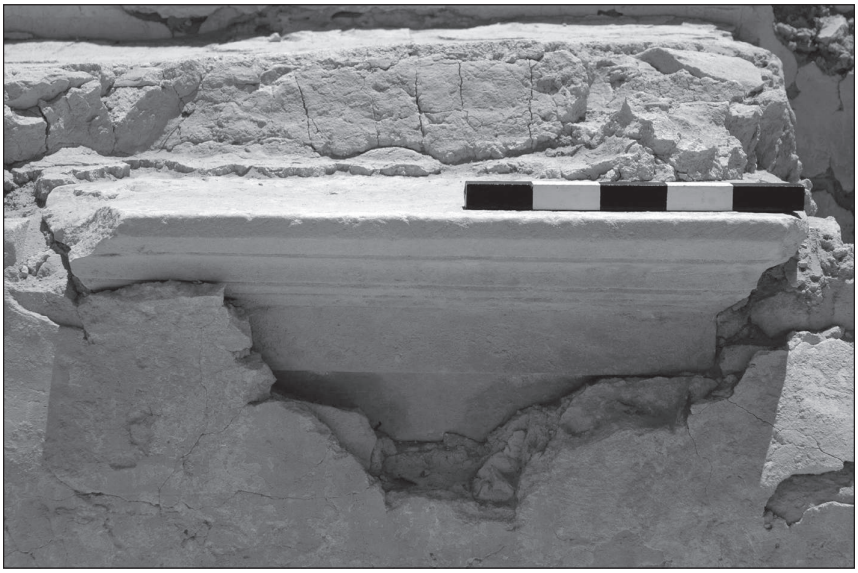
2. Plan of fort.

Phase I (First century AD)

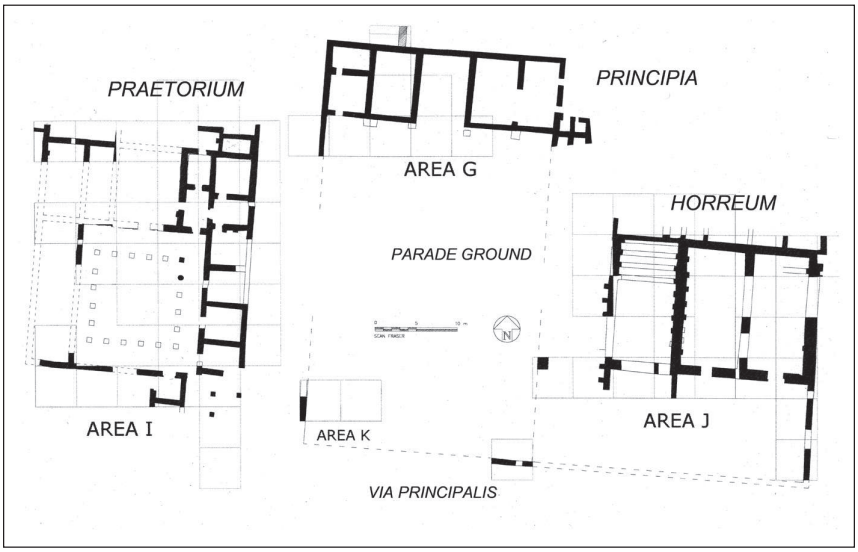
Is characterized by a scatter of late first or very early second-century AD Nabataean fine ware ceramics in the red sandy soil around the foundations of the fort walls and interior structures. No pre-existing Nabataean structures have been identified as yet within the fort area, although numerous stone mouldings and blocks taken from substantial Nabataean buildings elsewhere in the settlement centre were used in its construction. (FIG. 3) The Roman bath southwest of the fort was built on top of a Nabataean structure (Reeves *et al.* 2017), as was a shrine in the *vicus* (Reeves *et al.* 2009: 230-35), but the slope on which the fort was built is farther from the settlement centre and was probably outside the Nabataean occupation area.

Phase II (ca. 106 to 285)

Saw construction of the fortification wall, all interior buildings, and the internal water-supply and drainage system. Assuming some coordination with the completion of the *Via Nova Traiana*, these projects were probably finished by at least the first six years after the conquest in 106 (FIG. 4) There were subsequent minor, piecemeal alterations and renovations to some of the interior structures of the fort during the second and third century, but the main structures within the walls were complete in the early second century. Several strikingly luxurious features in the *praetorium* suggest the participation of Nabataean workmen. Stylistic details show that the mosaic floor in the commander's suite of the *praetorium* was laid by the same school of mosaicists that had



3. Nabataean block from *praetorium*.



4. Plan of central structures.

been at work in a Nabataean villa in Wādī Mūsā immediately before the Roman invasion (‘Amr *et al*. 1997: 470) (FIG. 5).

Room J, adjacent to the suite with the mosaic floor, was added later on in Phase II (Reeves *et al.* 2017). It had a hypocaust heating system very similar in design to that in the remarkable Nabataean or early Roman bath in a spectacular location on the Jabal al-Khubthah above Petra (Tholbecq 2015: 43-61). There was a similar heated room in the small fort at Khirbat al-Khālidī (ancient *Praesidium*; Oleson 2010: 457-59), 33 km south of Ḥawara. The luxurious House EZ IV at az-Zanṭūr in Petra, which belongs to approximately the same period as the *praetorium*, also had a winter *triclinium* with hypocaust heating (Kolb 2007: 167-68). A Nabataean or early Roman period house at Khirbat adh-Dharīḥ has two similar hypocaust rooms, one of which may have been associated with a bath (Kolb 2007: 168; al-Muheisen and Piraud-Fournet 2014: 838-39). Petra supplied most of the pottery used by both soldiers and civilians at Ḥawara throughout its history (Oleson and Schick 2014: 10-11), so other types of relations are natural. Reeves and Harvey (oral communication) have noted that the absence of military stamps on the bricks from Room J and elsewhere in the fort suggest that they, too, were supplied by potters at Petra.

5. Mosaic in *praetorium.*

Phase III

It is more difficult to document the abandonment in Phase III (late third to early fourth century). A gap in coin evidence suggests a temporary abandonment of the fort at the end of the third century, which probably reflects Diocletian's reorganization of the frontier after 285. Interference by Zenobia's army as she headed to Egypt in 270 is also a possibility. We have found no evidence of destruction in the fort attributable to Zenobia, but a shrine and buildings in the *vicus* were abandoned around this time (Oleson *et al.* 2008: 310-14). Perhaps her army by-passed the well-defended fort, cut the aqueduct that supplied it with water, and plundered the civilian settlement. Coins of five of the six emperors who directly preceded Diocletian were found in various locations in the fort. Not one coin of Diocletian, however, has been found in the fort or, in fact, anywhere at the site of Ḥumayma. Coins of the other early Tetrarchs –Maximian, Galerius and Constantius Chlorus– are also missing. In AD 305 coverage picks up again with Maximinus II, Maxentius, Constantine, and Licinius I and II. The juxtaposition of complete numismatic coverage of the emperors immediately preceding and following the absent Diocletian may indicate some sort of dramatic change: either transfer of the military unit elsewhere, or a break in the supply of new specie.

A few coins of the tetrarchy were found in the small tetrarchic fort at Bīr Madhkhūr, but so far none of Diocletian (A. Smith, Personal communication 2016). At the 'Ayn Gharandal fort, which actually boasts a building inscription of Diocletian, about 150 coins were found, but none of Diocletian and only one of Maximian (R. Darby, Personal communication 2016). Since Diocletian is unlikely to have abandoned these forts immediately after their construction, it probable that the absence of his coins there is either an accident of excavation or a symptom of supply problems. At a settlement located on the 'Arabah road in the southern Negev, a small fort very similar to that at Gharandal and with a similar inscription of Diocletian, two coins of Diocletian were found, two of Maximian, and 10 of Constantine (Davies and Magness 2015: 63). Farther north, coins of Diocletian were also found at the Diocletianic fort of al-Lajjūn (Parker 2006: 416-17). The preliminary report on the coins from the whole site of Hegra (Bauzou 2015: 523-25) lists coins of emperors before and after Diocletian but does not mention issues by Diocletian himself. Significantly, the Roman fort at Hegra, probably staffed just like Ḥawara by a detachment of the Legio III Cyrenaica, was also abandoned in the late third century (Villeneuve and Fiema. 2018). Despite the distance separating Hegra and Ḥawara (*ca.*

425km), there were close relations between the two outposts, leading to similarities in the design of fortifications and barracks and staffing with *equites sagittarii dromedarii.*

How should we interpret the absence of these coins at Ḥawara: problems with coin supply, or abandonment? Coins of the later tetrarchs show that the fort was in fact occupied by around 320, when Licinius, was busy in the region, or a few years later, early in the reign of Constantine. Perhaps the garrison was stationed elsewhere for a few years after the hypothetical Zenobia event, but returned once the aqueduct had been repaired and civilian Ḥawara had revived. So far, analysis of the ceramics, coins, and stratigraphy have not confirmed irrefutably that the fort was abandoned for a short period in the late third or early fourth century, but it seems likely. During this phase several roofs and walls collapsed in the *principia*, and debris accumulated in and around several of the rooms, but the absence of occupation debris below the collapse level in these rooms suggests that the rooms had been cleared out prior to the damage. In Area N, the craft area with five basins, which most likely served as a brewery, was abandoned at the end of Phase II and not put back into use in Phase IV.

Phase IV

During Phase IV (*ca.* 320 to 363), many structures in the fort were renovated or redecorated, notably the *praetorium* and *principia*. The rich deposits of fourth-century ceramics and numerous coins of the House of Constantine testify to continued occupation throughout this period, although it is not clear that the reoccupation was entirely military in character. The careless renovation of the *principia*, for example, suggests some change in the function of the structure.

The addition of at least one ballista platform (*ballistarium*) to the fort wall at some point during Phase IV, however, indicates the presence of at least a small unit of soldiers. This narrow platform, *ca.* 4.85 m long by 1.80 wide, was constructed against the wall in the southeast quadrant of the fort, between two towers. There are traces possibly indicating that several more were built at several other locations up against the inside face of the enceinte. In Josephus' admiring description of Roman field camps in Judaea (Jewish War 3.76-82) he says that "in the spaces between the towers are placed rapid-fire devices, catapults, and stone-throwers, every variety of artillery engine all ready for use." I believe the platform at Ḥawara is a rare surviving example of this type of catapult platform. Added to the wall walk, the feature provides a space of 4.85 x 3.20 m, sufficient for deployment of small arrow or stone shooters. This type of platform has seldom been preserved or recognized. One possible regional candidate is a platform built inside the city wall of Petra, on the North Ridge above a road and possible route of approach (Parker and Perry 2013: 401-2). Although this platform is long and thin (L 8.88 m, W 0.88 m), it was built up against a wall 2.25 m thick, the top surface of which should have given sufficient room for mobilizing a ballista on the wall walk behind the curtain wall. Such a platform is suitable for the smaller arrow-shooting machines that could be efficiently manned by two or three men and that did not require much space (Marsden 1969: 192 and pl. 8; 1971: 231-32). A slightly different arrangement, consisting of a rectangular rubble platform in the northeast corner of Camp G at Masada, may be another regional example (Davies 2011: 69, fig. 3, 75; no scale given).

During Phase IV, a forge was also installed in one of the former barracks rooms in Area H, either to produce metalwork in iron and bronze, or to recycle unneeded military gear, or both. This mix of craft of sleeping areas is unusual, but it is documented elsewhere in the later empire, in part because of the smaller unit sizes. The movement of civilians into forts was common along the frontier in Britain and along the Danube at this time, because of a decline

in the size of military units and a concomitant rise in insecurity (Lemke 2015: 90-92; Mosser 2015: 80). A reduction in the size of the unit stationed in the Ḥawara fort during the fourth century may explain the presence of civilians in the fort at this time. The failure to renovate in Phase IV the abandoned Phase II brewery, which was large enough to supply 500 soldiers, also suggests a smaller garrison. Phase IV ends with the collapse of all the buildings in the fort, most likely caused by the devastating earthquake of 363, which is well documented at the regional centres of Ayla and Petra (Oleson 2010: 59). The excavators of Diocletian's fort of Yotvata, which also suffers destruction at this time, suggest that it might be associated with either the earthquake or the rebellion of Queen Mavia in 375-378 (Davies and Magness 2015: 63).

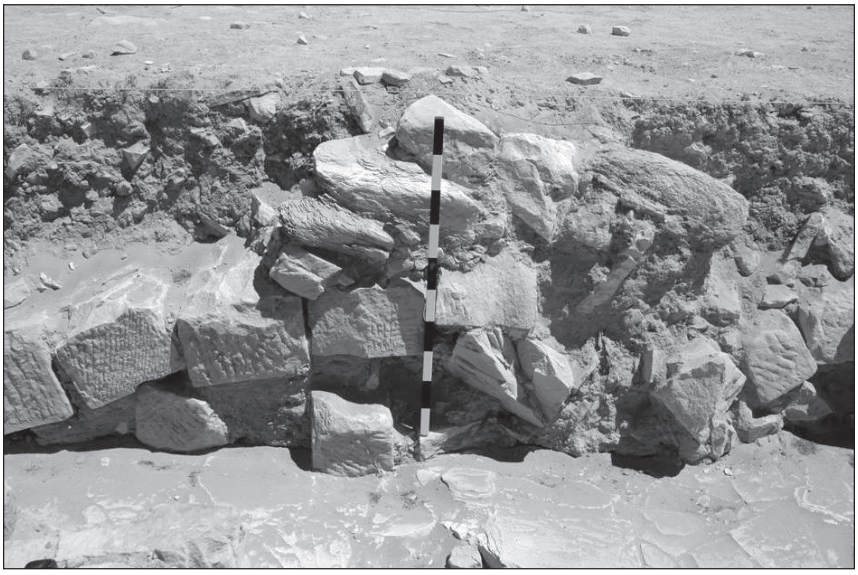
Phase V

The excavated areas that were not reoccupied in Phase V, for example parts of the granary, the latrine and associated craft area, and some peripheral rooms in the *praetorium* did not yield large quantities of artefacts in use at the time of the destruction event. Some of the rooms had packed earth floors belonging to Phase IV, incorporating ceramics and other finds, but no extensive collections of crushed artefacts appeared. In official service buildings such as the granary or the *praetorium*, this lack of residual objects probably reflects in part the discipline of military life, in part the hazards of the selection of areas to excavate. In addition, survivors of the disaster undoubtedly dug through the debris to salvage useful items, disturbing the pre-destruction deposits. There is apparently wind-blown soil on some of the floors in the *principia* and granary, directly below the level of structural collapse, so some parts of various buildings may have remained standing for a few months, allowing salvage of property prior to their final collapse.

At the beginning of the post-earthquake Phase V, some of the rooms in several structures were cleaned up for re-use, with repairs to damaged pavements, including the mosaic-floored rooms in the *praetorium* and the large rooms in the northeast corner of the *principia*. Many of the walls were roughly re-plastered, and benches, bins, new doors, steps, and cooking facilities were added at this time. The mosaics in the commander's suite in the *praetorium* reveal damage from falling debris, and large areas where the tesserae had been detached from the plaster sub-floor were patched and covered with plaster. All the rooms show some signs of burning, a process that left reddish or black marks on the *tesserae*. No carbonized wood or burned debris was found during excavation, indicating that the burning is unlikely to have occurred at the final destruction event. The majority of these burn marks appear along the room perimeters near a wall, although some occur in the centre of a room. The small size and location of these burned areas suggest that small, contained fires were lit, most likely by squatters who occupied the building in Phase V. Other rooms, particularly the hypocaust room in the *principia* and some *contubernia* in the barracks area, were filled with dumps of ceramics, plaster, and rubble cleared out of the rooms that had been put back into use. The complete lack of coins from this phase suggests low intensity, probably civilian occupation, as does the fact that the *horreum* remained out of use and unoccupied, the fallen roof arches left in place (FIG. 6). The ceramic record for this phase terminates sometime in the first quarter of the fifth century.

Phase VI

After the final abandonment of the fort in the early fifth century, Phase VI saw the removal of building materials for reuse elsewhere, particularly facing blocks from the fortification wall and interior buildings. The cores of these walls then spilled out over the remaining lower courses of facing, and the spaces in and around



6. Detail of fallen *horreum* arch.

the interior structures were gradually filled in with wind and water-born soil. The lack of stratigraphy in many of the rooms, and the typical mixing of artefacts from all periods of occupation, probably results in part from the churning up of the debris and fill during the salvage of fallen wall and roof blocks.

There was, however, one hiccup in this abandonment. In Phase VIA a single small room, only 2.0 m on a side, was built up against the inside of the fortification wall just west of the north gate. A bronze *follis* dating later than 491 and probably struck by Justinian dates this structure to the mid-sixth century. It is possible that this shelter was provided for a supervisor or for a night watchman and tool storage during the salvage of building materials from the fort for the construction of houses or some of the five Byzantine churches in the central part of the site. In any case, it is a reminder that even after the abandonment of the fort, the civilian settlement continued to thrive.

I can only summarize here some of the other information that has come up during the preparation of the final report. Excavation by the French-Saudi team at Madāin Ṣālih has recently revealed portions of a heavily fortified Nabataean military camp, adapted in the early second century for a Roman garrison (Nehmé *et al.* 2015: 17-77). A possible barracks building has been exposed that shows similarities in scale and plan with the barracks at Ḥawara (Villeneuve and Fiema 2018; Fiema, Forthcoming). Judging from the inscriptions found in the city gate located nearby, the camp was occupied by a detachment from the Legio III Cyrenaica, the same legion that supplied a detachment to Ḥawara. One inscription mentions a unit of *eq(uites) dro(medarii)* from this legion associated with the fort (Nehmé *et al.* 2015: 38). This evidence strengthens Nikolic's hypothesis that the *equites sagittarii indigenae* mentioned by the *Notitia dignitatum* (*Or.* 34) as stationed at Ḥawara.

were mounted on camels rather than horses (Oleson 2010: 54, 59; Nikolic, Forthcoming). Detachments of soldiers on their way to Hegra probably originated at or passed through the fort at Ḥawara, and it is likely that there was a good deal of movement between the two forts, despite the distance. There is no reason why units of *equites dromedarii* could not have rotated between the two forts, perhaps in connection with patrols along the routes that connected them.

The motivation and model for the selection of a fort plan with projecting towers at Ḥawara still remain unclear. (FIG. 7) Such a plan is unprecedented elsewhere for a Roman fort of this period, although it certainly makes sense in

7. View of Tower no. 5.

terms of defensive strategy. The Ḥawara fort has the proportions and internal layout of a typical principate "playing card" fort, but the architect abandoned the usual rounded corners and inward-projecting towers for projecting corner towers, supplemented by towers along the walls that project only on the exterior, all the towers projecting far enough to allow enfilading fire. Gregory's hypothesis that the fortress cities of the Near East inspired this design in forts of the third-century, can be applied to second-century Ḥawara as well (Gregory 1995: 148-227, 1996). Perhaps Trajan's engineers, preparing for the invasion and occupation of Parthia, were experimenting with an urban design that allowed a more effective defensive posture: enfilading fire, better access from the wall walk, and free passage on the wall walk across the back of the tower. Pietsch (2000: 27-30) has connected the growth in the importance of troops armed with the bow – both mounted and on foot – with the adoption of projecting towers in Parthian fortifications. According to his interpretation, in the first century AD the Parthians adopted tactics involving mounted *sagittarii* along with defensive rather than offensive manoeuvres, and these developments fostered the use of towers facilitating the deployment of archers in Parthian fortifications. Roman campaigns against the Parthians subsequently fostered similar changes in the design of Roman camps and forts in the third and fourth centuries. Like Gregory, however, Pietsch overlooks the early date of the Ḥawara fort design, and there is no reason the process could not have begun earlier in the second century, particularly since Trajan was preparing to invade Parthian territory. The detachment of the Legio III Cyrenaica stationed at Hegra in the mid-second century, probably sent from or via Ḥawara, added to the Nabataean fort at that site towers that project six Roman feet, just like those at Ḥawara (Villeneuve and Fiema 2018). The Hegra fort, significantly, was abandoned by its troops in the late third century, just as I have proposed for Ḥawara, and it subsequently seems to have been reoccupied by civilians (Fiema, Forthcoming). Another atypical aspect of the Ḥawara fort is the presence of a *titulum* outside the north gate, a curved earthen defensive wall, barely visible to the naked eye and difficult to photograph, but clear in GPR. (FIG. 8) shows the *titulum* during the winter rainy period, when ground moisture highlights the difference in patterns of vegetation over the disturbed soil of the *titulum* fill and the surrounding soil. The upper dashed line follows the highest ridge of the feature, approximately 0.75-1.0 m above the surrounding soil, while the lower line follows the approximate edge of the southern extent of the spreading fill. *Titula*

8. *Titulum* from south-east.

are rare throughout the Empire, but one can be seen in aerial photographs outside the north gate of the probable Roman marching camp at Khirbat Abū Safat near al-Jafr (Kennedy and Bewley 2004: 176; APAAME website image 20091022_DLK-0340.dmg). Another *titulum* is visible in aerial photographs outside one of the gates of the possible marching camp at Tall Abara, near Udhruḥ, although Kennedy (2004: 180-81) labels it a *clavicula*. Both of these parallels are well within the region of interest to the forces at Ḥawara.

The question of roofing is important for the reconstruction of the main structures inside the Ḥawara fort. The three storerooms of the *horreum* preserve arch support imposts and fallen voussoirs for cross arches that carried flat roofing slabs. The same arrangement is seen in the barracks. The walls of the *principia*, in contrast, have no arch support piers, suggesting that this structure may have had pitched roofs covered with roof tiles. This hypothesis is strengthened by the discovery of nearly 7,000 roof tile fragments in this area, weighing 842 kg. Only 322 roof tile fragments weighing 60 kg were found around the *horreum*. Several rooms in the *praetorium* have arch support piers, but not all of them, and 713 tile fragments weighing 109 kg were found in this area. So portions of this structure also may have been roofed with tiles. None of the other structures inside the fort yielded enough roof tile fragments to justify restoration of pitched roofs. It makes sense that the two most prestigious administrative structures in the fort should have been roofed in this conspicuously Roman style. Of course, these totals are far less than the original statistics would have been, indicating that large numbers of tiles were salvaged, probably in Phase V after the earthquake destruction. Approximately 18,000 cover tiles were inverted and reused in maintenance of the aqueduct channel, but the pan tiles are missing. Few turn up elsewhere at Ḥawara, even in the churches, so they most likely were exported to sites such as Ayla.

The fort at Ḥawara is notable for allowing the documentation of exceptionally thorough modular planning based on rational units of the *pes monetalis* (Roman foot, 0.296 m). I have expanded my comparative study of modular planning to the other published Roman camps and forts in the Near East, but publication of this type of analysis remains rare, and as a result comparative statistics are usually limited to the exterior walls (Oleson 2009, Forthcoming). Nevertheless, it is clear that the Roman engineers in this region routinely laid out their military structures according to pre-set proportions, or in rational numbers of the *passus* of 5 *pm,* or the *pertica* and *decempeda* consisting of 10 *pm*,

or in fractions and multiples of the *actus* of 120 *pm*. The *stadium* of 625 *pm* was sometime also employed; it consisted of 125 *passus*.

Despite its auxiliary status, the Ḥawara fort had many of the features and structures of a legionary camp or fort: four gates, with the *via principalis* and *via praetoria* crossing at 90 degrees; a *principia*, or headquarters building with parade ground in front; a *praetorium*, or commander's residence; a *horreum*, or granary (Area J); a barracks building; a possible craft area with latrine (Area N); and a probable stable. The advanced fortification technique and the careful modular planning of all the structures, along with their comprehensive variety, reflects the importance Trajan and his engineers placed on this isolated frontier post. As when the prince Aretas chose this unoccupied site for the foundation of Ḥawara in the later first century BC, and again just after AD 685 when 'Ali ibn 'Abd Allâh ibn al-'Abbâs purchased the village (Oleson 2010: 57-61), the location drew the attention of those in the highest ranks of power.

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A Byzantine-Umayyad Monastery and a New Interpretation for the Cistern in Area III on Tall Zar'ā

The excavation on Tall Zar'ā which is part of the 'Gadara Region Project' was initiated by D. Vieweger in 2003. Since then, 18 excavation campaigns have been conducted by the Biblical Archaeological Institute Wuppertal and the German Protestant Institute of Archaeology under the directorship of D. Vieweger and the author (Vieweger and Häser 2017). Three areas were opened: Area I in the west, Area II in the north and Area III in the south of the tall. In Area I, a sequence of 25 strata was excavated covering a time span from the Early Bronze Age II to the Ottoman period. In Area II, 10 strata were uncovered dating from the Iron Age IIC to the Ottoman period. In Area III, the sequence is shorter and covers the time from the Roman-Byzantine to the Ottoman period.

Below faint traces of an Ottoman and Mamluk stratum in Areas I and II, a large complex of rooms dated to the Byzantine and Umayyad periods was found, which obviously served for living and storage. The sequence of strata is similar in Area III, but the Mamluk presence is much more intensive. The large complex of rooms which is found in all three areas was originally interpreted as a Byzantine villa, with the main building in Area III and the living and storage rooms in Areas I and II.

However, an unexpected discovery in Area III brought the real nature of the building complex to light. Excavation of Area III began with a test trench in the summer of 2007 and continued during a two-week summer campaign in 2008; the field director for both seasons was U. Rothe. On the last day of the 2008 campaign, a mosaic medallion was uncovered which could not be excavated at that time. It was therefore covered with plastic and a thick layer of soil. However, due to continuous looting, the mosaic was partially uncovered again. In 2014, it was decided to continue the excavations in Area III in order to clarify the northern extension of the Byzantine-Umayyad building complex and – in accordance with the wishes of the Department of Antiquities (DoA) – to remove the mosaic medallion from the site and store it in the museum. This work was carried out under the direction of U. Rothe and with financial support from the CBRL. The recovery was undertaken by experts from the DoA, under the auspices of Amjad Bataineh. Restoration work has since been carried out by Mohammad al-Shiyab and

Ziad Aziz of the DoA. The mosaic is currently in storage at the Dār as-Saraya Museum in Irbid (Rothe *et al*. 2017).

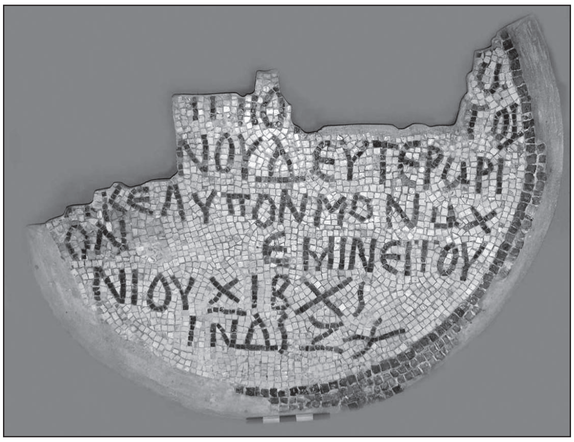
In preparation for recovery, a thick and very hard layer of chalk was removed from the mosaic. Only after this removal did it become obvious that the medallion bore a Greek inscription. The mosaic is comprised of white, black and red medium-sized stones. It became clear from the finding context that this inscription is derived from an older, no longer existing mosaic floor which was incorporated in a new floor. Interestingly, this inscription was not destroyed, but covered by a chalk layer in order to hide it (FIG. 1).

Andrea Zerbini (Rothe *et al.* 2017) has kindly transcribed and translated the inscription as follows:

[Two more lines?] | [- - -][.]α|[- - -ca. 6 - - -] [...]ιο[- - -c. 6- - -] ̣τοῦ| **[....]νου** δεụτ̣εραρί|ọụ **κὲ** λυπο͂ν μοναχ||ο͂**ν ἐ(ν) μινεί Ἰου|νίου χιβ’ χ(ρόνων) | ἰνδ(ικτιῶνοc)** ζ’

“(the work was carried out under?) … (and) Ioan]nes (?), the deuterarios, and all the other monks in the month of June, year 612 in the time of the 7th indiction (AD 709)”

Andrea Zerbini has chosen the era of Capitolias for the dating, since it agrees with the 7th indiction mentioned in the inscription. If this date



1. Mosaic with Greek inscription (TZ 310527-006) found in Area III on Tall Zar‘ah (photo: K. Takeshi).

is correct, previous studies regarding Capitolias may have to be re-examined, which A. Zerbini will deal with elsewhere.

However, there is another possible date using the Pompeian era, as suggested by J. Niehoff (pers. com.). If his suggestion is correct, the date would then correlate with the year 548/549 AD.

Examination of the building’s stratigraphy and of the archaeological finds is not yet finalised, therefore it is not possible at this point to categorically state which date is accurate. It must also be pointed out that this inscription refers to “a work” which might be the foundation of the building, but was more probably the construction of the mosaic floor. Therefore, the date of the mosaic inscription gives only a *terminus ante quem* for the construction of the building.

However, the inscription does make it clear that the large building complex in Areas I, II and III was actually not a Byzantine villa but a monastery. The mosaic medallion was probably situated inside a former church which was completely re-modelled in later times. The finds context of the medallion is a mosaic paved courtyard with installations which drained water into a large vaulted cistern below the floor.

Comparing the location of this mosaic medallion with similar inscribed medallions at other sites such as the monastery of the Holy Theotokos in ‘Ayn al-Kanīsah (Piccirillo 1994) or the church of St. George at Mount Nebo (Piccirillo 1997: 178–179), it is obvious they are always situated either in the main nave, the side nave close to the entrance or the chancel, or inside the *intercolumnia*. Only one inscription which is similar to these has been found outside a church; it was uncovered in the second church at Hayyān al-Mushrif – also called the “monastery” (Al-Muheisen 1997). However, this inscription was situated in an atrium close to the church.

Due to these comparisons and the layout of the extant remains, the author proposes that

the mosaic medallion at Tall Zar‘ā was located close to the entrance of the main nave of a two or three-aisled church with a narthex to the west. The portion of the chancel and apse which is presumed to have been to the east may possibly lie beneath later wall remains. There are further rooms at the southern side of the church. The northern side has not been excavated to the depth of the Byzantine stratum.

After examining the buildings in Areas I and II, the author believes they developed from three very simple houses, each with two rooms, (or possibly one) together with a courtyard, to a large complex of rooms and courtyards oriented almost north-south. They have several installations, for example tabuns and large basins, and appear to indicate use as a rural living and working quarter.

Pottery sherds of African Red Slip Ware, Late Roman Coarse Ware and Jarash Lamps, as well as glass finds, prove that the inhabitants were not poor, but shared the facilities of a prosperous population (Kenkel 2012; Rothe *et al.* 2017).

How does the monastery on Tall Zar‘ā fit into the picture of the monastic situation in Jordan in the Byzantine and Umayyad periods?

The Christian monastic movement started in the 4th century AD in Egypt. Very soon it had extended to the neighbouring regions. It was a movement against the wealthy lifestyle of the rich and a renunciation of secular life. People lived alone or in small groups in caves or simple shelters. Later, they congregated in larger communities.

The oldest evidence for monks in the area which includes modern Jordan stems from the account of the pilgrim Etheria, who probably travelled through the Holy Land *ca.* 400 AD. She described the church at Ṣiyāgha and the monks living in caves in the surrounding area. It appears that there was no monastery close to the church at this time. However, the account of the so-called Peter the Iberian who travelled to Mount Nebo during the first half of the 5th century AD led M. Piccirillo (1992: 18) to assume that a monastery was there at that time.

With regard to archaeological evidence of monasteries in Jordan, B. Hamarneh (2012, 279, 290–292) listed forty-two examples belonging to the Byzantine provinces of Arabia and Palaestina prima, secunda, and tertia.

The dating of these monasteries is difficult. B. Hamarneh (2012: 294 fn. 4) assumes that the so-called monastery of St. Sergius and Bacchus at Umm as-Surab is the earliest of them. The dedicatory inscription is engraved on the lintel of the main entrance to the church and gives the date of 489 AD. However, this inscription probably only refers to the church itself (King 1983: 115, 124). The adjacent rooms are later attachments, and without excavation an Umayyad date for them cannot be excluded. Even the designation as a monastery is questionable.

The correlation of inscriptions with architectural remains is always difficult, since it is seldom clear which part of the building the inscription refers to. The dating of churches and monasteries by architectural features is also inadequate, since none of them show a distinct datable development. Therefore, churches and monasteries can only be dated in ranges of centuries. With this in mind, we can state that most of the known monasteries in Jordan were founded in the 6th and early 7th centuries. There is no sudden end to the monastic movement, rather a gradual abandonment after the Islamic conquest. The latest evidence of a monastery in Jordan is a literary source. Leontius of Damascus mentioned the abbot Anba Cosmas from the monastery at al-Quwaysmah in the vicinity of Amman at the beginning of the 9th century (Piccirillo 1997: 266–267; Hamarneh 2012: 285–286).

Although the date of the monastery on Tall Zar‘ā has not been fixed yet, it can be posited that it was in use between the 6th and the 8th century, as are most of the other monasteries in Jordan.

M. Piccirillo’s (1992: 21) research into the

locations of foundation, and the character of monasteries in Jordan, resulted in a division of three major groups: the large *coenobion*, the small *dayr* near a village, which remains primarily agricultural, and the hermitage or *laura*, which are essentially rupestrian or semi-rupestrian.

Piccirillo only assigned Dayr Ṣiyāgha to the first group, but the monastery at Jabal Hārūn should be included in this group as well, as intensive excavations have shown (Fiema *et al.* 2016). Both of them are examples for the connection of monasteries to Biblical sites.

M. Piccirillo's second group is the largest one. It includes monasteries like Dayr al-Kanīsah south of Mount Nebo (Piccirillo 1992: 22; Piccirillo 1994). The characteristic features are their location outside the village in the vicinity of agricultural plots of land from which the monks made their living. In most cases, the villages are built on top of pre-existing Roman villages in the large wadis running from the Jordanian Highlands to the Jordan Valley.

In many instances, they are located close to roads which connect the Jordan Valley with cities, for example Gerasa, Capitolias or Abila. The environment was suitable for agriculture and herding. These were not places for an isolated ascetic life separated from the community. Instead, the monks and nuns were responsible for the pastoral care of the villagers. In addition to their religious duties, the monks and nuns supported themselves with agriculture, which is proved by wine- and oil presses found within the monastic complexes (Hamarneh 2012: 284).

The third group comprises hermitages which are thought to have existed close to Mount Nebo. Since there are only a few extant remains, they are very hard to detect and difficult to date.

A significant hindrance to the assessment of the actual size and arrangement of monasteries – not only for the hermitages – is the current state of research and excavation for these sites. In most cases, only the actual churches have been excavated, not the adjacent rooms. In other instances, all visible rooms were seen as one large coenobic complex, although they are actually later, non-monastic additions. Moreover, archaeological finds such as pottery and glass sherds, metal objects *etc.* have been published for only a few sites.

Therefore, the excavation of a monastic complex on Tall Zar'ā together with structures used for storage and living quarters, enables new insights into the daily life of a monastic community to be drawn. In general, the location, architecture and finds are well suited for inclusion within M. Piccirillo's second group of monasteries. It was situated outside a city and surrounded by arable land. The monastery on Tall Zar'ā also agrees with his observation that these monasteries were founded in the wadis connecting the Jordan Valley with the Jordanian Highlands and on routes leading to the cities.

One can only speculate about the administrative affiliation of the monastery on Tall Zar'ā:

If the assumption that the era of Capitolias was used in the mosaic inscription is correct, the monastery on Tall Zar'ā would have belonged to the diocese of Capitolias; on the other hand, if the Pompeian era is correct, the monastery would have been part of the diocese of Gadara.

Regarding the building history of the site where the monastery was founded on Tall Zar'ā, a new hypothesis was developed after a closer examination of the large vaulted "cistern" which was uncovered in Area III during the earliest investigation of Tall Zar'ā. It is constructed from fine masonry and measures 6 m from north to south and 10.4 m from east to west. Its height from the bottom to the inlet is 5.75 m. It is covered internally with several layers of hydraulic plaster. The inlet is built of four ashlars and a drainage channel which was secondarily cut into the mosaic floor of an Umayyad courtyard – the former nave of the church – leading the water inside the cistern. This vaulted chamber appeared to be, without question, a cistern. However, the excavators had never been able to

explain why the inhabitants would build such a large cistern when there is a permanent spring only 50 m away. Even more curious is the fact that P. Keilholz’s (2014) research in Gadara proves that no other cistern was built with ashlars. Of the more than one hundred registered cisterns in the study, all were cut into the rock, and such a rock-cut cistern would also have been possible on Tall Zar‘ā.

Therefore, an alternative interpretation of this vaulted chamber seemed to be required. Subsequent investigation proved that the masonry can be compared not only with Roman vaulted shops found in Capitolias and Gadara, but also with the vault of the substructure supporting the Hellenistic temple in Gadara (FIG.2).

As a result of these comparisons, the author proposes that the vaulted chamber on Tall Zar‘ā was not originally built for use as a cistern, but as the substructure of a large building which probably dates to the Roman period. S. Schütz (in preparation) identifies the main building of a Roman villa in Area II. In this respect, it cannot be excluded that we are dealing with another, even larger and more elaborate, building in Area III, which would have been destroyed during the foundation of the Byzantine church and re-modelled as a cistern after the transformation of the church nave into a courtyard in the Umayyad period.

Since the quality of construction for this building surpasses all others on the whole of Tall Zar‘ā, the author proposes that it is the substructure substructure of a Hellenistic and/or Roman sanctuary, perhaps ritually connected to the permanent spring in the middle of the tall, which must have been a miraculous phenomenon for the inhabitants of the region. The connection of sanctuaries with water is well represented, e. g. in Hammat Gader and at other sites (el-Khouri 2010; Weber 1997). The visual connection between Gadara and Tall Zar‘ā may support this assumption, as it is an important factor for other sanctuaries such as al-Qabū and ‘Arqūb ar-Rūmī in the vicinity of Gadara (Bührig 2016: 105–107).

2. Vaulted substructure/cistern in Area III.

Further investigation is needed in order to clarify the layout of the monastic complex in Area III and the evaluation of a Hellenistic/Roman sanctuary on Tall Zar‘ā .

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Between Collapse and Continuity: Late Bronze Age to Iron Age Transition on Tall Zar'ā

Introduction

Cultural transitions have always been of particular interest to scholars. In the southern Levant one of the most hotly debated topics is the nature of the transition from the Late Bronze Age to the Early Iron Age. That the transition involved considerable social and cultural changes is uncontroversial. In the area west of the Jordan River, the period is usually connected with the destruction of Late Bronze Age cities by the "Sea Peoples", a lack of Egyptian territorial organisation, and conflicts between Canaanite city states or the conquest by Israelite tribes. But east of the Jordan may be a different story, and scholars of this region can explore the evidence free from these presumptions, which are mainly based on written evidence.

The main archaeological questions are as follows: When did the Late Bronze Age city state system collapse? What caused this collapse? In what form did Late Bronze Age culture continue? Which continued and newly-founded settlements can be assigned to the Early Iron Age? Is it possible to identify social or settlement-related structures that shed light on the development from the Late Bronze to the Iron Ages?

This article will suggest possible answers to some of these questions by presenting the excavation on Tall Zar'ā where we have observed both continuity and new beginnings during this important period of transition.

The evidence at Tall Zar'ā seems to indicate a Bronze Age city that experienced violent destruction prior to 1200BC and whose inhabitants immediately rebuilt their settlement but on a smaller scale, partially enclosing its Bronze Age ruins. The Iron Age architecture shows examples of both continuity (as in the style of a Late Bronze Age "court-house") as well as newer developments (like the "four-room houses"). Generally the question regarding what kinds of conclusions can be drawn from a destruction layer still stands. It is usually assumed that such layers hint at military conquest, although conquerors tended to leave the infrastructure of cities that they seized intact. Therefore, in most cases, it seems more convincing to attribute large scale destruction to natural causes (like earthquakes).

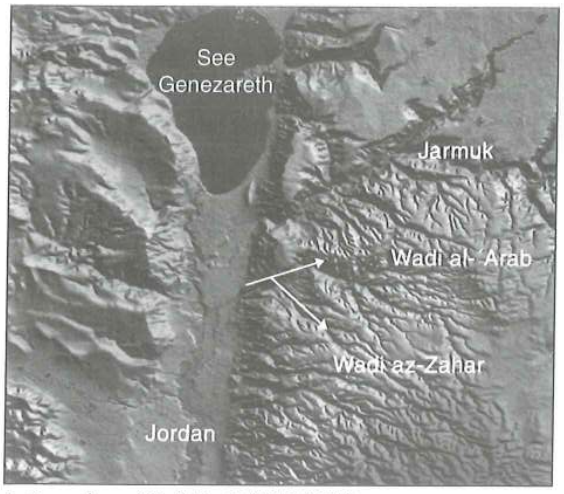
Tall Zar'ā presents an ideal starting point for discussing this complex set of issues given its continuous settlement through all of the historical periods in question.

Tall Zar'ā

Tall Zar'ā is located in north-west Jordan close to the border with west bank, 10km south-southeast of the Sea of Galilee and 4.5km south-west of the ancient Decapolis city of Gadara. Due to its strategic position and the natural conditions, the site was almost continuously inhabited from the Early Bronze Age to the 19th century AD (FIG. 1).

Tall Zar'ā is situated in the Wādī al-'Arab in north-west Jordan located at a key point, both topographically and geopolitically, lying as it does at the point of transition between Palestine and the Syrian-Mesopotamian as well as the Egyptian cultural spheres, and politically and culturally influenced by both. The settlement site was also well chosen on a prominent hill on a major trade route through the Wādī al-'Arab linking Egypt with Damascus and Mesopotamia. Finds of imported goods, *e.g.* pottery from Syria, Mycenae and Cyprus, bitumen from the Dead Sea, copper ore, faience and raw glass, bear witness to the inhabitants' contacts with neighbouring regions.

Through the centuries, a perennial artesian spring provided water to the tall and made habitation possible on a continuous basis. Its first inhabitants settled the 20 m-high, 5.6 ha-broad calc-sinter hill in the 4th millennium BC. From then on, the hill was settled virtually continuously until the 19th century AD. As a result, over the 5000 years of settlement more than 16 m of cultural layers accumulated. Tall Zar'ā thus offers archaeologists the unique opportunity to develop a comparative stratigraphy for northern Jordan from the Early Bronze Age to the modern period.



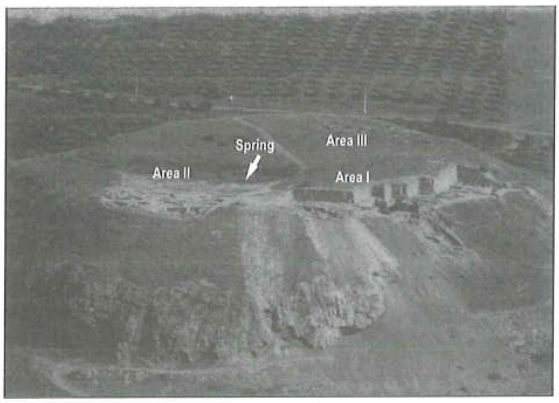
1. Location of Tall Zar'ā (BAI/DEI).

The first scholarly mention of Tall Zar'ā dates to 1885 by G. Schumacher; its systematic exploration started with a survey in August 2001 and was followed in 2003 by the first excavation campaign, both conducted by the Biblical Archaeological Institute Wuppertal and directed by Prof. Vieweger. Since 2004, this project has continued with two campaigns per year as a co-operative project of the Biblical-Archaeological Institute Wuppertal and the German Protestant Institute of Archaeology in Amman (and also in Jerusalem, since 2006), directed by Prof. D. Vieweger, Dr. J. Häser and, since 2013, Dr. F. Kenkel. Excavations ceased in 2012. Since then we have been preparing our final report that will appear in multiple volumes. We hope to publish the first volume [of nine projected] late this year.

Three areas were excavated. Area I was excavated to the earliest habitation layers of the site in the Early Bronze Age. Area II and III were excavated to the Hellenistic stratum and to the Byzantine stratum respectively. Therefore, the strata relevant for this lecture are located in Area I. This is situated in the north-west part of the tall and measures 1750m² (FIG. 2).

The Late Bronze Age Strata (16th to 13th Century BC)

During the Late Bronze Age, Tall Zar'ā was the center of a city-state as we can infer from the architecture and the finds. Unfortunately, there is no evidence for its name. In 2005, Jan Dijkstra assumed that Tall Zar'ā might be identified with the city "Qaduru in the land Hanma" (qa-dú-rù m p3 t3 n ha-an-má) mentioned in an inscription on the northern wall of the hypostyle of the Amun-Re-Tempel in Karnak. Here, Sethos I described his first campaign against Retenu and the



2. Overview on Tall Zar'ā (BAI/DEI).

victory over several cities on both sides of the Jordan River in 1293 BC. In Hellenistic times, the name "Qaduru" would have been transferred from Tall Zar'ā to the new city on the nearby plateau, Gadara. There is no proof for this thesis, but it is obvious that Tall Zar'ā was part of the network of the Late Bronze Age city-states in the Southern Levant. Besides some Egyptian finds, there are no signs that Egyptian culture had a vital influence. Instead, the inhabitants of Tall Zar'ā were strongly oriented to the north and west in respect to culture and economy. The city was destroyed around 1200BC, probably by an earthquake or another natural disaster: there are no signs for a military intervention causing the destruction.

The Late Bronze Age habitation can be divided in three occupational strata (16 to 14). The lowest stratum (stratum 16) of this period is represented by several courtyard-houses. We have only few architectural remains of this city because of a large landslide destroying almost all the area excavated in Area I around 1400 BC – therefore the evidence on layer 16 is meager. With great effort from the city's inhabitants, the whole area was filled with at least ten layers of stone and soil to create stable ground for further building activities (stratum 15).

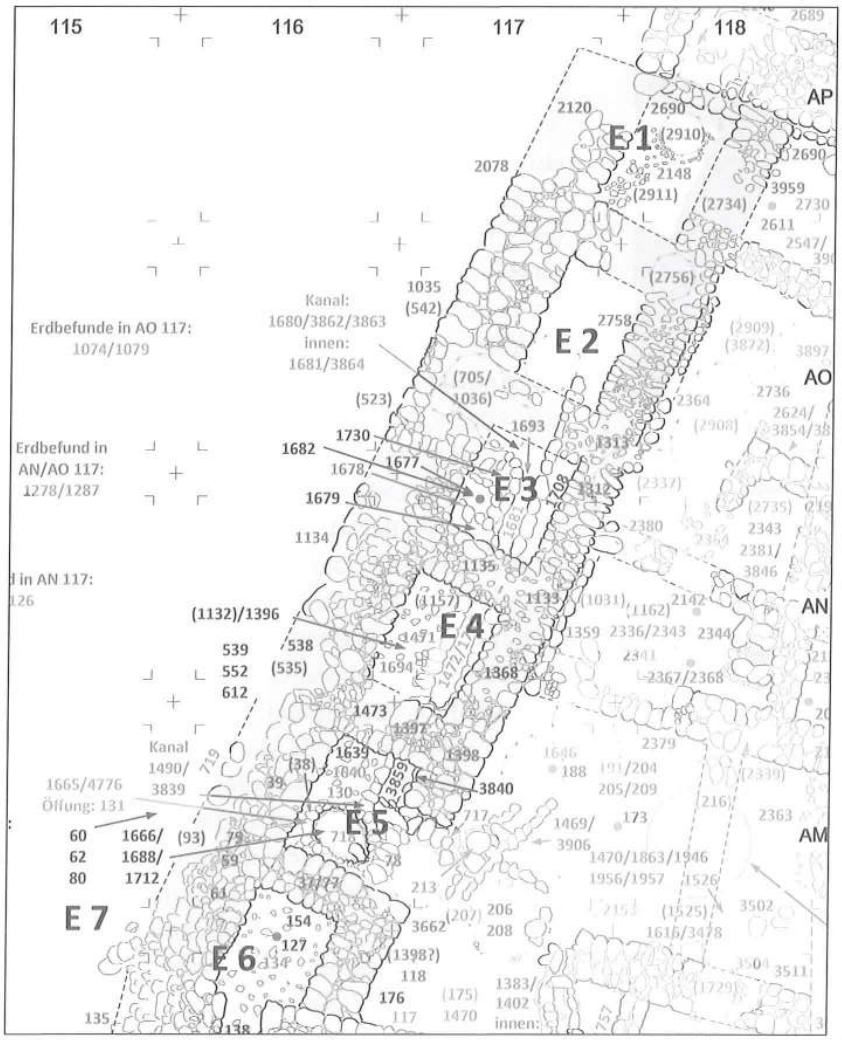
One of the most significant and remarkable structures from this period is a massive casemate wall in the northwest part of Area I (stratum14; FIG. 3). This building type is clearly influenced by Hittite/Syrian architecture. In the Southern Levant, it will not be common for settlement fortifications until the Iron Age. East of the casemate wall, large residential courtyard-houses were found typical for Bronze Age architecture in the Southern Levant.

Another building on Tall Zar'ā modelled on Syrian types is the temple *in antes* (Werner 1994). It is a large room with a base for a pillar or a column located almost in the centre. In front of the room two antes extended into a large paved courtyard. To the north, a staircase was attached, and to the east the courtyard was delimited by four small rooms (FIG. 4).

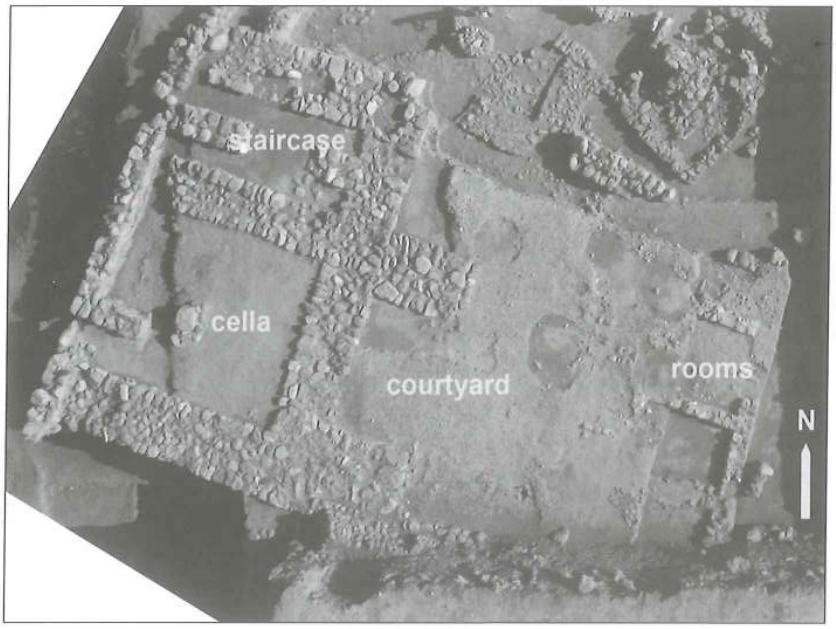
The finds excavated in the cella of the temple are very interesting. 24 of 38 cylinder seals of the so-called Common Style of the Mitanni glyptic were found there (FIG. 5). The remaining cylinder seals found in later occupation levels were probably dispersed due to later building activities but originally belonged originally to the offerings inside the cella as well. The seals in the cella were accompanied by a scarab bearing the cartouche of Amenophis III, a silver pendant with the depiction of a goddess and several other valued finds. Offering of cylinder seals and other precious finds in a temple was a well known rite as can be seen in the temple at Alalaḫ, Ugarit, Tall al-Qudah, Bisan, Dayr 'Allā, Pella, and 'Ammān at the same period (Häser *et al.* 2016).

In the south of Area I, the casemate wall ended in a large, inward-facing tower divided in two parts. It contained a temple of the long-room type with a small adytum, a main room and a courtyard with an elaborate altar. The peculiar character of this building calls to mind the Bronze Age gate sanctuaries found elsewhere. A large stone, cut flat on the bottom and with a symmetrical peak towards the top, which lay toppled beside the column bases, may be a cultic stone due to its similarity to cult stones found in the Southern Levant.

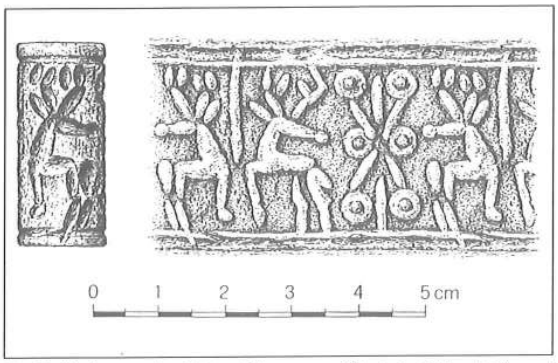
In addition to the finds that compare to northern and western material, some of which were imports from Egypt and the Eastern Mediter-



3. Plan of Late Bronze Age stratum 14 casemate wall on Tall Zar'ā (BAI/DEI, M. Voigt-Werling).



4. Temple area in stratum 14 (BAI/DEI).



5. Cylinder seal of the 'Common Style' of the Mitanni Glyptik from Tall Zar'ā (BAI/DEI).

ranean, the inhabitants of Tall Zar'ā produced some objects combining cultural features in a unique way. The best example from the Late Bronze Age material is a pot painted with a scene depicting a man sitting on a small chair and playing the lyre. The man is surrounded by a lion, a bull, snakes and some other animals. The pot and the red-black painting are common in the Southern Levant, but the depiction is obviously unique (FIG. 6).

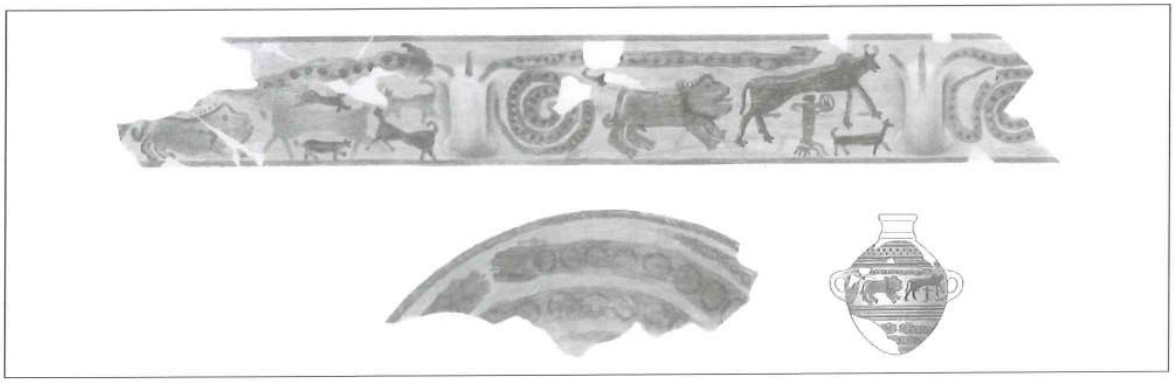
The importance of this Bronze Age city is attested to by its massive architecture and the exceptional finds found here, including a significant percentage of imported pottery from Cyprus and Greece (5 %). Taken together, these findings reflect wealth and extensive trade connections. It seems very likely we are dealing with a prominent city or capital of a Levantine city-state. It was destroyed around 1300 BC; not by an act of war, but by natural causes, most probably due to earthquakes, which are common in this area.

The Iron Age I Stratum (12th-11th Century BC)

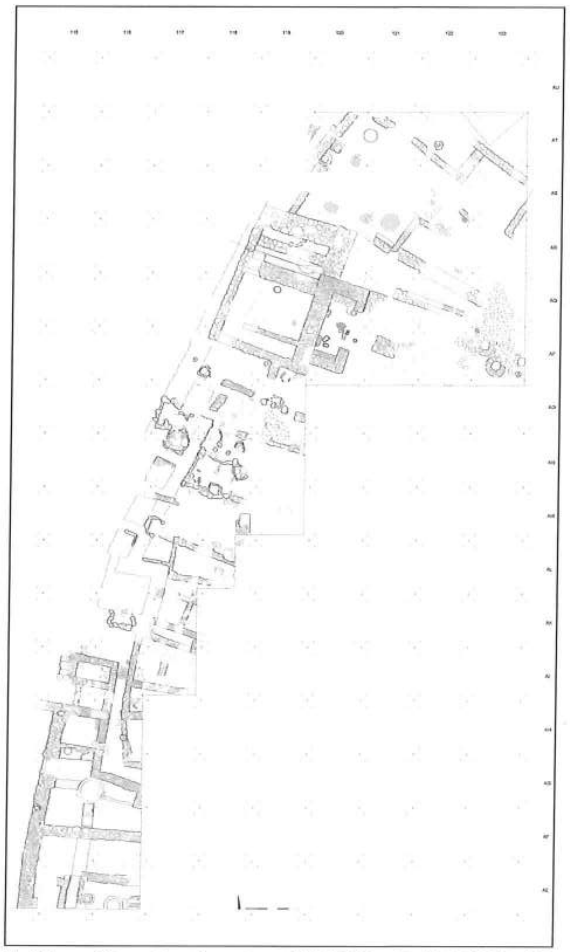
The Iron Age I settlement (12th to 11th century BC) reveals a significant cultural break in comparison to its Late Bronze Age features. Rather than a fortified urban complex, the evidence indicates a village without a surrounding wall that was inhabited by tillers and stock farmers. It is striking that its early Iron Age inhabitants did not create a specific settlement pattern (in the northern excavated area) but reused ruins of the Bronze Age city (FIG. 7).

They added fixtures to the foundations of the Late Bronze Age city wall that were still in place (*e.g.* large silos for grain, various agricultural installations, stables and simple huts). This indicates that the inhabitants could still see the city's previous structure, which is consistent with a rapid repopulation – maybe even by the same people – as seen by the continuity of crafts and artisanship.

Other areas of the excavation present an altogether different picture: In the southern part of the areal, an extraordinarily large kiln made of clay was found, along with a large, well-built house whose walls used Late Bronze Age ruins for additional fortification. The northern part of the house was built as a court-house, showing a connection between Iron Age and Bronze Age building techniques. It had a large court, long and narrow rooms in the north and south, as well as a central room – fitting the typical layout for so-called "four-room houses" – with a glass and faience workshop.



6. Painted jar from stratum 14 on Tall Zar'ā (BAI/DEI).



7. Plan of Iron Age I stratum 13 Tall Zar'ā (BAI/DEI, M. Voigt-Werling).

Concerning crafts, pottery shapes from the Late Bronze Age continued throughout the Iron Age. Overall, in the Iron Age, Tall Zar'ā can be described as an unfortified agricultural settlement.

The Iron Age I period took place either between 1220 and 970 BC or from 1270 to 1040 BC as shown by charcoal analysis.

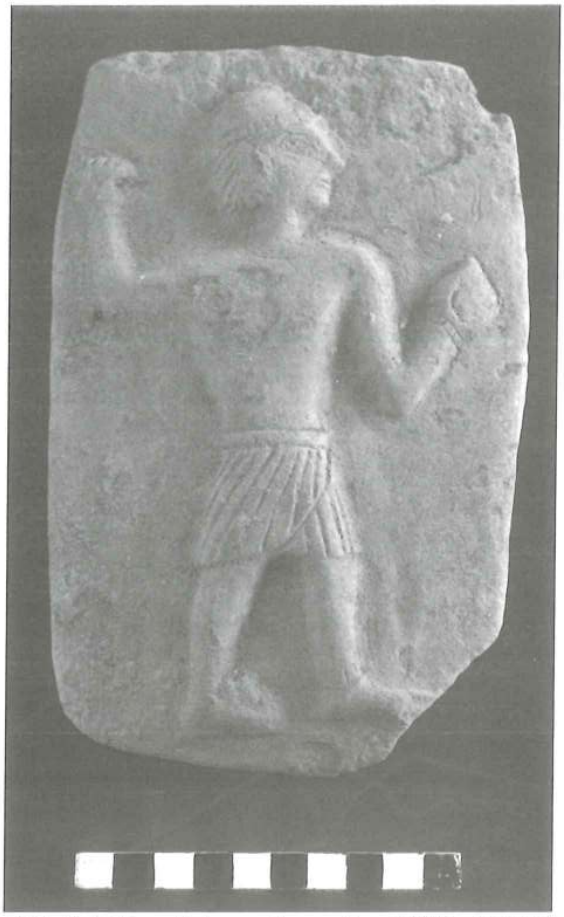
Although the character of the settlement has changed entirely, the cultural affiliation to the west and north continued, as can be seen by some finds. There was found a fenestrated vessel ("window pot"; FIG. 8) which can be compared to specimens from Late Bronze Age contexts in Ugarit, Kamid el-Loz, Tall al-Qudah and Tall Dayr 'Allā as well as in Iron Age contexts in Kinneret, Tall el-Qadi, Tall Hadar, and in Tall es-Sarem. Stefan Münger assumed that this special type shows affinities to the Syrian realm (Münger 2013: 163).

A kernos belongs also to a cultic context (FIG. 9). The best comparisons can be found again to the west and north: in Tall Dayr 'Allā from a Late Bronze Age context, in Bisan and Tall al-Mutasallim from an Iron Age I context and in Khirbat Ras az-Zayt (Ḥorvat Rosh Zayit) from an Iron Age II context (Gropp 2013: 412-415).

As in the Bronze Age, there are finds of the Iron Age I period from Tall Zar'ā that are unique. One of them is a ceramic plate with the depiction of a standing man, raising one arm and holding a cut head in the other hand (FIG. 10). The man is surrounded by four more cut heads scratched in the ceramic. The scene reminds one of Egyptian and Assyrian stone

8. 'Window pot' from Tall Zar'ā (BAI/DEI).

9. Kernos from Tall Zar'ā (BAI/DEI).



10. Relief plate with human figures from Tall Zar'ā (BAI/DEI).

reliefs showing kings holding or slaughtering their captives. However, a ceramic object like this has never been found elsewhere. The interpretation of the object in context is difficult. Perhaps the man was a local ruler celebrating a victory over his enemies.

This Iron Age I settlement demonstrated the continuity of Late Bronze Age traditions as well as the introduction of new features. As before, the cultural orientation extended to the west and north. The name of the settlement and the political affiliation, however, are unknown. This Iron Age I settlement was destroyed due to an earthquake, a fire or a violent attack in the late 10th century BC.

Shortly after, another settlement was built on top of the destruction layer – this time again with a more urban character.

Summary

Coming back to our questions from the beginning: What have we learnt from Tall Zar'ā?

There is a clear break between the highly developed urban culture of the Late Bronze Age and the smaller village-like settlements of Iron Age I. Nevertheless, some traditions continued without interruption, including architectural elements and artisanal techniques (*e.g.* pottery and glass-production). The time between 1200 and 1000 BC clearly was a period of transition, characterized by the co-existence of approved Bronze Age traditions on the one hand and technical developments that typify Iron Age II on the other. Though the destructions were severe and affected all of the excavated Area I, no clear signs of a military invasion could be recognized. The re-settlement of the site always followed shortly after these destructions. While changes in the settlement layout, house types and crafts are obvious, older traditions continued as well. Therefore, it is possible that the same people re-settled their destroyed place. This does not exclude the possibility that people from the surrounding became residents on Tall Zar'ā as well (Vieweger *et al.* 2014).

A second observation is the continuous cultural, religious and economic orientation of the inhabitants on Tall Zar'ā to the west and north. And in addition, during the domination of the Egyptians in the Levant during the Late Bronze Age, the inhabitants on Tall Zar'ā were only sparsely influenced by the Egyptian culture. This fact is not surprising, due to the geographical location of the site.

The third observation is the lack of concrete evidence for the political or ethnical affiliation of the inhabitants on Tall Zar'ā during the Late Bronze Age and the Iron Ages.

To answer the question of what caused the breakdown of the city states between 1200 and 1000 BC, we have to broaden our view: It is not a breakdown of one city or one nation but of a complete region (from Greece and Italy to Egypt, the Levant up to Mesopotamia). It is

not possible to name one reason: Not the "Sea Peoples", not one invading nation, not solely internal struggles, climate change or an earthquake seem sufficient to explain the scale of affected areas. Maybe it is helpful to remember how connected the city-states and countries at the end of the Late Bronze Age were – how dependent on trade with distant regions (*e.g.* importing tin from Afghanistan to produce bronze weapons). There was a powerful but at the same time fragile network of trade, communication and diplomacy, and when this network started to fail, all of its participants were afflicted. Some city-states (*e.g.* Ugarit or Tall Dayr 'Allā) were destroyed by invading enemies between 1207 and 1177 BC, some years later (*e.g.* Lachish), some already destroyed cities were re-settled by new settlers who were perhaps refugees (Cline 2014: 157 and 159f). Some cities were simply abandoned with no evidence of a catastrophe, some suffered from severe earthquakes between 1225 and 1175 BC (Cline 2014: 141). There is also evidence pointing to drought, famine and maybe a change in climate (Cline 2014: 142ff and see also the debate whether there was a climate change or not: Kaniewski *et al* 2013: 9 and Drake 2012: 1862-65 and Langgut *et al* 2013). All in all, there is not just one culprit to blame, but many. Concerning Tall Zar'ā, there is no evidence for military involvement and so it appears that natural causes that lead to the destruction of the Late Bronze Age city.

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Heritage Route Along the King's Highway: Networking Museums and Heritage Sites

The King's Highway

The King's Highway is one of the most important historical routes traversing the land of Jordan from the north to the south, connecting Syria and Gulf of Aqaba (Glueck 1970:21; Bennett 1982:182). The Book of Numbers narrates the story of Moses to ask the permission to Edomite King for passing the road called "King's Highway" (Numbers 20:17) as well as Sihon, King of the Amorite in Ḥisbān (Numbers 21:22). Glueck designated "the King's Highway" mentioned in the Book of Numbers same as *Via Nova Traiana* as well as modern road passing central part of Jordan from the north to the south (Glueck 1970:15-21; Miller 1982:173). Although the term of "the King's Highway" has been disputed by scholars as to the interpretation of the term and historical context[1], the ancient major road, probably "the King's Highway", might have been existed as early as Iron Age II as indicated by archaeological survey in southern Jordan (Abudanah *et.al.* 2015: 184)[2]. Following the annexation of the Nabataean Kingdom by the Roman Empire in 106 AD, the Roman Emperor Trajan constructed the road called *Via Nova Traiana*, between 111 and 114 AD. The new Roman road connected Bostra and Aqaba (Ayla), and part of the road ran along the earlier road of King's Highway (Borstad *et al.* 2010:486; Zayadine 2004:374). In the Medieval Islamic period, the Syrian *Hajj* route (*Darb al-Hajj ash-Shāmī*) followed partially along the King's Highway (Peterson 2012:16). In order to threaten the trade and *Hajj* route connecting the area of Syria, Egypt, Jordan and Arabian Peninsula which partially passes the King's Highway, the Crusader built the castle of ash-Shawbak and al-Karak in the 12th century (Hillenbrand 1999:291-292), that later on fell to the Ayyubid, and used as strategic fortress. During the Ottoman period, the *Hajj* route was moved eastward to the desert, present-day Desert High-

1. In the English translation of the Numbers (Revised Standard Version), the term "the King's Highway" is used as translation of Hebrew term "*derek hammelek*". However, the translation of the term "*derek hammelek*" has been disputed as to whether this term should be translated to "the King's Highway" referring to a particular road or "the royal road" referring to one of various "royal" roads (Miller 1982: 173). There has been also discussion as to Assyrian influence to the term "the King's Highway" (Bienkowski 2000:49-50).

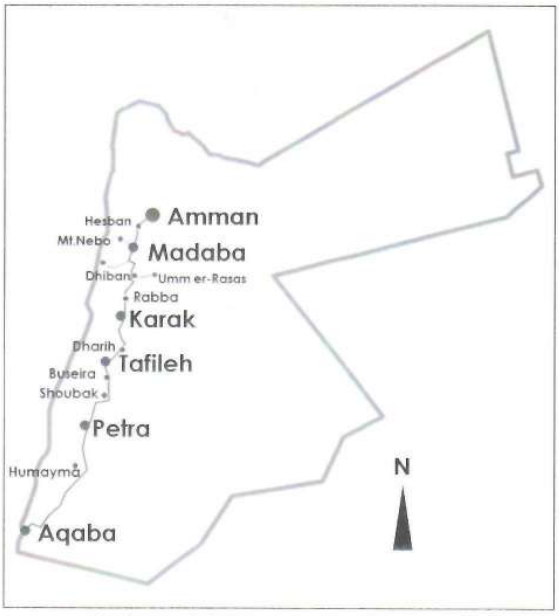
2. In this paper, I use the term "the King's Highway" as main road traversing Jordan from north to south, almost following the modern so-called "the King's Highway", since the Iron Age, which has been continuously used, later as part of "*Via Nova Traiana*", then as Medieval *Hajj* route, and finally as a part of modern road. Although there is discussion about "the King's Highway" mentioned in the Numbers, historical road network itself can be said as existed.

way, however, the King's Highway was continued to be used as alternative route to the main route as well as partial route for *Hajj* from al-Karak and Palestine (Peterson 2012:16). Some of early travelers who visited Jordan in the 19th century, such as J.L.Burckhardt, travelled the route almost following the King's Highway. Today national Route 35 mostly follows the part of ancient King's Highway, and used as one of the main traffic road connecting northern and southern Jordan. It can be said that the King's Highway is historical route which has been used since ancient time, possibly since the Iron Age, until today.

Historical Route as "Cultural Heritage" and the King's Highway Heritage Route

Historical route has been paid more attention as cultural heritage, following the registration of "The Routes of Santiago de Compostela (*Camino Francés* and Routes of Northern Spain)" as UNESCO World Heritage by Spain in 1993. Route as cultural heritage should have socio-cultural aspect as 'exchange and journey", not merely physical way. It should be the route continuously used by people in history, also should have historical authenticity (UNESCO 1994). With this respect, the King's Highway as a whole should be considered as "Heritage", not merely the heritage sites along the King's Highway.

Considering the aspect of the King's Highway as cultural heritage and potentiality for development of local community through heritage tourism, Ministry of Tourism and Antiquities and I are currently planning the King's Highway Heritage Route with cooperation of the Department of Antiquities and the Jordan Museum[3].The proposed King's Highway Heritage Route connecting Amman and Aqaba (FIG.1) follows part of the historical King's Highway[4]. Museums and heritage sites along the King's Highway will be networked as a form of the Heritage Route.



1. Map of Kings Highway Heritage Route.

The purposes of the King's Highway Heritage Route are:

1) To promote awareness of local community as well as tourist toward King's Highway as a whole as cultural heritage (historical route as heritage) and heritage sites along the route, in particular not well recognized heritage sites.
2) To establish network among heritage sites and museums, in particular museum exhibition, along the route.
3) To promote heritage tourism in the region and heritage site which is not well developed as tourism destination.
4) To bring benefit to local community along the King's Highway through heritage tourism.
5) To integrate and enrich tourism experience to heritage sites as well as museums.
6) To protect heritage sites by promoting awareness to the sites mainly through community involvement program by local museums.

3. Opinions, comments and viewpoint mentioned in this paper is based on my point of view, not official statement by JICA.

4. As an actual touring route, the proposed heritage route runs mainly the national road of route 35, which is commonly called as "King's Highway", and part of Desert Highway between Ras en-Naqab and Aqaba running almost parallel to the southern part of *Via Nova Traiana*.

Trails in Jordan and King's Highway Heritage Route

Networking of heritage sites is often figured by "Trail", which would be seen as one of key movement in heritage tourism field of Jordan. Thematic networking among heritage sites by trails is considered as an effective way for local tourism development as well as promotion of local community awareness toward their heritages. Several trails of different theme have been proposed or already installed in Jordan. The scale of trails differs, from inner-town scale and region or governorate scale to whole country, trans-regional scale. As inner-town scale and inner-governorate scale trail, 43 trails, including proposed one, exists in whole Jordan in 2017 (mota pers.comm.) As trans-regional scale trail, "the Jordan Trail "is the longest primary trail, traversing whole Jordan from north to south, from Umm Qays to Red Sea/Aqaba[5]. Jordan trail can be said to be eco-tourism oriented trail, mainly for trekking, although it includes some archaeological sites and traditional village landscape on the route. In the part of southern Jordan, "the Neolithic Heritage Trail" has been proposed, networking several Neolithic sites in southern Jordan, including Wādī Faynān 16, Ghuwayr 1, Shukarat al-Masā'īd, Bayḍā and Basṭa, to engage with local communities living along the trail (Finlayson 2016). Since 1990's, project networking museum collection archaeological monuments, mainly focusing on the Umayyad period, was implemented by "Museum with No Frontiers" (MWNF 1998). Under five thematic trails, early Islamic sites, such as Umayyad palace at Amman citadel, Quṣayr 'Amra, Qaṣr al-Kharrāna and Mushatta, and several major heritage tourism sites in Jordan were networked. As museum collection, Umayyad artifacts in Jordan Archaeological Museum in Amman citadel, Jordan National Bank Numismatic Museum and Museum of Jordanian Heritage in Yarmouk University are networked with heritage sites. Thematic trail connecting the wider range of Umayyad sites has been recently also proposed by the Umayyad Project (Akasheh *et al.* 2015). Umayyad heritage sites in Jordan, wider range than sites included in the trail by MWNF, are networked to form "touristic-cultural itinerary". In addition to Umayyad sites, this route includes also Umayyad collection in six museums in Jordan[6], that forms a networking among sites and museum collection under the theme of Umayyad culture. The King's Highway Heritage Route has similar aspect as thematic trail, although the King's Highway itself is historical route, not newly proposed thematic one.

Museums in the King's Highway Heritage Route

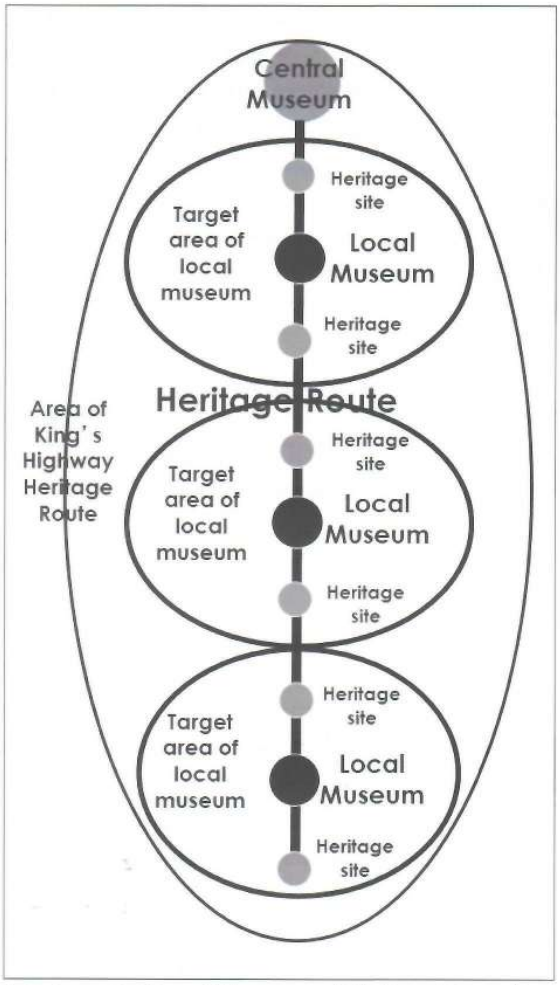
Museums in King's Highway Heritage Route should be considered as an important "hub" of network, in addition to each heritage sites along the route (FIG.2). They are expected to play an important role:

1) Introduction of heritage sites and its historical background by exhibition based on collection from sites in relevant region.
2) Documentation/Conservation/protection of artifacts from the heritage site
3) Local community (and tourists) awareness for heritage (through exhibition, education activity: exhibition is also tool for awareness)

Each museum has heritage collection from target area, such as archaeological artifacts excavated from sites in the area. Exhibition is based on collection, mainly from target area, to visualize local history of each region as well as introduce heritage sites. Networking of heritages sites and museums is essential to enhance synergy of both museums and sites interpretation. Heritage route is a way to establish such synergic network. Visitor can integrate their experience to see the object in museum and to explore heritage site via heritage route.

5. Jordan Trail. 2017. *Jordan Trail*. http://jordantrail.org/ (Viewed 10th of March 2017).

6. Jordan Museum, Jordan Archaeological Museum, Jarash Museum, Madaba Museum, Qasr al-Ḥallābāt Museum, Jordan Ahli Bank Numismatics Museum.



2. Schematic Plan of Museum and Heritage Networking by Heritage Route.

Museums along the King's Highway dealing with archaeology, history and heritage/folklore can be classified as:

i) Central-level museum, such as the Jordan Museum, located in the capital of Amman, and dealing with whole area of the King's Highway.
ii) Local/regional level museum, located in each local area, in most of the case local area as governorate.
iii) Site museum, located on the relevant site and mainly present site explanation in detail, with often collection from site.

Central and local/regional level museums are expected to play an essential role as hub for networking of heritage sites in relevant areas. Fortunately, central and local museums, including on-going local/regional museum projects and plans, dealing with regional heritage and history locates in main cities along the King's Highway. This makes it easy to connect and network museums and heritage sites along King's Highway It is also expected to museums along King's Highway Heritage Route, in particular local/regional museums, to act for local community involvement through education activities by museums as implemented in Karak Archaeological Museum (Oyama 2007b; Tarawneh *et al.* 2007).

Main museums (central and local/regional) along the King's Highway Heritage Route are:

1) The Jordan Museum (see below);
2) Jordan Folklore Museum and The Jordanian Museum of Popular Tradition (Amman): Located inside Roman Theater in Amman, this museum deals with folklore of whole Jordan. The Jordan Folklore Museum was renovated and newly opened in 2016. The exhibition theme of the Jordan Folklore Museum follows the category of traditional social life style in Jordan such as "Nomadic lifestyle" "Village Lifestyle" "Urban Lifestyle" with rich collection of folklore artifacts from all over Jordan. The Jordanian Museum of Popular Tradition includes display of traditional material culture, such as costume, from whole Jordan. Intangible cultural heritage in the area along the King's Highway is one of the field this museum deal with.
3) Mādabā Archaeological Museum, Located in the city of Mādabā, the Mādabā archaeological Museum display artifacts excavated from main sites in Mādabā governorate area. The exhibition includes display from main archaeological sites in the area around the King's Highway, such as Dhībān, Lāhūn, Umm ar-Raṣāṣ and Mukāwir. Currently new Madaba Museum Project is on-going by the Jordanian, Italian and American team. Constructed in "the Burnt Palace", the new museum will be regional museum of Mādabā

that will contain the exhibition currently on display at the Madaba Archaeological Museum (D'Andrea *et al.* 2016). As regional museum, Madaba archaeological museum is expected to be local hub for network of heritage sites along the King's Highway.

4) Karak Archaeological Museum (see below)
5) Other museums.

New al-Karak Folklore museum plan: In addition to Karak Archaeological Museum, there is a plan to establish new folklore museum of al-Karak. The folklore museum will deal with intangible heritage of al-Karak region as well as modern history of al-Karak. This museum will be also act as hub for network of living heritage in al-Karak region.

Museum plan in aṭ-Ṭafīla: There has been no regional/local museum in the city of aṭ-Ṭafīla, however, there is a plan to establish new aṭ-Ṭafīla Museum in the city of aṭ-Ṭafīla to introduce archaeology of aṭ-Ṭafīla region. If aṭ-Ṭafīla museum will be established, this museum will be expected to be hub of network among archaeological sites in aṭ-Ṭafīla region, including the sites along the King's Highway.

New Petra museum: The new Petra museum project, cooperated by JICA, is currently on going. Located in the gateway of Petra Archaeological Park, this museum will introduce archaeology and history of Petra and the surrounding areas. Exhibition will include theme relating with the heritage sites along the King's Highway around Petra, such as Ṭawīlān and Khirbat an-Nawāflah. New Petra museum is expected to be local hub for networking heritage sites in the area of Petra.

Museum in Aqaba: Before 2016 there was Aqaba Archaeological Museum inside the House of Sharif Hussein bin Ali. This museum had exhibition about archaeology of Aqaba city and Aqaba area. Currently Aqaba archaeological museum was closed, and the project to establish new museum about Sharif Hussein bin Ali and Jordanian modern history in the House of Sharif Hussein bin Ali is on-going. Aqaba has also a heritage museum dealing with culture relating with the Red Sea, such as fishery, shipbuilding, and traditional way of life of fisherman.

Background of the King's Highway Heritage Route

The concept to establish King's Highway Heritage Route is based on the experience of other project cooperated by Japan International Cooperation Agency (JICA). Since 1999, JICA and Ministry of Tourism and Antiquities have implemented Tourism Sector Development Project (TSDP) in Jordan. The main components of the project were construction and establishment of museums, including the Jordan Museum, Karak Archaeological Museum, Historic Old Salṭ Museum and Salṭ Eco-museum, Dead Sea Museum (Oyama 2016: 251). In addition, since 2012 cooperation project with Petra Development and Tourism Region Authority to construct new Petra Museum has started. Out of those museums, the discussion in terms of the King's Highway Heritage Route focuses on three museums:

1) The Jordan Museum

Located at Rās al-'Ayn in Amman, the Jordan Museum is "the story teller of Jordan", which is national center for learning and knowledge of Jordanian history and culture. The Jordan Museum was first raised in the 1960's, then in 1980 the conferees of the first *ICHAJ* conference, held by HRH Crown Prince El Hassan bin Talal, recommended the establishment of "the National Museum". The Society of Jordanian Culture, founded in 1989 and chaired by HRH Crown Prince El Hassan bin Talal, worked for general concept of the National Museum[7]. The construction of the Jordan Museum has been implemented under TSDP cooperated by JICA

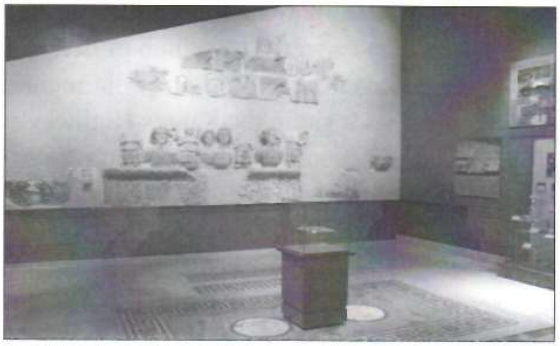
7. According to "The Jordan Museum. 2010. *The Jordan Museum: Introduction, History & Building.* http://jordanmuseum.jo/en/about_us#introduction (Viewed 10th of March 2017.)"and 'Amr 2009.

since 2000. As tourism context, the Jordan Museum should be recognized not only as heritage tourism destination in Amman but also as "gateway" of heritage tourism in whole Jordan(JICA *et al.* 2000a). The Jordan Museum includes exhibition story and display artifacts relating with the King's Highway. In the Iron Age exhibition section (FIG.3), the role of the King's Highway as a part of international trading route traversing the area of Ammonite, Moabite, Edomite Kingdom is explained, with display of related artifacts from three Iron age kingdom, such as Mīsha' stele (replica), al-Bālū' stele, Statue of the Ammonite king from Amman citadel and the Tall Sīrān bottle with Ammonite inscription. The defense system of the Ammonite Kingdom by watchtowers is also explained by Audiovisual, with focusing on Rujm al-Malfūf. In the section of Petra/Nabataean Kingdom exhibition, in addition to exhibition of artifacts from Petra, artifacts from Nabataean sites along the King's Highway are also on display, such as the façade relief of Nabataean temple from Khirbat adh-Dharīh (FIG.4). Relief of Atargatis from Khirbat at-Tannūr is also on display in the entrance hall. The Roman exhibition includes theme about *Via Nova Traiana*, explaining its continuity from the King's Highway. Considering the exhibition contents as well as function of Jordan Museum as national center for learning Jordanian history, heritage and culture, the Jordan Museum is expected to be a focal point of network of Jordanian museums and heritage sites, including the area along the King's Highway, as well as gateway to the King's Highway Heritage Route.

2) Karak Archaeological Museum

Karak Archaeological Museum was renovated under TSDP (JICA *et al.* 2004b) and newly opened in 2004 (FIG 5). After the temporally closure, it is currently under preparation of permanent exhibition[8]. Karak Archaeological Museum has two aspect. The one is as Site Museum of al-Karak Castle (as well as Old al-Karak city) with exhibition about archaeology and history of al-Karak castle and Old al-Karak city. The other aspect is as Local/Regional museum of al-Karak region. This museum has a role as a gateway to regional tourism of al-Karak area as well as al-Karak castle. Also, this museum has a role to promote awareness of Local community to heritages in al-Karak (Oyama 2016: 252).

3. Iron Age Exhibition in the Jordan Museum.

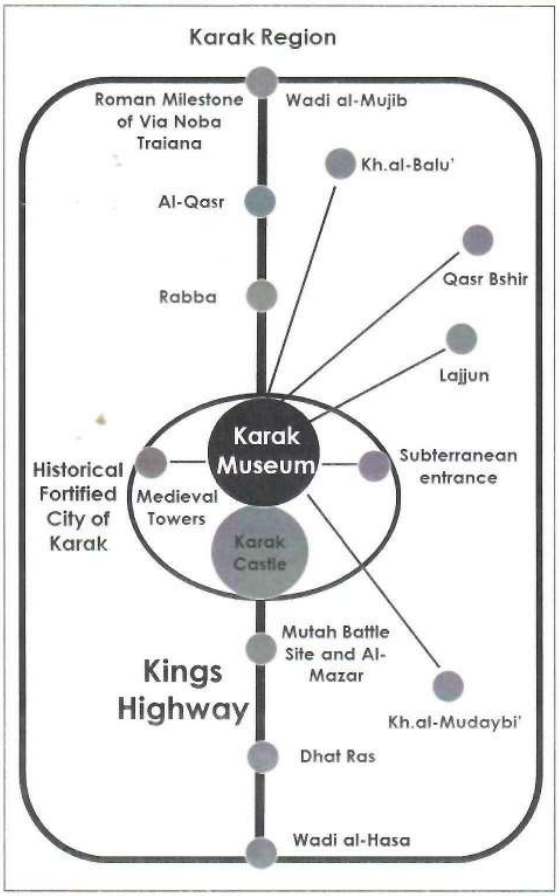


4. Khirbat ad-Ḍharīḥ Nabataean Temple Façade Exhibition in the Jordan Museum.

5. Exhibition in Karak Archaeological Museum.

8. As for situation in March 2017. The concept and exhibition theme of newly renovated Karak Archaeological Museum will be almost the same as the preceding one.

The King's Highway, traversing al-Karak plateau from Wādī al-Mūjib to Wādī al-Ḥasā, is one of most important factor of archaeology and local history of al-Karak. In addition to al-Karak castle and historical Old al-Karak city, there are several important heritage sites along King's Highway in al-Karak region, such as Roman Milestone of *Via Nova Traiana* in Wādī al-Mūjib, Iron age site of Khirbat al-Bālū', Nabataean Temple in al-Qaṣr and Dhat Rās, ar-Rabbah/Areopolis, Mu'tah battle site and Maqām in al-Mazār. In order to make Karak Archaeological Museum as gateway to tourism in al-Karak region, there has been a plan to form network between Karak Archaeological Museum and archaeological sites in al-Karak area (FIG. 6). King's Highway is, conceptually and physically, one of the way for networking. Then, if network of sites and museum through King's Highway is applicable in al-Karak area, the same can be implemented to the whole King's Highway. The King's Highway in al-Karak is merely a part of long historical route, and it is meaningful if we could connect most of sites and museums along the King's Highway. This is one of the background of the King's Highway Heritage Route. In the project of Karak Archaeological Museum, the term of "ecomuseum" discussed below has not been applied, however, the network plan between Karak Archaeological Museum and heritage sites in al-Karak already implies an aspect same as ecomuseum.



6. Schematic Plan of Karak Archaeological Museum and Local Heritage Network.

3) Ecomuseum in Historic Old as-Salṭ City (Salṭ Ecomuseum)

Experience of heritage tourism project co-operated by JICA in Old as-Salṭ City has been also considered in the planning of King's Highway Heritage Route. In Salṭ Project, Old as-Salṭ City as a whole considered as "open-air museum" by applying a concept of ecomuseum. As a first step, Historical Abu Jaber House, built between 1892 and 1905, was renovated to establish Historic Old Salṭ Museum which deals with modern history and folklore of Salṭ city, mainly focusing on 19th and early 20th century. As a second step, set-up of Salṭ ecomuseum has implemented, such as establishment of thematic trails starting from Historic Old Salṭ Museum.

The concept of ecomuseum was first initiated in 1970's by H.D.Varin and G.H.Riviere in France. It was then developed in several countries in Europe, North America, North Africa and East Asia as well. Following the development of ecomusuem in different areas, the definition of "ecomuseum" has been disputed, and there are several interpretations about the concept of ecomuseum (Davis 2011). However, basic points of ecomuseum can be pointed out: Ecomuseum is not conventional museum which basically focuses on collection in the museum. Rather, ecomuseum is a holistic system to exhibit tangible and intangible heritages of the re-

gion which can be described as a sort of organism or ecosystem (not natural ecosystem but socio-cultural regional ecosystem). The region which ecomuseum deal with is described as spatial "territory" in ecomuseum concept, such as village, city or region (similar with municipality or governorate, but not limited to political administration area). Each heritage distributed in the "territory" are considered as parts forming the territory as ecosystem. This whole territory or ecosystem is considered as "museum", that is "ecomuseum". As exhibition method of "ecomuseum", heritages in the "territory" are networked to be exhibited basically *in situ*, by participation of local community from the" territory".

Although the concept of ecomuseum has been already introduced in early1970's into the project in an oasis of Algerian Sahara desert to establish "The Bou Saâda ecomuseum"(Rivière 1973:39-43), it has not been very common in museum field of the Middle East. The ecomuseum of old Salṭ city in Jordan, which was first proposed in 2000 (JICA *et al.* 2000b), can be said as one of the early case of ecomuseum in the region[9].

In Japan, the concept of ecomuseum was newly introduced in 1980, and applied in several local villages, cities or prefectures. The ecomuseum model developed and applied in several Japanese areas consists of the factor of "Core" "Satellite" "Discovery Trail" (Ohara 2003:51)[10]. Core Museum has a function as center for introduction of regional heritage mainly by exhibition, documentation, research and conservation of heritage, and implementation of community awareness program. "Satellite" is heritage sites within "Territory". "Discovery Trail" connects core-museum and satellite (heritage sites) to form network as tourist route based on several theme (FIG. 5). This ecomuseum model was applied to old city of as-Salṭ to formulate as-Salṭ Ecomuseum (SEMMC 2015). Historic Old Salṭ Museum (HOSM) is considered as "core museum", which has a role as information and research center of "Historic Salṭ City" as "Territory". HOSM implement introduction of history and culture of historical Salṭ city by exhibition and education activity with local community. HOSM acts also as starting point of heritage tour in Salṭ. Heritages distributed in Salṭ city, such as traditional architecture back to the Ottoman era are considered as "satellite" in Salṭ Ecomuseum. HOSM as core-museum and heritage sites as satellite in Salṭ Ecomuseum are connected by several thematic trails about daily life, socio-cultural harmony, education history, or architectural heritage. Guide tour to museum, trail and satellite sites by local interpreters, who are local people from Salṭ, are also introduced as a form of community participation in Salṭ Ecomuseum.

The concept of ecomuseum is not the same as heritage route. Ecomuseum is basically applied to the area with unified regional identity and socio-cultural context that can form "Territory" in ecomuseum term. On the other hand, heritage route connects among different cultural regions which can act as way of communication and mutual understanding among different cultures (also UNESCO 1994). However, the method of ecomuseum as network among museums and heritage sites is one of the system to be referred for establishment of King's Highway Heritage Route.

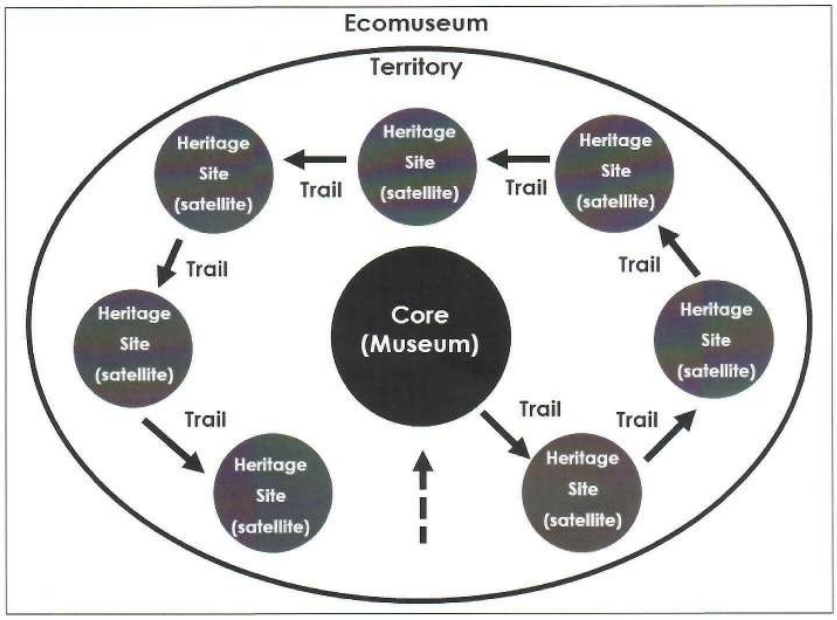
Heritage Site and Museums in the King's Highway Heritage Route

Several type of heritage site are included in the King's Highway Heritage Route:

1) Archaeological sites: Considering historical context of Kings Highway, archaeological sites includes sites after the Iron Age, such as site relating with Ammonite, Moabite and

9. Recently, ecomuseum has been developed in several areas in the Middle East, such as Hüsamettindere village ecomuseum and Gokcaeda ecomuseum in Turkey, and Meymand village ecomuseum in Iran (Davis 2011: 229-231). Battil village in Palestine also introduced the concept of ecomuseum to form "Battir Landscape Ecomuseum".

10. The model directly referred for Salṭ Ecomuseum is the ecomuseum project in historical city of Hagi Japan (Nishiyama 2004).



7. Ecomuseum Concept.

Edomite Kingdom, Nabataean City and Temple, Roman and Byzantine city, and Crusader/Islamic Castles. Archaeological sites also include sites directly relating with ancient road system, such as Roman Milestones as part of *Via Nova Traiana*, and sites used for *Hajj* caravan stop, such as ad-Dawsaq (Peterson 2012:16). Part of ancient road itself, such as roads in southern Jordan (Abudanah *et al.* 2015), should be also included.

2) Religious sites, such as sites relating with early Islamic history (Mu'tah battle site, *Maqām* in al-Mazār *etc.*), and sites relating with story of Moses.
3) Traditional village landscape, such as Buṣayrah, Sila', al-Ma'ṭan, Wādī Mūsā (Elji) and Ḍānā.
4) Natural landscape with historical context, such as Wādī Mūjib (Arnon) or Wādī al-Ḥasā (Zared) depicted in Mādabā Mosaic Map.

Following are museums and heritage sites currently proposed to be included as part of King's Highway Heritage Route. Most of the selected sites are located along the modern King's Highway. It should be noted that not all proposed sites are included in the media introducing Heritage Route to tourists, such as tourist map of the Heritage Route, considering actual accessibility and condition of sites.

1) In Amman region: Jordan Museum, Jordan Folklore Museum and The Jordanian Museum of Popular Tradition, Heritage sites inside 'Ammān (Roman Theater , Odeon, Nymphaeum, 'Amman citadel, Rujm al-Malfūf), Tall 'Umayrī
2) In Madaba region: Madaba Archaeological Museum, Ḥisbān, Mādabā (Heritage sites inside Mādabā, such as Madaba Archaeological Park), Ṣiyāghah (Mt. Nebo and site museum), 'Ayn Mūsā, Khirbat al-Mukhayyaṭ (Iron Age site of Nebo, The Church of St. Lot and Procopius), 'Ayn Mūsā, Mukāwir, 'Atarūz, Qurayyāt, 'Atīm, Libb, Wādī al-Wālah, Umm ar-Raṣāṣ, al-Lāhūn, Za'farān, Tall Dhībān, 'Arā'ir, Wādī al-Mūjib
3) In al-Karak region: Area: Karak Archaeological Museum, Karak Folklore Museum (Future stage), Roman Milestone (Part of *Via Nova Traiana*) in Wādī al-Mūjib, Maḥaṭṭit al-Hajj, Shīḥān, al-Qaṣr, ar-Rabbah, Khirbat al-Bālū', Khirbat al-Mudaynah, Mazār an-Nabī Sulaymān, an-Nabī Yūsha', al-Karak (al-Karak Castle, Old City of al-Karak, Thaniyyah), Mu'tah (Battle Site), Shrine in al-Mazār, Dhāt Rās, Wādī al-Ḥasā, Roman

road in al-Karak area.

4) In aṭ-Ṭafīlah region Area: aṭ-Ṭafīlah Museum (Future stage), Khirbat at-Tannūr, Khirbat adh-Dharīḥ, Hammāmāt 'Afrā, Hammāmāt Buraybīṭah, aṭ-Ṭafīlah (aṭ-Ṭafīlah Castle), Buṣayrah (Edomite site and Village), Sila' (Village and Edomite Site), al-Ma'ṭan Village, ar-Rashīdiyah, Ḍānā Village, Ḍarīḥ as-Sahabi al-Ḥarith Ibn 'Umayr al-Azdī, Gharandal
5) In Ma'ān and Petra region: New Petra museum, ash-Shawbak castle, ad-Dawsaq, Khirbat an-Nawāflah, Ṭawīlān, 'Ayn Mūsā, Wādī Mūsā (Elji), Petra Archaeological Park, al-Wu'ayra, Sīq al-Bārid, Ṣadaqa, 'Udhruḥ, part of ancient road.
6) In 'Aqaba region: House of Sharif Hussein bin Ali and new museum in Aqaba, Aqaba Heritage Museum, al-Ḥumayma, al-Quwayrah, Wādī Ramm, al-Khāldī, al-Qīthārah, Heritage sites in 'Aqaba (Ayla, Late Roman Church, Mamluk fort, Tall al-Khalīfah).

Concluding Remarks

King's Highway Heritage Route would suggest several important points. The first point is re-evaluation of museum's role as hub of heritage networks in the relevant region. Museum ha potentiality to visualize history and culture of relevant region through exhibition, not simply display of important object from archaeological sites (Oyama 2007a). As Jordan Museum is described as "story teller of Jordan", local museum has also potentiality to be "story teller of regions". Networking of museums with heritage sites by heritage route would enhance such role of museum, as well as enhance heritage tourism which brings benefit to local community.

The second point is awareness toward historical route of Kings Highway as a whole as cultural heritage. Although King's Highway is already famous with tourists as well as local people, the value of historical route as cultural heritage is still not well recognized, comparing with monumental archaeological sites. Networking of museums, sites and historical route as "Heritage Route" would help awareness of people. Museums can launch practical awareness campaign toward local community as well as tourism sector. This would lead also protection of the sites and historical route as well as sustainable heritage tourism development.

Acknowledgement

I would like to express sincere gratitude to H.E. Ms. Lina Annab, Minister of Tourism and Antiquities, H.E. Mr. Issa Gammoh, Secretary General of Ministry of Tourism and Antiquities for kind support and assistance. I would like to also express sincere gratitude to H.E. Eng.Ihab Amarin, Director General of the Jordan Museum. I would like to thank to the staffs of MOTA, DoA, Jordan Museum, JTB and JICA who gave kind assists and comments for the work.

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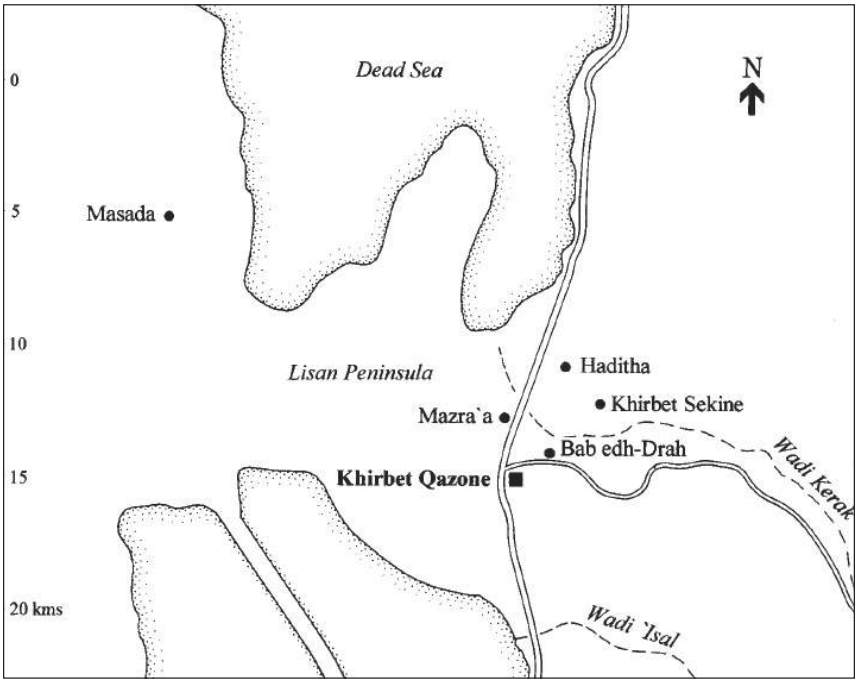
The Discovery, Excavation, Study, Conservation and Exhibition of Khirbat Qāzūn

The Discovery

In 1994 the author along with other archaeologists of the Dayr ʻAyn ʻAbāṭa excavation project noticed that tombs were being exposed while the Ghawr al-Mazraʻa to Ghawr aṣ-Ṣāfī highway at the al-Karak intersection was being widened (FIGS. 1, 2). Systematic pillaging by tomb-robbers followed daily (or rather, mostly

1. 1992 aerial photo of al-Karak intersection in Ghawr al-Mazraʻa before discovery and consequent tomb-robbing of Khirbat Qāzūn (Royal Jordanian Geographic Centre).



2. Map locating Khirbat Qāzūn at al-Karak intersection in Ghawr al-Mazraʿa (J. M. Farrant).

nightly) but unfortunately nothing was done to protect the site even though a Jordanian police station and the local governor's office were located directly across the road. When mentioned to the authorities their answer was "let them work", referring to the tomb-robbers' illicit activities. An immediate investigation was therefore undertaken by the archaeologists who discovered human bones strewn on the surface along with pottery sherds and many textile fragments. Some samples were taken for analyses which were roughly dated them to the 1st-2nd centuries AD. This prompted further investigations and during the following excavations at Dayr ʻAyn ʻAbāṭa the archaeologists found the opportunity in May 1996 to conduct further exploration of the site and collect more material on the surface which had been thrown out of the robbed-out tombs with the dug-up soil.

Meanwhile, interviews were conducted with local people to ascertain what was being found there. They recounted that complete glass vessels, jewellery and pottery were found in deeply-buried graves lined with adobe bricks and stones. Although many tombs had been looted from nearby Early Bronze Age Bāb adh-Dhrāʻ (immediately to the north-east), these seemed quite different.

The landscape was relatively level, not rocky and recently ploughed for agricultural purposes by the landowner, a man from Karak named Ghazigian whom the locals called 'Qazone'. The author therefore named the hitherto unknown site *Khirbat Qāzūn* (the ruins of Qāzūn in Arabic) in all future publications (see comprehensive bibliography below).

Further discussions with locals followed by site inspections revealed that similar graves of the same period were also found at Khirbat Sikin, Ḥadītha and Fayfā south of Ghawr aṣ-Ṣāfī. Sadly though, none of these cemeteries escaped pillaging and had no protection.

The 1997 Excavation

During April and May 1997 a rescue excavation project was begun with permission from the Department of Antiquities of Jordan, funding from the British Museum and logistic support from ARAMEX International Couriers. It was led by the author with staff from the Dayr ʻAyn ʻAbāṭa project (Politis 1998: 611-614).

Initially surface collections and a survey were conducted to understand the extent of the cemetery. Over 3,500 robbed-out shaft graves

were counted on the surface which were orientated roughly north-south (FIGS. 3, 4).

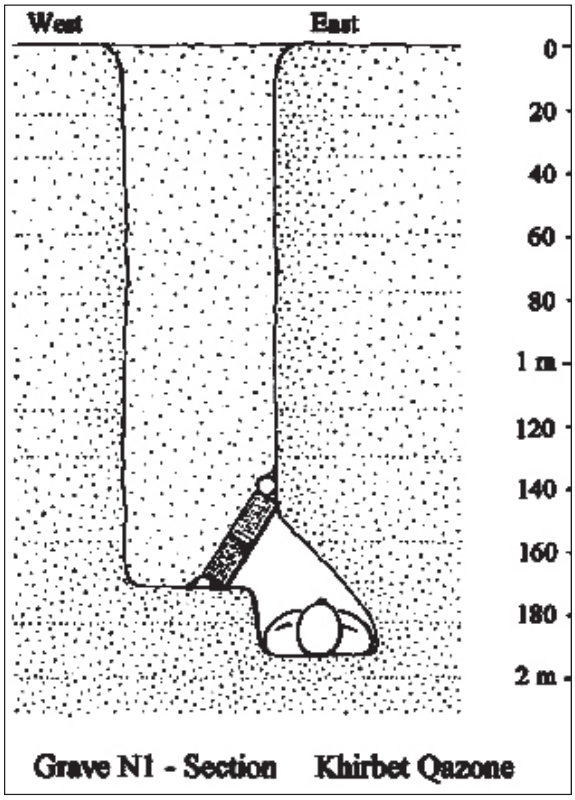
In total, twenty four shaft graves were investigated in detail, twenty of which were excavated. Each of the graves had a single burial and there was no evidence of re-internment. Most of the graves were dug into the soft natural Lisan marls, undercut to the east and covered by adobe brick slabs (FIG. 5).

A few were constructed of stones. Men, women and children were laid out with their heads on the south side of the grave. The dry conditions of the soil in which they were buried allowed many of the corpses to be so well preserved that hair, skin and even internal organs survived (FIG. 6).

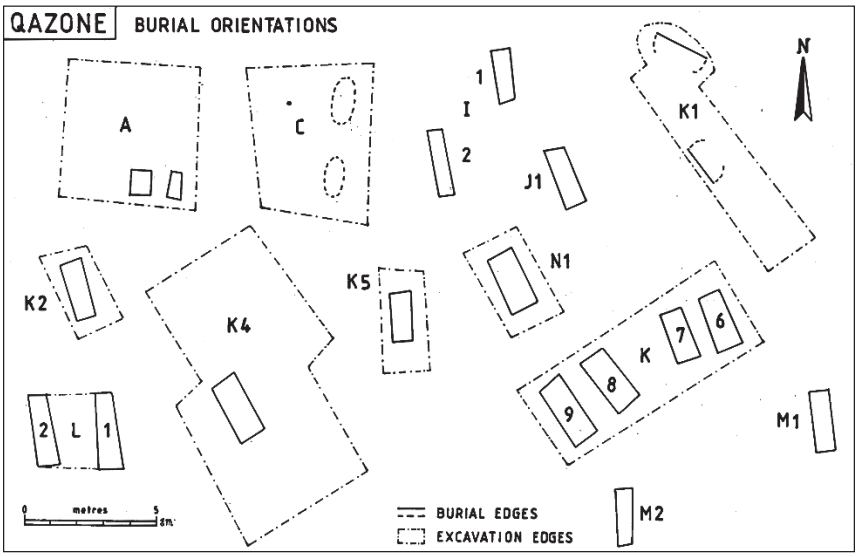
Some of the bodies were encased within decorated, painted and stitched leather shrouds. (FIG. 7 a, b) Others had reused clothing wrapped around them (FIG. 8).

From robbers' spoil and excavations thirty-five complete and partial tunics, mantels and scarves representing some the most intact textiles (mostly made of wool) found in the ancient Near East were retrieved.

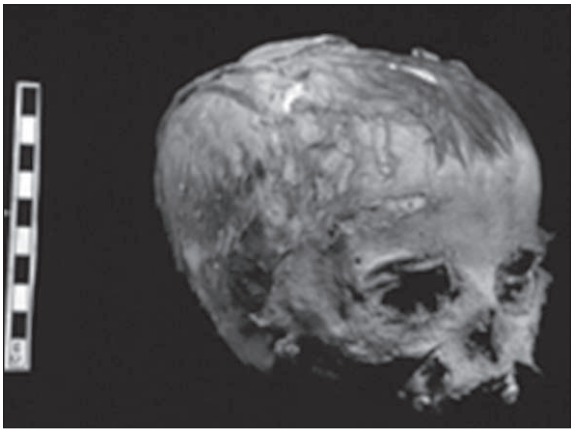
3. Aerial view of Khirbat Qāzūn after extensive tomb-robbing in late 1990s (K. D. Politis).



5. Section of grave N1which was characteristically undercut to the east and covered by adobe brick slabs (J. M. Farrant after C. Pickersgill).



4. Burial orientations of excavated burial at Khirbat Qāzūn (W. E. Moth).



6. Well-preserved head of youth from Khirbat Qāzūn (T. Springett).

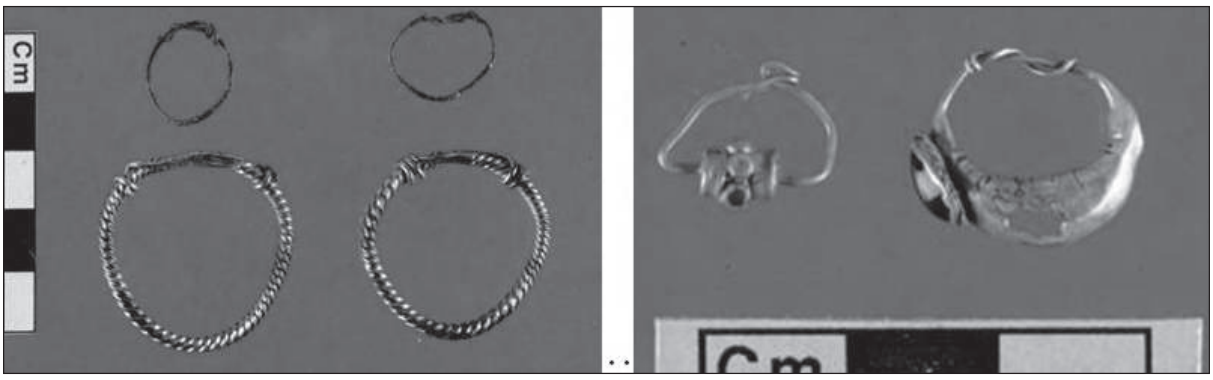
Only a few of the burials which were excavated contained any grave goods. They included iron, copper, silver and gold earrings (FIG. 9 a, b) and bracelets, beads, a scarab, a wooden staff, a pair of leather sandals and a laurel wreath; all very typical Graeco-Roman accoutrements.

A preliminary identification and analysis of the textiles was done by Hero Granger-Taylor and initial laboratory conservation was conducted by Karen Horton who also compiled a catalogue of the textiles (FIG. 10).

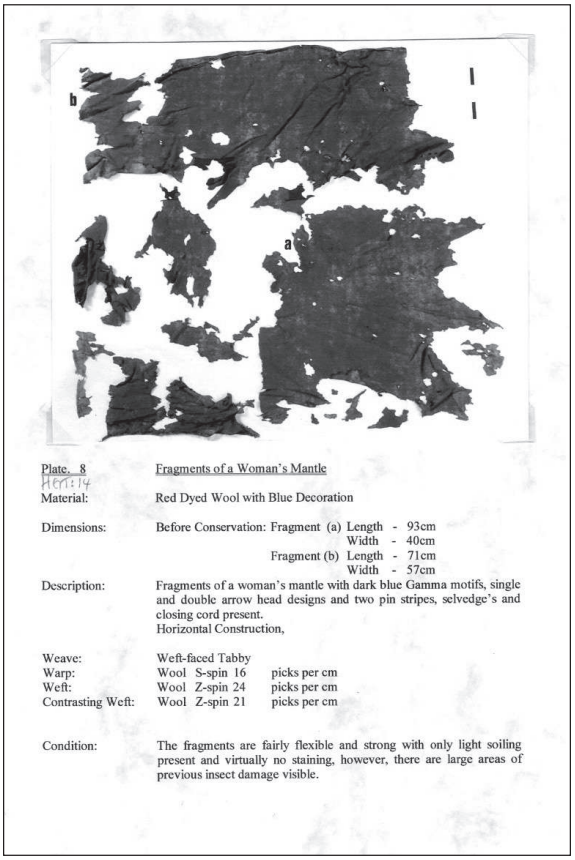
From surface collections more metal work was recovered, as well as pottery (FIG. 11) and

7a, b. Burial with body encased within stitched leather shroud (K. D. Politis).

8. Burial A1 with clothing wrapped around body (T. Springett).



9a, b. Silver and gold earrings (T. Springett).



10. Sample of initial catalogue of textiles from Khirbat Qāzūn (K. Horton).

glass fragments belonging to the 1st - 2nd century AD. Five funerary stelae were also discovered from robbed-out tombs, three of which had engraved rectangular signs (*betyles* or 'Dhusharā blocks') (FIGS. 12 a, b, c) and one which was inscribed in Greek, AYCENH H KAΛH ("Afseni the virtuous") (FIG. 13).

The 2004 Survey and Excavation

Survey and excavation were conducted at the cemetery of Khirbat Qāzūn during April and May 2004. The work was an extension of the earlier rescue excavation conducted in 1996 and 1997 (Politis 1998: 611-614) with the objective to identify the full extent of the site. The main aim of this season was to complete all field work and studies at the site and prepare for publications. The project was sponsored by the Hellenic Society for Near Eastern Studies and supported by the National Geographic Society and the British Academy.

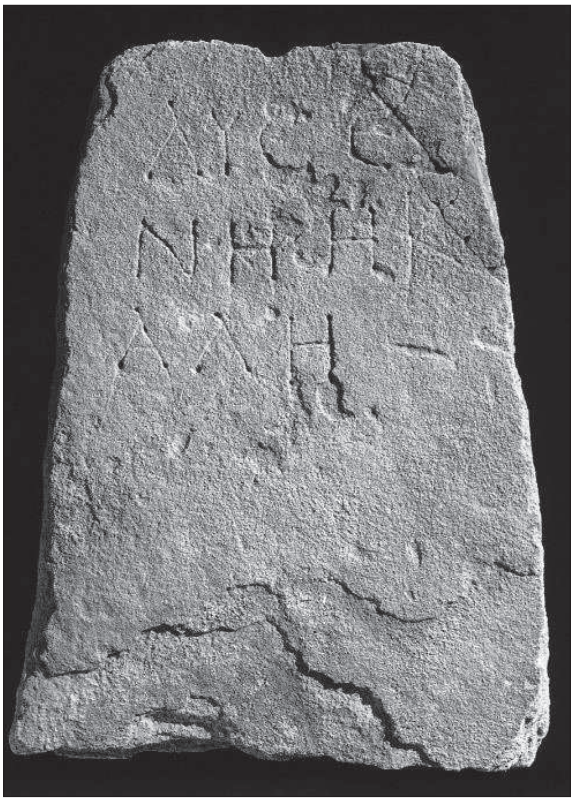
The Survey

A complete contour survey of the cemetery was conducted incorporating previous excavation areas. Finally a digital map was produced recording all natural features and excavation trenches (FIG. 14).

Trimble Global Positioning System (GPS) receivers were utilised to achieve an accurately geo-referenced survey. Using Trimble survey software loaded onto a hand-held data logger thousands of spot heights were recorded enabling post production of a Digital Terrain Model (DTM) and contour map of the cem-

11. Pottery sherds from Khirbat Qāzūn (T, Springett).

12a, b, c. *Betyles* or 'Dhusharā blocks' engraved on tombstone (a) and adobe brick (b) (T. Springett).



13. Tombstone inscribed in Greek, AYCENH H KAΛH ("Afseni the virtuous") (T. Springett).

etery. Also specific points of plan detail were recorded such as trench edges and specific tombs. Once control points from earlier phases were coordinated, all the survey work carried out to date could be referenced within the new geodetic survey framework.

The 2004 Excavation

In total twelve trenches (each measuring 5 metres × 5 metres) were opened in various areas of Khirbat Qāzūn. The objectives of this strategy were to help establish the variety of tomb types throughout the cemetery and the chronological sequence of various areas within it.

A total of twenty new graves were recorded and DNA samples were taken from all of the intact skeletons in order to help ascertain the ethnicity of the interments and whether specific tomb types are indicative of ethnic/cultural groups.

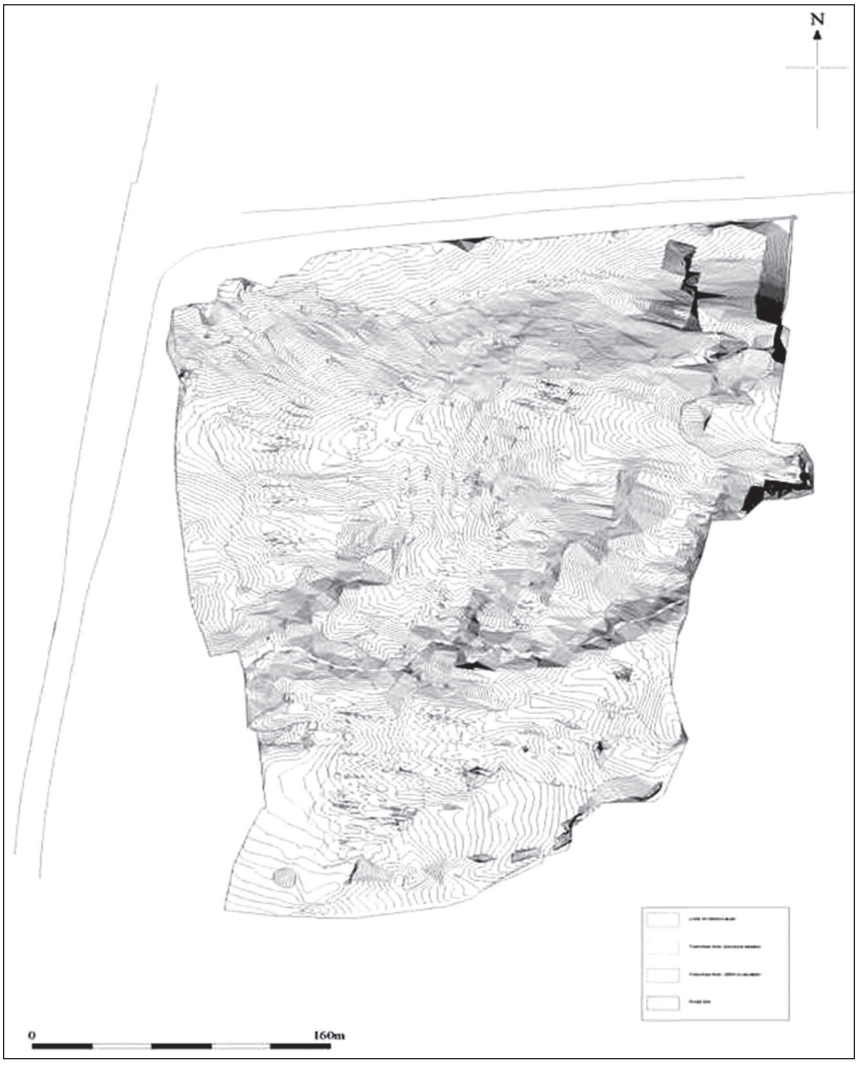
Grave Typologies (FIG. 15)

Grave-type A represented the predominant grave-type in the cemetery and included Graves T1, T2, U1, W (both inhumations), Y1, Y2 and Z1 (FIG. 16). The grave-type consists of a shaft grave with a *loculus* undercut to the east at the base of the shaft. This undercutting is sealed by adobe bricks propped at an angle against the east wall of the shaft. The grave is orientated north-south, with the skull to the south in every case.

This is the most characteristic grave-type found at Khirbat Qāzūn and is particularly important in relation to similar graves first discovered at Khirbat Qumrān (Politis 2005a: 149-151).

Grave-type B is the type found to the north-west of the cemetery, specifically in Trench R. These graves are aligned along an east-west axis, with the skulls to the west. Large roughly-hewn slabs seal the grave-cut which tapers slightly to the east. The graves are multiple and in one instance (*i.e.* Grave R) contained seven individuals (FIG. 17).

Grave-type C is the type found to the west



14. Contour map of Khirbat Qāzūn boundaries, 2004 (J. Severn).

of the cemetery (represented by graves Θ2, Θ3, Σ1, Σ2 and Σ4). These graves are orientated east-west but, as opposed to those in Trench R, each grave contains only a single burial. Most of the skeletons associated with this grave-type have been positioned on their right sides, facing south, and secured in this position with the aid of small stones. No grave-goods accompanied the bodies. These five graves contained a narrow *loculus*, in which the skeleton was laid out, forming a wide platform feature within the northern section of the grave-cut. None of the *loculi* were sealed and were all filled with soil.

Type A	Length of shaft (north-south)	Width of shaft (west-east)	Depth of shaft
Grave T1	2.30m	0.40m	1.12m
Grave T2	2.08m	0.45m	0.82m
Grave U1	1.90m	0.50m	1.20m
Grave W	2.22m	0.62m	1.76m
Grave Y1	1.95m	0.50m	1.60m
Grave Y2	1.98m	0.62m	1.48m
Grave Z1	2.24m	0.52m	1.24m

15. Grave Type A at Khirbat Qāzūn (Politis *et al* 2005b: fig. x).

Grave-type D (represented by graves Θ1 and Σ3) is the type found in association with type-C graves. These graves are composed of a simple cut and lack the platform feature associated with type C. The skeletons are supine with the head turned to face south. The left arm was slightly bent over the lower vertebrae with the hand placed on the pelvis.

Grave-type E is characterised by a stone sarcophagus and is represented by one unique

16. Grave KQ.W with *in situ* well-preserved bodies of a mother and child wrapped in two textiles (A. Kelley).

17. Multiple burials in Grave R at Khirbat Qāzūn (K. D. Politis).

shaft grave in Trench P in the south-eastern of the cemetery (FIG. 18 a, b).

Grave-type F is represented by two robbed-out tombs to the southeast of the cemetery and is characterised by a rectangular receptacle constructed of adobe bricks. The receptacle is located centrally at the base of the shaft. This *loculus* was capped with horizontal adobe bricks which sealed the receptacle.

In the northwest sector of Khirbat Qāzūn two tombstones were found, one with an engraved cross in a square (FIG. 19) and the other with an etched palm branch flanked by the Greek letters alpha and omega (FIG. 20). These are clearly early Christian symbols and date the northwest of the Khirbat Qāzūn cemetery.

The 2015 Excavation

In 2015 a rescue excavation by the Department of Antiquities of Jordan just north of the Khirbat Qāzūn cemetery, revealed a triple-asped basilical church paved with mosaics with geometric designs and four Greek inscriptions in the chancel, diakonikon and south aisle (Zahran 2017; Politis 2018) (FIG. 21a, b). Apparently, this was associated to the early Christian graves in the northern sector of the Khirbat Qāzūn cemetery (Trench R mentioned above).

The Studies

Studies of the finds from Khirbat Qāzūn cemetery began from the onset of the discovery and subsequent rescue project in order to discern the date of the new site. Most of the material culture was consequently dated between the 1st and 3rd centuries AD, clearly within late Roman and Nabataean times.

Textiles

World-renowned ancient textile historian Hero Granger-Taylor was the first to identify the material found at Khirbat Qāzūn as being

18a, b. Limestone fragments of upper part of sarcophagus in Trench P (K. D. Politis).

19. Tombstone with an engraved cross in a square from north-western sector of Khirbat Qāzūn (T. Springett).

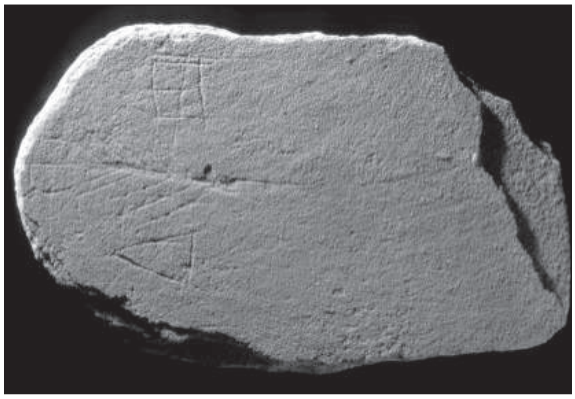
Graeco-Roman (FIG. 22). She has since studied all 53 textiles and published preliminary results on them (Granger-Taylor 2000, 2005). Her general conclusions are that they represent a unique collection of complete and semi-complete ancient clothing unparalleled in the Near East.

Pottery

Pottery analysis was first made by Prof. Dr Stephan Schmid who dated them to the late Nabataean period, between 1st-2nd century AD. Isabelle Sachet included the pottery in her Ph.D. thesis and had a similar conclusion (Sachet 2006:214-216, Pl. 121-123) (FIG. 23).

Human Remains

An initial study of the human remains from Khirbat Qāzūn was made by Dr Kathy Grus-



20. Tombstones with an etched palm branch flanked by the Greek letters alpha and omega from north-western sector of Khirbat Qāzūn (T. Springett).

pier who undertook their exhumation in 1997. During the course of the 2004 excavations, Lisa Usman, forensic scientist, lifted the bodies and made their basic identifications (Politis *et al* 2005b: xx). She also took systematic DNA samples of most of the bodies. Since then, more specialised studies on the human remains have been conducted by Jessica Walker under the supervision of Dr Megan Perry (FIG. 24).

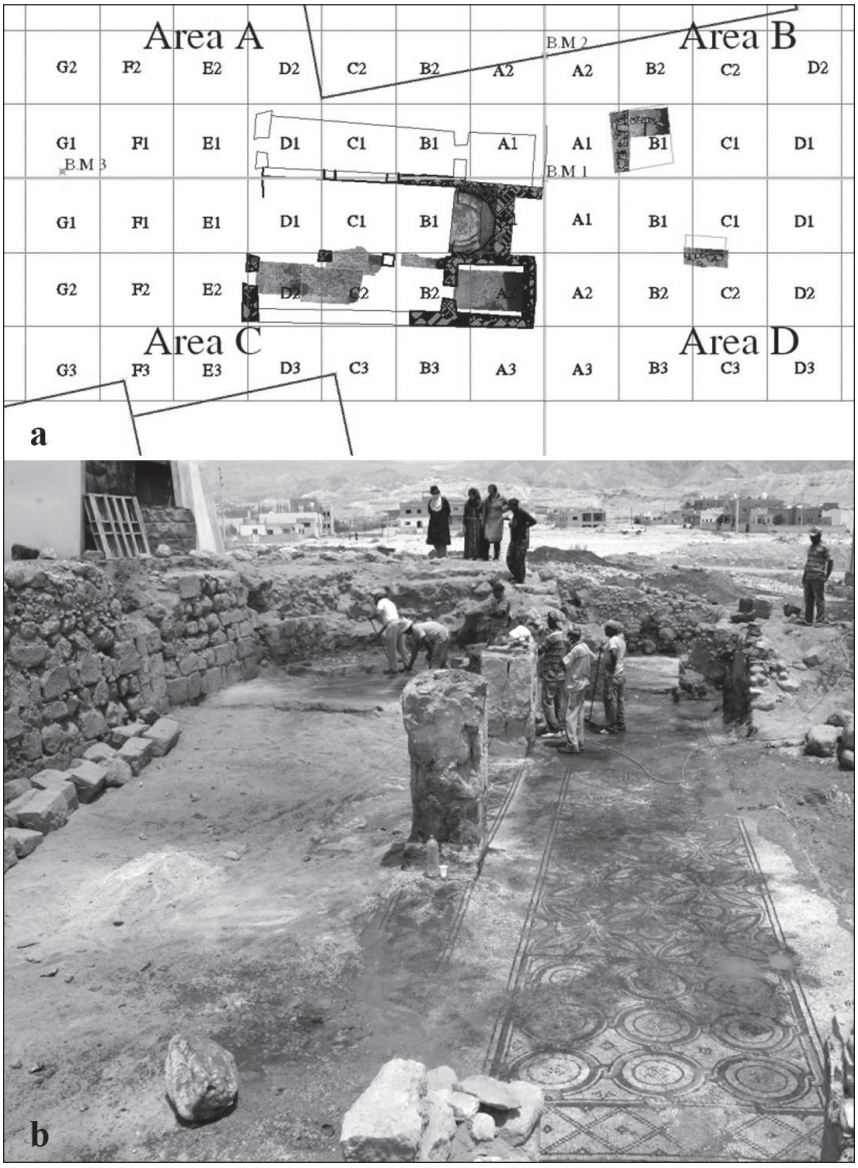
Conservation

Textiles

The Khirbat Qāzūn textiles were first catalogued in 1998 by Karen Horton at the Institute of Archaeology, University College London (for an example FIG. 10). This was an invaluable first step in organising the collection and recognising its significance as a whole. It was the basis for all future study by Hero Granger-Taylor. This was followed by the relocation of the textiles to the Textile Conservation Centre at the University of Southampton where Karen Horton commenced a post-graduate research on the material in 2007 (FIG. 25).

Then with a substantial grant from the British Museum all the textiles were taken to London for final conservation and a selection was mounted for display in Jordan. Following an official agreement with the Jordanian Government, six pieces were returned to Jordan and the remaining retained at the British Museum.

Two textiles (nos. 52 and 53) found during



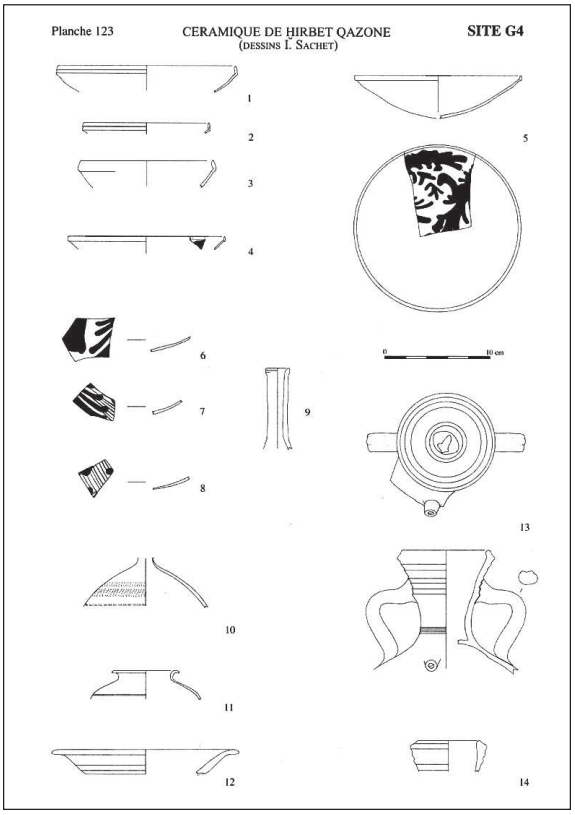
21a. Grid plan locating church of Khirbat Qāzūn in 2015 (J. Safi). 21b.View of south aisle and nave of Khirbat Qāzūn church from west during rescue excavations (M. Zahran).

22. Hero Granger-Taylor inspecting conserved and mounted textiles from Khirbat Qāzūn with Tall Vogel at British Museum conservation lab, London (K. D. Politis).

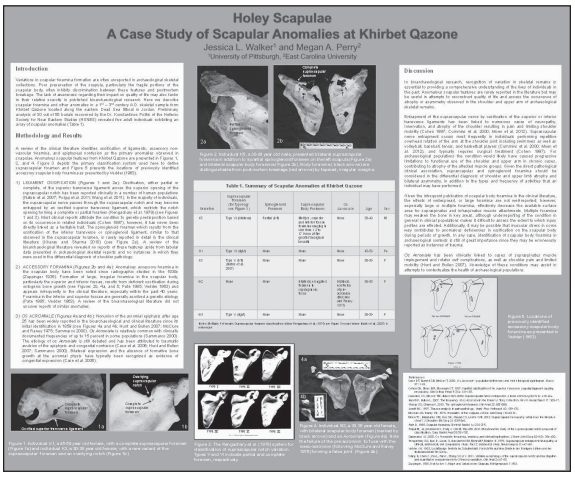
the 2004 excavations were taken for treatment and analysis at the Technical Training Foundation of Athens under textile conservator Rula Rapti (FIG. 26). When completed they were returned to Jordan and placed on exhibition in the Museum at the Lowest Place on Earth (MuLPE) in aṣ-Ṣafī (FIG. 27).

Exhibition and Storage

Khirbat Qāzūn has four information panels and four exhibition cases dedicated to excavations and material finds from the site at the Museum at Lowest Place on Earth (FIGS. 28, 29, 30, 31a, b). Objects not on display there are located



23. Selection of pottery from Khirbat Qāzūn drawn for Ph.D. thesis (I. Sachet).



24. Human bones study by Jessica Walker supervised by Megan Perry.

in storeroom (FIG. 33a). The only exceptions are six complete and some fragmentary textiles which were officially bequeathed by the Jordanian Government to the British Museum in London where they are currently in secure storage (FIG. 33b). One textile is on permanent display in the new Jordan Museum in Amman (FIG. 32).

25. Karen Horton at Textile Conservation Centre, University of Southampton where Khirbat Qāzūn textiles underwent further treatment and study (K. D. Politis).

The gold and silver earrings (FIG. 9a, b) went on temporary display at an exhibition at the Basel Museum of Ancient Art in Switzerland entitled 'Petra - Miracle in the Desert' from October 2012 to March 2013 followed by the Rijksmuseum van Oudheden at *Leiden in the Netherlands in 2013.*

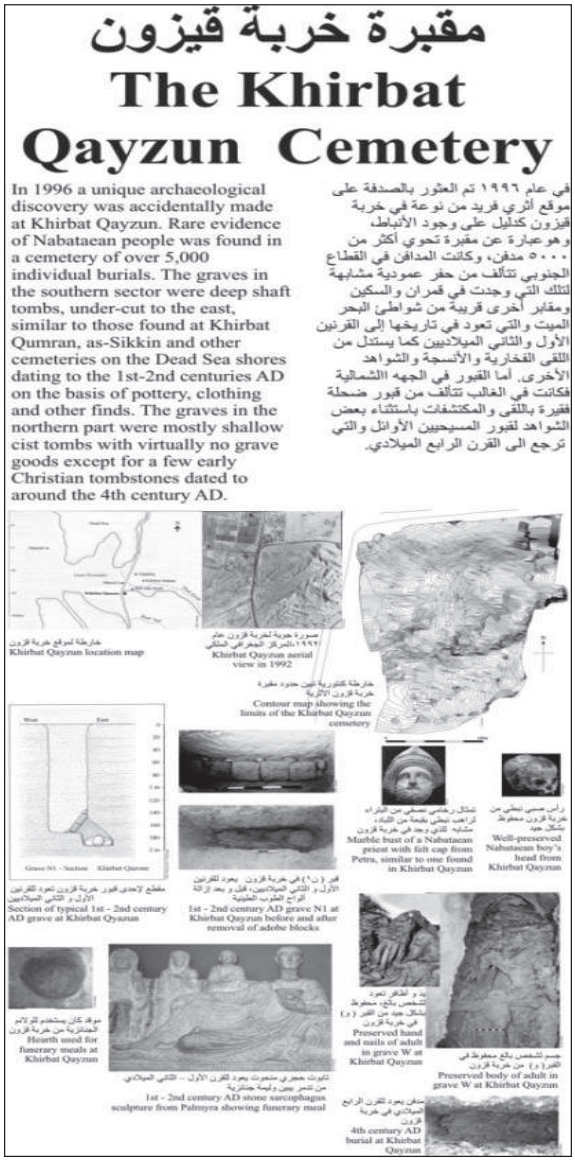
Summary and Conclusions

Khirbat Qāzūn is comprised of a cemetery with over 5,000 burials dating from the 1st-4th centuries AD according to Nabataean pottery, jewellery, inscribed tombstones and textiles discovered at the site. These latter finds include at least 53 identifiable Graeco-Roman style tailored clothes, many of which are complete. They are comparable to garments found at Fayum in Egypt, Palmyra in Syria and Mas'da in Palestine. But their exceptionally well-preserved condition makes them invaluable for study and exhibition.

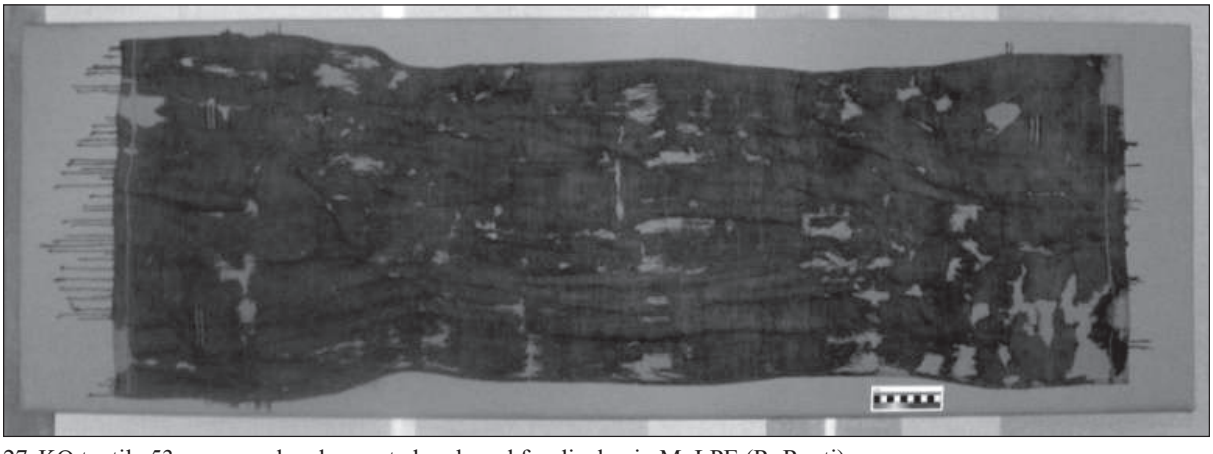
Historically Khirbat Qāzūn has been identified as Mahoza as mentioned in the 2nd century AD. Babatha papyri discovered in the 'Cave of

Letters' on the north-western shore of the Dead Sea (Bowersock 1996). The manner in which the bodies were interned, in a metre and a half deep *arcosolia* under-cut to the east and tightly sealed with adobe bricks, is similar to the characteristic burial method of nearby Khirbat Qumrān (Politis 2005a), which up until recently was considered unique. The last phase of the cemetery at Khirbat Qāzūn was clearly Christian as indicated by a different burial method,

26. Hero Granger-Taylor examines KQ textile 53 with conservators before treatment at Technical Training Foundation of Athens (K. D. Politis).



28. Information panel on Khirbat Qāzūn excavations in MuLPE (Hellenic Society for Near Eastern Studies).



27. KQ textile 53 conserved and mounted on board for display in MuLPE (R. Rapti).

29. Information panel on Khirbat Qāzūn textiles in MuLPE (Hellenic Society for Near Eastern Studies).

30. Objects from Khirbat Qāzūn and other Nabatean sites on display in MuLPE (K. D. Politis).

32. Conserved, mounted and framed KQ textile on display at Jordan Museum, 'Ammān (K. D. Politis).

31a, b. Bodies from KQ.W on display at MuLPE in 2016 and later stored in box (K. D. Politis).

33a, b. File cabinets storing KQ textiles stored flat in MuLPE (a) and British Museum (b) (K. D. Politis).

corpse orientation and inscribed symbols. This is now associated to the discovery in March 2015 of a church just north of the cemetery.

It is hoped that from the field work and research so far completed of Khirbat Qāzūn, sufficient material evidence will be made available to understand the nature of this key site in the context of the Dead Sea region during the late Nabataean period.

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Trade and Cultural Exchange – Late Bronze Age Cypriote Import Ware from Tall Zar'ā

Introduction

This paper is focused on Late Bronze Age Cypriote Import Ware from Tall Zar'ā in northwestern Jordan. The archaeological project started with a survey in August 2001 directed by Prof. Dr. Dr. Dr. h.c. D. Vieweger of the Biblical Archaeological Institute Wuppertal. Since 2004 the excavations are conducted by the cooperative project of the Biblical Archaeological Institute Wuppertal and the German Protestant Institute of Archaeology under the direction of Prof. D. Vieweger and Dr. J. Häser. Because of the preparation of the final report excavations ceased in 2011. Volume I of the final report was published in the beginning of 2017: http://www.tallziraa.de/Endpublikation//1_472.html

The settlement hill lies in the Wādī al-'Arab and has been inhabited over 5000 years (Vieweger and Häser 2017: 2). The *wadi* played an important geopolitical role between the Yarmūk Valley in the north and the Wādī Ziqlāb in the south. Because of their steepness and narrowness both could not work as major trade routes, the Wādī al-'Arab instead served as an about 30km long trade route leading to the Irbid-ar-Ramthā basin, which lies 560m above sea level. Thus, it connects the Jordan Valley including the Mediterranean coast via the Marj Ibn 'Amir (Jezreel Valley), Bisan and the Jordanian Highland, and worked as a link between Egypt in the south and the Syrian-Mesopotamian region in the north. Therefore, the settlement is not only part of the trading routes from the Mediterranean coast with direct routes to Damascus in the north, Baghdad in the east and 'Ammān in the south, but also part of an important trade route between the south and the north in general (Aharoni 1979: 45-54; Astour 1995: 1415; Dorsey 1991: 95-97).

Tall Zar'ā itself is distinguished by an artesian spring, fertile soil, and the highness of the hill provided protection. These very suitable conditions explain the long-lasting settlement history and the importance in the trade network of the region. During the Late Bronze Age, an extensive trade network arose and goods were traded through the whole Mediterranean region. The famous Late Bronze Age shipwrecks of Uluburun and Cape Gelidonya provide insight into the extensive international trade network during that period (for an overview see Yalcin *et al.* 2005; Bass 1967). In this context,

Cypriote pottery played an important role. It has been distributed to Italy, Sicily and Sardinia, the region of the Black Sea, Egypt, but also to the Southern and Northern Levant (Vagnetti 2001). Especially during the Late Bronze Age, the Levant was flooded with Cypriote imports. Although the vessels can be found in both funeral and non-funeral contexts, the majority of Cypriote imported wares stem from settlement contexts like private houses, public buildings and sanctuaries (Bergoffen 1991: 64-71).

One special Cypriote import were the White Slip Wares (Amiran 1969: 172). According to their decoration scheme they can be devided into three groups: Proto White Slip Ware, White Slip I Ware and White Slip II Ware. They appear in the Middle Bronze Age II B-C to Late Bronze Age IIB.

White Slip Ware

The vessel types of White Slip Ware consist of jugs and jars, but mainly of bowls. All vessels are handmade with extremely thin walls and were fired at high temperatures that could exceed 1080°C (Karageorghis 2001: 9-11). The dominant shape is a globular hemispherical bowl with the characteristic horizontal wishbone handle, the so-called milk-bowl. The name derives from the open form, which evokes an association of modern milk pans. Whilst earlier publications still use that name, younger ones prefer using the more neutral term hemispherical bowls. Despite of its shape and the involved assumption the bowls were used for cooking milk, it is not convincing that they functioned as cooking pots. It seems more reasonable that they were used as tableware keeping and serving food and beverages. Scientific investigations regarding the use of the vessels, for example which foods they contained, have not been conducted yet.

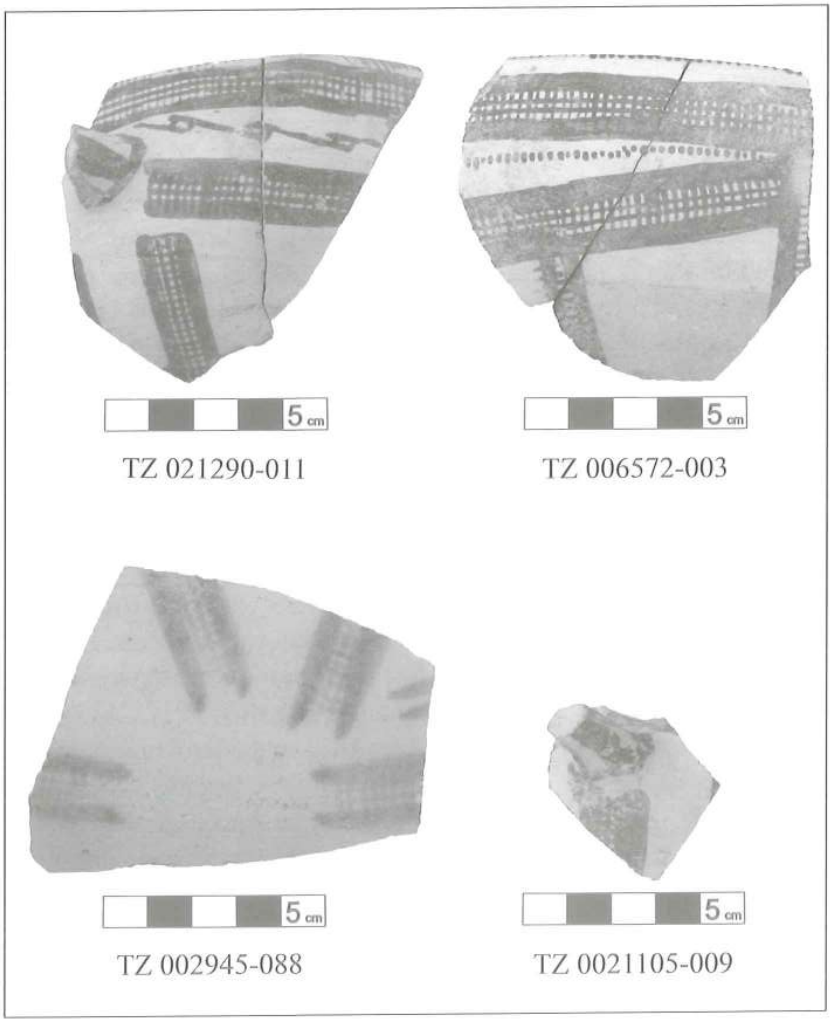
The earliest examples can be found in the Proto White Slip Ware. The bowls are decorated with a wavy-line pattern at the rim and a net pattern on the body. Between the lines are small circles and diamond-shaped grids, sometimes also small triangles. The handle is already wishbone-shaped.

The decoration of White Slip I bowls consists of several horizontal or vertical lines, some of them are framed by small dots. The rim is characterized by a small zigzag pattern. Below the rim appears a horizontal line with small circles. The handle is wishbone-shaped and decorated with short lines. The decoration of White Slip II Ware seems more similar to the one of Proto White Slip and is less slenderly than the decoration of White Slip I. The rim is decorated with small lines. The decoration also consists of horizontal and verticals lines, the so-called ladder pattern. Pearl bands and geometric patterns can be arranged between the ladder pattern. The characteristic wishbone handle is decorated with several thick and thin lines. The majority of hemispherical bowls found in the Northern and Southern Levant belongs to White Slip II Ware (Amiran 1969: 172).

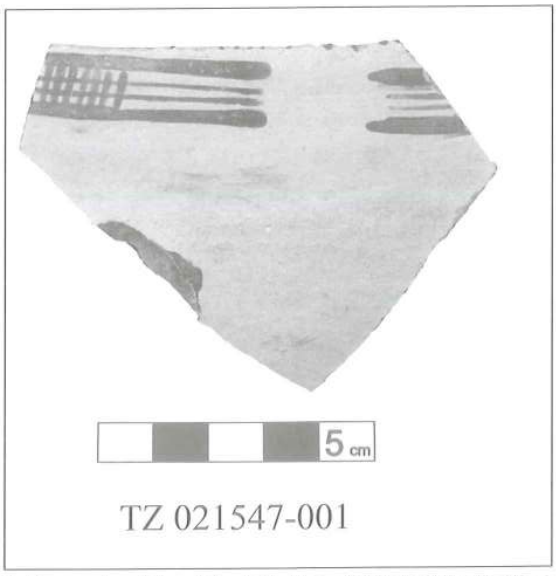
The White Slip II Ware from Tall Zar'ā

During the campaigns carried out between 2003 and 2011, 64 sherds of White Slip II Ware have been found (FIGS. 1 and 2). Proto White Slip or White Slip I Ware have not been identified yet. The sherds stem from Area I, which was inhabited from the Early Bronze Age to the Ottoman Period. The sherds came to light in strata 14 to 10, which date from the Late Bronze Age to Iron Age II C. The Late Bronze Age stratum 14 shows several houses of different sizes, remains of a casemate city wall, which fortified the northwestern part of the settlement, a tower with a sanctuary in the west and a temple in the north. Radiocarbon results date the destruction of the casemate wall before 1500BC (Vieweger and Häser 2017: 249-250).

Three courtyard houses have been identified so far. Before 1500BC a landslide, perhaps caused by an earthquake, destroyed huge parts of the settlement. Only the northern part in the excavated Area I was not affected. After the



1. Examples of White Slip II Ware from Tall Zar'ā.



2. Example of feasible imitation of White Slip II Ware from Tall Zar'ā.

catastrophe, the inhabitants reconstructed the damaged hill side with more than seven layers of soil and stones elaborately. The White Slip II Ware was found in the so-called complex O and in the courtyard-houses G and P.

It is noteworthy, that all sherds have been found in private buildings. Because of the decoration the pottery can be identified easily as White Slip II Ware. Due to the different soils where the pottery has been deposited, the decoration of the sherds are differently preserved so that the slip is sometimes faded and has a white to greyish colour. The painted decoration is reddish-brown to black. The diameter of the opening of the bowls is 16 to 18cm on average. The wall thickness is 0,3 to 0,5cm. The rim tapers upwards to 0,2cm. The clay is fine

with small particles of limestone, calcite and quartz and has a greyish-brown colour. Unfortunately, no intact bowls were excavated at Tall Zar'ā, but several joining sherds, rim and body sherds as well as two bottom sherds and ten handles are preserved. The exact number of vessels cannot be determined, counting the handles there must be at least ten White Slip II Ware vessels. Although the question of imitation is generally still under discussion, five of the found sherds are probably imitations (TZ 003915-008, TZ 004035-017, TZ 004590-001, TZ 006749-009, TZ 21547-001), because they differ significantly from the ones mentioned above. The clay has a reddish colour, also with small particles of limestone, calcite and quartz. The painted decoration is light brown, the slip is faded. The diameter of the rim sherds with 16 cm (TZ 004590-001) and 18cm (TZ 021547-001) is comparable with the already mentioned ones above. Especially because of the different colour of the clay and the painted decoration these five sherds are perhaps imitations. For clarification further investigations like pottery analyses are necessary. Imitations of Cypriote White Slip II Ware were also found in ancient Ugarit, modern Ras Shamra, in Tomb 4253 (after Courtois 1969: fig. 6 D). If they were produced from local clay is still under discussion (Yon 2001: 118-120; Artzy *et al.* 1981: 35-47). Several pottery workshops have been identified on Cyprus. Clay analyses correspond with clay deposits in the Troodos Mountains in Cyprus. One example is a Late Bronze Age site, which lies in Moutti tou Ayiou Serkou near the village Sanidha at the foot of the Troodos Mountains. Unfortunately, no remains of kilns have been found, but extensive manufacturing waste, misfirings and pottery sherds may indicate a manufacturing site (Todd and Pilides 2001). There are probably also manufacturing sites at Kalavasos, Enkomi and Amathous. But for a definite clarification more analyses are necessary (van der Does 2012: 29; Christou 1992: 813-815, 1993: 735-738).

Tall Zar'ā and its Role in the Trading Network

In general, the Late Bronze Age at Tall Zar'ā is distinguished by exceptional finds, which show the wealth of the city on one hand, and its involvement in the trading network on the other hand. The sherds of White Slip II Ware represent examples of these trading connections to the Mediterranean region. Other examples are two scarabs, one with the name of the Hyksos ruler Apophis (1590-1550BC), the other of Amenophis III, glaced faience cylinder seals (14th - 13th BC) in the so-called Common Style of Mitanni glyptic, and imported Egyptian faience wares (Vieweger and Häser 2008: 512; Häser *et al.* 2016).

The majority of cities with Late Bronze Age imported pottery are known from cuneiform inscriptions, like the Ugaritic cuneiform tablets or the Amarna tablets (Dietrich *et al.* 2013; Moran 1992). According to the written sources the cities were connected by trading links which is also confirmed by archaeological evidence. Concerning the pottery distribution one can see a focus on coastal cities and ports. Occasionally there are cities in the inland too, but those are usually connected with the coastal cities via trading routes (Cline 1994, 91-93 map 4). In these cities, the pottery has been found both in private and public-religious contexts, but especially in private graves. While the White Slip finds occurred mainly in habitation contexts, other Cypriote imports, for example Bichrome Ware, were most common in funeral contexts (Gittlen 1984: 510-512; Gittlen 1981: 52). The hemispherical bowls can be identified as the most popular pottery type of White Slip II Ware, whereas vessels like jars or jugs are rare (Amiran 1969: 172). However, Cypriote imports can not only be found at Tall Zar'ā, but also at several settlement hills in the Jordan Valley, which – like Tall Zar'ā – lay at a trading route connecting the Jordan Valley with the Jordanian Highland, as well as south of another route starting at the Mediterranean coast and

passing the Marj Ibn 'Āmir (Jezreel Valley), and Bisan, *e.g.* Tall Abū al-Kharaz, Tall Dayr 'Alla, Pella and Katarit as-Samrā. Petrographic analyses have shown that the pottery found at Tall Abū al-Kharaz originated from the Troodos mountains in Cyprus (Amiran 1969: 172; Fischer 2001; Fischer 2006: 283-285) Furthermore, Cypriote imports were found in settlements farther to the west of Tall Zar'ā, *e.g.* in Tall al-'Ajjul, Bisan, Tall al-Mutasallim, Tall Qamūn, Tall 'Akka, Tall Abu Ḥawwam and Tall al-Qudah. Here again the sherds have been found in private contexts, just parts of White Slip II Ware from Tall al-Qudah stem from a temple context (Amiran 1969: 172; Bergoffen 2001; Artzy 2001; Gittlen 1981; Hesse 2008: 38-41. 65. 112. 144-146. 159-161. 201-203. 208-210).

Summary

This brief overview of White Slip II Ware from Tall Zar'ā can be summarized as follows. Firstly, the amount of pottery sherds of this ware excavated on Tall Zar'ā is relatively high. Due to the position of the settlement hill in the Wādī al-'Arab, its fertile soil and guaranteed water supply by the artesian spring, the strong fortification and massive architecture, as well as the high amount of Cypriote imports, Tall Zar'ā seems to be a satellite city or even a city state itself in the Late Bronze Age. Together with the exceptional finds mentioned above, the settlement hill seems to be part of the international trade network during that period.

Secondly, the White Slip II sherds were found in private contexts similar to most finding contexts on other sites. On one hand, this may suggest the pottery was affordable even for poorer people, not only for the elite, and on the other hand, this reflects the integration of the pottery in the trading network of the Mediterranean region during the Late Bronze Age. Due to better archaeological evidence, most studies concerning Late Bronze Age trade have just focused on maritime and coastal trade. Though a stronger focus on the role of trading routes in the hinterland seems to be necessary.Thirdly, the pottery sherds, which may be an imitation of White Slip II Ware, illustrate the popularity of this ware type. While the topic about imitations is still under discussion, additional researches like extensive pottery analyses should clarify the question about the origin and potential production sites. Therefore, all archaeological evidences should be re-examined critically.

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The Udhruḥ Intervisibility: Antique Communication Networks in the Hinterland of Petra

Adjacent to this region is Arabia, which on one side adjoins the country of the Nabataei, a land producing a rich variety of wares and studded with strong castles and fortresses, which the watchful care of the early inhabitants reared in suitable and readily defended defiles, to check the inroads of neighbouring tribes. (Ammianus, 14,8,13, translation by J.C. Rolfe).

Introduction

Reliable and swift communication and information systems are pivotal for modern life. In these globally connected times some of the world's leading corporations produce neither tangible goods, nor assets, but merely assist in sharing knowledge and information. The rapid transfer of information over certain distances has always been a crucial factor throughout history.

For the military states and empires of the antique world the existence of sophisticated systems for communication were ubiquitous, as is evidenced through antique literary sources[1] and the archaeological record. Many studies have been conducted in the last decades on especially military signalling and observation systems throughout the Roman Empire. Although his work on Roman military signalling might have received some initial scepticism, the seminal studies by David Woolliscroft (2001) along Hadrian's Wall and the Roman Wetterau-limes in southern Germany are now widely endorsed. Woolliscroft showed that great effort and ingenuity was invested in Roman military communication systems, which relied predominantly on sight lines. Clark and Parker (1987) investigated a Late Roman signalling system around the legionary fortress of al-Lajjūn of the *Limes Arabicus* by means of a field experiment in the 1980's. Alistair Killick carried out several archaeological excavations and survey campaigns in the Udhruḥ region in the same period. He mentions recording over 60 – in a second publication even more than 150 – watchtowers (Killick 1986a, 1986b) eastward of Petra around the village of Udhruḥ , which according to him were constructed as part of an exclusive Roman military defensive system. Besides then countered forts and watchtowers, this system also comprised inroads and walls, and was

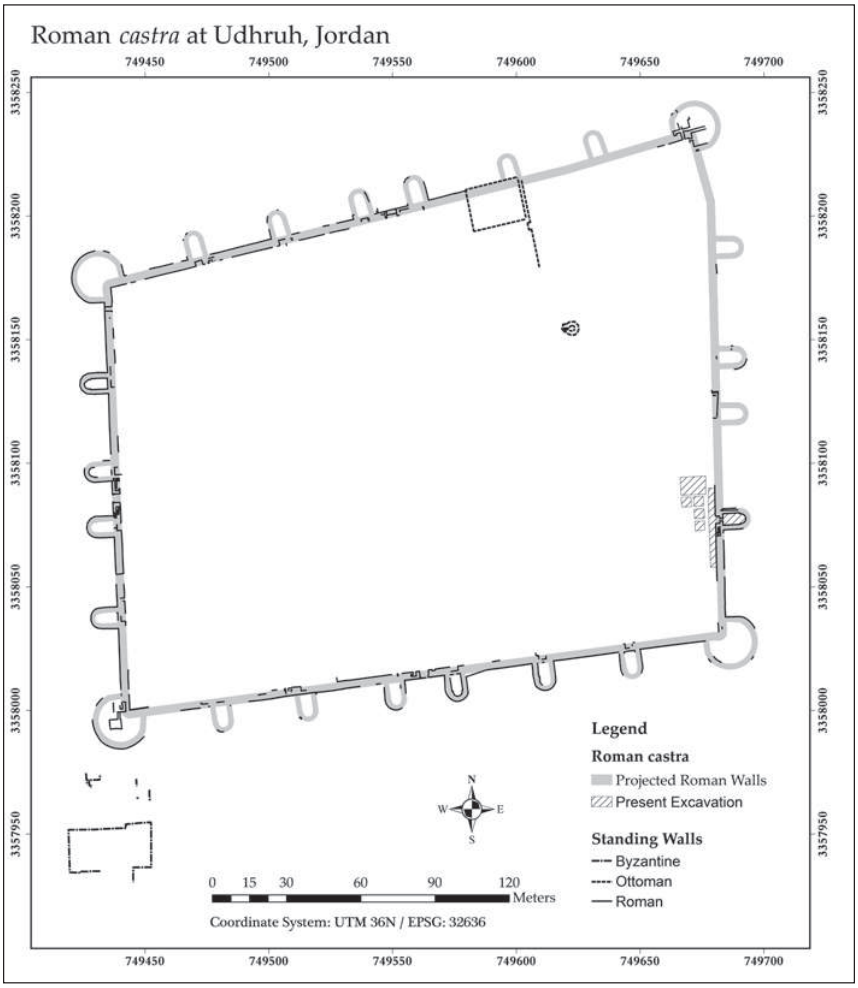
1. For extensive references to antique literary sources see Clark/Parker 1987:166-168; Woolliscroft 2001: 159-171.

according to Killick similar to the *Fossatum Africae* and a splendid example of Luttwak's Defense-in-depth.

Following many years of archaeological field campaigns we consider that the antique communication system in the Udhruḥ region was initiated in the Nabataean period, most probably not as elaborate as Killick proposed, and serving a wider variety of purposes than purely military defence.

The Udhruḥ Archaeological Project

Udhruḥ was an almost forgotten archaeological site until Fawzi Abudanah (2006) drew again attention to it. In 2011, the authors started a joint effort to study the site and its environs. The central place of the region is the town of Udhruḥ, 12km to the east of Petra. Udhruḥ housed an important Nabataean settlement (Killick 1990), but is best known for a Roman *castra* 4.7 hectare in size (FIG. 1). The curtain walls of this fort - still standing up several meters high – served as the perimeter of a town in the Byzantine and Islamic periods. Byzantine Udhruḥ – identified with Augustopolis – was one of the most important towns of South Jordan. Classical sources and archaeological evidence point to a long-term development throughout the Nabataean, Roman, Byzantine, Early and Late Islamic periods[2]. This development concerns intriguing cultural, socio-economic and religious transformation processes. These processes can be noticed, not only on the site itself, but also in the surrounding landscape where a wide variety of archaeological structures largely survived the ravages of time. The

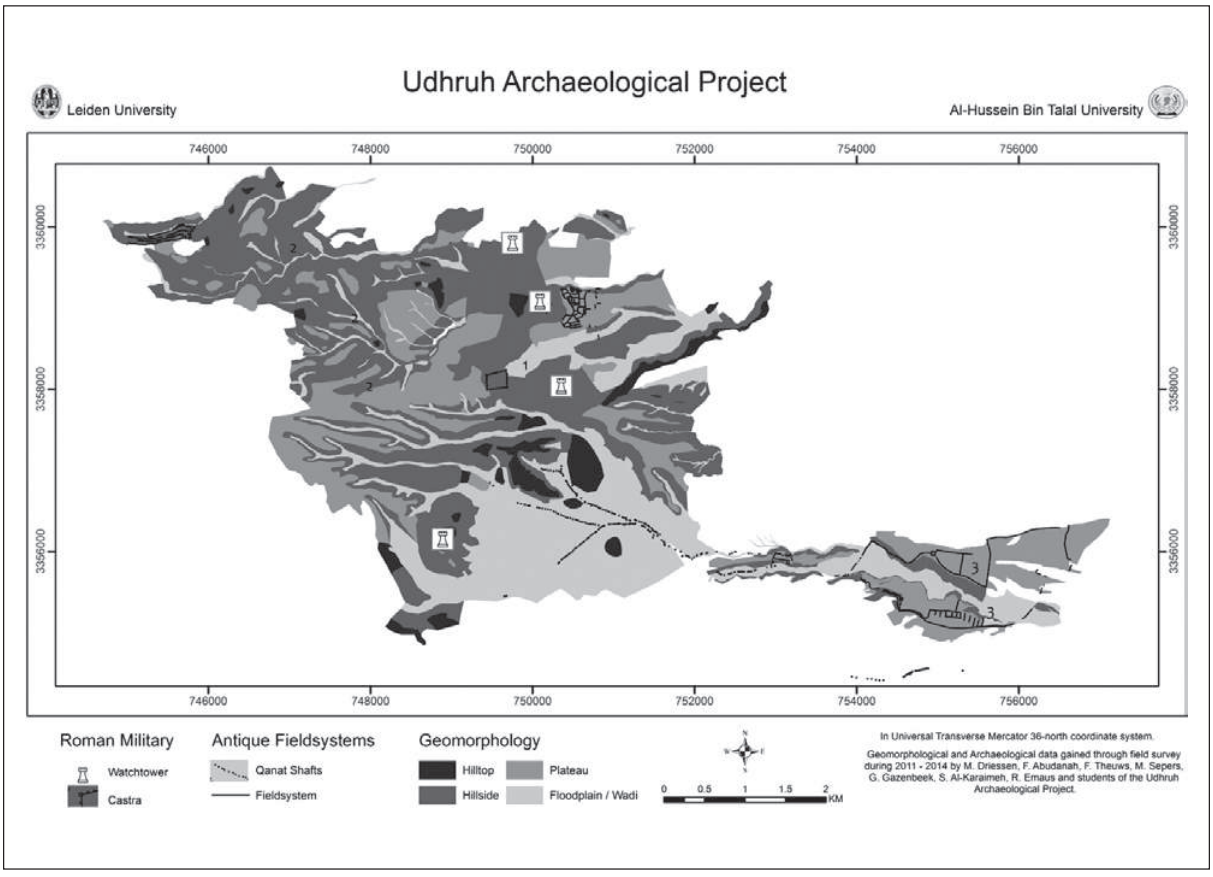


1. Udhruḥ Roman fortress (illustration by Roeland Emaus).

2. See *e.g.* Fiema 2002: 209-10; Kennedy/Falahat 2008; al-Salameen *et al.* 2011.

promising site itself, the archaeological diversity and excellent preservation of the surrounding landscape, were important criteria for launching the Udhruḥ archaeological Project (UAP) in 2011[3]. The UAP, a joint venture between Leiden University and Al Hussein Bin Talal University, started with a field-survey program, small-scale excavations and diverse GIS-related and subsurface-detection techniques in order to reconstruct the geomorphology of the landscape and the location of observed archaeological *immobilia*. After five years of archaeological campaigns we have reconstructed a significant part of the 48km² Udhruḥ region, which reveals an actively exploited landscape reflecting antique investments of great effort and ingenuity in agro-hydrological intensification, building material procurement, communication and security networks, military dominion and settlement development (FIG. 2).

The Udhruḥ Archaeological Project can significantly contribute to the understanding of rural development and major societal transformations in Nabataean, Roman, Byzantine and Islamic times in the wider region of Petra, by focusing on the development of the nearby secondary centre of Udhruḥ and its environment. The central research question for the Udhruḥ Archaeological Project is: What transformations can be observed in the hinterland of important centres like Petra that contributed significantly to their rise, development and decline? To understand the dynamics of the region, the project will focus on water resource



2. Geomorphological map of the 48 km² research area of the Udhruḥ Archaeological Project showing only Roman military structures, antique hydro-agricultural systems and cairns, made on base of 2011-2014 field seasons. 3 antique agro-hydrological systems: 1) Irrigated horticulture - Byzantine; 2) Floodwater farming - Nabataean and Byzantine; 3) *Qanats* plus large field systems - Roman/Byzantine (illustration by Roeland Emaus).

3. For an earlier, more basic version of the Udhruḥ watchtower research see Driessen/Abudanah 2013, and for the initial methodology and results of the UAP see Driessen/Abudanah 2015.

management, agricultural innovations, trade logistics, communication-security systems, religious transformations and settlement development from the Nabataean era to Islamic times[4].

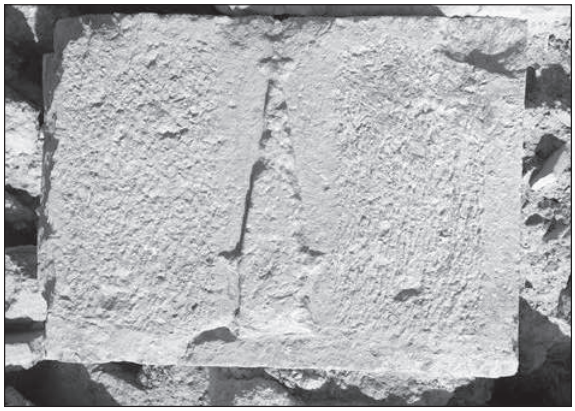
Field Work, Selection and Approach

During the 2011-2015 field surveys, several strategic landmarks with rectangular or square structures on summits were encountered and have been analysed by GIS-modelling. Some of these structures are already mentioned in earlier studies, while others are not. The identified structures are associated with ancient signalling systems because of the perfect views over the landscape and their intervisibility. The authors attempt to answer the following questions: Are these outposts part of a regional, and possible larger communication network? If so, when were these systems implemented, and for which periods were they or parts of them reused? We would also like to clarify the *modus operandi* and the purposes of these information transfer networks, seen from a diachronic perspective. To answer these questions fully we need to excavate (parts of) the presumed structures. Such excavations have not been carried out yet. However the results of our surveying and analyzing the 48km² research area do allow us to come up with sound assertions regarding such ancient communication systems. For this, certain additional landmarks beyond the boundaries of the research area have also been surveyed. These were selected on their tactical locations, and observed and analysed viewsheds and intervisibility, and therefore were considered to be part of a connectivity network, fitting in the setting of the palimpsest landscape around Udhruḥ. At these locations we also searched for the remnants of built structures, like small fortlets and towers, and collected and sampled material culture in order to get a basic idea on the practiced activities through time. The observed sightlines and visibility can however be misleading and part of a modernistic interpretation of the landscape. More scholars have been struggling with this. Kennedy (2013) analyses the possibilities of a Nabataean communication system in the direct surroundings of Petra, and refers to viewshed analyses and culturally different perceptions in visibility. Kennedy leans – like others working with archaeological visibility and landscape perceptions (*e.g.* Wheatley and Gillings 2000) – on quantifiable distance values of visibility perceptions as introduced by Higuchi (1988). In Higuchi's viewshed model three visibility ranges are distinguished: short-, middle- and long-distance views. The first is part of the immediate surroundings of the observing point whereby visibility aspects are not crucial. In the long distance view the topography is part of the horizon, and have visible features no direct impact on the observer. The middle-distance view range deals with a wide spacing over a distance whereby topographical features are to be perceived, but the recognition of individual details tend to become difficult, and whereby weather conditions can play a decisive role in perception. Changes in vegetation coverage remains a factor that has to be considered as well. Kennedy (2013: 282-287) bases his viewshed analyses on Higuchi's method, whereby a standardized height of 4m is chosen for the watchtowers and fort lets in the Petra region. Landscape and climatic conditions, as well as a description of the retrieved structures and setting are also to be considered of importance. In order to come up with a uniform approach of the analysis of the communication systems in the Petra region, we decided to follow Kennedy's (2013: 286) choice of a crucial middle distance range between 240 and 4400 meters.

4. The preliminary results of the research of antique water resource management and agricultural innovations in the Udhruḥ region which was part of our presentation at the 13th International Conference on the History and Archaeology of Jordan, will be presented in the proceedings of the University College of London April 2016 Workshop: Comparative Water Technologies and Management: Pathways to Social Complexity and Environmental Change (Driessen and Abudanah 2018). That is the reason why we decided to hand in this paper on another aspect of our research program for present volume.

The Udhruḥ Antique Communication Systems

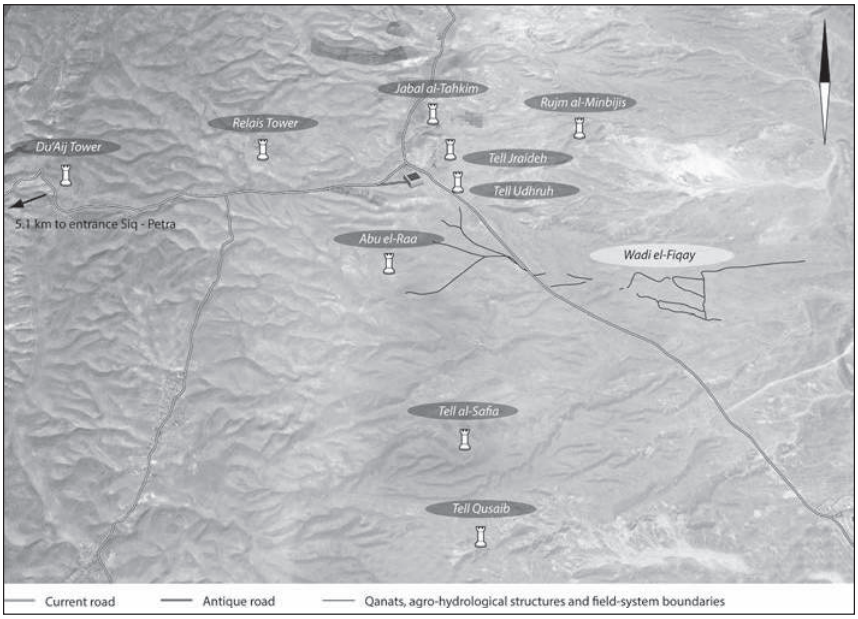
The site of Udhruḥ is a nodal centre for the region and for this study. Udhruḥ hosted one of the most reliable perennial springs in the entire region[5]. Abudanah (2006: 201) links the continuity of human activity predating the Persian period to this spring. The site is best known for a Roman legionary fortress of 4.7 hectares, which with its large external U-shaped towers, is clearly late Roman. This is supported by a building inscription found near the western gate, mentioning the rebuilding of the fortress by the Legio VI Ferrata, which could be dated to 303-304 AD (Kennedy and Falahat 2008: 159-160). Udhruḥ must have housed a Nabataean settlement of some importance before it was redesigned as a Roman military base. This settlement was most probably integrated, and/or (partly) destroyed by the construction of the latter. Glueck (1935:m 76-77) already mentions large quantities of Nabataean pottery surface finds at Udhruḥ, and on a spot outside the southern wall of the fortress, Killick (1990: 249) has excavated one and a half ton of Nabataean pottery fragments. This is interpreted by the Killick's as the location of a large Nabataean pottery kiln. During the last years no proof of such a kiln has been retrieved during the surveys, but we are planning for a trial with several geophysical techniques for this area during the 2018 campaign. However, we suspect that part of the Nabataean settlement was located at the southwest part of the still standing curtain walls of the Roman fort. An abundance of surface finds of Nabataean pottery was also retrieved by the UAP in this area. Also some iconographic evidence was discovered here during our surveys: a cut and worked limestone block with a *nefesh* (FIG. 3) and a rectangular sandstone block with a *betyl*. These were retrieved as *spolia* at respectivelythe southwest corner tower and the adjacent Byzantine church at Udhruḥ. The limestone is likely of local provenance, but



3. *Nefesh* found near the southwestern corner tower of the Udhruḥ fortress (picture by Mark Driessen).

the sandstone block most probably comes from the Petra area as no sandstone quarries or outcrops have been noticed around Udhruḥ . Marie Killick (1990:251) mentions that 13% of the coins found in/around Udhruḥ are Nabataean, with a peak of the reign of Aretas IV (9 BC – 40 AD), but the earliest dating from the early 1st century BC. Tholbecq (2013: 299) endorses earlier ideas that Udhruḥ developed as a second Nabataean nucleus in the hinterland of Petra. Most probably both the perennial spring and the elevated location,where the later southwest corner tower of the fort was built and which is 19 meter higher than latter, were important criteria for as well the Nabataeans as well as the Roman troops to settle here. The connectivity of Udhruḥ becomes especially clear through the survey of several hilltop sites in the region. Ten of these were finally selected based on the following criteria. They are having elevated and strategic locations with wide views over the region, connecting Udhruḥ and Petra to each other through sight lines and view sheds (FIG. 4).On the tops of these hilltops remnants of fort lets and watchtower-like structures were retrieved which were probably part of a signalling system, and these were surveyed for relevant material culture. During the 2011-2015 field surveys many structures were encountered that might have been part of what Killick thought to be an elaborate Roman signalling system with 60-

5. Since a few years this Udhruḥ spring is unfortunately no perennial source of water anymore.



4. Map of the Udhruḥ region with *castra*, watchtowers and the water and irrigated field system in Wādī al-Fiqay (illustration by Joanne Porck).

150 watchtowers in the Udhruḥ region. Most of these were the sort of cairns that archaeologists tend to encounter everywhere around the world on or near landmark locations. Some might be prehistoric burial mounds, others were pointed out by locals as being recent Bedouin graves or cadastral land demarcations[6]. Others were deselected as being part of the ancient communication systems because they lacked the earlier mentioned criteria. We are fully aware that by these decisions some of the elements originally belonging to these systems might have been ruled out. This is however an ongoing project and new insights can hopefully rectify these omissions. This may well be the case for watchtowers integrated in contemporary and/or later complexes or homesteads like the ones mentioned in Serila (πυργοφρουρίου; Koenen *et al*. 2013: 85-86), Khirbat Salantah (Hirschfeld 1995: 71-73) or Mampsis (Negev 1988: 85-88).

The above discussion clearly shows that the study of the selected sites will only lead to preliminary results which we still have to test through future field research with non-destructive geophysical exploration techniques, sondages and possibly through excavations.

Description of the Surveyed Structure

Three of the surveyed hilltops with built structures have a visibility field including an overview of Udhruḥ and its spring.

The first one is Tall Udhruḥ, which not only overlooks the complete fortress of Udhruḥ, but also has also visual control over the water systems and the irrigated fields in Wādī al-Fiqay (FIG. 4). The visibility from this 1300m hilltop reaches most of the other selected sites in this study (TABLE 1). On bright days even the inter visibility with the Du'ayj tower on Zubayriya hill, the nearest watchtower to Petra in our system, is attested (FIG. 5). However, the distance between these hilltops (8200 m) overstretches the chosen middle-distance view range of 4400 meters. On top of Tall Udhruḥ (also called Dubais), 700m eastwards of the fortress of Udhruḥ , a 12×25m rectangular structure made of limestone blocks can still be distinguished (FIG. 6). The structure consists of impressive walls with a width of 0.8-1.1m. Killick (1986a: 444) who excavated parts of the structure mentions that he encountered the remains of '*a two-storied tower structure of Roman foundation built on top of an Iron II settlement*'. These blocks resemble in provenance, dimensions and

6. See for antique field markers *e.g.* Koenen *et al*. 2013: 17.

Table 1. Visibility and distances between (possible) watchtowers in the Udhruḥ area and the legionary fortress of Udhruḥ. Y = yes; N = no; NA = not applicable; SWT = southwest corner tower castra; F = overview castra. Distances in km.

Visibilitiy	Castra Udhruḥ	Jabal at-Taḥkīm	Tall Juraydah	Tall Udhruḥ	Abū ar-Ru‘āh	Tall aṣ-Ṣafiyyah	Tall Qasīb	Relais Tower	Du‘ayj Tower	Rujm al-Munbajis
Castra Udhruḥ	NA	1.6 (SWT)	0.7 (F)	0.7 (F)	2.0 (F)	5.6 (SWT)	7.3 (SWT)	3.5 (SWT)	7.5 (SWT)	N
Jabal at-Taḥkīm	1.6 (SWT)	NA	0.9 (Y)	1.8 (Y)	3.7 (Y)	7.3 (Y)	9.0 (Y)	4.0 (Y)	8.1 (Y)	3.2 (Y)
Tall Juraydah	0.7 (F)	0.9 (Y)	NA	0.9 (Y)	N	N	N	N	8.3 (Y)	2.8 (Y)
Tall Udhruḥ	0.7 (F)	1.8 (Y)	0.9 (Y)	NA	N	5.5 (Y)	7.2 (Y)	N	8.2 (Y)	2.9 (Y)
Abū ar-Ru‘āh	2.0 (F)	3.7 (Y)	N	N	NA	3.9 (Y)	5.6 (Y)	3.8 (Y)	7.1 (Y)	N
Tall aṣ-Ṣafiyyah	5.6 (SWT)	7.3 (Y)	N	5.5 (Y)	3.9 (Y)	NA	1.7 (Y)	N	9.9 (Y)	N
Tall Qasīb	7.3 (SWT)	9.0 (Y)	N	7.2 (Y)	5.6 (Y)	1.7 (Y)	NA	N	11.8 (Y)	N
Relais Tower	3.5 (SWT)	4.0 (Y)	N	N	3.8 (Y)	N	N	NA	4.2 (Y)	N
Du‘ayj Tower	7.5 (SWT)	8.1 (Y)	8.3 (Y)	8.2 (Y)	7.1 (Y)	9.9 (Y)	11.8 (Y)	4.2 (Y)	NA	N
Rujm al-Munbajis	N	3.2 (Y)	2.8 (Y)	2.9 (Y)	N	N	N	N	N	NA

5. Picture taken from Du‘ayj tower in eastward direction (picture by Mark Driessen).

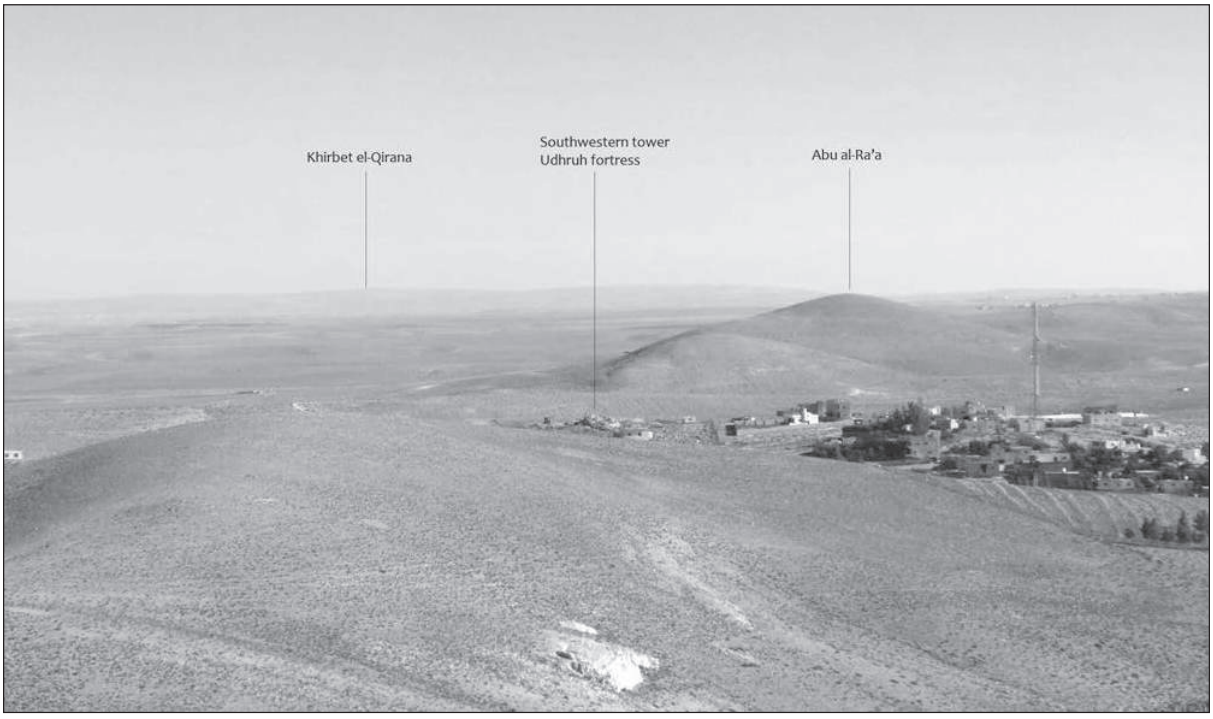
6. Aerial picture of Tall Udhruḥ taken from the south. At the right of the rectangular structure the circular ditch is very clear, and at the top Jabal at-Taḥkīm can be distinguished (picture by Stafford Smith: APAAME_20101016_SES-0263 (C) Stafford Smith, Aerial Photographic Archive for Archaeology in the Middle East).

finishing the ones used for the curtain wall of the Udhruḥ fortress. A ditch around the structure was most probably dug for defensive purposes. A modern cemetery is laid out on the western part of the hill. At Tall Udhruḥ , Early Bronze age II-III, Nabataean, Roman and Byzantine pottery was collected, and during earlier investigations also fragments of Edomite ware were found[7].

Tall Jurayda, a crescent shaped hill 700 m northeast of Udhruḥ , has an undisturbed view over the fortress of Udhruḥ . On the eastern side of this 1324 m high hilltop, a quarry, several caves and two built structures are found. The caves seem to have been used throughout a long period, as is the case with many caves in the research area. The best preserved of the two built structures measures 40×47m and is located on the southeast side of the hill. The structure is built of quarried and finished coquina and limestone blocks, which resemble the ones used for the fortress of Udhruḥ . The ceramic evidence corresponds with the most prominent periods of use of the fortress and later town of Udhruḥ , and dates to the late Roman, Byzantine, Umayyad and Ayyubid/Mamluk periods (Abudanh 2006: 422, Appendix 4D). This is one of the rare hilltop sites that lack the presence of Nabataean ware. We expect that Tall Jurayda possessed only a local function in connection with Udhruḥ and the irrigated fields in Wādī Udhruḥ because of a limited visibility to the other watchtowers in the region (TABLE 1).

The third hilltop with an overview of Udhruḥ and its spring is Abū ar-Ruʻāh, which lies 2000m southwest of the fortress of Udhruḥ. As is the case with Tall Udhruḥ and Jabal at-Taḥkīm, this 1372m hill overlooksthe water and field systems in Wādī al-Fiqay. From the summit of Abū ar-Ruʻāh 2012-2013 field teams working 6km away in Wādī al-Fiqay could be followed on bright summer days. This regionallystrategic territorial marker connects visually with most of the other surveyed hilltops, except for the above described Tall Jurayda east of Udhruḥ . The most remote watchtowers of our system are clearly visible on bright days, although the distances overstretch the chosen middle-distance view range. At the top of Abū ar-Ruʻah the remains of a watchtower or fortlet with massive walls were observed. The dimensions of the structure are not clear at this stage, since its upright walls were toppled and scattered around. Geophysical research and possible sondages are planned for the coming field seasons. Killick (1986a: 436-438) interpreted a rectangular enclosure on this hill –which he called Tall ʻAbāra– as a possible temporary Roman camp. This enclosure –which consists

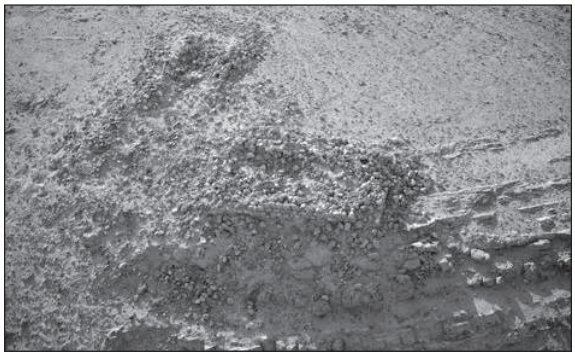
7. For earlier visits of the site see also Glueck 1935: 76; Killick 1986: 444 and for the ceramics: Abudanh 2006: 141; Glueck 1935: 76.



7. Picture taken from Jabal at-Taḥkīm in southward direction (picture by Mark Driessen).

of modest earthen walls– lies halfway on the very steep slopes of this hill, which makes it less suitable as the location for a Roman camp. No ceramics or other material culture linking it with a possible military use was found in and around this enclosure. North and northwest of Udhruḥ many similar structures most probably belonging to Nabataean and Byzantine dryland farming systems are being surveyed as part of our research (Driessen and Abudanah 2018). The pottery found near the collapsed structure on top of Abū ar-Ru'āh can be assigned to the Nabataean, Roman and Byzantine periods.

Another territorial marker in the Udhruḥ area is Jabal at-Taḥkīm, which lies 1600 m north of Udhruḥ. This hill, also called Jabal al-Ash'arī or Khirbat aṭ-Ṭamiyyah, has an elevation of 1364m and excellent and wide views over the surrounding landscape. On clear days the Nabataean-Roman stronghold of Khirbat al-Qirāna (40km to the south) and the hilltop of Jabal al-'Aṭā'ṭah near Ḍānā (37km to the north) are within the long-distance visibility range (FIG. 7). Jabal at-Taḥkīm lies within the network of middle- and long-distance visibility ranges of almost all the other examined hilltop sites and the irrigated field system in Wādī al-Fiqay. The view to the Udhruḥ fortress is blocked by the western part of Tall Jurayda. Only the southwest corner tower can be seen clearly from the L-shaped structure on top of Jabal at-Taḥkīm (FIG. 8). The both sides of the stronghold on Jabal at-Taḥkīm measure 40×10m, with the outer two-faced walls still standing around 2m high. The inner and outer faces of these walls consist of roughly cut quarried blocks of brecciated chert and limestone. The blocks and the



8. Aerial picture of Jabal at-Taḥkīm taken from the east (picture by David Kennedy:APAAME_20101016_DLK-0426 (C) David L. Kennedy, Aerial Photographic Archive for Archaeology in the Middle East).

construction technique and finish of these walls do not resemble the characteristic construction of the Roman fortress of Udhruḥ , but are comparable with Nabataean structures from the wider region. This is not a solid and empirically diagnostic observation, but something we might take in consideration. The odd shape of this 0.08ha structure seems anomalous for the layout of a Roman fortlet or watchtower. We are only aware of one other L-shaped Roman military structure at Halton- Chesters at Hadrian's Wall, which is the result of a later addition (Breeze 2006:178-183). It cannot be excluded –without excavating– that the odd shape of this structure is also the result of a later alteration. The 1.0-1.2 meter wide outer walls were re-used as burial chambers in later periods. At certain sections of the wall, the inner filling has been removed to create chambers, which were covered by slabs of brecciated chert and hold human skeletal remains[8]. The ceramic ware collected at the L-shaped building during our field survey consisted almost entirely of pottery from Nabataean period (1st century BC – 2nd century AD) and the Roman era, with only a few Byzantine fragments. Earlier research also recovered late Byzantine, early Islamic and Ottoman wares[9].

On a hill between two *wadis* 3500m east of Udhruḥ stands a square structure made of nicely cut limestone blocks. Largely demolished by looters, only parts of some walls remain standing. The 1140m hill called Rujm al-Munbajis connects visually with only Tall Udhruḥ , Tall Jurayda and Jabal at-Taḥkīm. The ceramic finds from this structure point to the Byzantine period. This possible tower overlooks two *wadis* which were exploited for irrigated agriculture. Therefore it was suspected to have a local security function in connection with these field systems in Wādī Udhruḥ and the northern Wādī al-Buraykah.

Southward of Udhruḥ , two prominent landmark hills were investigated for visibility and connectivity patterns. The first hill –5600m south of Udhruḥ– is locally known as Tall aṣ-Ṣafiyya. This steep 1310m hill with a north-south outcrop of coquina-limestone on its ridge is a striking feature surrounded by a relatively flat area with several *wadis*.The top of the outcrop has been cleared to make place for a 6×6.5m structure composed of cut limestone blocks. These blocks were probably quarried from the outcrop on the hill. The southern side of the hill was most certainly used for access, as this is the only passable slope. Older members of the local community remember a water reservoir at the eastern base of the hill (Abudanh 2006:148- 434). Several nicely cut limestone blocks that might have belonged to this reservoir can be seen on eastern foot of the hill. Tall aṣ-Ṣafiyya connects visually with many of the other hilltops; the southwest tower of the Udhruḥ fortress –although 5600 meters away and beyond the limits of the middle-distance view range– can be seen on most days by the naked eye. The rest of the fortress is not visible, not even with binoculars. The collected pottery consists mainly of Nabataean and Roman wares, although earlier surveys did also produce some late Byzantine/early Islamic sherds (Abudanh 2006:434).

Tall Qaṣīb, 1700 meters further south of Tall aṣ-Ṣafiyya, lies at a distance of 7300m from Udhruḥ . On the hilltop of 1285m a built complex was discovered, one square room of whichhad been exposed as a result of looting by treasure hunters. This subterranean room of 3.9×4m with walls 1.5m high is built of a mixture of limestone, sandstone and brecciated chert blocks. The remaining parts of the

8. Jabal at-Taḥkīm is an important historic Islamic site and hosted, according to al-Salameen *et al*. (2011: 233), 'the famous arbitration... [that finally] resulted in the establishment of the Umayyad state based in Damascus'. It is not clear yet if there is any relation between this historic event and the burials here. These likely date to more recent periods, as can be derived from the condition of the osteoarchaeological remains and remarks by members of the local community.

9. The pottery of our survey was analysed by Sarah Wenner (NCSU) and Mark Driessen. The Nabataean ware ranges from phase 2a till phase 3b painted fine ware and other forms (following Schmid's (2000) pottery determination). Glueck (1935: 77) also mentions large quantities of Nabataean ware and Killick (1983: 127) collected late Byzantine/early Islamic pottery from the site. Abudanh (2006: 175) also found some Ottoman ware.

complex were still largely covered, but for how long? South and east of the structure, 14 graves had been looted leaving human bones lying scattered around. A natural spring can be recognized by the pockets of lush natural vegetation at the north-western base of Tall Qaṣīb. During an earlier survey two parallel walls could be seen here, which had been exposed by seasonal flooding once more. During our later survey they had been buried under alluvial deposits. These walls might have been part of a water reservoir (Abudanh 2006: 507).Tall Qaṣīb connects visually with many other hilltops of the survey on bright days, although most of them are beyond the middle-distance view range. The southwest corner tower of the Udhruḥ fortress could also be seen with the naked eye, but this was again during some clear summer days. During the survey, predominantly Nabataean wares, but also some Roman and Byzantine sherds were discovered. Earlier surveys also recovered some pottery fragments from Edomite, Umayyad and Ottoman periods (Abudanah 2006: 150).

The following hilltops cover the western connection in the direction of Petra. A Structure of 5×5m was located on a hill more or less halfway and just north of the road between Udhruḥ and the Zubayriyya ridge towards Petra. This watchtower is probably the one that Killick refers to and illustrates in his publication (1986a: 440 and pl. 24.14).We are however not sure, as he did not give more details.With a height of 1450 m, this is the most significant hill in this area, lying 3500 m west of Udhruḥ and has an unblocked view of the southwest corner tower of the legionary fortress. Because it can serve as a connection between Udhruḥ and the more western Du‘ayj Tower (on Zubayriyya ridge) towards Petra, it is called the Relais Tower. This rectangular structure is made of roughly cut brecciated chert blocks and was likely a pivotal part within the communication system. It has however also a clear view over an ancient settlement and parts of elaborate Nabataean and Byzantine dryland farming systems[10], a mere 1000m north of the tower. It might have served multiple functions, as is expected to be the case with other hilltop sites. Only a few body sherds were collectedat the site, with fabrics that could only be determined as roughly belonging to the Nabataean-Roman-Byzantine periods. It is suspected that previous archaeological surveys such as those of Killick may have cleaned the site of its ceramic surface remains, and this reason justifies the need to continue our future research here with sondages and other techniques.

A 5×5m structure (Du‘ayj Tower) on the Zubayriyya ridge, just north of the road connecting Udhruḥ with Wādī Mūsā, is the most western connection in the communication system with the city of Petra. The remnants of what must have been a tower-like structure are to be found at a height of 1575m and at a distance of 7.5km from the fortress of Udhruḥ. The southwest tower of the Roman fortress, Tall Udhruḥ (8200m) and Jabal at-Taḥkīm (8100m) are visible on clear days with the naked eye, as well as other hilltop structures (TABLE 1). Towards Petra –at a distant of 5.7km from Du‘ayj– a visual connection with Jabal Hārūn and Umm al-Biyāra[11] is easily made on clear days, although again this lies beyond the limits of our determined middle-distance view range. The structure is called Du‘ayj Tower as it lies at the end of the old Du‘ayj-road[12]. Du‘ayj tower connects visually within the middle-distance view limits with the eastern watchtowers and fortlets of the Jabal ash-Sharāh Survey: JSS86 on Ṭal‘at ‘Iyad, JSS89 on Q(u)lay‘ah, JSS122, and JSS123 on Abū al-Baql[13]. The retrieved cultural artefacts from the Du‘ayj tower point to Nabataean and Roman use.

The last structure operating in the Udhruḥ

10. This dating is again based on surveyed material only, recent studies in the Petra area show that scientific dating techniques as OSL and 14C endorse the establishment of agricultural terraces as from the 1st century AD (Beckers and Schütt 2013).

11. For the last see Kennedy 2013.

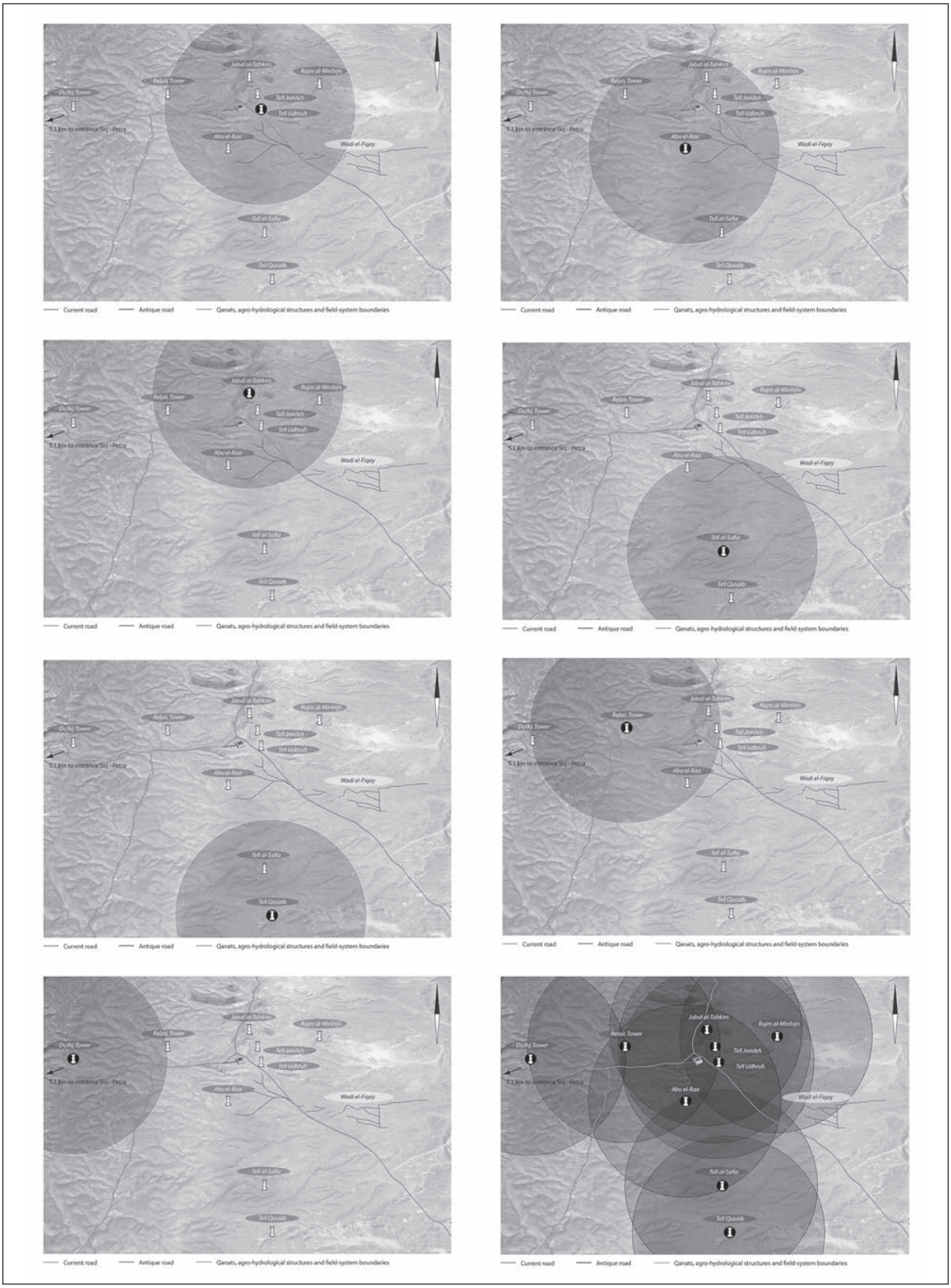
12. For the Du‘ayj-road see Abudanh 2006: 102-3; 403.

13. For these see Tholbecq 2013: 300.

communication system is Udhruḥ itself, with the location around the southwest corner tower of the Roman *castra* playing a pivotal role. For the Roman period this tower was most probably part of the system. For the Nabataean period we suspect that there was a fortlet or watchtower structure on this spot, as this location links visually with most Nabataean hilltop structures in the region. This would also explain why the Romans laid out their fortress in such an anomalous way on a slope with a difference in height of almost 20m over a distance of 330m. The above surveys and visibility studies were carried out during summer periods with predominantly clear days and sometimes amazing inter visibilities covering dozens of kilometres. These visibilities could have been different in the past, due to different climatic, environmental and/or anthropogenic conditions. Climatically, no dramatic changes are to be expected when comparing the current conditions with those in antiquity, although it should haven been more humid then than in present (Finné*et al*. 2001; Gilbertson *et al.* 2006:406-409). A wet phase in the classical period was followed by a drier phase in Islamic times (Gilbertson *et al.* 2006: 406-408; Besançon 2010: 67). The area around Petra and in the direction of ash-Shawbak must have been partly covered with woodland species like Palestine oaks and Juniper (Besançon 2010: 62). The deforestation of these trees must have started already well before the Roman period (Fall 1990:275). For the region of Udhruḥ –due to the climatic and hydrological circumstances– no high trees are to be expected in classical times, which could have affected the antique sightlines. The chosen hilltops are outstanding markers in the landscape and even nowadays anthropogenic structures do not block the sight from these hills, and there is no evidence that this might have been different in ancient times. Weather conditions, and hence the visibility, change throughout the year. In order to tackle this and to come up with a uniform approach for the analysis of the communication systems in the Petra region it was decided to follow Kennedy's (2013: 286) criteria. This means that a standard height of 4m was chosen for the structures on the hilltops. Some of these buildings must have been much higher, as can be surmised from the surviving foundations; thickness of the walls and the overall layout, but this height of 4 m remains the standard. With this average height a short-distance of less than 240m, a middle-distance range between 240m and 4400m, and a long-distance range of more than 4400m was calculated (Wheatley and Gillings 2000: 16-19). The middle-distance range between 240m and 4400m is decisive for visibility, as within this range structures such as watchtowers and phenomena such as lights, fires and larger beacon signals can be seen, though details cannot be discerned.

Nabataean Connectivity in the Udhruḥ Area

What already becomes very clear from the surveyed hilltops is that on almost all of them (except for Tall Jurayda and Rujm al-Munbajis) Nabataean ceramic wares were found. Based on the quantities of this surveyed material the Nabataean era seems to be the most dominant period of use for many of them. When the middle-range limits for these hilltops with a Nabataean usage are plotted on a map, it becomes apparent that the visibility fields of these lie perfectly within these boundaries (FIG. 9). A network of communication appears, connecting on the one hand Udhruḥ with Petra in an east-west direction and on the other hand Udhruḥ with a north-south line of control. For the east-west connection the highest part of the ancient settlement –which is the location of the later southwest corner tower of the fortress– is directly connected to the Relais Tower over a distance of 3500m, which falls within the middle-distance radius. Indirectly, Udhruḥ is connected via Tall Udhruḥ and Abū ar-Rūa'a, both with an overall view over what we think are the outer limits of the ancient settlement, with the Relais Tower. With a distance of respectively



9. The middle-range limits for several watchtowers of the Udhruḥ communication system (Illustrations by Joanne Porck). N.B.

4200m and 3800m these fall within the middle-distance *radii*, and all of these possess unblocked views towards each other. As a back-up in cases of emergency or blocked views, Jabal at-Taḥkīm could be put in operation with a clear visible connection over a distance of 4000m towards the Relais Tower. It is situated only 1600m north of Udhruḥ and from this Nabataean stronghold Udhruḥ's SW corner tower can be seen. The Relais Tower connects visually with the Du'ayj tower on the Zubayriyya ridge towards Petra, and here too the middle-distance range with a distance of 4200m is maintained. The Du'ayj tower connects visually with some structures in the direction of Petra that fall beyond our research area. Tholbecq (2013:300) describes the structures JSS 89, JSS 122, JSS 86 and JSS 123 as possible actors in a system of 'visual long-distance communications'. The distances to these from Du'ayj tower are respectively 2100m, 3200m, 1500m and 4100m, and are thus all situated within the chosen view range.

The north-south connection starts for this study from the north with Jabal at-Taḥkīm. As mentioned above, on clear days the views from this summit reach out far and even the Dana hilltops and Khirbat al-Qirāna are within the long-distance visibility range. We have not yet surveyed hilltop structures north of Jabal at-Taḥkīm, but the Nabataean settlement on the hills near Khirbat al-Jarbā can be considered. These connect visually with each other and the distance of 2600 m makes Khirbat al-Jarbā a plausible candidate. On Rujm al-Jarbā –300m south and on the same hill as Khirbat al-Jarbā– a rectangular 15×11m structure made of limestone blocks, has been observed by Abudanh (2006: 413).

During a more recent visit no ceramic evidence has been retrieved here, so more research is required here. Jabal at-Taḥkīm links in a southern direction, as has already been seen with Udhruḥ's SW corner tower, but also with Tall Udhruḥ and Abū ar-Rūa'a with distances of 1800 and 3700m. These all fall within the calculated middle-distance range, as are the two southern hilltops –Tall aṣ-Ṣafiyya and Tall Qaṣīb– with a span of 3900m and 1700m.

The authors think that Nabataean Udhruḥ and its communication system played a role in the Nabataean military defense system. Such a system can be confirmed by various ancient literary sources. Diodorus of Sicily (19, 96, 3) describes a very early Nabataean network of watchtowers, relating to a late 4th century BC situation. The Nabataean settlement and the retrieved communication network in the Udhruḥ region could have played a role in the protection, control, provisioning, trans-'ship'ment and taxation of the trans-Arabian caravan trade. Through this trade in aromatics the Nabataeans accumulated part of their wealth and power, and became part of an antique globalised network for certain period[14]. The trade in myrrh and frankincense was a lucrative, but also a hazardous enterprise. In the arid no man's land of the desert and steppe travellers were prone to different dangers and challenges. The caravans had not only to venture the drought, but also the perils of desert-piracy. It is not clear if armed escorts were sent along the entire route, most probably the chain of fortlets and watchtowers played a role in guarding and controlling the safety of the caravans. The members of these transport and trade communities were not allowed to enter the Nabataean capital, so these 'services' had to be carried out at satellite stations in the vicinity of Petra (Zayadine 1992: 230). For the required services places were needed with sufficient supplies of water, food and fodder in a secure setting along or near the trade routes. Udhruḥ that developed according to Tholbecq (2013: 299) as a second Nabataean nucleus in the hinterland of Petra could have been pivotal in this.

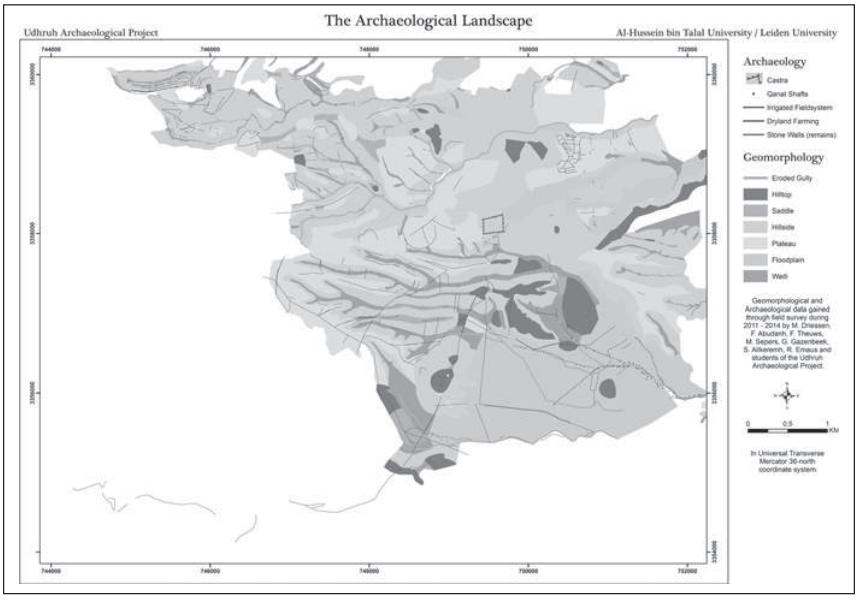
14. For the Nabataean incense trade see inter aliaYoung 2001: 112-117 and Zayadine 2007.Globalisation as seen by Versluys (2015) as part of a dynamic approach to a world of cultural connectivity with emphasis on social values, balances and connections whereby diachronicity can be integrated.

The 4th century AD Roman historian Ammianus Marcellinus (14, 8, 13) mentions that the early inhabitants of the Nabataean country watchfully took care of the safety of their well defended territory from strategically positioned posts. These were installed to control the roads from neighbouring territories into their land where according to Ammianus a rich variety of goods were produced. Archaeological evidence for the Nabataean agricultural intensification shows that this took place predominantly west of Udhruḥ (Kouki 2012: 84ff; 2013). The eastern boundary of this is located almost along the north-south line of the Udhruḥ communication system as described above. Is it possible that we are looking at one of the defensive lines of the Nabataean territory? On the one hand this might have had an external function directed towards neighbouring territories and incoming routes.

On the other hand it is directed internally, possibly to protect and control the local supplies of water and the established agricultural schemes such as the Nabataean dryland farming systems that were encountered west and northwest of Udhruḥ. In the hilly area northwest of Udhruḥ a combination of ancient rainwater-catchment and floodwater-harvesting techniques is observed. These terraced fields cover a vastarea of most probably dozens of square kilometers and provide surface finds dating from predominantly Nabataean and Byzantine times (FIG. 10). The location of Udhruḥ with its perennial spring, its surrounding Nabataean hydro-agricultural schemes and communication network underline Tholbecq's proposition (2013: 299) that Udhruḥ can be labelled as a secondary Nabataean centre next to Petra.

Roman and Byzantine Connectivity in the Udhruḥ Area

In the 3rdand 4th centuries a revitalization of military structures took place under Roman control in Jordan. Many of these military installations were already in use throughout the preceding centuries (Kennedy 2000), but others, such as the legionary fortress at al-Lajjūn, were newly constructed. The legionary fortress of Udhruḥ was probably, according to the west gate building inscription, rebuilt by the Legio VI Ferrata in 303-304AD (Kennedy and Falahat 2008: 159-160). It is not clear if this rebuilding refers to an earlier Roman legionary camp, an earlier Roman military fort of another character, or to earlier defensive installations of non-Roman origin. Till now, no literary or archaeological proof has been found pointing to a long lasting Roman occupation of the site before the second half of the 3rd century AD.



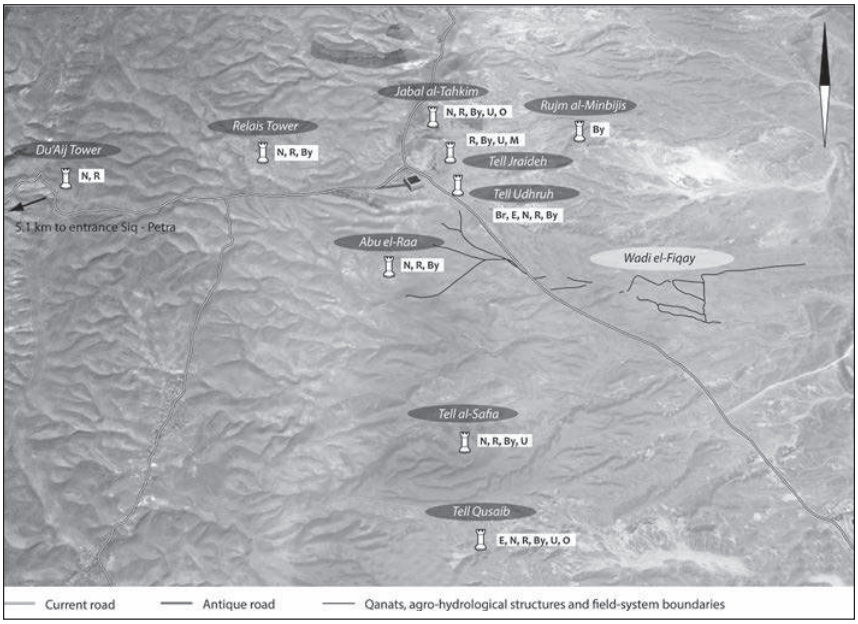
10. Geomorphological map of the western research area of the Udhruḥ Archaeological Project showing the fortress and the water management and field systems, whereby the structures part of the western dryland farming area are mapped (illustration by Roeland Emaus).

Except for a few 1st century AD *terra sigillata* sherds from the South Gaulish production centre La Graufesenque and some Trajanic coins, which could still have been in circulation in later periods, the evidence for this is very meagre[15]. In a trench carried out in the *intervallum* at the eastern side of the legionary fortress it was noticed that the Roman curtain wall was constructed on top of different foundations. The upright parts of this wall were made of nicely finished coquina limestone blocks, carried out in what can be described as clearly Roman practise while the foundations were made of more roughly cut and ditto finished brecciated chert and flintstone blocks. Such building practices do resemble the method of construction seen at the L-shaped fortlet on Jabal at-Taḥkīm and other Nabataean structures in the region. It seems that the Roman curtain wall was constructed on top of initial Nabataean walls or foundations. At this stage it is not clear when this was carried out and if the Roman curtain wall that still stands is part of the 303/304 rebuilding or of another earlier Roman building campaign. The layout and realization of these defensive works and the dozens of beautifully articulated architectural elements retrieved on the surface of the fort, which most probably belonged to its headquarter building, indicate that the legionary base of Udhruḥ was definitely of a more monumental stature than its counterparts along the *limes Arabicus*. Why is this the case at Udhruḥ and not at the other Roman legionary fortresses? This most probably has to do with its location near Petra, and this monumental refurbishment could have been part of a function as desert gateway to the capital of the Nabataeans. Several aspects of continuity from Nabataean days and ongoing connectivity with the centre of the Nabataean world can be noticed in Roman Udhruḥ . This can also be derived from the following. The spring of Udhruḥ was most certainly an important factor for the choice of location for this Roman camp as had been for the preceding Nabataean structure[16]. In Roman times access to this water resource was located at the northeast side of the fortress, where a natural depression leads to the present-day spring. This connection to the spring and the control of this important water source is most probably the reason why this side of the *castra* has an atypical trapezoidal shape. Another unusual feature that struck us immediately, as has already been mentioned, was the slope on which the fort was built. The reason for this became clear when the location of what we suspect to be the Nabataean settlement and the *castra* southwest corner tower, proved to be a territorial marker connected to all the watchtowers identified in the region of Udhruḥ . This seemed to be the case for the Nabataean, as well for the Roman signalling and communication system.

If we look at the ceramic evidence of the hilltop sites in the Udhruḥ area it becomes clear that all of the surveyed Nabataean watchtowers were still in use or reused in the Roman period (FIG. 11). Most of the Roman sites in Jordan discussed by Kennedy (2000) exhibit ceramic evidence from the Nabataean period. A well-functioning communication system is of vital importance for any military organization, and the Roman military system was no exception. That the Roman military authorities put emphasis on military communication can be seen from both the archaeological and the historical record all around the empire. It looks like that for Udhruḥ the connection with Petra as well as the north-south link were still of vital importance. Does the last link coincide with the routing of the *Via Nova Traiana* –a highly debated issue among archaeologists and historians– or with Roman eastern frontier? We are not going to give an answer in this paper, but leave this issue open to discussion. Does the system –as

15. Such South Gaulishterra sigillata sherds have also been recorded at several sites in and around Petra. The globalised distribution patterns of this ware in the whole antique world in the 1st century AD is considered as an early example of mass consumption and commoditisation (Woolf 1998: 185-205; Pitts 2015).

16. For the locational analyses of Roman military sites based on classical sources and archaeology, see *e.g.* Driessen 2007:28-35, tables 2.1 - 2.3.

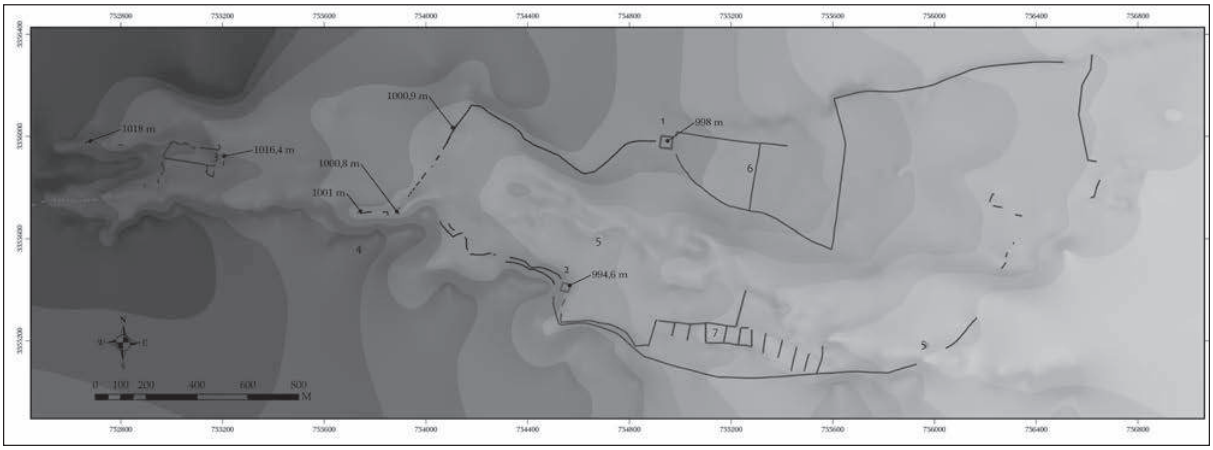


11. Map of the Udhruḥ region and watchtowers with ceramic finds (illustration by Joanne Porck).

we think of being the case in the Nabataean period– also has an internal control function on the nearby agricultural schemes in the Roman era? If we look at the ceramic evidence from the combination of ancient rainwater-harvesting agricultural schemes in the area to the west and northwest of Udhruḥ we see a strong Nabataean and also a Byzantine component, but Roman material seems to be lacking from these areas. Southeast of Udhruḥ however, an impressive network of well-preserved ancient subterranean and surface-water conservation measures and associated irrigated fields – a *qanat*- system - was recorded in a large flood plain largely covered by alluvial deposits (FIG. 4 and 12). The basis of these *qanats* consist of four aquifers or water levels, tapped by subterranean canals which are constructed and maintained through more than 200 vertical *qanat*-shafts, probably hacked out of the limestone bedrock over an overall distance of more than 8.5km. The surface transport of the water is through more than 2000 m³ of solidly built channels and aqueducts, and it accumulates in large reservoirs with capacities of millions of litres of water, constructed to irrigate an extended agricultural field system with at least 35 hectares of tilled land. These fields seem to consist of pockets of very fertile, though not easily cultivable soils. It became clear through observations in erosion gullies, small scale excavations and a combination of non-destructive geophysical ground-based and airborne exploration methods that the long-lived Udhruḥ *qanat* and field systems are perfectly conserved. OSL dating of the mortars used for the construction of the large reservoirs shows that these were most probably built in the Roman period, with what seem to be adaptations and/or renovations in Byzantine times (Versendaal in Driessen/Abudanah 2017)[17].

If this landscape was actively exploited this landscape with the investment of great effort and ingenuity in such an agro-hydrological intensification, would it not be logical to identify some sort of control over the safety of such investments? We would like to think so, and we suggest that the agro-hydrological systems in the region of Udhruḥ are secured by the above described communication network. From the summits of Abū ar-Ru'āh and Tall Udhruḥ

17. 14C analyses of charcoal twigs found in the mortar of a later added supporting wall on the outside of one of the reservoirs dates in the Umayyad period. This might be evidence that the *qanat*- and field systems were still in use or were reused during early Islamic times. The early Islamic periods are probably also very important in this context, but these are beyond the chronological range of this volume.



12. The antique water management and irrigated field systems in the Wādī al-Fiqay, which is fed by the *qanat* system. 1) Northern reservoir - 50×50m; 2) Southern reservoir – 34×36m; 3) Smaller western reservoir – 15×15m; 4) Settlement Khirbat al-Fiqay; 5) Large lime kiln ovens; 6) Northern field system; 7) Southern field system. The darker lines left of reservoirs 1-2 are surface channels, now partly covered with alluvial deposits. The lighter lines right of the reservoir are irrigation channels and field walls (drawing by Roeland Emaus).

we could follow our field teams working on these field systems in Wādī al-Fiqay on some bright summer days. The distances of 6000 and 5100m between these are, however, beyond the calculated middle-distance range of 4400 m. In order to reconstruct the complete layout of the communication system in relation to these agricultural schemes we are still searching for the connecting spots between the above mentioned summits and the field systems. We might expect to find this connection within the boundaries of the middle-distance range of 4400m at an intermediate part of the water management system connecting the *qanat* shafts with the fields in Wādī al-Fiqay. A possible candidate is a reservoir with clear views from and to Tall Udhruḥ and Abū ar-Ru'āh, with a distance of respectively 3500 m and 4250 m. The dimensions of this reservoir, that has been partially demolished by looters armed with a bulldozer, have been reconstructed to approximately 15×15m by means of research with a ground penetrating radar.As the remnants are retrieved just below the current ground level only the bottom 0.3-0.5m of the reservoir remains, in a flood plain filled up with alluvial deposits. A concentration of nicely cut rectangular and sometimes decorated coquina blocks –comparable to those of the Udhruḥ *castra*– make clear that a large structure can be suspected here. A 4 m high structure at this spot would visually also connect to the most prominent agricultural field systems at a distance of 1800-2600m. As seen before watchtowers in the studied region are not only positioned as solitary structures on the top of summits, but can be also part of homesteads or other structures (Negev 1988: 85-88; Hirschfeld 1995: 71-73; Koenen *et al*. 2013: 20. 85-86).

In Byzantine times the agricultural intensification seems to continue in the region around Udhruḥ . In contrast, most of the other locations around Petra where in decline as can be observed in settlement continuity and/or agricultural use (Kouki 2012: 90-91). Several Byzantine literary sources mention Udhruḥ (Adroh) as a large and important town (Fiema 2002: 209-210 plus references). According to one of these, the Beersheva Tax Edict, Byzantine Udhruḥ had a provincial standing as it was taxed for 65 *solidii*, which is the highest on the list of places in the province of Palaestina Tertia (di Segni 2004: 151-152). Some of these sources, especially the 6th century Petra Papyri, refer to a place called *Augustopolis*, a town with (regional) jurisdictional powers situated not far from Petra (Frösen/Arjava/Lehtinen 2002; Arjava/Buchholz/Gagos 2007).Many scholars

accept the identification of Augustopolis with Byzantine Udhruḥ (Fiema 2002: 209; Kouki 2012: 90, 99). One may well ask why this place was renamed prestigiously as *Augustopolis*, and how did it obtain the status of such a wealthy town? The Petra Papyri offer some hints indicating that the regional economy was based on agricultural production– with complex issues of hereditary-taxed landownership – in the Byzantine period. The agricultural intensification of the Udhruḥ region can also be archaeologically attested. The *qanat*- and adjoining field systems in the Wādī al-Fiqay were still active in Byzantine times, as demonstrated not only by the OSL-dating but also by the establishment of an adjacent settlement[18]. The dry-land farming areas west and northwest of Udhruḥ were reinstated in the Byzantine period, and the small fields in the Wādī Udhruḥ which were under irrigation of Udhruḥ's spring seem –according to the ceramic evidence– to be actively cultivated at this time.

In this period the communication system seems to focus again on the control of those fields that provided the landowners with their wealth. All hilltop structures yield Byzantine pottery, and two extra watchtowers seem to have been established for the guarding of the fields in the Wādī Udhruḥ: Tall Jurayda and Rujm al-Munbajis. These had most probably only a local function in connection with Udhruḥ and its bordering irrigated fields, as their visibility towards the other watchtowers in the region is very limited. The survey at the Du'ayj Tower towards Petra did not yield Byzantine material, may be this connection was not important any more. However the survey generated only a limited amount of pottery, so conclusions should not be drawn without further research.

Conclusions

The antique communication system in the area of Udhruḥ –consisting in fortlets and watchtowers on prominent summits– was established in the Nabataean period, and was not as some earlier researchers thought constructed as exclusive part of the Roman military defence.

Although the authors only studied this based on surveys, observed inter visibility and quantifiable visibility perceptions with a 240-4400m radius, it becomes already clear that it is a well laid out regional system which was most probably part of alarger communication network. The Nabataeans took care of the safety of their well defended country from strategically positioned posts –as also some antique authors mentioned– whereby they watchfully controlled the incoming roads. Most certainly also to safeguard the incoming caravans loaded with aromatics by which the Nabataeans accumulated part of their wealth and consequently power. The Nabataean people did transform the steppe region around Petra in an agricultural landscape consisting in new settlements, water harvesting and conducting works, and arable fields. The authors think that the Udhruḥ communication system was a multi-purpose system through which the communication and control for military, trade, and agricultural settlements was combined. Udhruḥ itself played a central role in the communication with its perennial spring located not far from a higher point that connected visibly to almost all regional summits. We even think that through we might have located the Nabataean settlement, but this has still to be further examined and is part of our research for the coming years. In the Roman period this perfectly laid out security system dating from the Nabataean period was reused, and most probably adapted to the wishes of the Roman authorities. Such an information network is on the one hand pivotal for a formal organization as deployed by the (late) Roman armies. The connection with Petra remains important in Roman days. On the other it can be observed that it might have played a role in controlling and safeguarding a

18. This settlement Khirbat al-Fiqay (site 44 in Abudanh 2006) – which was damaged severely by looters with bulldozers – will be part of future GPR-research and has till now produced fragments of Nabataean, but especially Byzantine pottery. Here also many finished rectangular coquina limestone blocks have been found.

newly established agro-hydrological intensifications to the east of Udhruḥ which was laid out with great effort and ingenuity. In the Byzantine period the region of Udhruḥ was, in contrast with many other locations and settlements in the Petra vicinity, an area with agricultural intensification. The communication system was also in this period actively exploited, and most probably used to control and safeguard the wide variety of water harvesting and field systems in the area around Udhruḥ. Further research on the Udhruḥ communication system by means of non-destructive geophysical methods and destructive excavations is however necessary to produce more conclusive results, which are planned for future field campaigns.

About the Authors

Fawzi Abudanah and Mark Driessen are the directors of the Udhruḥ Archaeological Project –a joint venture between the Petra School of Archaeology and Tourism of the Al-Hussein Bin Talal University from Wādī Mūsā and the Faculty of Archaeology of the Leiden University– and both are lecturers / researchers at their respective universities.

Acknowledgements

The results of the Udhruḥ archaeological project and this paper were not possible without the work and assistance of our team. We would also like to thank Carol van Driel-Murray for the correction of our English translation. Our gratitude also goes to the APAAME-team of David Kennedy, Roeland Emaus and Joanne Porck who provided us with the beautiful pictures and illustrations, and the organisation team of the ICHAJ 13 conference who make this publication possible. More aerial pictures made by David Kennedy and his team can be found on www.apaame.org.

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The New Madaba Regional Archaeological Museum Project (MRAMP)

Introduction

The Madaba Regional Archaeological Museum Project (MRAMP hereafter) is an Italian-American-Jordanian commitment to prepare an urban archaeological site in Mādabā, one of the main touristic sites in central Jordan, located some 35km south-west of Amman, for the construction of a regional museum to display archaeological finds from the Mādabā region.

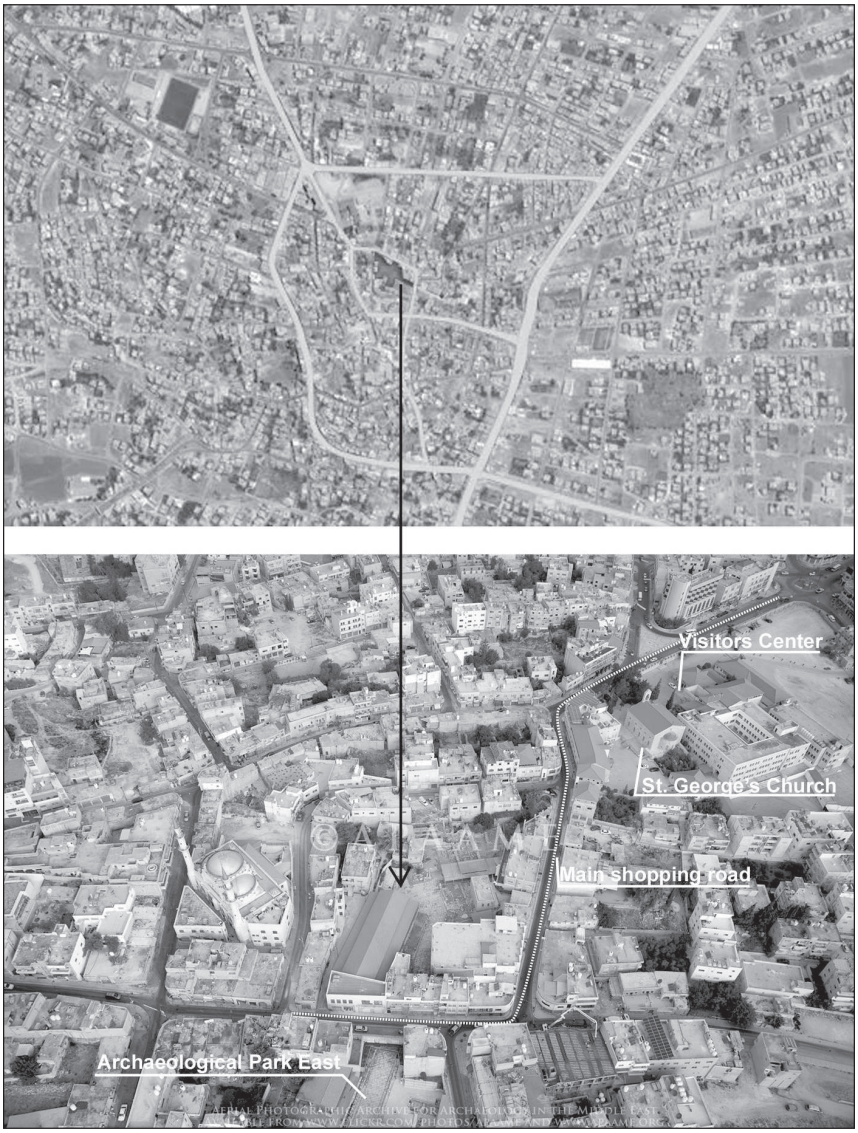
In the mid-2000s then Director General of the Department of Antiquities, Dr. Fawwaz Al-Khraysheh, made a request for three things in connection with the Madaba Museum:

1) Renovate the Madaba Archaeological Museum.
2) Train the staff to administer the museum and the collections.
3) Digitize the museum's records.

Following several years of discussion among dig directors in the Mādabā region and significant fund-raising efforts, there is a renewed and enthusiastic focus on this project, after new impetus given to this initiative by an Italian-American collaboration. In cooperation with the Department of Antiquities of Jordan, Douglas R. Clark (La Sierra University), Suzanne Richard (Gannon University), Andrea Polcaro (University of Perugia) and Marta D'Andrea (Sapienza University of Rome) recently submitted a proposal for an Italian-American project to develop a new museum.

The project proposal is focused on the choice of the area known as the Madaba Archaeological Park West (FIGS. 1-3) and, thus, it sets out to prepare an urban archaeological site for the construction of a regional museum to display archaeological finds from the Mādabā region. The specific type of research agenda is tied to the long-term goal of archaeologically preparing for and ultimately establishing a significant archaeological institution for the betterment of archaeology and archaeological resources in Jordan. The sponsoring institutions are La Sierra University, Gannon University, Perugia University, and the Department of Antiquities of Jordan, with the Mādabā regional directorate of the DoA as on-site coordinators.

In this paper, we report on the choice of a new location for a museum, the background and history of the Madaba Museum and the archaeological research in the Archaeological Park, and the results of our 2016 Pilot Season. We



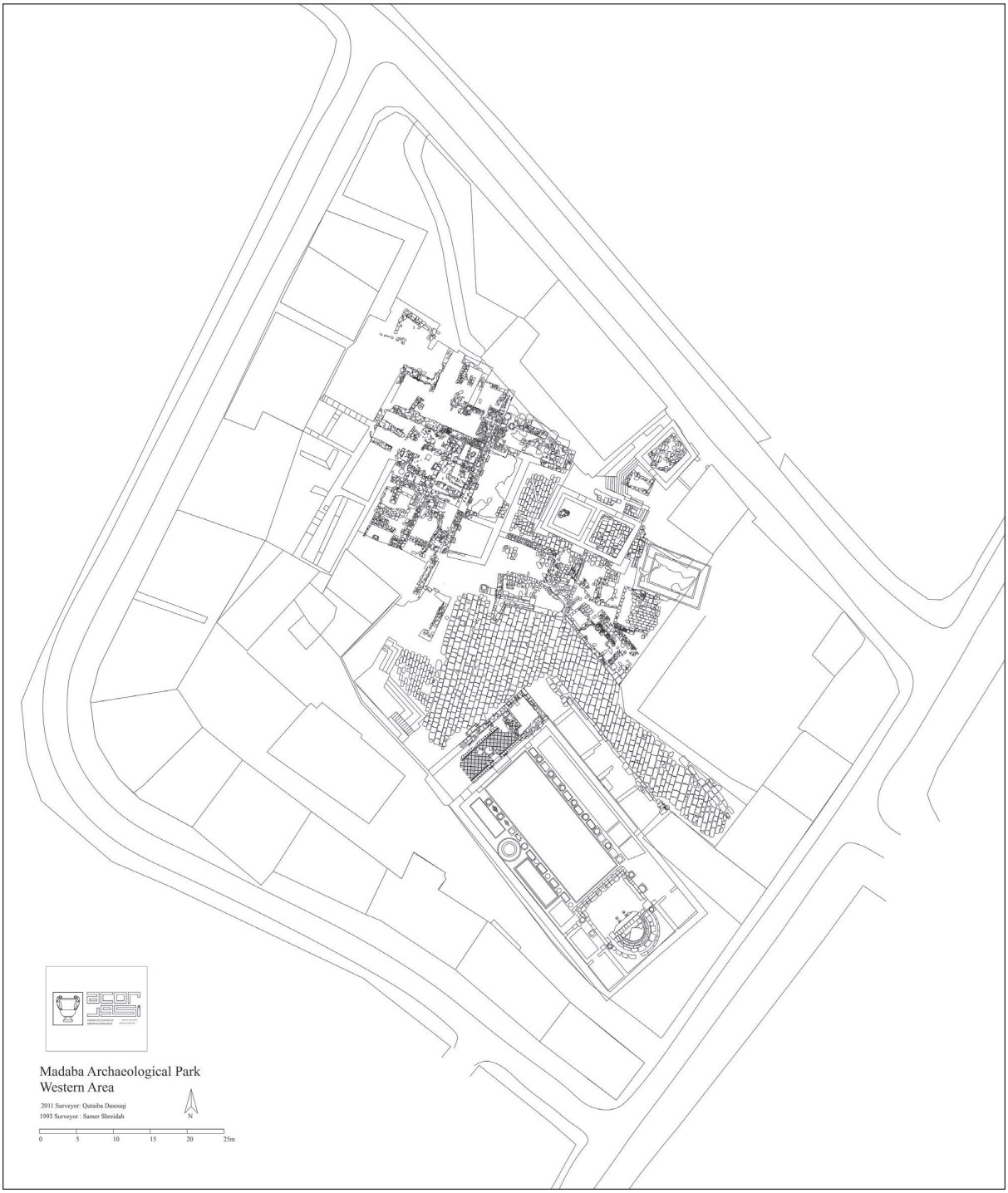
1. Location of the current Archaeological Museum of Madaba in relation to the main touristic routes in the town (top photo: graphic elaboration by Studio Strati; bottom photo: © APAAME, Robert H. Bewley).

subsequently present briefly the vision for the new Museum and next steps of the project, and conclude with the significance of the MRAMP.

The Choice of a New Location for the Madaba Archaeological Museum

Mādabā is one of most visited towns in Jordan. Tourists are attracted by the spectacular Byzantine mosaics (Piccirillo 1989, 1993), some of the better preserved in the region, but the history of Mādabā goes back to the late 4th millennium BC (Harrison 1996b, 1996c; Harrison, Foran and Graham 2007: 146) and human occupation in the region is documented from the early Prehistoric period (on the history, archaeology and culture of Mādabā, (Bikai and Dailey (eds.), 1996; Harrison, Foran and Graham 2007). The town has a favourable geographical position, located along one of the most ancient routes of communications, known as the King's Highway from ancient sources, later transformed in the *Via Nova Traiana* by the Roman Emperor Trajan between AD 111 and 114 and still bordering the town on its southern side.

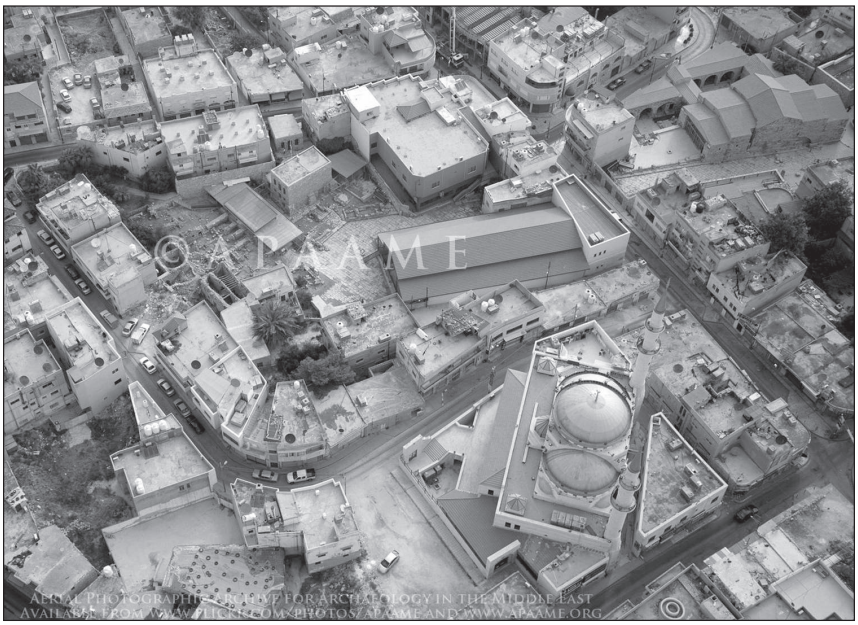
At present, the Madaba Archaeological Museum is situated away from the main touristic routes in the town. Therefore, the proposal of a new regional archaeological museum for the city is centered on the choice of the area known as the Madaba Archaeological Park West (FIG.



2. General plan of Madaba Archaeological Park West (courtesy of Robert Schick).

2) as the location for the new museum, given its visibility on one of the main touristic paths in the town, in close proximity to St. George's Church and the Visitors Center (see FIG. 1). Furthermore, the Archaeological Park boasts three important historical periods of the city of Mādabā, from the Roman Period to the early 20th century (FIGS. 3-4). The large Roman road running east-west has been identified as part of the ancient *cardo* of the 2nd-3rd centuries AD city (Piccirillo 1985) (FIG. 4). On its northern side, there is a large building with beautiful

3. Aerial view of the Madaba Archaeological Park West (© APAAME, Robert H. Bewley).



4. Aerial view of the Madaba Archaeological Park West showing the large Roman road running east west and its connection with the stretch uncovered in the Archaeological Park East (© APAAME, Robert H. Bewley).

mosaics, used uninterruptedly during the Byzantine and Umayyad periods, from the 6th until the 7th century AD, when it was destroyed by a fire, possibly due to the AD 749 earthquake (Piccirillo 1989: 119-128) (FIG. 5). It seems that during the early Islamic Period both re-use of the Byzantine ruins and the construction of new structures on top of the remains occurred. Finally, on the western side of the Burnt Palace, outstanding examples of the late Ottoman traditional architecture of Mādabā are the remains of the houses (FIG. 6) of the first Christian families who immigrated to Mādabā from al-Karak around 1880 (Harrison 1996: 8; Harrison, Foran and Graham 2007: 150), which were still used in the 20th century. Some of the descendants of those families still live in the houses that surround the Archaeological Park West today.

Following several years of discussion among the directors of archaeological expeditions in the region of Mādabā, and surveying and planning a proposal to use the property owned by the DoA in the Madaba Archaeological Park West for the new Madaba Archaeological Museum was submitted by Douglas Clark and Huda Kilani in 2014. The general idea of

5. The "Burnt Palace" of the Byzantine Period, 6th century AD, with its mosaics (photo: MRAMP).

6. Madaba Archaeological Pak West, examples of the late Ottoman traditional architecture of Madaba (photo: MRAMP).

the proposal was to move many of the archaeological artifacts from the museum's current location to the Madaba Archaeological Park West, in order to enhance the display of these artifacts, organize them chronologically, center them around Mādabā, and display the wealth of the region's cultural heritage. Subsequently, increasing Italian-American cooperative research in archaeological expeditions fostered a synergy that resulted in a new, broader proposal for the Madaba Archaeological Museum, put forward by Polcaro, Richard, Clark and D'Andrea, submitted to the DoA in May 2015. This new proposal pivots around the same general ideas of the previous one, but with a broader, more ambitious vision for the new museum, as we shall see, made possible by the cooperation with Architects Guido Batocchioni, Laura Romagnoli, and Valeria Gaspari.

The MRAMP is a combined American, Italian, and Jordanian commitment to the renovation and restoration of the chosen area and the construction of new exhibition wings and the new set-up of the archaeological exhibitions from regional archaeological projects, realized within and integral to the rich heritage of monuments in the Roman – Ottoman periods.

Archaeological Research in the Area of Archaeological Park West

The area of the Madaba Archaeological Park West has been excavated by several archaeological expeditions, uncovering the main buildings in the area, the Burnt Palace of the Byzan-

tine Period and the remains of different Islamic buildings overlapping the earlier structures in the western area of the archaeological park (see FIGS. 2-3).

The early excavations in this area were carried out by the archimandrite Melezius Metaxakis, who uncovered some sectors of the Burnt Palace (Metaxakis 1905: 452-454). Several decades later, the area of the Madaba Archaeological Park West was intensively excavated by F. Michele Piccirillo on behalf of the Studium Biblicum Franciscanum (1985-1994) and Cherie Lenzen (1992-1993), administered by Pierre Bikai, Director of ACOR, on behalf of USAID, and Ghazi Bisheh (1993-1995) on behalf of the DoA and ACOR (Bisheh 1994). F. Piccirillo extensively published his results (Piccirillo 1985, 1986a, 1986b, 1989: 119-128, 1994) and the final publication of the results of the DoA excavations is due to appear in 2017 in an ACOR publication by Robert Schick (Schick forthcoming), who agreed to share his pre-publication data with the team of the MRAMP 2016 Pilot Season.

Finally, a first step of preliminary survey, investigation, cleaning, and renovation of the area chosen as the location for the new museum in the Madaba Archaeological Park West was carried out during the two-week MRAMP 2016 Pilot Season in May, the results of which are reported below.

Results of the 2016 MRAMP Pilot Season

In a meeting of the sponsoring institutions and the co-directors of the MRAMP in May 2015 in Jordan, it was agreed that the essential first stage of the proposed revitalization of the Archaeological Park West was a season of archaeological investigation and cleaning. This season took place from May 7 to 21, 2016. It was the first step in a multi-stage effort to relocate the Madaba Archaeological Museum and make it an integral part of the stunning array of churches and monuments within the Madaba Archaeological Park in the heart of the city. The 2016 Pilot Season of Archaeological Investigation of the Madaba Archaeological Park West (FIG. 7) was intended to investigate monuments from the Roman through Ottoman periods in that spot and salvage data.

The focus of the MRAMP Pilot Season was a general cleaning of the area, down to the top of the archaeological layers where the past expeditions stopped their excavations, with no further digging. The aim of this operation was to enhance the presentation of the area and understand the superimpositions of the different architectural phases, as an essential first step to planning the construction of the new museum in the Madaba Archaeological Park West. We concentrated our work, in particular, in the northwestern part of the park (Buildings 1-3; FIGS. 8-12), west of the already exposed rooms of the

7. The international team of the MRAMP Pilot season (photo: MRAMP).

8. Plan of three cleared buildings: Buildings 1, 2, and 3 (map courtesy of Roberth Schick).

9. The area of the Madaba Archaeological Park West before the MRAMP 2016 Pilot Season (photo: MRAMP).

Burnt Palace. During the second week of work, a team of architects also joined the project in order to complete a new architectural plan of the area as well as a preliminary design of the museum.

Although the immediate goal of the pilot season was focused on cleaning and clearing post-occupational deposition, work followed traditional, best practices of stratigraphic excavation methodology (FIGS. 13-14). All the objects and pottery sherds collected during the cleaning of the area have been drawn, photographed and entered into a relational database (FIG. 15).

A major accomplishment of our Pilot Season was the implementation of our engagement with

10. General photograph of Building 1, looking north, at the end of the MRAMP 2016 Pilot Season (photo: MRAMP).

11. General photograph of Building 2, looking south, at the end of the MRAMP 2016 Pilot Season (photo: MRAMP).

the local community. To that end, local specialists joined our team for cleaning and restoration of the mosaics (FIG. 17), and we trained two people from the Madaba office, which included field work (see FIGS. 13-14) as well as an orientation to our documentation system (FIG. 18). Likewise, we initiated relationships with the Madaba Municipality and the Mayor of Mādabā and planned future interventions in the area with DoA District Director Basem Mahamid. We were also able to interview the third generation of descendants of the original own-

12. General photograph of Building 3, looking west, at the end of the MRAMP 2016 Pilot Season (photo: MRAMP).

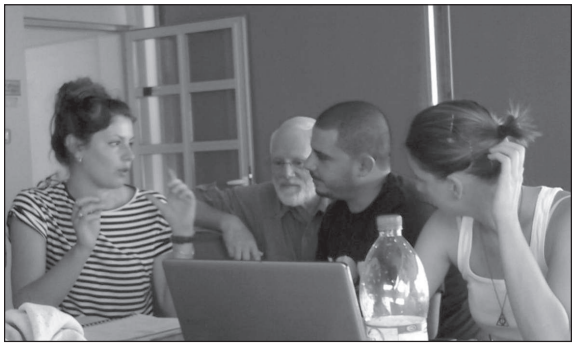
13. Cleaning and clearing operations in Building 1 during the MRAMP 2016 Pilot Season (photo: MRAMP).

14. Cleaning and clearing operations in Building 3 during the MRAMP 2016 Pilot Season (photo MRAMP).

15. The international team of the MRAMP Pilot Season 2016 processing the materials collected after fieldwork (photo: MRAMP).

16. Recording the collected data into a relational database after fieldwork during the MRAMP 2016 Pilot Season (photo MRAMP).

17. Specialist from the DoA for the cleaning of the mosaics working in the Burnt Palace during the MRAMP 2016 Pilot Season (photo MRAMP).



18. D.R. Clark and two Italian staff members training the DoA staff during the MRAMP 2016 Pilot Season (photo: MRAMP).

ers of Ottoman houses built over the ancient ruins of the Burnt Palace and the early Islamic buildings –the Oweimrin Family– part of the groups of Christians who settled in Mādabā in the 1880s from al-Karak.

The Vision for the New Museum

The architectural project of the Studio Strati pivots around the connection between open and built-up spaces that will showcase the archaeological exhibition. Briefly, the plans drawn up creatively integrate exhibition space with passageways among the monuments. The architectural setup of the project is based on a functional, integrated system to organize flow of attendees, exhibition itinerary, plant designs, and a communication system, which is flexible and adaptable to different architectural settings.

The plan further envisions the readaptation of the Offices of the Ministry of Tourism and Antiquities (FIG. 19) –a historical building that was the first hospital of the Late Ottoman town of Madaba– to introductory halls to provide visitors with an overview of the historical-archaeological timeline of the region.

New roofing to protect the remains of the Byzantine and Islamic structures is planned as well as foundational supports upon which the new museum will be built. In this manner, the ancient structures will be protected and their presentation enhanced. The foundations will support an upper story, conceived as a gallery with a balcony from which it will be possible to

19. The first hospital of the Late Ottoman town of Madaba, now occupied by the offices of the Ministry of Tourism (photo: MRAMP).

look down at the Byzantine, Early Islamic, and Ottoman remains. In this way, it will be possible to use the Byzantine, Islamic and Ottoman remains for the display of materials from those periods, while the gallery on the upper story will serve to showcase artefacts from earlier periods, such as the prehistoric to Roman periods, the town of Madaba itself, as well as from the numerous archaeological sites in the Mādabā district. Such a template for the exhibition complex will provide new exhibition spaces for a wider display of materials than is currently possible in the present museum. This architectural vision and exhibition concept has already been used successfully in some European museums that were built to protect archaeological sites by transforming them into museums. We may recall the Gallo-Roman site of Perigeux, in France, where the Vesunna Museum was built by Jean Nouvel (http://www.perigueux-vesunna.fr/vesunna-site-musee-gallo-romain-perigueux/une-architecture-de-jean-nouvel/), or the *Domus* dell'Ortaglia complex, in Italy, realized by an Italian firm (https://divisare.com/projects/325681-gtrf-tortelli-frassoni-architetti-associati-musealizzazione-delle-domus-dell-ortaglia).

As next steps for the MRAMP project we envisage further cleaning and consolidation, along with the stratigraphic analysis of building phases where these are not clear. Finally, the completion of the architects' project will include a new topographic plan of the area and a 3D virtual model of the new museum.

Ethical and Theoretical Concepts and Significance of the MRAMP

The four co-directors have conceived a long-term international project to create a regional museum in Mādabā. This project in community archaeology, *i.e.* archaeology as a common, public asset to be used for public education through collaborative projects, rests on three main objectives.

1) We hope to raise awareness of cultural and archaeological assets among local communities, by establishing a link between local communities and their cultural legacy and strengthening cultural identity. This is intended to minimize threats to archaeological sites and damage to cultural heritage and make it accessible and enjoyable for local communities to understand the potential of cultural heritage as a driver of economic growth.
2) Within the MRAMP Project, and in accordance with the DoA, we foresee a brand new set-up, which could showcase the richness and variety of the archaeological and historical background of the Madaba region

directional maps. In this way, visitors have the opportunity to see the best of the material remains from Mādabā and its regional sites, but also to travel to them as a series of related museums without walls.

3) Cooperative research with universities and cultural organizations is envisaged to support capacity-building and training of local specialists. The ultimate goal is to promote Jordan's autonomy in the management of cultural heritage and generate societal continuity between experts in the field and final "consumers" of cultural products and to generate employment through the economic potential provided by the museum's management.

Conclusion

We are particularly focusing on five different objectives, with the hope to promote civic pride in Jordan's cultural heritage and engage community stakeholders:

1) Establishing a committee infrastructure for developing and dealing with the wide variety of issues which will arise over the duration of this process.
2) Utilizing the planning, restoration, and construction processes as an immersive, collaborative educational tool for museum staff.
3) Repurposing of current Madaba Archaeological Museum facilities for research (library and labs), storage, conservation, maintenance of mosaics on site.
4) Defining the various communities with whom the museum will interact.
5) Planning for the various types of educational endeavors to be sponsored by the museum for communities (local and extended), including partnerships with universities and private organizations. We have likewise set up with DoA on-site coordinator Bassem Mahamid a number of day workshops provided by several American archaeological expeditions in the region.

While only a beginning of the MRAMP initiative, the progress we made in 2016 in collaboration with DoA and the Ministry of Tourism and Antiquities, the Madaba Municipality, the local home and business owners, and regional excavation projects has been exceptional. Building on this foundation, we sincerely hope the future will produce the desired outcomes of a new museum, digitized records, and a well trained staff.

Acknowledgements

The international team of the MRAMP Pilot Season included: *Co-Directors*: Douglas R. Clark, Marta D'Andrea, Andrea Polcaro, and Suzanne Richard; DoA: Basem Al Mahamid (on-site coordinator); Ahmed Ajarmeh: Nisreen Fouqahaà; Staff: Marco Benatti; Chiara Castiglia; Maira Kaye; Matthew Murdoch; Chiara Panicucci, Maddalena Scattini; architects: Guido Batocchioni; Valeria Gaspari. We wish to thank all our collaborators and staff.

We wish to thank Dr Monther Jamhawi, Director General of the DoA, and Samia Khouri of the DoA who oversees the development and sustainability of DoA museums in Jordan.

We want to acknowledge the support of the sponsoring institutions—La Sierra University, Gannon University, and Perugia University—for financially supporting the project. The project was carried out with the support of the Madaba Regional Directorate of the DoA, whose Director (and MRAMP coordinator), Basem Mahamid, also provided local labor and specialists and logistical support and supplies; we wish to thank warmly Mr Mahamid and his staff for sustaining the MRAMP. We want to acknowledge ASOR for financial support for the MRAMP Pilot Season in 2016 through a Harris Grant. Alessandrini Group for Archaeological Restorations financially supported the architectural team of the Studio Strati during the 2016 Pilot Season.

We are grateful to ACOR and the Director, Dr Barbara Porter, for logistical support during our 2016 season as well as USAID for a

15 months SCHEP grant received in 2017, housed at ACOR; in particular, we are grateful to SCHEP administrators Nizar Al Adarbeh and Jihad Haron for their invaluable help.

Finally yet importantly, we would like to acknowledge and thank Robert Schick for his wonderful colleagueship in sharing his pre-publication data and results with us. It has immeasurably helped the project and work of the architects.

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Ayyubid Reception Halls in Southern Jordan: Towards a 'Light Archaeology' of Political Powers

Introduction

The Italian archaeological mission of the University of Florence, 'Medieval Petra', celebrated, in 2016, 30 years of uninterrupted activity in Jordan; starting with the first archaeological season at al-Wu'ayra in 1986[2]. It was an important anniversary and an occasion to reflect on both, the lines of research developed in the last three decades, as well as on the most relevant results acquired so far[3].

As to that, a constant and distinctive commitment of the mission, founded and directed by Guido Vannini, was to transfer and test Italian and European methodologies and historical-archaeological (medievalist) research issues in the Middle Eastern context, in order to contribute in an original way to the historical and archaeological debate animated by the scientific community, national and international, active in the study of the history of Jordan. Under this very perspective should in fact be read: the constant contextualization at euro-Mediterranean scale of Medieval Jordan (within the frame of studies devoted to the "feudal" and rural society); the adoption of a historiographical-interpretative perspective linked to the experience of the French "*Les Annales*" (for the Middle Ages, the most important and influential school of European and international historiography); the selection of historical regions, namely territories (not sites), as a priority object of study and, finally, and as a result, an investigation-interpretation approach based on Light Archaeologies, again of Italian and medieval, as well as historical – archaeological origin[4].

Today, 'Medieval Petra' operates, in cooperation with the Department of Antiquities of Jordan, on 4 of the 5 main 12th century Jordanian sites (ash-Shawbak, al-Wu'ayra, al-Ḥabīs and al-Karak) and the present contribution aims at briefly taking into consideration the application of methodological and interpretative options selected by the Italian Archaeological Mission with reference to the field of 'Archeology of power' in the Middle Ages[5], using as a case study the monumental core architectures

1. Authorship of paragraphs. Michele Nucciotti: par.1,2,4,5,7 and Lorenzo Fragai: par 3,6,7.
2. Vannini *et al.* 2003.
3. Vannini Nucciotti 2009; Vannini 2011.
4. Vannini *et al.* 2003a; Vannini 2007.
5. G. Bandmann 2005 (1951), Francovich Ginatempo 2000, Liddiard 2005; Nucciotti 2010; Tabbaa 1997, for the theoretical framework.

of Ayyubid (and Mamluk) palatine complexes at ash-Shawbak and al-Karak castles.

Such an analysis elaborates on the cultural-technical processes underlying the material creation of Ayyubid reception halls, *par excellence* the space of manifestation of top governmental functions in Jordan between AD 1190s and 1260s. By comparison with 12th century 'Crusader' technical environments, site plans and regional/territorial organizational plans at large, the authors will address the issue and support the argument of considering Crusader Jordan and Islamic Jordan as component parts of a single, historical, "Medieval Jordan".

Ayyubid Jordan and the Conservation of the Topography of Power of Crusader Epoch

In 1189, with the successful siege started in 1187, after the landslide victory at Ḥiṭṭīn, Saladin comes into possession of ash-Shawbak, the last and, together with al-Karak, the largest settlement and administrative center of Latin Transjordan. Saladin and the Ayyubids invested considerable economic and political resources in both sites, turning them in the main governmental centers of Ayyubid Jordan. From this angle, then, the control strategy of the wide territory between the Dead Sea and the Red Sea, implemented by the Ayyubids, shows a direct continuity with the political and administrative systems developed by the first half of the twelfth century by the lords of Latin Transjordan: initially by the Kings of Jerusalem and eventually, after 1142, by the princes of ash-Shawbak and al-Karak.

The location at ash-Shawbak and al-Karak of the main Ayyubid palatine complexes in the region[6], constitutes at the same time a sufficient and incontestable proof in this regard. The administrative division of southern Jordan in the 13th century in fact repeats, '*verbatim*', the one documented in the 12th century by William of Tyre (lib. XIII, c. II), with an *Arabia Secunda Petracensis* seat of the metropolis of al-Karak to the north, and an *Arabia Tertia* focused on *Mons Regalis* to the south.

Such preservation of the geography of power at territorial level is further emphasized, at the site level, with the topographical and urban location of new palatine complexes: sometimes in direct stratigraphic connection with the former princely palaces of Crusader period. If, for al-Karak, this aspect of the Ayyubid building strategy is readable almost exclusively on a topographic basis, given the lack of a systematic study on the formation processes of 12th century archaeological and architectural deposits; on the other hand, at ash-Shawbak, stratigraphic analysis of upstanding buildings and archaeological excavations definitely prove that this was the case[7].

Ayyubid Reception Halls in Jordan and in Bilād ash-Shām: An Overview

Since the death of Saladin in 1193, al-Adil I dominated the Ayyubid scene, both through political and military means, as well as (ideologically) through expensive building programs centered on palatine architecture.

The preferred ichnographic model shows the use of 2 to 4 *iwans*, to form a cruciform plan overlooking a central and rather small patio (*durqā'a*), and was featured with multiple variations in all residential complexes sponsored by al-Adil I and the Ayyubids.

According to Yasser Tabbaa (1997: 88) two possible modes of transmission of such cruciform plans from the 9th to the 12th-13th century can be figured out: either through a series of quadripartite buildings, that no longer exist, built by Hamanide and Ayyubid dynasties in or around Aleppo; or through cross-plan buildings, also that no longer exist, built in Syria and the Jazira.

In this regard, however, it is necessary to highlight the strong ichnographic similarity between Ayyubid reception halls and 9th century palatine Abbasid architectures in Samarra, by

6. In 1214-5 a reception hall was also built on the top floor of the so-called Tower of Aybak, in Ajlun (Yovitchitch 2006).

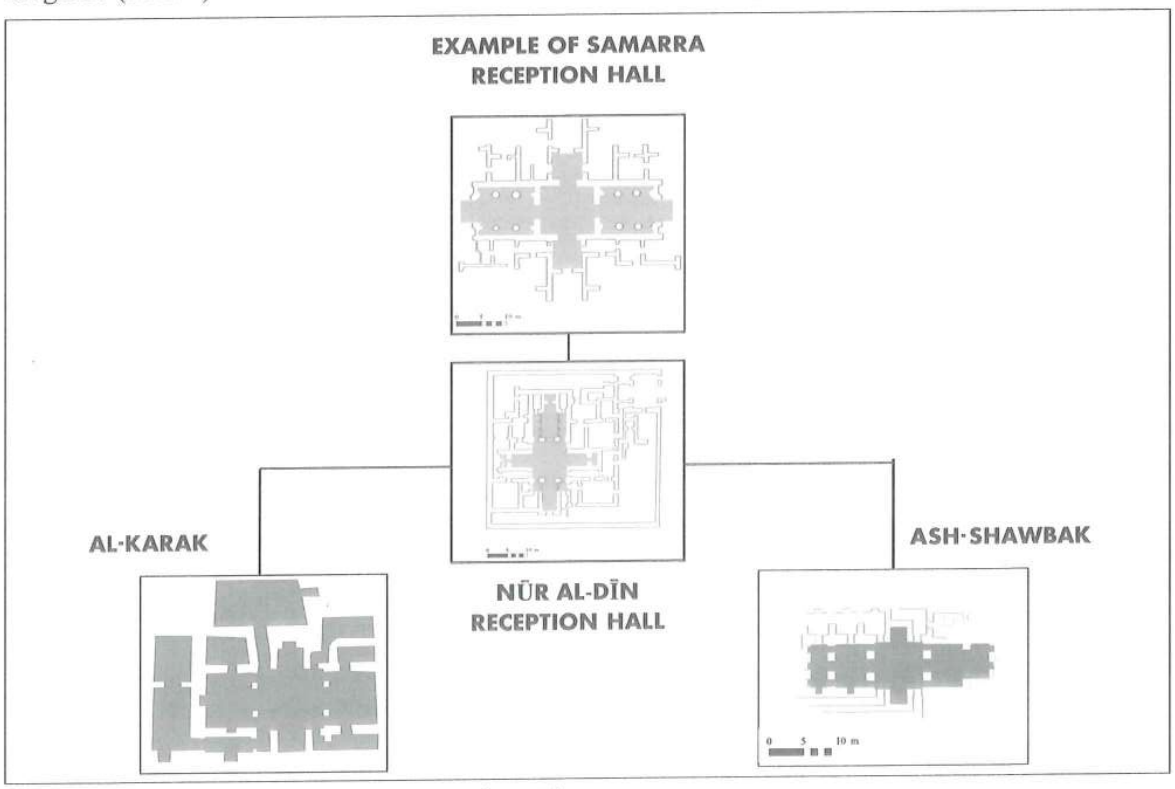
7. Nucciotti 2007 and the contribution by Pruno Ranieri in this volume.

analogy with what happened in Europe as regards the transmission of Roman architectural legacy to the middle ages[8]. All major components found within the Ayyubid reception halls - four *iwans* plan, tripartite elevations, ornaments, portals, *muqarnas* - repeat, in fact, well-established formal types of Early Islamic palaces[9].

The fundamental difference between Early Islamic buildings and the Ayyubid ones is primarily one of size (Abbasid palaces exceeded often 1 kilometer in length); however, such difference (a sort of miniaturization process), does not impair ichnographic similarities between the two series of buildings. An aspect which seems to allude to the willing conjuring, by the Ayyubids, of a golden age – the 9th century in Samarra – which they were not able to fully re-enact, although they were certainly not willing to ignore (FIG. 1).

A Medievalist Contribution to the Historical Archaeology of Crusader-Ayyubid Jordan: Stratigraphic Building Archaeology and Light (Territorial) Analyses

In order to analyze the technical knowledge related to building industries in medieval Jordan, the Medieval Petra mission carried out from 1997 to present[10] Light-archaeological studies based on stratigraphic analyses of medieval upstanding structures in the largest Crusader-Ayyubid medieval settlements of Petra region (al-Ḥabīs, al-Wu'ayra and ash-Shawbak[11]) and more recently (from 2012) and with specific aims in al-Karak. The time-span covered by archaeological-architectural evidence runs from the 4th century (ash-Shawbak, building 18, phase 1)[12] to 1900s (ash-Shawbak, late Ottoman/Hashemite settlement). The methodology adopted by the Medieval Petra mission was developed since 1970s within Italian Me-



1. Synthesis of Reception Halls evolution from 9th to 13th century.

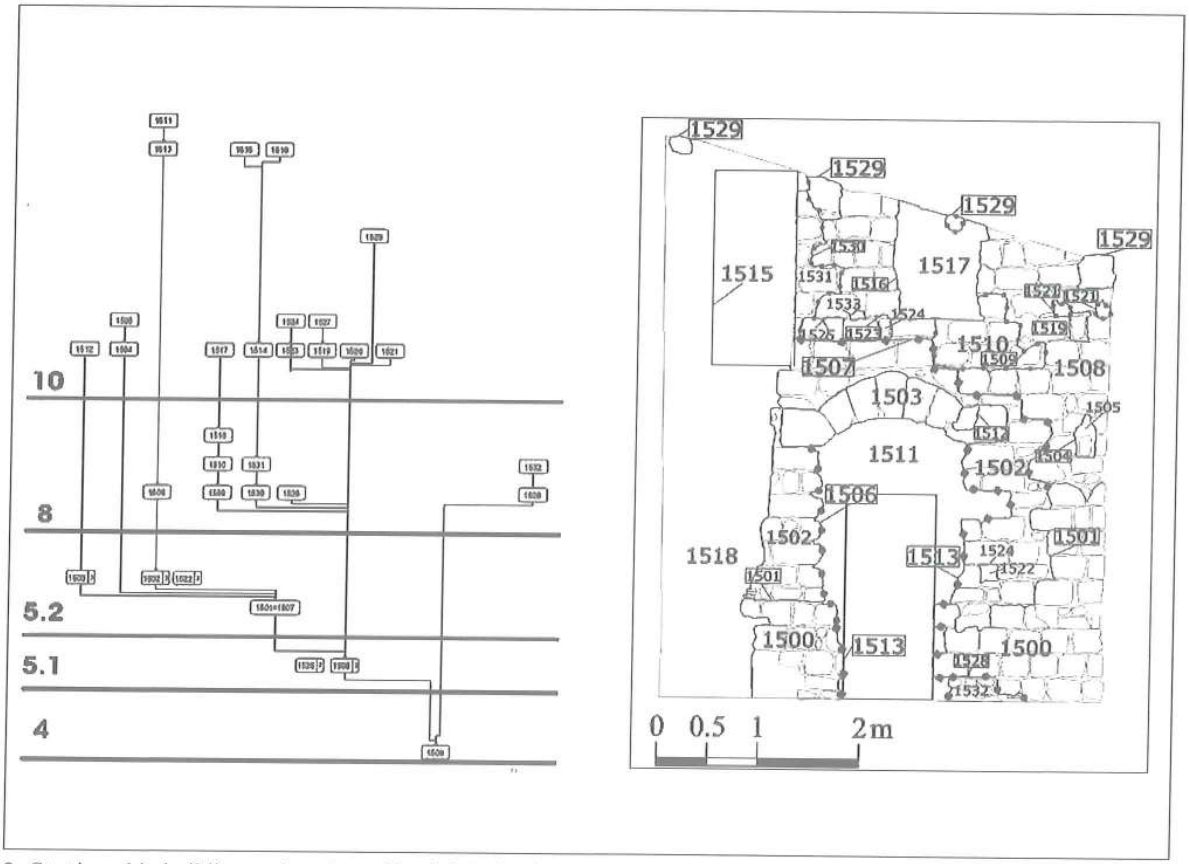
8. Bandmann 2005 (1951); Nucciotti 2010.
9. Fragai 2014 and 2018.
10. Vannini 2013; Nucciotti Pruno 2016
11. Vannini *et al.* 2002.
12. al-Wu'ayra occupation phases start at least in Nabatean times, although built structures of that age (as well as those of Roman period) are generally not (or very poorly) preserved (Vanni Desideri and Sassu 2014, Pp. 95-101).

dieval Archaeology, with a strong historical-archaeological approach, in the realm of non-destructive urban and territorial analyses. Such was indeed the (successful) attempt to embed the stratigraphic theory in the study of historical buildings (FIG. 2), extending the principles of site-formation-process to the architectural-formation-process[13].

In the light of the methods so far used for the study of Ayyubid reception halls in Jordan (based on written sources, architectural-historical and historical-topographic interpretation, with a limited contribution of archaeological excavations and a more substantial one of typological pottery analysis), the contribution of Light Archaeology appears be able to add further, and hitherto not considered, elements of historical interpretation.

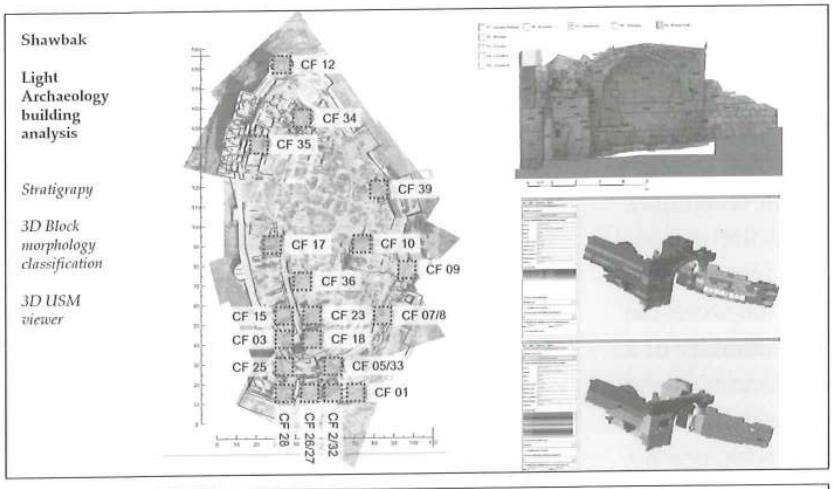
The Ayyubid Reception Hall in ash-Shawbak: Between Light Archaeology and 'Great and Little' Architectural Traditions

The Ayyubid reception hall in ash-Shawbak (CF 34) was first historically and archaeologically investigated (through a series of soundings) in 1986 by Robin Brown, who provided the first extensive and still fundamental reference study for the architectural complex[14], which was then assigned to al-Mu'azzam 'Isa (lord of ash-Shawbak between 1208 and 1227). The study was further implemented by our mission between 2006 and 2010 on stratigraphic building archaeology basis and the very structure was re-dated, in 2010, between 1189 – 1208 AD. The correction was grounded on stratigraphy, masonry technology and ichnographic composition[15], all pointing towards an architec-

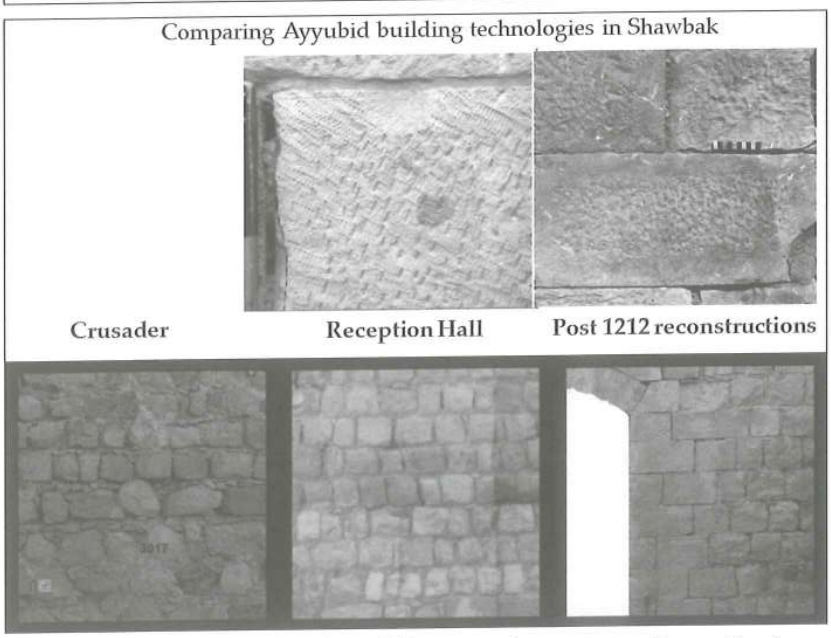


2. Stratigraphic building archaeology: Harris Matrix (left) of one of the upstanding elevations in Arcidosso's medieval palace (right – Italy, Tuscany.

13. Brogiolo Cagnana 2012; Nucciotti Vannini 2018 (forthcoming).
14. Brown 1988.
15. Vannini Nucciotti 2012, Pp. 64-69.



3. Upstanding buildings investigated through stratigraphic analysis in ash-Shawbak castl.



4. Main Ayyubid coarse masonry typology from ash-Shawbak in comparison with common Crusader masonry types.

tural patronage of the first Ayyubid generation: Saladin and/or his brother Al-Adil I (lord of ash-Shawbak between 1193 and 1208)[16].

In particular: as to stratigraphic analysis of upstanding buildings, a phase of restoration following *post* 1212 earthquake was identified

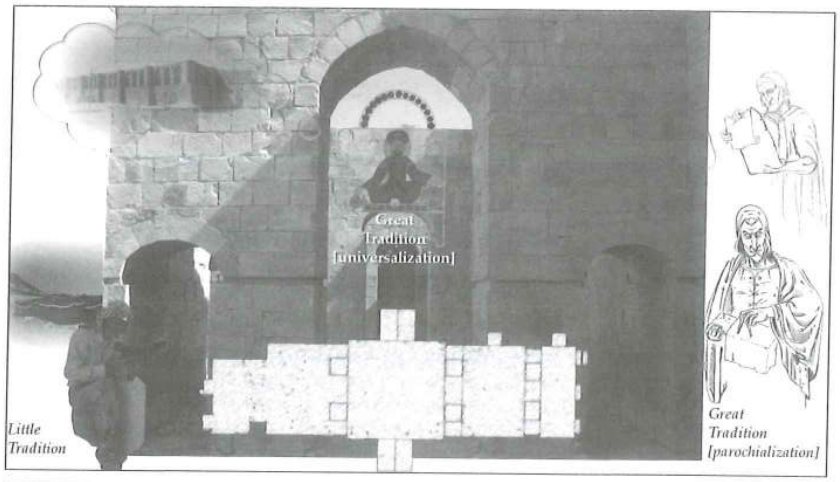
16. Robin M. Brown published recently (2016) an updated study on Jordanian Middle Islamic Palaces with a detailed and insightful analysis of early Ayyubid political situation in the Bilad al-Sham, restating, on that ground, the very likely possibility that Al Mu'azzam 'Isa was in fact the original patron of ash-Shawbak Ayyubid palace (ibid. pp. 549-552). Although accepting Brown's reconstruction of the assets of power in the areas of Transjordan and Palestine during the time of Al-Adil and Al-Mu'azzam 'Isa, based on available written sources, further discussion of such a conclusion is needed when taking into consideration the analysis of ash-Shawbak upstanding masonry stratifications and masonry typologies of early Ayyubid epoch (1189-1212, see infra). Furthermore, the apparent inconsistency of a patronage of the ash-Shawbak palace by Al-Adil, suggested by Brown on the basis of Al-Adil's political-administrative priorities and the location of his main residences (ibid. p. 551), risks to create a major inconsistency: in that Saladin and Al-Adil would appear to have left ash-Shawbak castle 'architecturally marked' by the previous Crusader palace, for almost 20 years after the site had been taken from the hands of the Latin lords. That seems quite unlikely. On the contrary, the substitution of the 12th century Crusader palace with an Islamic one, albeit its infrequent use by early Ayyubid sultans, seems to fit better in the picture of territorial re-appropriation of Transjordan carried out by the new ruling dynasty. As to that, the results of medieval palace studies carried out in Europe show that royal/princely palaces often acted 'in loco regis', specifically to counter the structural absence of the lord from politically relevant sites. As Annie Renoux puts it, with reference to the 'architectural foundations' of princely power in 9th-13th century France, royal/princely architecture worked mostly as a 'remote lord' "perpetuating and commemorating at local level the appearance of the prince; fixing and strengthening the dynastic memory and occasionally providing a material setting for the public display of the prince himself" (Renoux 1992, p. 172, English translation mine).

and assigned to al-Mu'azzam 'Isa as *ante quem* dating for the building (the restoration was connected to changes in the hall plan, hardly conceivable in a seemingly newly built palace); concerning masonry technology, the similarity between 1180s Crusader epoch techniques from the fortified gate CF 3 and the masonries of the Ayyubid reception hall (outer walls) highlights both a short time-span between the two architectures, as well as the continuity of a same building tradition between Crusader and (*pre* 1212) Ayyubid epoch, and was therefore assigned to local builders; as to ichnography, the reference to Abbasid architectures from Samarra's Qaṣr al-Ashiq was interpreted as a willing selection of dignified architectural elements from the Early Islamic Caliphate, linked to the elaboration of a 'new' royal style, in line with the needs of the first Ayyubid generation.

More recently, in 2012-2015, further studies have been carried on in order to integrate Oystein La Bianca's Great and Little traditions' methods (originally developed for the interpretation of the multi millennial archaeological site of Ḥisbān) into the interpretation of medieval architectures of 12th and 13th century in Petra and ash-Shawbak[17], providing further insight into ash-Shawbak Ayyubid palace history and its historic meaning. In particular Great and Little Traditions were used as a means to interpret the interaction between local (Little) and imported (Great) architectural knowhow. Stratigraphic analysis was used to identify the continued use of local (Little) technologies in connection both with 12th c. Crusader and 1189-1208 Ayyubid imported (Great) technical traditions.

In a 'building archaeology' translation of Robert Redfield's theory of the "Structure of Tradition"[18], specialized groups of builders were considered as 'cultural agents' enabling *parochialization*[19] of imperial great traditions and, on the other hand, local (folk) communities were considered as cultural groups owning specific sets of little traditions[20], including basic elements of architectural production.

Finally, Ayyubid Sultans of the first generation could be seen as cultural agents promoting the *universalization* of selected (ideologically meaningful) architectural forms taken from a long past architectural tradition, whose revival (albeit in a miniature scale) was instrumental to the construction of a suitable new royal public image. In analogy with European medieval *bauherren*[21], who embedded Ancient Roman 'architectural abbreviations' into Romanesque constructions of cc. 8-13th, with the explicit function of backing (politically and ideologically) the claimed direct derivation of their



5. Scheme of interaction among Great and Little building traditions in the making of the Ayyubid reception hall in ash-Shawbak (bottom: plan of the reception hall.

17. Nucciotti Pruno 2016.
18. Redfield 1947, 1962; discussed in La Bianca 2007.
19. That is, the downward spread to the villages of a specific know-how from the network of transmission centers belonging to a Great Tradition (La Bianca 2007 Pp. 276).
20. La Bianca 2007, Pp. 283.
21. Bandmann 2005, for the definition.

powers from the ancient Roman Empire.

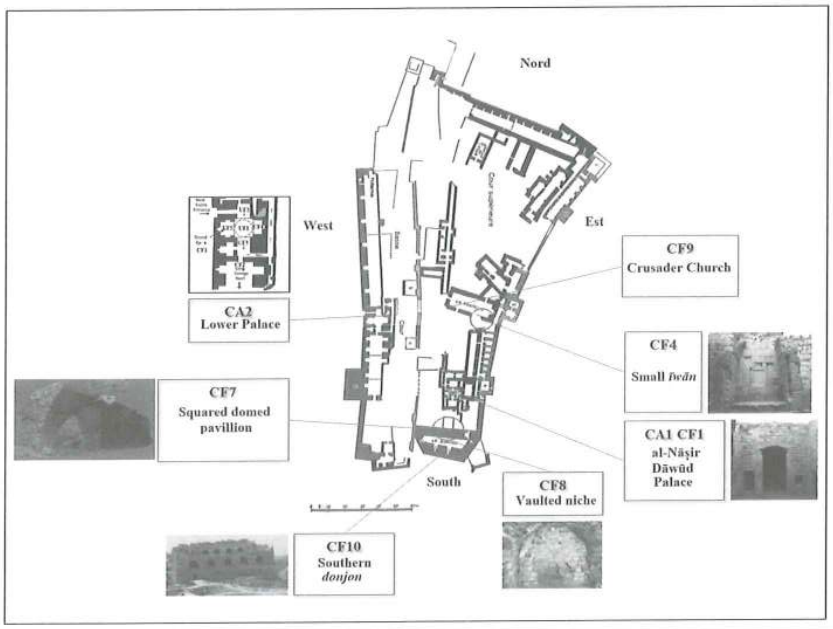
Read in this perspective, the ash-Shawbak palace may therefore appear as a consistent political and architectural statement, with the Ayyubid sultan presenting himself as a cultural mediator between, on the one hand, the political tradition of the Caliphate, and, on the other, local communities of farmers and nomads, formerly acknowledged crucial social-political players already in Crusader Transjordan[22].

Light Archaeology of the Islamic Palace in al-Karak: Formation and Characters of a Princely Architectural Complex Between 13th and 14th Century

The Ayyubid and Mamluk palaces of 13th - 14th centuries located in the citadel of al-Karak represented a place of power and authority of the sultans of both dynasties. Historical sources recorded the construction in al-Karak of at least four palatine complexes (or reception halls) during the Ayyubid and Mamluk periods, two by prince al-Nasir Dawud (1229-1249), the others by the early Mamluk sultan al-Nasir Muhammad.

The most significant studies about palatine complexes in al-Karak are due to Robin Brown[23] and Marcus Milwright[24]. Results from the 1987 archaeological investigation in the well-preserved palace complex at the southern end of the upper castle, with its four *iwans* plan and tripartite elevations of his *durqā'a*, suggested a Mamluk foundation date, but this interpretation has been re-evaluated and an Ayyubid foundation seems now more likely[25].

Light archeological surveys carried out in al-Karak started in 2012 and have focused so far on 7 buildings (FIG. 6), 5 of which are relevant



6. Light Archaeology in al-Karak castle: stratigraphic investigation of upstanding buildings.

22. Few elements, although very significant, point towards a strong alliance between Crusader lords and local sedentary/nomadic communities in Latin Jordan: a) The territory would have been simply impossible to be military controlled without the positive support of Arab Bedouins; b) Crusader sources mention 'the king's Bedouins' in a number of occasions (Tibble 1989, Pp. 93-94); c) Crusaders and Bedouins together fought against the Egyptians in 1154. Husama ibn Mumqid recalls the event in his diary and names two tribes or Bedouin confederations allied of the Franks that he had to escape from or deal with in the vicinity of Petra/ash-Shawbak. They were called Banu Fuhayd and Banu Tayy (Hitti 1984, Pp. 53); d) The allegiance between Crusaders and Bedouins allowed Reynold of Chatillon, lord of ash-Shawbak, to set up the military exploit against Ayyubid Ayla and Meccan armies in 1183 (La Viere Leiser 1977, Ligato 2012). Moreover strategic shared interests linked tightly Crusaders and Bedouins. From an economic point of view the need to leave the road open for nomadic agro-pastoralism between Transjordan and Palestine, as well as for trading along the same track, was a relevant mutual interest. After the conquest of Jerusalem and of Palestinian coastline around 1099, the king of Jerusalem became, then, key stakeholders for the Jordanian tribes.

23. Brown 1989 - 2016.

24. Milwright 2008; he follows the first attribution to the Mamluk period.

25. Brown 2013.

for the present discussion. They are:

- CF1: the reception hall located in the southern area of the castle and ascribed by Robin Brown[26] to the Ayyubid prince al-Nasir Dawud;
- CF8: a vaulted niche incorporated at the ground level of the southern *donjon* CF10, dated *ante* 1263;
- CF7: a square plan domed pavilion, stratigraphically set against CF8 and coeval with the north elevation of the *donjon* CF 10. Dated *post* 1263;
- CA2: a palatine complex located in the lower court, recently identified by Robin Brown[27] as an Ayyubid building;
- CF4: the so-called "*small* īwān», located south of the Crusader church CF9; assigned by Robin Brown[28] to the 14th century by stylistic comparison;

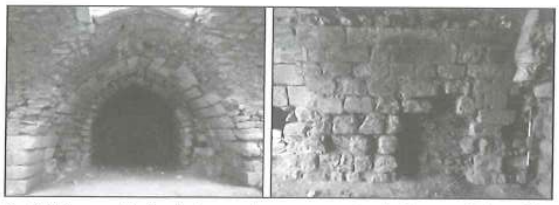
Synthesis of the Results of Topo-Stratigraphic Analyses

The stratigraphic reading of CF1 shows a masonry technique with organogenetic limestone ashlars, dressed with a plain blade (perhaps a small axe), used for the pillars and architectural elements in the *durqā'a*[29].

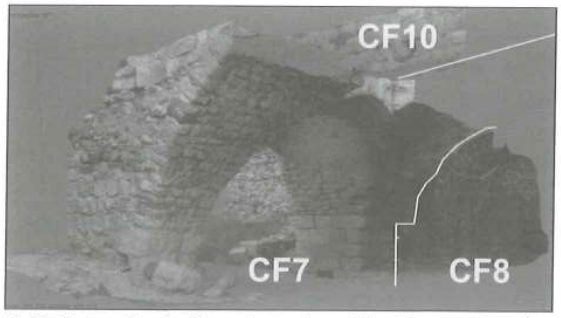
Similar materials were recorded in the inner elevations of the vaulted niche CF8, which is therefore technologically (and chronologically?) comparable to the *durqā'a* CF1. Besides, CF8 predates stratigraphically the north elevation of CF10, whose foundations were laid out against the back wall of the niche, originally plaster coated on the outside. CF8 was in fact spared, not de-functionalized nor dismantled, by the builders of the keep's north wall. CF8 was therefore considered an important space in Mamluk epoch, such that it had to be preserved from destruction. Its privileged *status* (ideological, if not material) is confirmed by the construction of the pavilion CF7, typologically and stratigraphically coeval to the north elevation of CF10, which incorporated and monumentalized CF8 by connecting it to a new and sumptuous *qā'a* (FIGS. 8, 9).

CF7 is a cross-vaulted pavilion supported by four corner pillars, with a square central eye decorated with *muqarnas*, of which only the lower register survives. It is characterized by large square blocks of limestone, in the base of the pillars. The cross vaulting is composed of small blocks, although the vaulting overlapping to CF8 is instead built in ashlars quoins. Similar quoins are used, inside CF10, in the lithic chains of the chamber vaulting, as well as in the alcove of the access corridor at the ground level of this latter building (FIGS. 10, 11).

7. CA1 CF1: Inner view of *Qā'at an-Nāṣirī* Reception Hall.



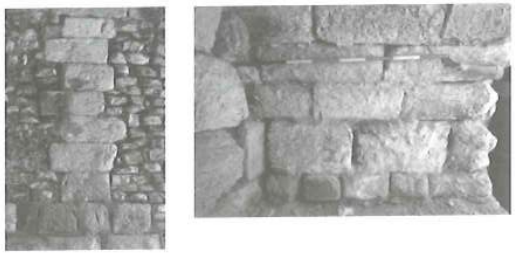
8. CF8: vaulted niche and masonry techniques (Type 3).



9. CF7, typologically and stratigraphically coeval to the north elevation of CF10, incorporated and monumentalized CF8.

26. Brown 2013, Pp. 316.
27. Brown 2013, Pp. 316.
28. Brown 2013, Pp. 317.
29. USM 220, 301, 304, 3190 *etc.*; see Fragai 2014.

10. The pavilion CF7.



11. CF10: the type of ashlars used in the lithic chains of the chamber vaulting, as well as in the alcove of the access corridor at the ground level, are the same of those used in the basement of the pillars in CF7.

Interpretation

In the light of stratigraphic readings and on the basis of Ayyubid and Mamluk written evidence (epigraphic, archival and literary sources), CF1 was identified with the reception hall of al-Nasir Dawud mentioned by al-Zahir as *Qā'at an-Nāṣirī*[30]; a building similar (though smaller and, architecturally less refined) to the reception hall at ash-Shawbak, which constituted almost certainly its archetype, in turn derived from Samarran palatine models of the 9th century.

CF8, stratigraphically and technologically dated to *pre*-1263, was assigned to the Ayyubid epoch. It very likely is a fragment of the *Dār al-Sulṭāna*[31] mentioned by al-Maqrizi[32] as the first residence of al-Nasir Dawud in al-Karak. The recent discovery (during the preparation of this paper) of a second niche, mirroring CF8 from across CF7, also technologically consistent with Ayyubid masonries, may confirm it (FIG. 12). This "sultan residence" could possibly have been located at the heart of the palace of al-Adil or of al-Mu'azzam 'Isa (dating to 1192-1227), although it is not yet clear which (pre-Mamluk) building phase is actually preserved in the upstanding structures. In any event, CF8 provides sound evidence of the presence of a second Ayyubid reception hall, coeval or predating Nasir Dawud's CF1.

The primary role of the latter, possibly the *Dār al-Sulṭāna*, is confirmed by the monumental sumptuous pavilion CF7, that in the 14th century was connected to CF8, and that could be assigned to al-Nasir Muhammad[33] recalled around 1311 as a major architectural patron of al-Karak[34].

Moreover, the construction of CF7 relates topographically to the dismantling of previous structures both to the East and to the West of the pavilion. The result of such a re-planning seems to highlight the setting up of a huge reception hall (*Dār as-Sa'āda*), more than twice the size of CF1. A Mamluk imperial residence where the Ayyubid remains of the *Dār al-Sulṭāna* had been architecturally enshrined as a monumental relic (FIGS. 13, 14).

Finally, technological similarities with CF7 (dome and masonries) are recorded for CA2, which should be dated to the Mamluk

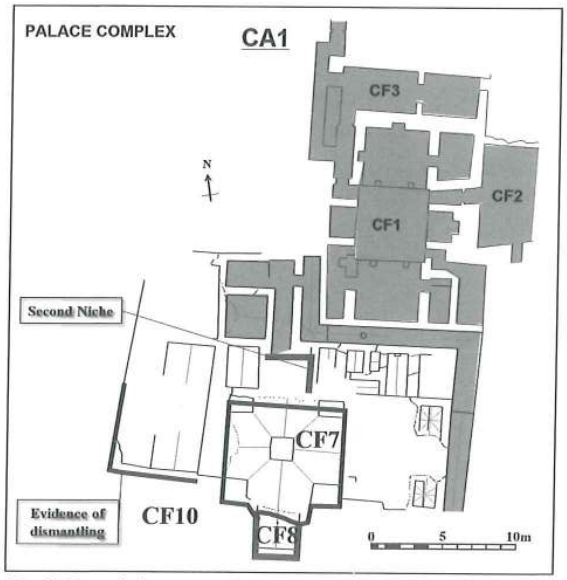
30. Sadeque 1956, Pp. 179; Brown 2013, Pp. 316.

31. The illusory lack of buildings in al-Karak before al-Nasir Dawud is, at the very least, peculiar; given that "minor" sites, such as ash-Shawbak and 'Ajlun, used to own one palace before 1229. ash-Shawbak's building has been built by al-Adil before 1212 and reused by his son Isa; in 'Ajlūn, the reception hall on the top of the tower of Aybak, was already built between 1214 and 1215. It's unlikely, then, that al-Karak, the biggest crusader Transjordan's site, didn't have a place where the Ayyubids could stay once they got in town, before Dawud arrived. If we consider the fact that 40 years had passed between 1189 (when al-Adil took al-Karak) and 1229, when Dawud arrived, it might be possible that the Dār al-Sulṭāna is an al- Adil or his son al-Mu'azzam Isa's palace. In this case, Dawud would have taken care of the restoration of such building once he got to al-Karak (repairs were perhaps needed because of the two earthquakes of 1202 and 1212).The actual building's name is a clear reference to its own builder (al-Adil o Isa, Damascus' sultan).

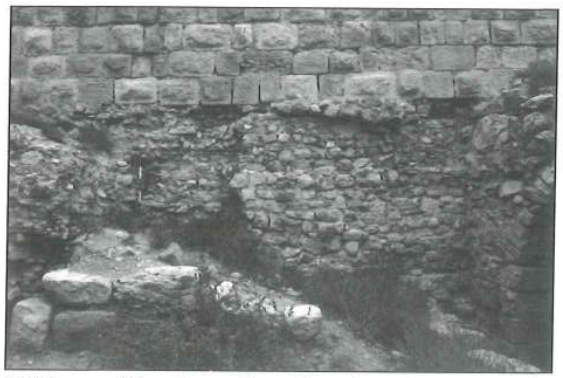
32. Ghawanimah 1979, Pp. 219; Walker 2011, Pp. 87.

33. Ibn Taghribirdi 1963-1971.

34. Walker 2011, Pp. 89.



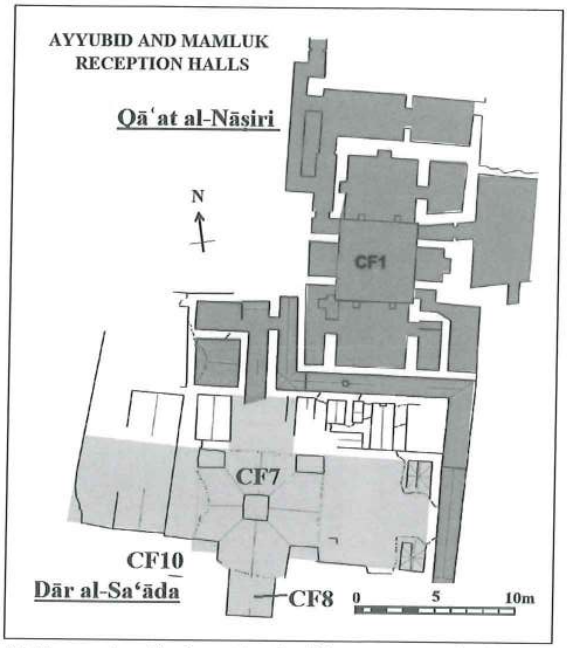
12. CF8 and the new niche provides sound evidence of the presence of the second Ayyubid reception hall, coeval or predating Nasir Dawud's CF1 (Dār al-Sulṭāna).



13. Traces of the dismantling of previous structures to the East of CF7 pavilion.

period and possibly identified with the *Qā'at an-Naḥḥās* (Al-Maqrizi 1936, Pp. 632; Ibn Taghrībirdī 1963-1971, Pp. 328) described by al-Furat (Al-Furat 1936, Pp. 107, 137) as looking towards Hebron and Jerusalem, exactly as CA2 does.

As for the '*small iwan*' CF4, we agree with Robin Brown (Brown 2013, Pp. 317) on its function as a vestibule access to the al-Karak palace proper, albeit its chronological position (Ayyubid or Mamluk) remains dubious. However, waiting for the final results of al-Karak investigation (in 2018), we would propose for CF4 a date to *ante* 1311, since ashlars similar to

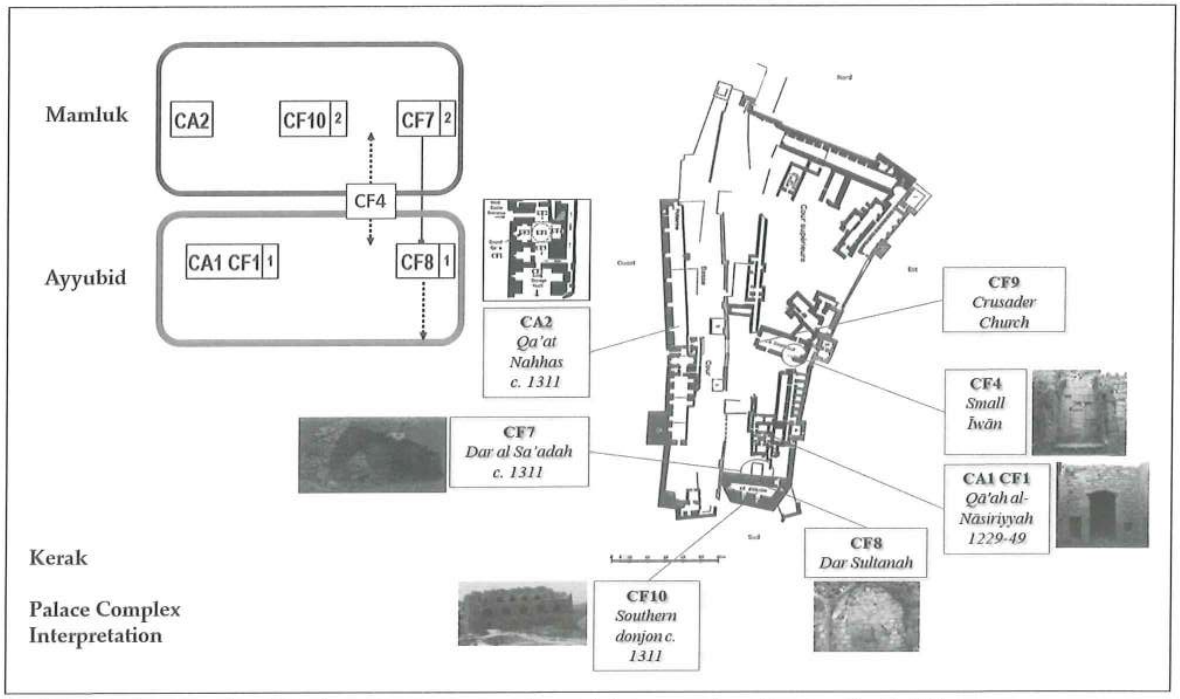


14. Reconstructive hypothesis of the area occupied by the Mamluk Dār al-Sa'āda, *ca.* 1311.

those of this latter building were reused in the pillars of CF7, the lofty pavilion of the imperial palace of al-Nasir Muhammad.

Conclusion

In conclusion, the use of stratigraphic building archaeology as a dating method, in connection with historical-archaeological (and territorial) Light Archaeology, may appear an effective tool in order to improve (to a certain extent) present day knowledge of medieval Jordan, in both Crusader and Islamic periods. In fact, thanks to the possibility of elaborating fully stratigraphic readings at territorial and site levels without resorting to excavations, on the one hand, and to the inner connection of Light Archaeology to historiographic hermeneutics, on the other, a number of gaps in our understanding of 12th to 14th century Jordan could be bridged. The study of al-Karak palace seems to demonstrate that this can be done, for instance evidencing the use of masonry techniques (when recorded in a stratigraphic framework) as chronological markers for defining the development stages of the Ayyubid-Mamluk palatine complex. There the architectural-stratigraphic dataset constitutes



15. Light Archaeology in al-Karak castle: chrono-stratigraphic interpretation of upstanding buildings.

a new, direct and independent historical source, to be compared against and considered together with other available historical records (written, archaeological and art-historical), in order to interpret the available material and non-material remains. The case study from ash-Shawbak, in this regard, shows even further possibilities, helping clarifying how Light Archaeology can be used to investigate also broader cultural issues, beyond chronology, including aspects of ideological relevance for the past societies and historic phenomena at large. In this regard, if for al-Karak more data would be needed, especially regarding the 12th century structures, in order to draw additional conclusions for instance on the composition of medieval building teams as well as on the specific roles of their components (local/non local, specialized/non specialized, 'Little'/'Great') and their degree of integration/non-integration, such data are available for ash-Shawbak. Here, the interpretation of the Ayyubid reception hall, dated through stratigraphic building archaeology, extends further into the search for the 'historic meaning' of the palace, or, to put it more plainly, for unveiling the political-ideological message conveyed by ash-Shawbak palace's architecture. The considerations drawn from anthropological-archaeology, as well as from the field of Medieval Studies, in this case broaden the cultural context and setting of the palace construction. On the one hand, considering the patron as a *bauherr* in the Bandmann's (2005) sense and not only as a mere *sponsor*, the building process is enriched by an 'ideological' planning phase, when specific and meaningful architectural features are selected by the patron to be included in the conceptual design of the work. Through this process the palace is being given a role within the very public discourse that the lord broadcasts to his subjects, peers and overlords. Without resorting to a developmental theory of 'style', then, architecture (and particularly public architecture) is seen as a product of willing and self-aware manifestation of 'the state' and thus re-introduced among the objects of historical research and not just among those of art-history and architectural-history. With stratigraphy providing a physically-consistent dating method in order to validate and limit the field of possible speculation.

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Life and Death at Shakārat al-Masā'īd: Results of the 2014 and 2015 Seasons

Introduction

The small Early-/Middle-Pre-Pottery Neolithic B site of Shakārat al-Masā'īd (*ca*. 0.1ha) is situated approximately 16km north of Petra/ Wadi Musa in southern Jordan and is in close proximity to other well-known Early Neolithic sites such as Ba'ja and Beidha. Excavations at the site began in 1999; from 1999 to 2001 as a field school project of the Carsten Niebuhr Institute (Kalizan *et al.* 2001) and later on as a research excavation project (2002 to 2005, and from 2010) by the Department of Cross-Cultural and Regional Studies, University of Copenhagen in close co-operation with the Jordanian Department of Antiquities and the Carlsberg Foundation (Jensen *et al*. 2005; Hermansen *et al.* 2006; Kinzel *et al.* 2011, 2015, 2017).

Twelve seasons of excavation exposed approximately 600m^2 of early Neolithic architecture from six phases of occupation (Kinzel 2013). Phase 0 describes the occupation predating the stone buildings at the site, lacking so far secure dates. According to ^{14}C-dates Phases I to III span the first half of the Middle Pre-Pottery Neolithic B (hereafter MPPNB, *ca.* 8250 to 7950 calBAD, Jensen *et al.* 2005, 116; Hermansen *et al.* 2006; *cf.* http://shkaratmsaied.tors.ku.dk/). Phase IV is dated to the Late Neolithic and Phase V represents the Nabatean / Roman Period (Kinzel 2013).

In the MPPNB Shakārat al-Masā'īd is characterized by circular buildings of various sizes (between 5m^2 and 27m^2). More than 25 circular buildings have been identified and provide evidence of complex and long lasting use histories (Jensen *et al.* 2005; Kinzel 2013).

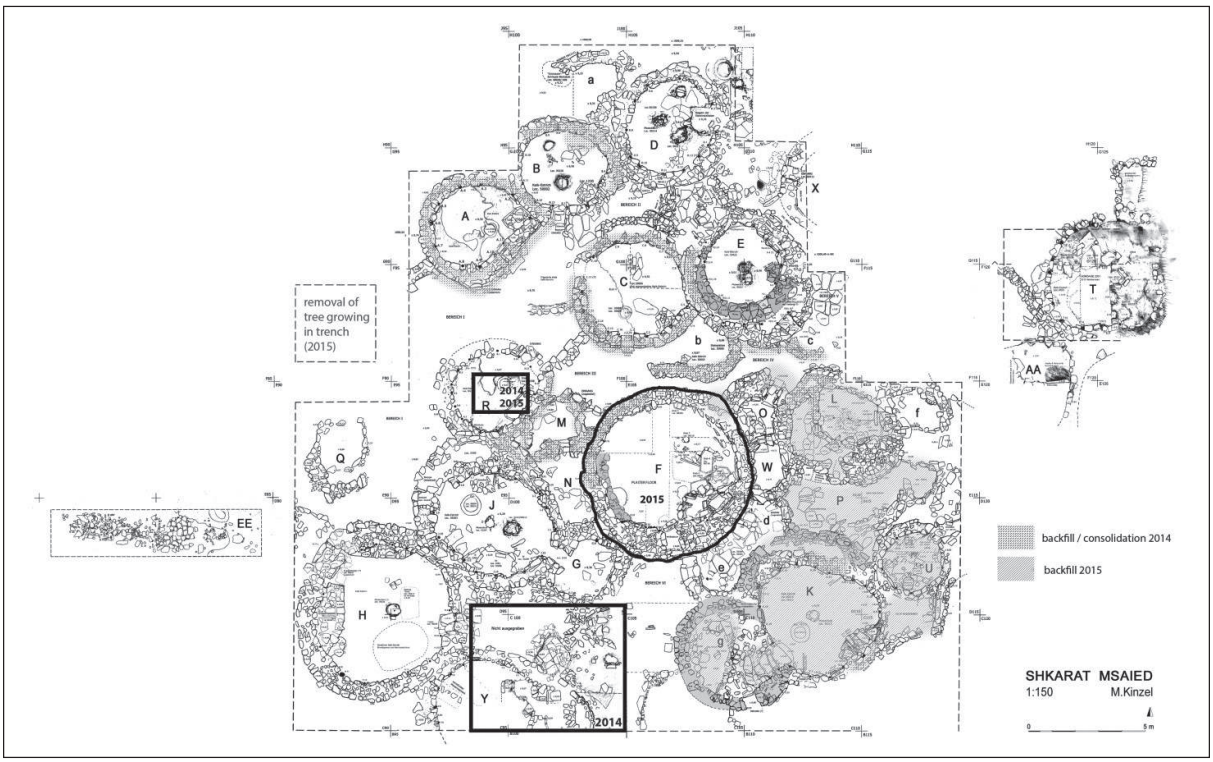
The main objective of the 2014 and 2015 excavation seasons was to consolidate the exposed architecture which had been affected by heavy winter rains in 2013. Additionally, illicit diggings and vandalism has been noted in 2013 and damaged the architectural remains of two buildings (Unit B and Unit R). The severe damage necessitated salvage excavation to document the state of destruction and to carry out immediate actions to consolidate and stabilize the affected architecture. A looting pit in Unit R was used to investigate the earlier use history of the building as well as the underlying phases of the earliest occupation and the beginnings of the settlement (Architectural Phase 0, *cf.* Kinzel 2013). Work also focussed on the continua-

tion in excavating Unit F which was used as a communal burial ground (*cf.* Hermansen *et al.* 2006; Kinzel *et al.* 2010). Other investigations concerned the excavation of the southern area to clarify the functional and spatial relations of the area south of Unit F (Kinzel *et al.* 2015). In 2015 we returned to Unit F for further investigations (FIG.5 and FIG. 6). We continued excavating the interior of the unit removing later floors, walls and fill-material to expose fully an earlier plaster floor (*Loc.* 120.120) to identify remaining, additional burials. This was also meant to clarify the stratigraphic context in the building.

Unit R and the "Deeper Stratigraphy"

Unit R is a domestic building in the western part of the excavated area. Our excavations in 2014 revealed that the child burial which was found in 2010 here was interred when the building already was abandoned and in disrepair. Unit R is an example for a ruined building within the settlement structure. Located north of Unit J and west of Unit M was the southern limits of the open space "area I". The walls of Unit R were all badly preserved and it seems that the exterior wall of the building was removed intentionally. Only some stones of the wall base were left demarcating the limits of the interior plaster floor.

In 2013 an illicit pit was dug in the south-eastern part of Unit R cutting the stone cist and partly undercutting the buildings outer wall. The looting pit was dug *ca.* 1.5 m into the occupational layers of Unit R and into the layers below the building. The back-dirt of the pit showed an extraordinary density and richness of artefacts. Among others abundant land snails, few marine mollusc shells (Abu-Laban, pers. comm.), flint artefacts and tools (*e.g.* some Jericho-points), worked and unworked bones as well as relicts of a sandstone bead workshop were found. The majority of animal bones are from goats (both *Capra aegagrus* and *Capra ibex*), but also bones of fox (*Vulpes* sp.) and bird bones are well represented. Among the bird bones the third phalanges (talons) of raptors are particularly numerous and may indicate that these



1. Site plan Shakārat al-Masā'īd 2015; grey-shaded areas of backfill and consolidation work in 2014 and 2015.

parts of birds may have had some ritual significance at Shakārat al-Masā'īd.

The section of the cleaned looting pit showed in its upper part a sequence at least five, probably six, plaster floors, which alternate with occupational deposits (FIGS. 2-3) and illustrate the complex and long lasting use history of Unit R. The lower sequence, which appears to predate Unit R, is characterized by a sequence of deposits that are generally ashier, often with spots of charcoal and burnt lumps of clay, and are marked by a high density of finds. A series of light brownish-reddish hard packed surfaces could be traced between the various layers of heterogenic roof (?) collapse material. In the lower sequence of the stratigraphy a dense concentration of land snails and (a few) marine mollusc shells was found embedded in a greyish-white ashy layer.

Southern Areas

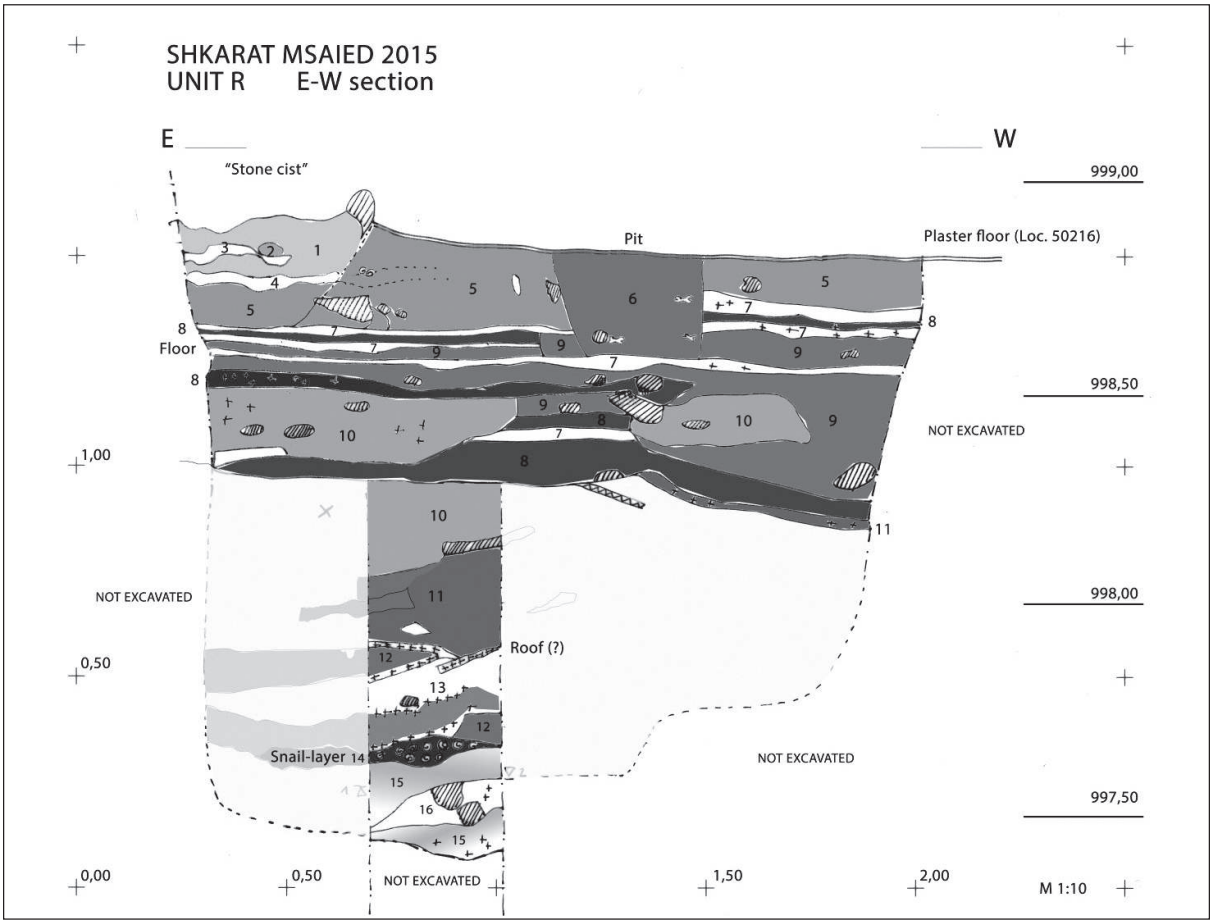
The excavation continued in the area south of Unit F between the Units G, H, J, K, g, and Y, which had formerly been referred to as Area VI as it was assumed to be a courtyard area (Kinzel *et al.* 2011). After the initial investigation of Area VI in 2010 (Kinzel *et al.* 2011) the area showed several compartments with plaster floors and pavements, but no clear structure. Additionally, a pit (*Loc.* 90.307) filled with production waste from the reduction of 9 to 11 bidirectional blade cores was found south of a low partition wall (*Loc.* 90311) in the eastern part of the area (Purschwitz in press, in prep. a, 2016). However, our understanding of use, function, architectural configuration and internal stratigraphic relation as well as the fine-scaled stratigraphic connection to adjacent buildings is still limited. The 2014 season revealed a small circular feature (*Loc.* 100.203; approx.45 cm. in diameter) which appears to be a posthole in the middle between Unit Y and G (FIG.4). The posthole was placed into a course plaster surface (*Loc.* 100.208/212) and might therefore indicate the presence of a roof The shape and dimensions of the posthole shows that the post was composed of multiple "trunks". Evidence of multi-trunked posts was excavated at *e.g.* Unit K (Hermansen *et al* 2016; Kinzel 2013) and may indicate a quite compact/solid/substantial roof construction. Some upright placed stone slabs might be relicts of an earlier circular structure. Findings in this area show a series of modifications and adjustments due to changed functions and needs over a long period of time.

Unit F

Unit F has a long use history and a quite complex stratigraphy. There are at least four main building phases attested. Several modifications and repairs were carried out during these main phases making it difficult to define sub-phases. Very simplified we can describe the stratigraphy of Unit F as follows (FIG. 5, *cf.* Kinzel 2013):

1) Unit F is built as a single room round house structure with an entrance (*Loc.* 120.134) oriented to the SE. A lime plaster floor (*Loc.* 120.120) covers the interior of the building with a plaster "basin" (*Loc.* 110.130) located in line with the entrance. Into this floor some of the larger burial cists are placed into.
2) On the plaster floor (*Loc.* 120.120) we find the remains of a collapsed roof (*Loci* 110.137/138) covering some articulated placed animal remains as well as ground stones. The layer is very densely packed.
3) The roof collapse material is covered by

2. Excavation trench in Unit R (2015) with the deep sounding following the outline of the illegal digging.



3. Unit R, east-west-section of deep sounding with occupation deposits (prepared by M. Kinzel after Harpelund and Nielsen 2014/2015). Stratum 1. Brown loose fill with yellowish-red inclusions of mortar; Stratum 2. Dark grey with reddish inclusions and lighter grey inclusions; Stratum 3. Plaster floor remain (?), light yellowish brown with small pieces of charcoal; Stratum 4. Very pale brown to pink plaster floor with inclusions of small charcoal pieces and white areas, two snails *in situ* (?) on floor ; Stratum 5. Greyish brown (10YR 5/2) with inclusions tending to 10YR 4/2, dark greyish brown a lot of pieces of charcoal especially at the top of the layer, loose fill mixed with spots of brown reddish mortar; Stratum 6. brown loose fill with some bones and smaller stones, pit feature; Stratum 7. Hard packed (plaster) surface light greyish brown; Stratum 8. dark brown loose fill; Stratum 9. Mixed fill- dark brown with spots of brownish-reddish mortar (disturbed); Stratum 10. Compact fill light greyish-brown (in west: remains of a plaster feature?), in lower parts with small charcoal pieces and more ashy; Stratum 11. Brown-reddish loose fill with lumps of reddish-brown mortar and charcoal; Stratum 12. Grey ashy fill; Stratum 13. hard packed (mortar?) fill, brown-reddish; Stratum 14. Densely packed layer of snails with dark brown soil; Stratum 15. greyish-white ashy layer; Stratum 16. mixed matrix with greyish-brown to darker grey soil, charcoal in various sizes included; diagonal hatching= stones.

hard packed "Fill" material which also runs over the cut exterior wall (*Loc.* 110.111) of Unit F in the western part of the building.

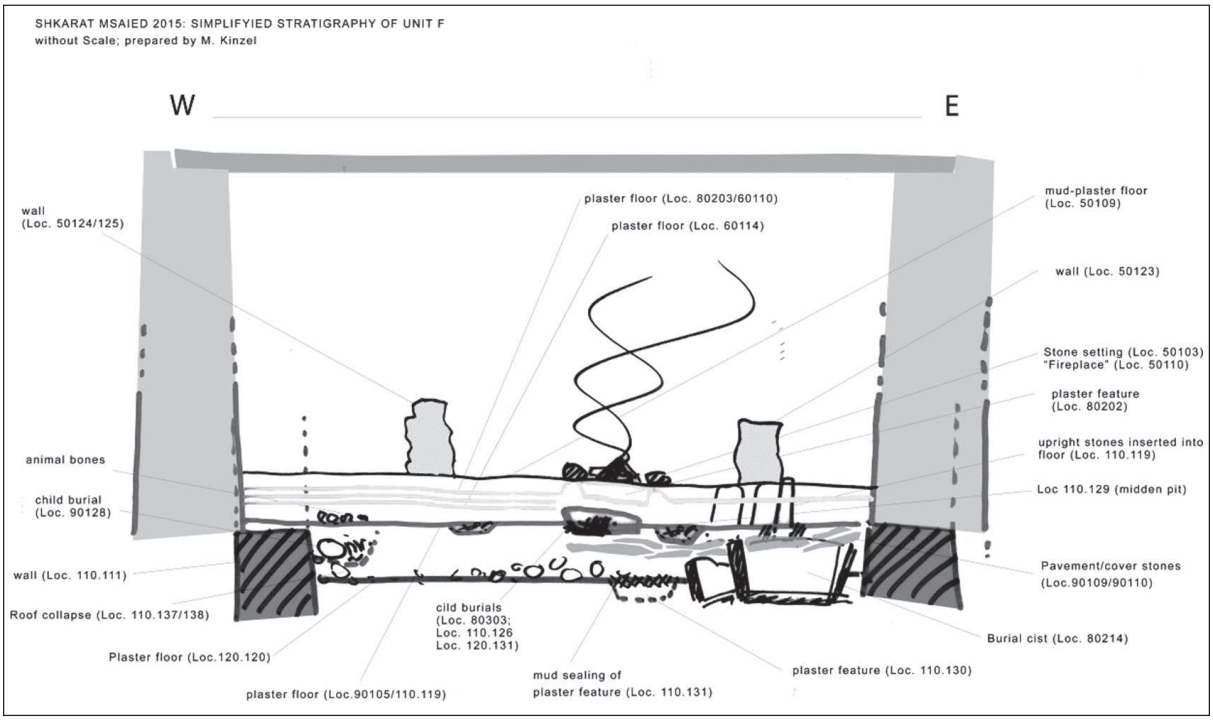
4) Plaster floor (*Loc.* 90105/110.119) is placed on the hard compacted fill material and covers the entire house interior (Covering also the earlier plaster feature). In the floor most of the child burials (see below) are interred. The relationship to the larger burial cists is unclear as the burials are mainly covered by a multi-layered and disturbed pavement (*Loc.* 90109/110) which is partly embedded or over-laid by this floor. On this floor the wall (*Loc.* 110.107/70209) was erected closing off the earlier entrance (*Loc.* 120.134).
5) Several layers of various plaster surfaces and repairs (*Loc.* 60114; 60110) underlying the plaster floor (*Loc.* 60100/-104/-105/80203).
6) Course plaster floor (*Loc.* 60100/-104/-105/80203) of a late phase of Unit F. The

4. Southern Area (2014) with central posthole and various surfaces; facing north.

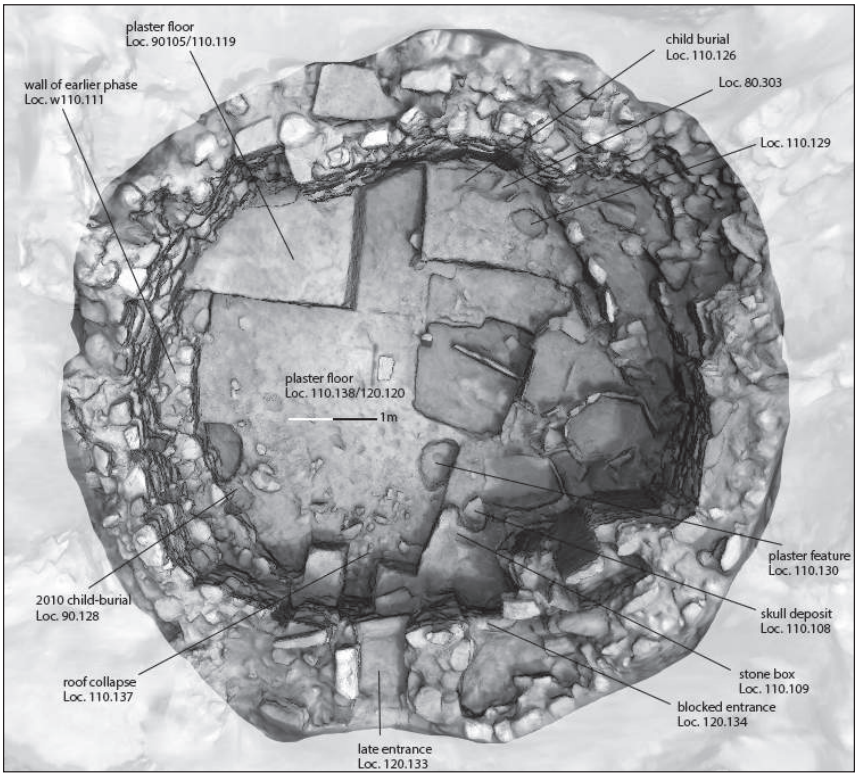
floor is related to the entrance oriented to the south (*Loc.* 120.133). It shows also a plaster feature (*Loc.* 80202) with a raised rim and a shallow basin.

7) A layer of mixed fill material, most probably stemming from a roof collapse.
8) Hard packed mud floor (*Loc.* 50109) covering most of the interior of unit F. On the rim of the plaster feature (*Loc.* 80202) stones are placed to mark a possible fire place (*Loc.* 50103/50110). The Interior of the late Unit F is divided into three spaces by low partition walls (*Loci.* 50124/125 and 50123) transforming the central area into a rectangular space. In the floor some larger ground stone tools were embedded.

The investigation in Unit F revealed a number of primary, secondary and tertiary burials as well as new information on the earlier use phases of Unit F and the remains of an older building (as partly explained above). East of the entrance to Unit F (*Loc*. 120.134) a stone cist (*Loc*. 110.108) containing three skulls was recovered at the bottom of wall (*Loc.* 70.209) (Kinzel *et al.* 2016). This feature is similar to skull caches from other Neolithic sites such as 'Ain Ghazal (Griffin *et al.* 1998), Jericho (Kenyon and Holland 1981:77), Yithahel (Slon *et al.* 2014) or Tall Ramad (Ferembach 1969). The plaster floor (*Loc.* 90105/110.119) was cut in order to build this stone cist. South of the skull deposit (*Loc.* 110.108) another stone feature (*Loc.* 110.109) was discovered which contained the remains of at least two foxes (*Vulpes* sp) (FIG.7) and might indicates a very close relationship between human and animal remains. Animal bones (although mostly goats, *i.e. Capra aegagrus* or *Capra ibex*) were often found



5. Unit F, simplified W-E-cross-section to understand stratigraphic relations; prepared by Moritz Kinzel.



6. 3D-model of Unit F with Loci mentioned in text (2015); prepared by Moritz Kinzel.

close association with human remains, or were deposited along the wall of Unit F.

An entrance (*Loc.* 120.134); approximately 65 cm wide; of an earlier use phase of Unit F was identified just east of the later entrance (*Loc.* 120.133) after wall Loc. 110.107 (same as *Loc*. 70209) was removed. As wall Loc. 110.107 was built this entrance became blocked and integrated into a niche-like feature (*Loc.* 2261).

The lime plaster floor (*Loc.* 110.138/120.120), which was exposed throughout the unit is obviously related to this earlier building phase. A plaster "basin" (*Loc.* 110.130) – as common for most (domestic) buildings at Shakārat al-Masā'īd – was found in the axis of the former entrance. The plaster basin was filled by a white-greyish powdery chalky material (*Loc.* 110.132) without showing traces of charcoal or charred material. A flint cache (*Loc.* 110.133) was found in the basin (FIG.8). The cache consists of seven bidirectional blades and is the first flint cache found at Shakārat al-Masā'īd. Three of the blades were tooled into Jericho-points (FIG 9). All the blades and projectiles were manufactured from two flint types (FRMG 6

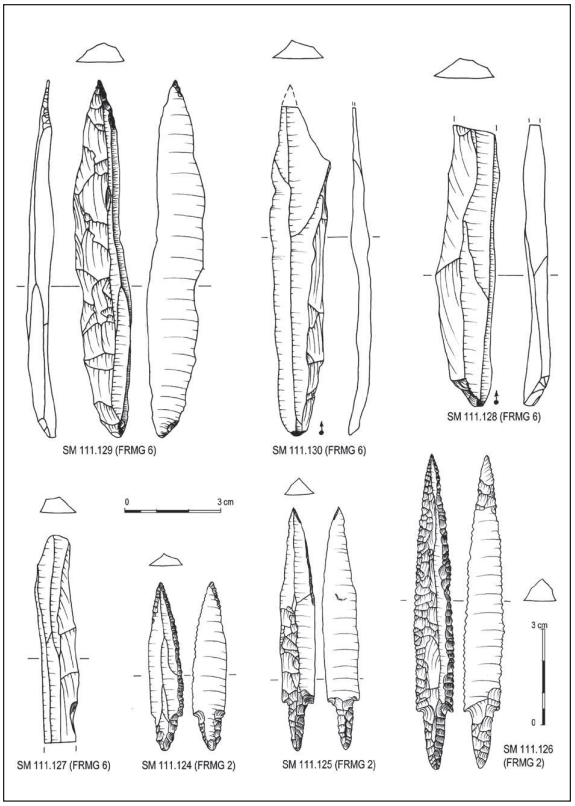
7. Jaw of a small fox (Vulpes sp) found on the floor surface (Loc.110.138) in Unit F.

8. Plaster feature (Loc. 110.130) with flint cache under excavation (2015); Photo: Marie Louise Jorkøv.

and FRMG 2), which are not attested within the geological environment of the Greater Petra Region (Purschwitz 2013, in prep b) but are commonly used for core reduction at Shakārat al-Masā'īd and at the contemporary site of Beidha (Purschwitz 2017, in prep. a; Mortensen 1988; *cf.* Barzilai 2010). The plaster basin (*Loc.* 110.130) and the flint cache were sealed with clayish mortar material (*Loc.* 110.131) at a later point. This took place before the roof collapsed and fill material was compacted to establish the next layer of plaster floor (*Loc.* 90105/110.119).

In the southern part of the room roof collapse (*Loc.* 120.104/ 110.137) was found on the earlier floor level (*Loc.* 120.120) and confirmed the materials and construction methods attested by the roofs in other buildings (*e.g.* Unit K) at the site. Two pestles and a hammer stone were found *in situ* on the floor surface, indicating perhaps some normal day-to-day processing of food.

A wall, which belongs to an earlier building (W *Loc.* 110.111) was exposed in the western part of Unit F. Although it seems to form a bench-like feature/platform; it can be seen as the remains of an early building phase of Unit F with a slightly smaller size. The earlier building might have been demolished and the exterior wall was cut down to the preserved height. All the larger burial cists were cut into the earlier plaster floor (*Loc.* 110.138=*Loc.* 120.120) and covered by the pavement in the eastern part of the building (*Loc*. 90109/90110). Most of the child burials seem to be associated with a later plaster floor (*Loc.* 90105/110.119) but the burials may still have been contemporary.



9. Flint artefacts from the flint cache (Loc. 110.133) in unit F; drawings: Christoph Purschwitz.

Human Remains: Preliminary Results 2015

Three areas containing human remains were excavated in Unit F. In total a minimum of 12 individuals (10 sub-adults and two adults) were recovered. Against the northern wall west of stone cist (*Loc.* 80.303), excavated in 2005, infant remains were recovered in the fill. Another small stone cist was be identified and contained the remains of a minimum of three individuals of which two were secondary burials (one was represented by a mandible [6-7 year old child, B115.102], one was the disarticulated remains of a 38-40 week old foetus/new-born [B115.104]). Finally, one individual was of a c. 4 year old child buried resting on its left side with flexed arms and legs with the back towards the north wall (B115.103). The head and first cervical vertebra were missing. No pathology could be observed on the remains.

To the southeast of locus 80.303, a deposit of mixed remains was uncovered in a very hard soil. The deposit contained completely mixed sub-adult remains of minimum six individuals: one juvenile eight years (represented by a mandible), a child of *ca.* 5 years, a child of *ca.* 3-4 years, a child of *ca.* 2-3 years, a child of *ca.* 2-2.5 years, and a child of *ca.* 1.5-2 years. They have been placed at the same time and are likely a tertiary deposit. No pathology could be observed on these remains.

The third excavated area was a stone cist (*Loc.* 110.108) in the southern part of the house, immediately north of stone cist locus 110.109 and next to locus 110.128. The stone cist contained three skulls all facing west. Skull #1 had been placed while soft tissue was still partly present. This was evident from the first neck vertebrae (cervical 1 and 2) still articulating to the base of the skull. Furthermore, the mandible was articulating with teeth in occlusion. The skull belonged to a male aged *ca.* 30-45. He had suffered periodontal disease and had calculus on the molar teeth. He had lost the second and third molar ante mortem. In their place a large abscess (healed) was seen, hence there was little wear observed on the occluding mandibular molars. Skull #2 and #3 had their left sides positioned against and partly underneath the southern stone slab separating locus 110.108 from locus 110.109. The stone slab had been pushed down after burial and after the construction of the stone cist (*Loc.* 110.109) as well as the erection of wall locus w70.209/110.107. This had resulted in crushing the left parietal bones of both crania. Skull #2 was located southwest of skull #1 (FIG.10). There was no mandible, but it had all its maxillary teeth present. It belonged to a 3 year old child. No pathology could be observed on this individual. The third skull (Skull #3) belonged to a 6-7 year old child. Enamel hypoplasia could be identified on the permanent maxillary incisors, indicating a disturbance in the enamel production as a consequence of malnutrition or other stress related instances around the age of 3-3.5 years.

East of Skull #3 a complete humerus of a fox (*Vulpes* sp) was found. A proximal epiphysis of an animal tibia which may have been from a small cat was found as a secondary deposit in Skull #1. In the fill of locus 110.108 a foot bone (a metatarsal) was found from a juvenile *ca.* 6-11 years old. In the fill of locus 110.128 an adult knee cap (a patella) was recovered. It showed initial stages of arthritis.

As the human remains of the 2015 season are mainly from the same contexts excavated back in 2005 we will re-assess all the human remains to clarify the minimum number of individuals; especially in the case of the burial *Loc.* 80.303.

Conservation and Protection Activities

In addition to the above presented archaeological investigations the state of conservation of each building unit was assessed and documented. To improve the appearance of the site and also to protect the architectural remains, plants and litter was removed from all buildings. A comprehensive state of conservation report was handed over to the Department of Antiquities in 2014. In general the site was (in 2014 and 2015) in good condition and the fence around the site is in a decent state. Most damage seems to be related to the intense rainfall in winter 2013/2014, but also due to vandalism. However, the exposure of the archaeological remains to weathering, including intense sun and wind, has resulted in the loss of the Neolithic wall mortar as well as the disintegration of the (sand-) stone material itself. The sand stone slabs show flaking and detachment of layers.

The backfill put in place in 2010 and 2014 seems to fulfilled its purpose to stabilise the structures. The surface run-off water after heavy winter rainfall has created some drainage gullies in the backfill material. In Units J, K, P, single wall segments between the post channels (sockets) have collapsed due to the loss of bonding material and rainwater penetrating the wall core. To reduce the risk of wall collapse some

10. SM2015: Skull #2 from the skull cache (Loc. 110.108) in Unit F.

stabilization and consolidation works were executed in 2014 and 2015 (FIG. 1). In Units A, C, E, F, K, L, and M joints were re-pointed and voids filled using a (simple) soil mortar. This mortar is made out of the sieved spoil heap soil and water. Due to the high content of calcite (lime) in the soil the mortar is relatively stable but softer than the stone material and the Neolithic mortars containing partly burned lime. The same mortar was used to complete some wall capping to prevent water penetrating the wall core. The repair mortar has to be seen as a sacrificial layer that will need to be renewed on a regular basis. Regular monitoring will help to define maintenance cycles necessary to maintain the current state. In case of Units L, P and K substantial backfilling was carried out to prevent collapse and minimise water penetration. In Unit F and R only limited areas were backfilled to allow an easy continuation of our work again in 2016.

Compared to the number of damages reported in 2013/2014 only minimal further damage could be observed in 2015. The soil mortar used for the consolidation of some walls in 2014 seems to be efficient, but will need some maintenance work in the coming year.

We plan to rise additional funding for conservation and site presentation measures. The self-guiding track around the excavation area has proven to be a very good way of keeping visitors out of the actual trenches. Additional info panels could add considerably to the presentation of the site, but also more innovative techniques as mobile apps could help explain the various features with AR-3D-reconstructions of the buildings (Kinzel and Tanaka 2015).

Future Plans

In preparation of a final publication, covering the work since 1999, additional fieldwork is planned for 2017/18 to fully excavate Unit F. During the 2015 season we were joined in the field by the Greenlandic artist Nuka Godtfredsen who will produce visuals of interpretational (graphic novel) scenarios in the future to discuss findings and contexts. In addition to the presentation of scientific results it is planned to undertake further preservation measures and to prepare the site for visitors and to promote the concept of the Neolithic Heritage Trail.

Acknowledgment

The 2014 and 2015 work was supported by the generous grants from the Danish Institute in Damascus and the Danish Palestine Foundation. We also wish to thank Bo Dahl Hermansen, Charlott Hofmann Jensen, and Aiysha Abu Laban for comments and on-going discussion; Khaled Hwawra and Lena Bakkar– our Department representatives – for their help and support; and Mohammed Almrahleh and the Petra Park Authority for their hospitality. We would like to thanks as well Lisa Yeomans for her comments and proof reading of our manuscript. We also would like to thank the local Bedouin tribes for their interest and constant support of the project.

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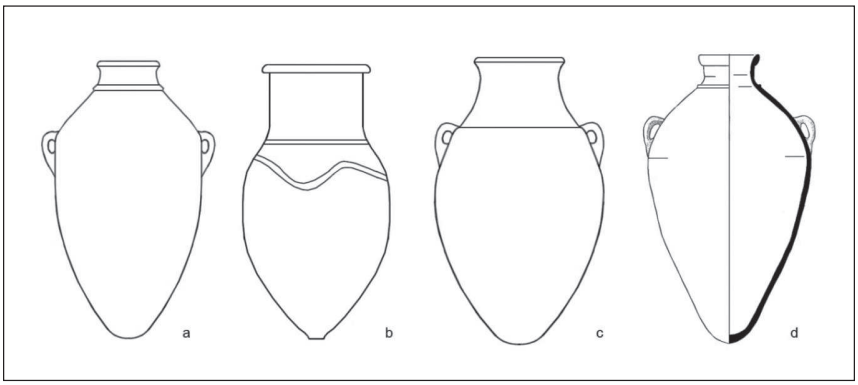
P. M. Michèle Daviau and Stanley Klassen

Linking Iron I Sites on the Mādabā Plain: The Evidence from Collared Pithoi

Introduction

The most distinctive Iron Age I vessel form in Transjordan is that of the collared pithos. The rim forms assigned to these pithoi are similar to those on large storage vessels found in the central highlands or hill country of Cisjordan, a type recognized by Raban (2001:494; fig. 25.1) and Mazar (2015:13) as distinct from Cypro-Tyrian jars found at site on the Mediterranean coast of Canaan, also known as wavy band jars, and from "Galilean" pithoi, which are the northern wide-mouth version of these large jars (FIG. 1). Central Highland style jars recovered at Shiloh (Bunimovitz and Finkelstein 1993: figs. 6.56:4, 6.63:3–5), as well as at Tall al-Mutasallim (Megiddo) where fifty-five jars from the early excavations in Stratum VI are in the range of 1.00-1.15m tall (Loud 1948: pl. 83:1, 4; Esse 1992:88; figs. 2; 3:1)[1].

The first known group of comparable Early Iron Age pithoi found in central Jordan (FIG. 2) was recovered at Saḥab by Moawiyah Ibrahim, who described them as large jars with a collared rim and plastic ridge below a short neck (Ibrahim 1978: fig. 1; pls. XIX, XX). At sites in the Jordan Valley, large storage jars are somewhat smaller, such as a jar from Tall Dayr ʻAllā that is 85cm tall (Franken 1969: fig. 47:1) and one from Tall as-Saʻīdiyya at 92.5cm (Tubb *et al.* 1996: fig. 20). So too, their numbers are



1. Types of Iron I pithoi: a) hill country pithos; b) Coastal, Cypro-Tyrian pithos; c) Galilean pithos (drawn by P. M. M. Daviau, after Raban 2001: fig. 25:1); Transjordan pithos (MPP Tall al-ʻUmayrī pithos, L. G. Herr, published with permission).

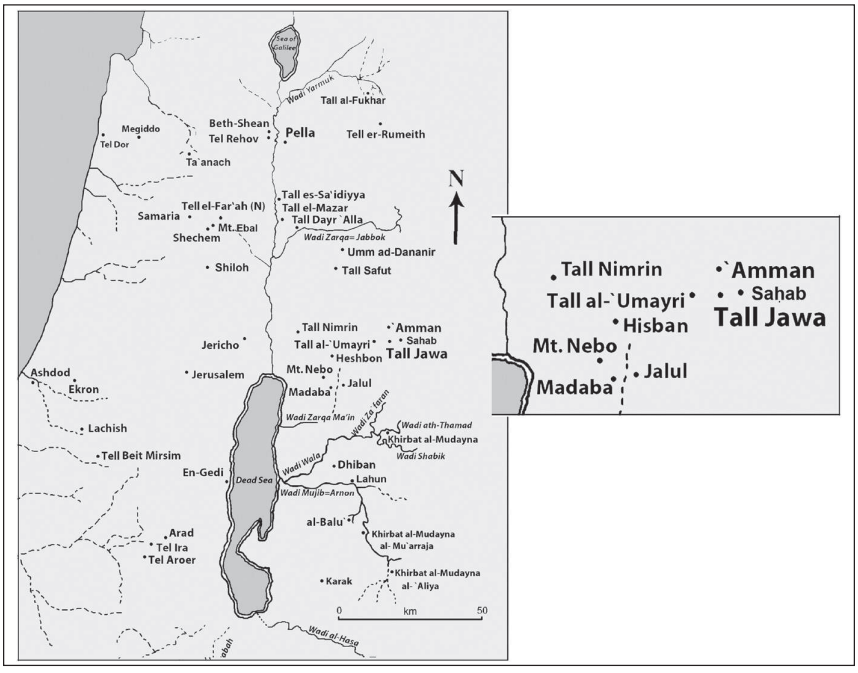
1. Note that the scale of P6069 in Tall al-Mutasallim (Megiddo) 3 (Harrison 2004: pl. 12:2) is misleading.

fewer–one each from Tall Dayr ʻAllā and Tall as-Saʻīdiyya, two possible late Iron I jars from al-Lāhūn in Muʼāb (Steiner 2013: fig. 3:1–2) and six (+2?) short-necked jars from Bālūʻ (Worschech 1992: fig. 2, 3). It is noteworthy that the jars from al-Lāhūn do not have a collar around the neck and only the rim, neck and shoulder are preserved.

The second, even larger group of 80 restored pithoi was recovered from secure Iron I contexts at Tall al-ʻUmayrī. These jars are in the range of 110–120 cm in height (Clark 2002: fig. 4.17–4.23) with an ovoid or piriform body shape (see FIG. 4). Less well-known is the Iron I corpus from Tall Jāwā, where pithos sherds were recovered from Iron I loci as well as in later debris layers. Altogether, more than 900 diagnostic sherds were assigned to Iron I and of these, the collared pithos is the most characteristic Iron Age I vessel type. The identification of the pithos with a collar at the base of the neck is called the *collared* pithos, rather than the *collared-rim* pithos, since the rim may be folded, thickened, ribbed, or simple[2]. Thus, an initial study of the basic types of collared pithoi from Tall Jāwā (Daviau) pertains to vessels with a collar at the base of the neck, regardless of the shape of the rim. In order to investigate the production technology of the potting industry that produced these large jars, this paper also presents an analysis of their petrography (Klassen).

The Context

Tall Jāwā, south of ʻAmmān, is located on the eastern edge of the Mādabā Plain, southwest of Saḥāb. Excavation at the site was carried out for six seasons from 1989-1995, after which modern development reduced access to the site. Two principal strata of occupation were identified, Stratum VIII in the western sector and Stratum VII in the southeast, dating to Iron IIB and IIC respectively. It was below the Iron II remains of Building 113 that a small amount of Iron I architecture and pottery was located *in situ* (FIG. 3). Iron I architecture, identified as two walls, W1015 and W1016, forming a corner of Building 50 (Daviau 2003:34; fig. 4.3), was first encountered in a deep sounding in Field A, below Wall 1009 in Building 113. These walls framed a thick layer of ash and burnt mudbrick,

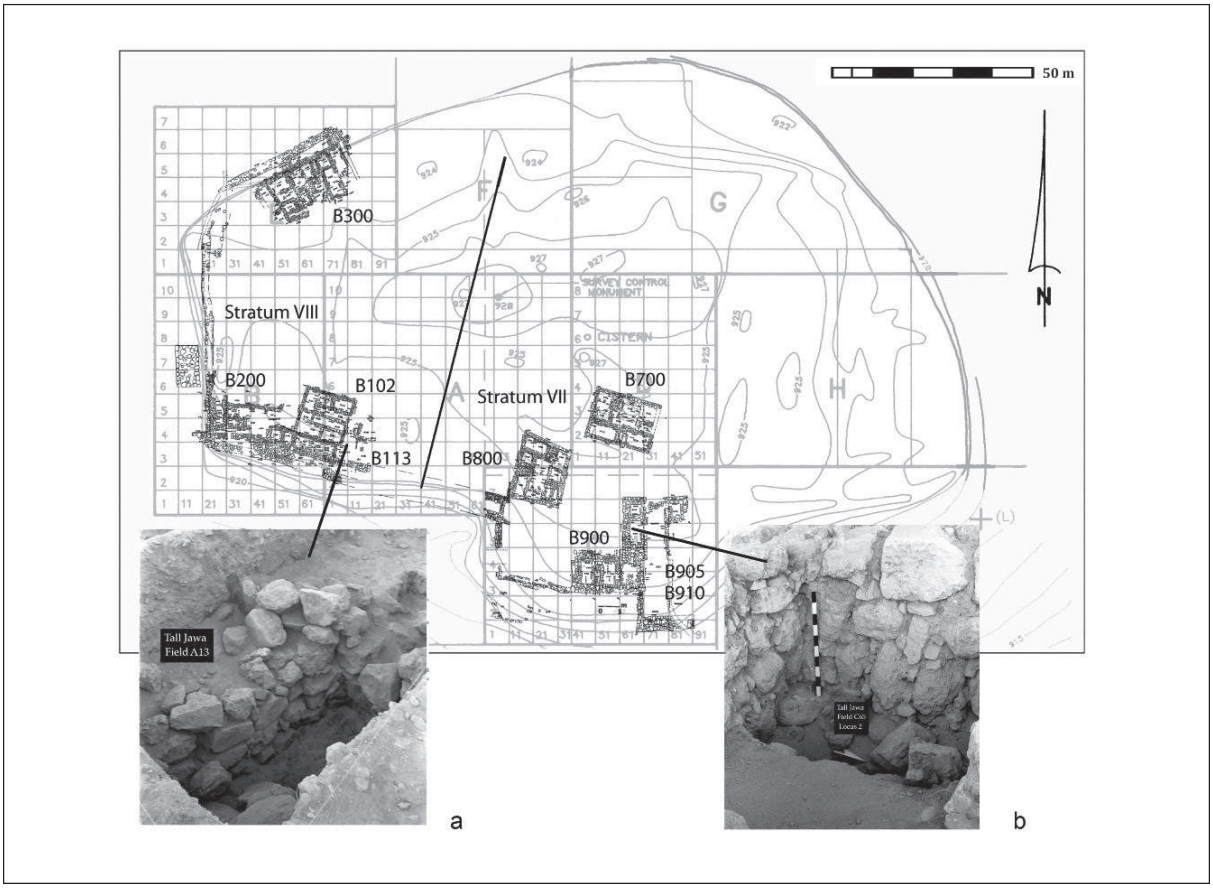


2. Map of Palestine and Jordan, with detail of sites in the ʻAmmān region and on the Mādabā Plain.

2. This designation follows Killebrew (2001:377, n. 1), who explains the misunderstanding that arose from the term "collared-rim pithos", when several scholars, including Ibrahim, thought that the rim, rather than the neck, had a collar. More recently, Mazar (2001:13) also uses the term "collared pithos" to refer to large jars with a ridge at the base of the neck.

a building material not seen in any of the Iron II walls. Typical Iron I pottery, consisting of collared pithoi, kraters and triangular rim cooking pots (Daviau 2003: figs. 4.7, 4.8), clearly distinguished this assemblage from the later Iron II ceramic material. In Field C-east, below the footings of the Iron II gate building, Iron I collared pithos rims were recovered from a packed soil layer, although no Iron I architecture was identified in this area.

Altogether, more than 240 sherds, including rims, collars, handles and a base, were identified as Iron I pithoi (Stratum X; for example, Daviau 2003:37–38; fig. 4.7:1–4). Various rim styles and fabric types are represented in the corpus, suggesting either a long period of use or considerable change in ceramic technology over time[3]. Both the rim and the collar vary in shape from one vessel to another and determine the sub-types among the Tall Jāwā jars. Based on the shape of the rim, its stance, and the height of the neck, styles extend from tall-necked to short-necked jars, similar to the variety of rim and neck forms seen at Tall al-ʻUmayrī and Ḥisbān. So too, the shape of the collar varies from pointed to rounded to flattened. Finally, the fabrics differ from coarse wares to compact fabrics, from oxidized fabrics to dark gray wares; vessels with a short neck were assigned to Stratum IX, early Iron IIA at Tall Jāwā[4], although these sherds from fills and ceiling material are stratigraphically insecure.



3. Town plan of Tall Jāwā (R. Force, C. J. Gohm): a) detail of Iron Age remains of B50, below B113 in Field A; b) detail of Iron Age debris below B910 in Field C-east.

3. The great diversity of fabric composition and firing techniques argues for wood's position that the model of itinerant potters observed in ethnographic studies can be applied to Palestine and Transjordan. Wood also points out that such large vessels may last as long as 40-50 years (Wood 1990: 81–82, Table 4), with one known example lasting 130 years.

4. Early Iron Age IIA elongated pithoi with a short neck and vestigial collar are also found in the Negev, such as in Stratum II at Tall Masos (Fritz and Kempinski 1983: pl. l55:4).

Technology: Forming techniques employed in the production of Iron Age I pithoi from Tall al-'Umayrī were described by Clark and London (2000:104). Only the formation processes used to make the rim, neck and collar, and the clay preparation and firing of pithoi from Tall Jāwā, can be commented upon here[5]. Of note is the fact that several sherds show in section that the rim was formed in two and sometimes three stages. First, the clay was folded to the outside to double the thickness of the neck[6]. At the bottom of the neck, this clay was pinched or cut off, forming the collar. Thereafter, a second coil of clay was added and again folded over to form either a simple, but longer rim (V16) with either a rounded lip or to fashion a thickened rim, either a plain ovoid rim or a heavy rim enhanced with grooves or ribs on the outer face (A13/142.2; E75/32.7; E54/15.4)[7]. In some cases, a third stage was added to form the lip. This multi-stage technique can be seen most clearly in section where the colour of each fold is distinct with the second fold a lighter or darker colour than the first innermost fold (for example, A2/74.7)[8]. In one case, the rim is darker than the reminder of the neck and appears to comprise two additional clay coils to form the rim and the lip (FIG. 4).

Among the Tall Jāwā pithoi, there is considerable variety of rim shape and stance that makes it difficult to establish a typology and a secure chronological sequence without C14 dates; this was also noticed by Killebrew (2001), who studied the pithoi from Biet Jala and Bisan (Beth Shean) and judged the tall-necked jars to be the earliest examples of this vessel type (Killebrew 2001:380). This is supported by comparison with a collared pithos from Khirbat an-Nuḥās, which has a short neck and is dated to the 9th century by C14 analysis (Smith and Levy 2008: fig. 11:7).

At Tall Jāwā, pithoi with a tall flaring rim come in three styles. The first type is a tall flaring rim pithos with a rim folded to create a rib below the lip or on the upper neck (FIG. 4:1, 2). This type is also seen in two unstratified sherds from Ḥisbān (Herr 2012: fig. 2.3:1) and in a group from Tall Mādabā; however, the best example, with a more upright stance, comes from late Iron I (Stratum V) at Shiloh in the central hill country (Bunimovitz and Finkelstein 1993: fig. 6.53:6).

The pithoi with a flaring mouth that have a thickened rim may have a break at the point where the rim joins the neck (FIG. 4:3, 4). In the third group, there is a sharp mid-neck ridge above the collar and a large, sharply defined collar (FIG. 4:5). Also in this subtype is a pithos with a rectangular rim, a gentle upper-neck ridge, and a rounded collar (FIG. 4:6).

In a second group, the rim is vertical or incurving and externally thickened, either plain or ribbed. The incurving rims (FIG. 5:1, 2) have a relatively tall neck as do the heavy walled jars with a plain thickened rim (FIG. 5:3, 4). There are several examples of the ribbed rim (FIG. 5:5), while a thickened, undercut rim stands on a ribbed neck above a pronounced collar (FIG. 5:6). Pithoi with a shorter neck are seen with either a vertical or sloping stance (lower image), approaching the stance of Iron II vessels.

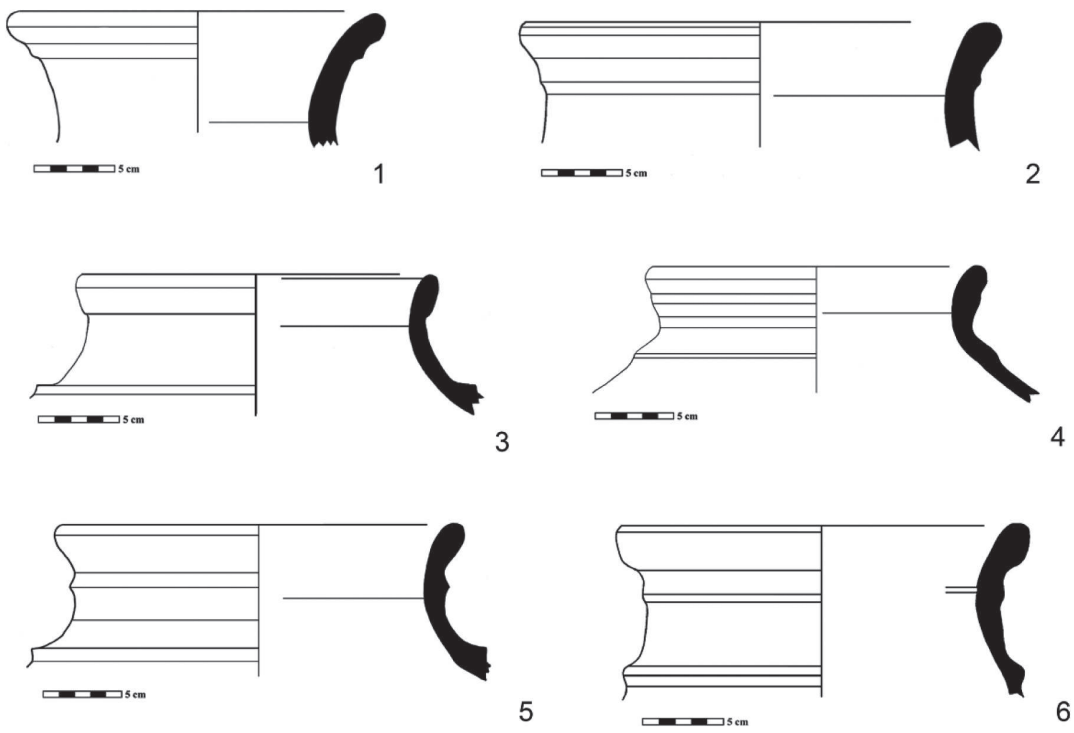
A group of sherds represent variations on

5. Of the early Iron Age I vessels illustrated by Franken, one collared jar and a second jar without a collar are sufficiently restored to determine their full height. These large jars (0.75–0.85 m tall) are from Phase A at Dayr 'Allā (Franken 1969: fig. 47:1). Collared pithoi from Saḥab with a short neck (Ibrahim 1978: fig. 1) are close in size (1.20 m tall) and overall body shape to the Iron Age II pithoi from Tall Jāwā (Daviau 1995; Chapter 4, below) and are discussed below in association with early Iron Age II forms (Stratum IX).

6. That this was the case can be seen clearly on Sherd E75/44.4, where the lower edge of the collar was not compressed sufficiently to erase the seam. This sherd also has an accumulation of clay on the interior of the lip where the second coil was attached to form the lip and the rectangular rim.

7. In the case of Sherd E54/15.4, the lower edge of the outer rim is preserved and is separated from the neck by a groove.

8. That the collar was a technological rather than a stylistic feature is also suggested by Killebrew (2001:391). A good illustration that shows how the clay was folded to strengthen the neck is the profile of a pithos from Tall al-'Umayrī (Herr 2001: fig. 14.4:2=Clark 1997: fig. 4.20:2); unfortunately there is no mention of the forming technique for this particular vessel by Herr or by Clark and London (2000:104–106) in their discussions of pithoi. MacDonald's observation (1992:135; fig. 12.12:7) of a lighter coloured clay used to reinforce the handle of a jug affirms that the addition to a pot of a different clay is not unusual. The jug in MacDonald's corpus was recovered at Site 34 of the Southern *Ghawrs* and North-East Arabah Archaeological Survey and is dated to the Iron Age IA.

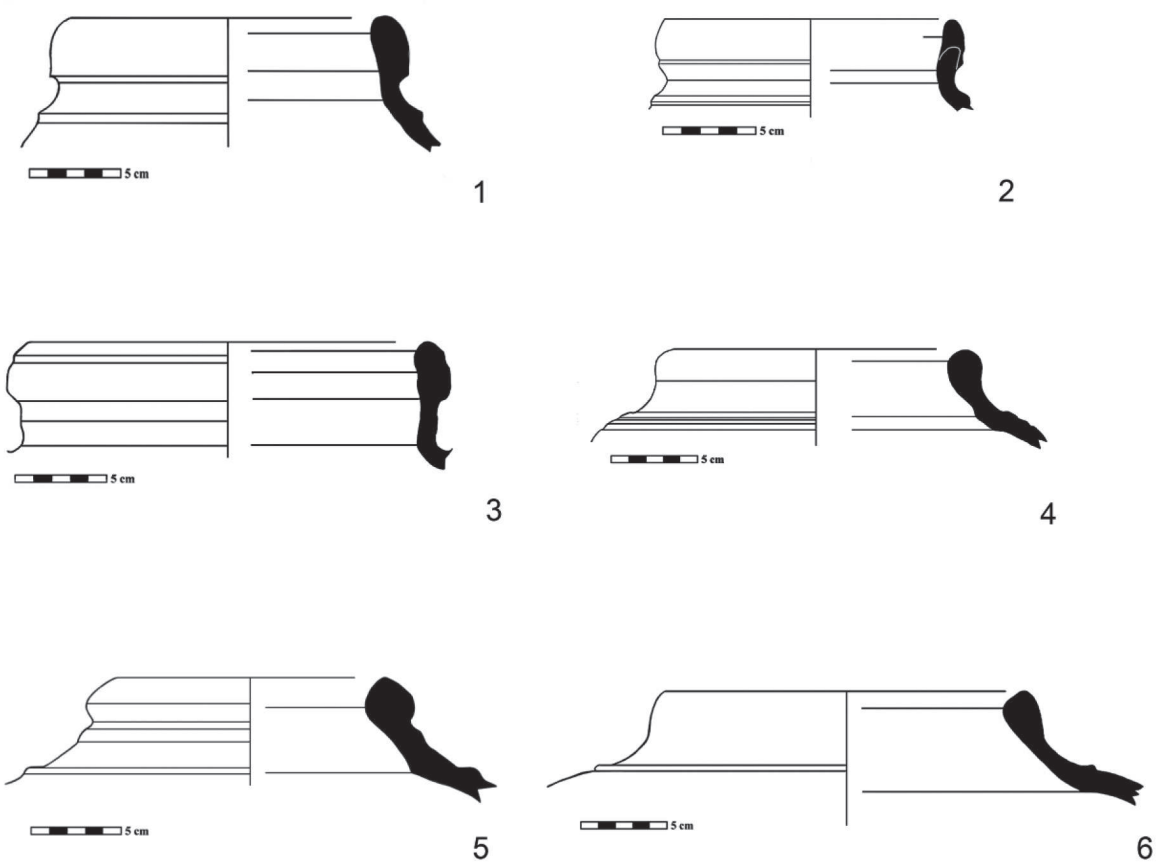


ID	SITE YR	FIELD SQUARE	PAIL	REG NO	VESSEL NO	FEATURES	FEXT CCODE	FEXT COLOUR	EXT CCODE	EXT COLOUR
1	TJ91	A14	14	1	V20	ridge below rim	5YR 6/6	reddish yellow	5YR 6/6	reddish yellow
2	TJ89	A2	74	2	V18	gray slip	7.5YR 7/4	pink	2.5Y 7/1	light gray
3	TJ94	E54	170	13	V16	round collar	5YR 7/3	pink	7.5YR 7/4	pink
4	TJ89	A2	74	1	V9	flattened collar	7.5YR 7/6	reddish yellow	7.5YR 7/6	reddish yellow
5	TJ91	A14	36	1	V10	pointed collar; neck ridge	5YR 7/4	pink	10YR 7/3	very pale brown
6	TJ95	C65	38	3	V21	neck ridge	5YR 6/6	reddish yellow	7.5YR 5/4	very pale brown

4. Tall-necked pithoi.

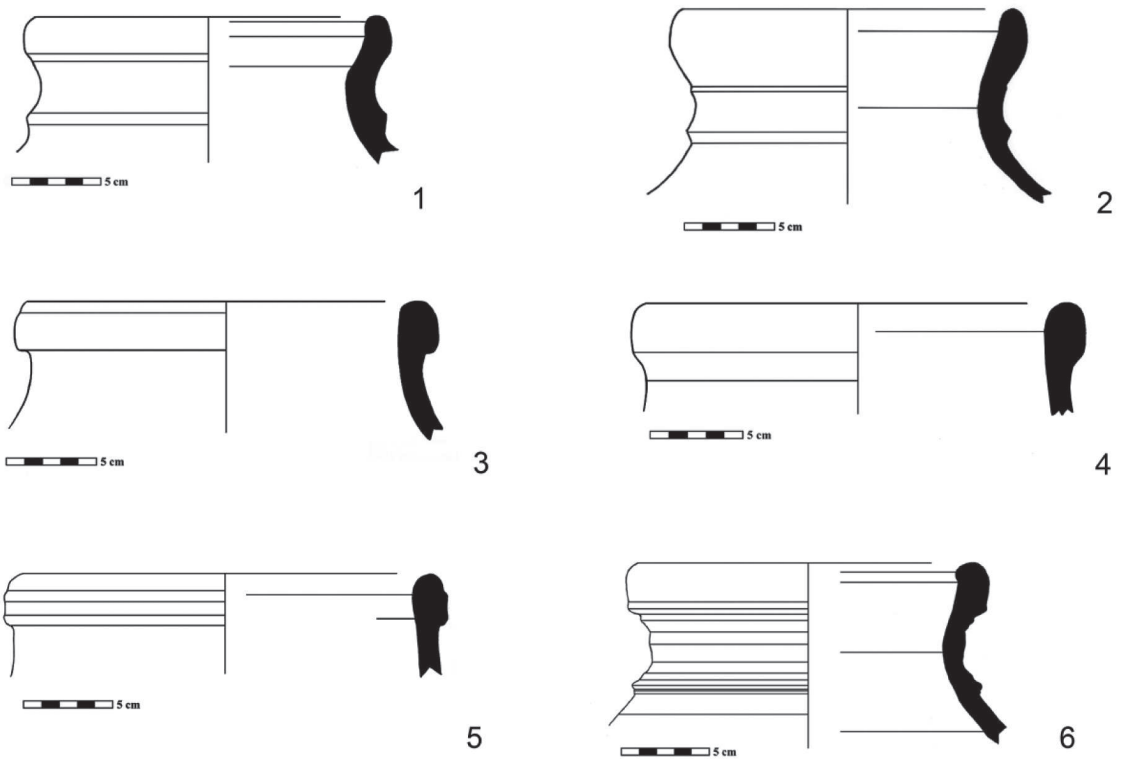
the styles described above. These include thickened rims, plain or with one or more ribs (FIG. 6:1–3) on shortened necks. Rolled and externally thickened rims on sloping necks (FIG. 6:4–6) suggest that the sherds in this group probably date late in Iron I or early in Iron II. However, among the short-necked pithoi are numerous examples with an Iron I gray ware fabric (FIG. 7). These are gray throughout, often with a gray slip on the exterior. A variant has a thin light red margin immediately under the surface, which itself may be gray or red.

Collars (FIG. 8): Both tall and short-necked pithoi are found with pointed or rounded upright collars, round collars on the shoulder, round compressed collars and even rounded



ID	SITE YR	FIELD SQUARE	PAIL	REG NO	VESSEL NO	FEATURES	FEXT CCODE	FEXT COLOUR	EXT CCODE	EXT COLOUR
1	TJ89	A13	106	1	V11	pointed collar	5YR 6/4	light reddish brown	7.5YR 6/3	light brown
2	TJ89	A13	142	28		pointed collar	5YR 6/6	reddish yellow	5YR 6/4	light reddish brown
3	TJ89	A2	74	7	V19	mark	2.5YR 6/6	light red	10YR 5/1	gray
4	TJ89	A13	8	7		flattened collar	7.5YR 7/4	pink	7.5YR 7/6	reddish yellow
5	TJ93	D22	40	1		neck ridge, collar	5YR 6/6	reddish yellow	5YR 6/6	reddish yellow
6	TJ93	C53	26	8		collar	5YR 7/6	reddish yellow	7.5YR 7/4	pink

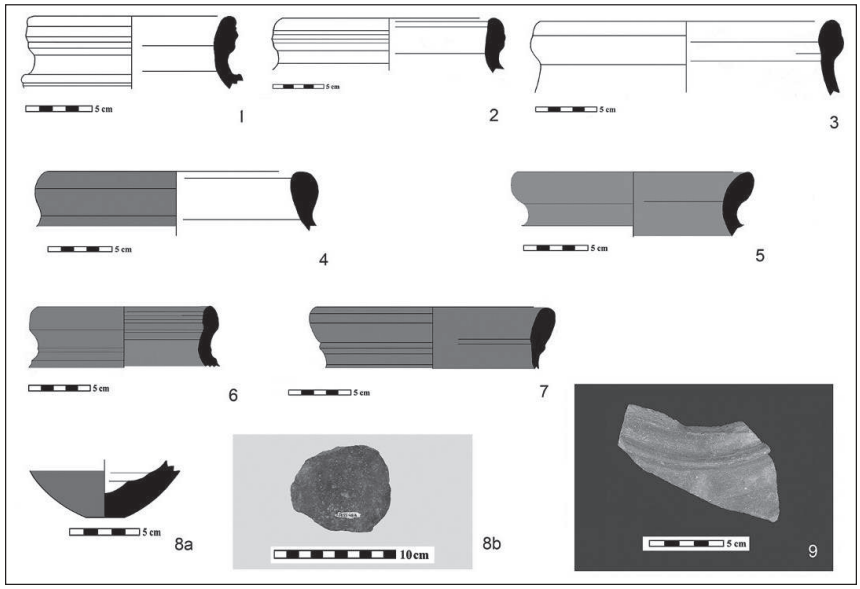
5. Thickened and Incurving Rim Pithoi.



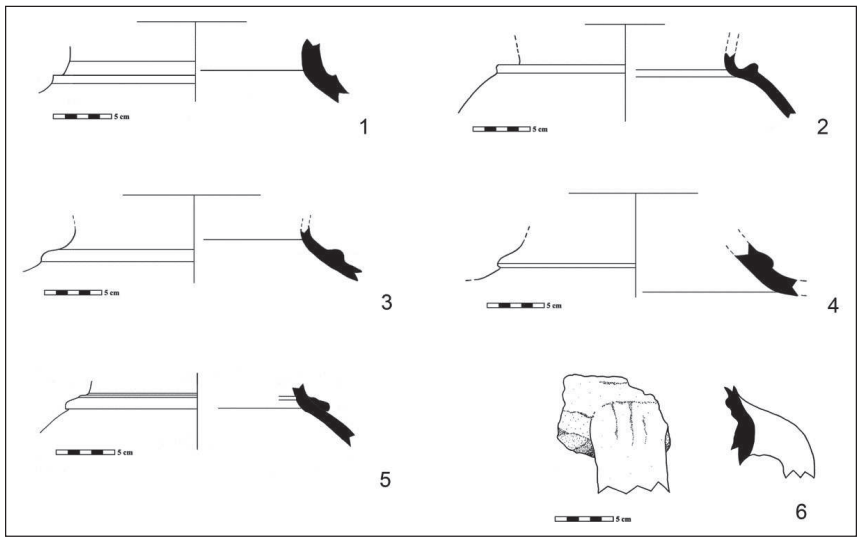
ID	SITE YR	FIELD SQUARE	PAIL	REG NO	VESSEL NO	FEATURES	FEXT CCODE	FEXT COLOUR	EXT CCODE	EXT COLOUR
1	TJ89	A2	11	2	V23	small collar	7.5YR 6/6	reddish yellow	7.5YR 7/4	pink
2	TJ89	A13	88	2	V8	pointed collar	7.5YR 7/4	pink	5YR 6/6	reddish yellow
3	TJ89	A2	74	3	V24	collar style; ribbed rim	7.5YR 7/3	pink	7.5YR 5/1	gray
4	TJ94	B24	47	2		collar style	10YR 7/2	light gray	5YR 7/4	pink
5	TJ89	A13	107	1		collar style	7.5YR 7/3	pink	2.5YR 6/6	light red
6	TJ95	E75	44	4	V22	stepped collar	2.5YR 6/4	light reddish brown	2.5YR 6/4	light reddish brown

6. Thickened and ribbed rim, long sloping-necked Pithoi.

and flattened collars. Most unusual among these jars is the round flattened collar that is vestigial in some places around the neck. A close parallel is found among the pithoi in a storeroom at Tall al-'Umayrī (Clark 1997: fig. 4.17) and in the corpus from Biet Jala near Jerusalem (Mazar 1981: fig. 9:5). As at Shiloh and Biet Jala, the collar may have one or more grooves, like



7. Examples of gray ware pithos rims, base and collar.



8. 1) Pointed, 2–3) rounded, and 4–5) compressed collars; 6) large ribbed handle.

a step, on the lower edge (Bunimovitz and Finkelstein 1993: fig. 6.58.8; Kelso 1968: pl. 56:1, 9, 11; Mazar 1981: fig. 9:4). This great variety of styles points to the production of various workshops, as well as different clay preparation and firing techniques. Although no restorable pots were recovered at Tall Jāwā, several handles can be assigned to these large jars (FIG. 8:6).

Function: While it is apparent that these very large jars were used for long term storage, scholars still debate their precise function. Were they used exclusively as containers for liquids or were dry goods also stored in these jars? and how were the contents removed from the jars given their size, which is usually more than 1.00 m in height. This problem, apparent at Tall al-ʻUmayrī where jars were found containing barley, was also evident at Tall Jāwā, where there is no sign of dipper juglets in the contemporary assemblage.

Petrography

Recent discussions of technology and potential modes of production used to produce collared pithoi have often been couched in the "ethnicity" debate. London (1989) preferred to see the collared pithos as a marker of the dichotomy between urban and rural lifestyles rather than the traditional highland vs. lowland

view, whereas Esse's (1992) work on the pithoi from Tall al-Mutasallim (Megiddo) lead him to reaffirm that collared pithoi were indicative of a highland tradition. He maintained that diversity and diffusion of this tradition was through both economic relations as well as exogamous marriage as these vessels were likely produced by women at the household level. Although Ibrahim (1978) does not comment exclusively on the mode of production of the pithoi found at Saḥab, he argues strongly that the diversity and spread of this vessel style is due to a socio-economic tradition not ethnicity[9]. London (1989) put forth the notion that these vessels were formed by specialists, likely itinerant potters producing pithoi locally. This position is also advocated by Herr (2006:66) for vessels excavated at Tall al-'Umayrī, as well as Killebrew (2001:391) for vessels found at smaller hill country sites, adding that specialized production centres were also likely involved (2001:389–391)[10].

Due to the size and complexity in construction techniques involved, it is clear that these vessels were produced by very skilled potters. The appearance of groups of collared pithoi composed of multiple petrographic or chemical groups at individual sites is often suggested as an indication of multiple workshops[11] (Yellin and Gunneweg 1989; Cohen-Weinberger and Goren 1996; Glass *et al*. 1993)[12], some not always local, which contradicts the notion that these vessels were produced by itinerant potters. Analysis of the collared pithoi from Biet Jala indicates diversity even in local production with the identification of two distinct ware groups (G1-A and G1-B; Killebrew 2001). This is further reinforced with the existence of 4 subgroups within Group G1-A suggesting production by multiple potters (2001:389). Similar diversity is noted at the Mādabā Plain sites of Tall al-'Umayrī and Ḥisbān (London 2012, London *et al*. 1991). Although most collared pithoi from both sites fall into the same chemical group[13], three separate Ware groups were identified (London 2012:694–696). Wares 6 and 7 differ on the basis of the percentages of limestone inclusions, with Ware 9 identified as having no single dominant inclusion (London 2012:649–653). Diversity within Ware group 6 is slight, however, London does indicate that the pithoi from Tall al-'Umayrī consistently contain limestone inclusions at slightly less than 65%, with those from Ḥisbān having between 70 and 80% (London 2012: 695).

Methodology

To address questions regarding mode of production, technological style, and provenance, petrographic analysis was conducted on six collared pithos rims from Tall Jāwā[14]. Although not a representative sample, the analysis of the six vessels does give us some insight into the technological choices made by the potters manufacturing these vessels. Examples of all three rim forms (tall flaring rim, tall neck thickened rim and short-necked rims) were sampled. Analytical procedures espoused by Mason (2004) and Whitbread (1986, 1995) were utilized, with petrographic descriptions of "primary characteristics" following Freestone (1991). Petrofabric groups where characterized based on quantity, shape, size, and composition of inclusions (Klassen 2009).

Petrographic Descriptions

Although there is apparent variety between the samples, the petrofabrics identified appear to be variations of the same clay matrix and mineral suite evident in the aplastic inclu-

9. After this paper was completed, we learned that the final report on Saḥab has recently been published by the Department of Antiquities (personal communication, M. Ibrahim).

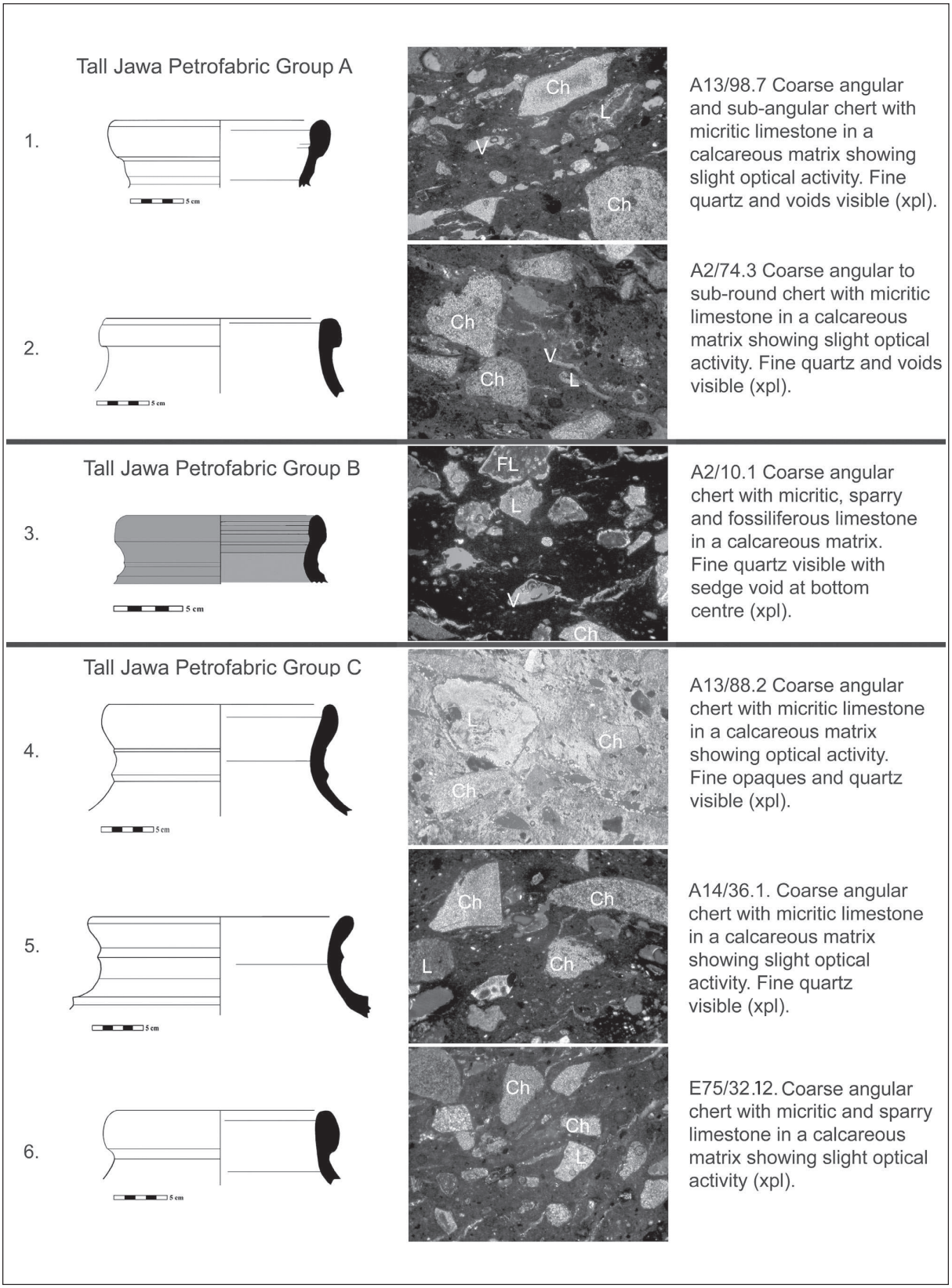
10. Raban (2001) agrees but goes on to suggest these highly specialized containers evolved out of the Late Bronze Age store jar tradition and are standardized in volume to meet administrative demands.

11. Mazar (1981: 30) suggests this on basis of diversity in rim shapes.

12. A collared pithos from Tall Kaysān, has been suggested to come from the Nahal Qishon region to the south of the site (Courtois 1980:356, table 1.12).

13. Two vessels from Tall al-'Umayrī that belong to Ware groups 7 and 9 do not fit any of the chemical groups determined through Instrumental Neutron Activation Analysis.

14. Sherd numbers include the field+square/pail number.item number.



9. Illustrations and photomicrographs of Iron I collared pithoi from Tall Jāwā analyzed using petrography; image width = 3.5 mm (Ch=chert, L=limestone, FL=fossiliferous limestone, V=void).

sions[15], all showing bimodal distribution. As a whole, the petrofabrics can be described as calcareous clay with slight to high optical activity with most samples showing a speckled b-fabric. Identifiable features of the aplastic inclusions suggest that there are three Tall Jāwā sub-groups defined by the presence or absence of shale and the coarseness of texture.

Petrofabric Group A

Petrofabric A (FIG. 9:1, 2) is composed of 2 samples (A13/98.7 and A2/74.3), which have a reduced core and are relatively coarse, with trace to non-existent shale. Dominant features include poorly sorted coarse inclusions composed of 13–14% well round to angular, medium to granule sand sized chert, 11–16% well round to sub-angular, fine sand to granule sized limestone (micritic, coquina, and sparite), 8-10% well round to sub-round, fine to very coarse sand sized opaques, trace to 1% medium sand sized rounded clay nodules. Sub-angular to angular grog and trace sub-angular medium sand size basalt occur only in A13/98.7. Finer aplastic inclusions consist of 1–2% silt to very fine sand sized angular quartz, with well round opaques, and micritic carbonates. Vessel A2/74.3 also shows small amounts of allochems in the form of echinoderm.

Petrofabric Group B

Group B (FIG. 9:3) has only one sample (A2/10.1) showing 1% of shale, much coarser than Group A, and is the only sample that does not show optical activity. Aplastics include poorly sorted course inclusions composed of 16% sub-round to angular, medium sand to very coarse sand sized chert, 20% well round to angular, medium sand to granule limestone (micritic and fossiliferous, with some sparite), 3% well round to sub-round, medium to granule sand sized opaques, 2% sub-angular to angular, medium to coarse sand sized calcite, 1% well round to sub-round, medium sand sized clay nodules, and trace sub-angular to angular, fine to medium sand size basalt and pyroxene. Finer aplastic inclusions consist of 1% silt to very fine sized angular quartz, well round opaques, chert, and micritic carbonates. Plant phytoliths are present in some voids in long section (.5 mm) with sharp edges indicating chaff temper; however most voids appear to be due to drying.

Petrofabric Group C

The final petrofabric group (FIG. 9:4–6), is composed of 3 samples (A13/88.2, A14/36.1, E75/32.7) defined by a finer texture than both groups A and B, and contains trace to 1% medium to coarse sand sized shale. Group C is characterized by poorly sorted course inclusions composed of 10-18% sub-round to angular, medium to granule sand sized chert, 4-18% well round to sub-round angular, medium to very coarse sand sized opaques, 8-16% well round to angular, medium to very coarse sand sized limestone (micritic and sparite), trace to 2% well round to round, medium to coarse sand sized clay nodules, and trace sub-angular, medium sand sized grog (E75/32.7 and A13/88.2). Trace medium sand sized basalt (A13/88.2) and plagioclase occur (A13/88.2 and E75/32.7), along with trace fine sand sized pyroxene and amphibole (A14/36.1). Finer aplastic inclusions consist of 2% silt to very fine sand sized angular quartz, along with well round opaques, angular chert, and micritic carbonates. Samples show trace amounts of allochems in the form of echinoderm, foraminifera and peloids, along with minimal fine to medium sand sized phosphates (E75/32.7).

Discussion

Organic inclusions are clearly evident by the presence of negative voids, ranging from 1–4% in four of the six samples. Of these, sedge is prominent with poorly preserved silica skeletons visible in both long and cross section in three of the samples (A13/88.2, A14/36.1, and

15. Overall, the petrofabrics of the collared pithoi, excluding the chert temper and course limestone, show similarities to those fabrics from Tall Jāwā described by Daviau and Graham (2009).

A13/98.7). As the percentage of this inclusion is relatively low, it is possible that it occurs naturally within the clay, suggesting clays were harvested from a wet environment, likely from a local wadi (Daviau and Klassen 2014:105. fig 4.3). Some negatives suggest the presence of chaff; however, this is not evident in all samples[16]. Other voids show parallel alignment and are the result of the drying process (Quinn 2013:61).

The angularity and poor sorting of the chert inclusions in all samples suggest this material was added as temper. Trace amounts of angular basalt inclusions (not common to the region) along with associated minerals (plagioclase and pyroxene) occur in four of the six samples, and may indicate that basalt vessels or tools were used to process the chert (Klassen 2009:199; London 2012:687–689).

In all of the vessels analyzed, separate coils can be clearly discerned in the thin section showing the primary forming technique used to produce the rim as discussed above. Consistency in fabric and aplastic inclusions in the observed coils is evident in all but one vessel. In sherd A13/98.7 there is a clear distinction of organic material in the form of sedge occurring only in the upper coil. The addition of organic material to the clay, or the use of clay with natural organic material for the upper coil, may have been used to even the drying time between the coils to avoid differential shrinkage with the potential of causing cracking (Quinn 2013:158).

When we compare the petrofabric groups of the Tall Jāwā collared pithoi to those analyzed at other sites on the Mādabā Plain, the diversity in the manufacturing of these vessels is clearly apparent. Although variety between the subgroups at Tall Jāwā has been noted, the mineral suite is consistent and the use of chert as temper is unseen at other sites in the region[17]. London (2012) identifies three Ware groups of collared pithoi at Tall al-'Umayrī, two of which overlap with those identified at Ḥisbān (Wares 6 and 9), although subtle differences in the percentages of limestone occur (see above). Similarities between Tall al-'Umayrī and Ḥisbān go beyond the mineralogy evident in the fabrics, as grog is consistently used as temper in all three groups (2012:646–653), unlike Tall Jāwā. Differences are also evident in the much higher percentages of carbonates in the form of limestone, as well as fine sand sized quartz in the clays used at both Tall al-'Umayrī and Ḥisbān[18].

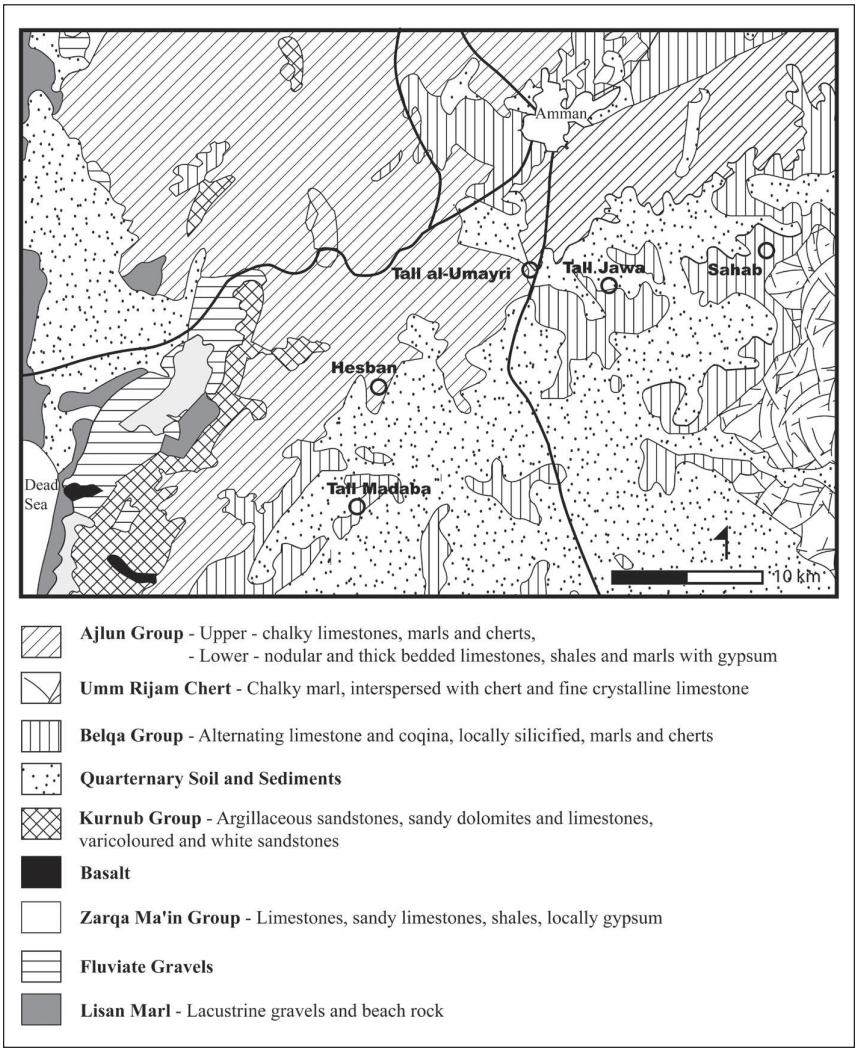
Local Production

The site of Tall Jāwā sits firmly on the 'Ajlūn and al-Balqā' groups of the Upper and Middle Cretaceous periods with the Wādī as-Sīr Limestone, Umm al-Ghudrān and the 'Ammān Silicified Limestone formations exposed in outcrops found throughout the Mādabā Plain region (FIG. 10) (Bender 1974; Bullard 1972; Lacelle 1986; Schnurrenburger 1991; 2003). It is understandable that the mineralogy described in the various petrographic analyses conducted on collared pithoi from Tall Jāwā, Tall al-'Umayrī, and Ḥisbān show such homogeneity, as these sites share a common geology. Similar clays and aplastic inclusions used to produce the collared pithoi are evident, as potters acquired materials from the formations that outcrop in the region. However, a clear distinction in the temper applied, as well as in the percentage and size of aplastic inclusions, highlights the heterogeneity in the production of these vessels. This additional petrographic study from Tall Jāwā reinforces the suggestion that unique technological styles are clearly evident in the production of collared pithoi at the various Iron I sites on the Mādabā Plain.

16. The use of chaff as temper is far from ubiquitous at Iron I sites in central Jordan. Chaff tempering has been noted as common in early Iron Age fabrics at Lāhūn (Steiner and Jacobs 2008) as well as Mādabā (S. Klassen, personal observation), whereas only 6% of the 51 samples analyzed petrographicaly from Khirbat al-Mudayna al-'Uliya show evidence of tempering with any organic material (Routledge et al 2014:98–99). Ibrahim (1978:117) mentions the occurrence of "straw" as a temper in the collared pithoi at Saḥab.

17. Only one of the eight collared pithoi analyzed from Tall Mādabā showed evidence of chert temper (Klassen 2012).

18. A local calcareous clay with a low percentage of fine quartz similar to that used for the Tall Jāwā collared pithoi was utilized by potters producing flared rim jars and holemouth vessels during the EB III period at Tall al-'Umayrī (Klassen 2009).



10. Geological map of Mādabā Plain region (adapted from Bender 1974 and Bullard 1972).

Distribution

When we look at the distribution of collared pithoi in the southern Levant, the hill country/ central highlands style has its heaviest concentration at sites from Tall al-Mutasallim (Megiddo) to Shiloh in Cisrjordan. Small numbers of collared pithoi are found at other sites south of Shiloh, but are not represented in the Negev at Beer-Sheba (Brandfon 1984:41) or Khirbat al-Mishāsh (Tall Masos) (Kempinski and Fritz 1977:144, n.6). The second area where collared pithoi are numerous is located south of ʻAmmān in central Jordan. Especially notable are the sites of Saḥab, Tall al-ʻUmayrī, Tall Jāwā, Ḥisbān and Tall Mādabā (Table A). Sites to the north and south of this area have many fewer examples of this large storage vessel, and most jars show no evidence of a collar around the neck. At the same time, these two area with heaviest concentration of collared pithoi reflect a settlement pattern that is not contiguous across the Jordan, especially in the area of Tall as-Saʻīdiyya and Tall Dayr ʻAllā, where collared jars are few.

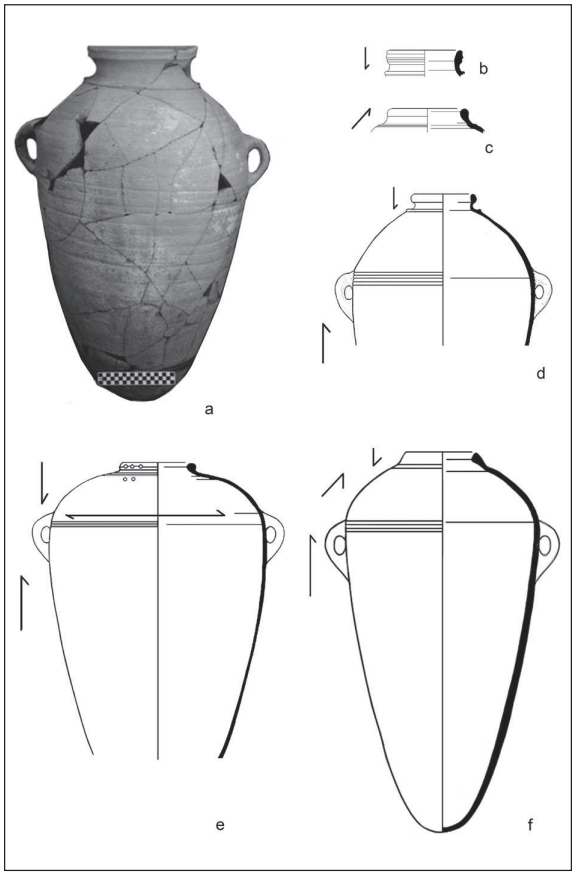
Table 1. Distribution of Collared Pithoi in Transjordan

Site	No.	Comments	References
Tall al-Fukhar	2	and 7 Galilean style, no collar	Barako 2015
Tall Abū al-Kharaz	2		Fischer 2013
Tall al-Saʻīdiyya	1 ?		
Tall Dayr ʻAllā	2		Franken 1969

Tall al-Mazār	?		
ʻAmmān		Unpub	
Saḥab	**16**		Ibrahim 1978
Tall al-ʻUmayrī	**80+**	Restored and 100s among sherds	Herr 2001; pers. communication
Tall Jāwā	**230**	rim sherds	In preparation
Ḥisbān	**45**	rim sherds	Herr 2012
Tall Mādabā	**20**	rim sherds	In prep
Jalūl	**8+**	rim sherds; more to come	Ray, pers. communication
Lāhūn	2	rim sherds	Steiner 2013
Bālūʻ	6 ?	short necked pothoi	Worschech 1992
Khirbat al-Mudayna al-ʻUliya	1 ?		Routledge 2004

What this does not tell us is whether there was social, political or ethnic cohesion among the sites using the collared style of large jar or whether there is continuity between the peoples of Iron I and Iron Age II in the ʻAmmān region. What is clear is that the potting tradition underwent a transformation with the noticeable decline in the use of gray ware, the development of new fabrics, the introduction of oxides and, possibly, grog as inclusions, and modifications in the shape of large pithoi. Most noticeable are the changes in the height of the neck that becomes shorter over time and the position of the shoulder that rises toward the rim throughout the Iron Age II, culminating in neckless pithoi (FIG. 11). With these changes came a repositioning of the handles at the change of direction between the body and the shoulder, often marked by grooves or string lines, and the disappearance of the collar. A new method of sealing the edge of folded clay is introduced consisting of a finger wide compressed band near the top of the shoulder that is marked by the resulting fine ridges flanking it on either side (Daviau 1995).

In order to expand our understanding of Iron Age I settlement on the Mādabā Plain, we hope



11. Changes in pithos shape from Iron I to Iron II: a) MPP Iron I Tall al-ʻUmayrī pithoi, photo D. R. Clark (used with permission); Tall Jāwā pithoi: b) neck becomes shorter; c) neck begins to slope inward; d) shoulder rises; e) shoulder is compressed and expanded; f) shoulder slopes directly to rim.

to see the full publication of additional ceramic assemblages that may clarify the distribution and the limits of the collared pithos tradition, especially from Tall Ṣāfūṭ, north of ʻAmmān, from ʻAmmān itself and from Jalūl. Pottery from these sites may also enable us to document changes over time in technology and body shape throughout the Early Iron Age in Transjordan.

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A Series of Iron Age Domestic Buildings in Field C at Tall Jalūl

Introduction

Excavations in Field C, located roughly in the center of Tall Jalūl, immediately east of the Acropolis, on the western side of the tall, were begun in 1994, focused on the remains of a pillared house, parts of which covered the original four squares (C1-4) of the field. Unfortunately, the western wall of this building was removed, due to stone robbing, not long after the building went out of use. In an effort to locate its southern end, an additional square (C5) was opened to the south, in 1996. Not only was this side of the building found, but two walls of another building were also unearthed. Hence, while the general contours of this pillared house have been known since the late 1990s, with most of it excavated to bedrock[1], the intriguing nature of the new building dictated that operations move laterally, to the south, where work in this part of the field concentrated for several more seasons.

However, in the decade following the work in the northern part of the field, the elements eroded part of the previously-unexcavated balk, north of the pillared building, exposing several stones that appeared to be part of a wall, and in 2011 the last remaining section of this building, including its northern wall and entrance, were completely uncovered (FIG. 1).

Phase 3

Phase 3 remains were originally found in Field C, in 1996, consisting of the bottom course of a well-built wall (C4: 29), located immediately above bedrock, beneath the eastern wall of a later building. The exposed section was 3.2m long and protruded 0.55-0.60m, beyond a later slightly offset wall, to the east, and is dated to Iron Age I on the basis of sherds from this period found in the lowest earth layer, next to it, to the east (Herr *et al*. 1996: 74, 1997: 155). A complementary section of this same wall, three stones in length, protruded beneath the upper wall, in Square 2, about 0.30m to the west, and was designated Wall C2: 30. The top elevations of both of the exposed sections of this wall were similar, being 809.52m and 809.50m respectively. This feature represents part of the eastern wall of a building, much of which was later robbed and reused as part of the Phase 2 building, above it, with much of the

1. At the base of the acropolis, bedrock is relatively close to the surface of the mound, becoming greater in depth toward the southern edge of the tall.

1. North balks of field C squares 1 and 2.

Phase 3 building reconstructed on the basis of its 1.50m and 1.90m wide southern and eastern walls.

In addition to Wall C4: 29 (=C2: 30), on the east, the building also consists of Wall C4: 34 (=C3: 29) on the south, and Wall C2: 31 on the north. A Robber from Phase 2 indicates the location of a missing western (Ghost) Wall C1: 35 (=C3: 51). On the basis of the later east-west blocking wall (C1: 32), from Phase 2, the original entrance of the building, measuring 1.0m wide, appears to have been in the north wall, slightly west of center. The missing western end of the northern wall of the building can reasonably be reconstructed as Hypothetical Wall C1: 36, between the entrance and the west wall.

Partition Wall C4: 31 was located on the east side of the building, apparently indicating the division of the building into a separate room at the southern end of the house. The remains of several pillars were found on the eastern side of the building. Only two pillars were found on the west side of the building, with the southernmost perhaps also representing the eastern end of a now-missing partition wall (Hypothetical Wall C3: 52).

The Phase 3 building was constructed directly on bedrock, and on the basis of the above evidence, would appear to be a typical four-rooms house, with three long rooms (A- C) separated by pillars, and a broad room (D) at the rear. On the basis of the reconstruction here, its north and south walls average 10.0m in length, with the length of its east and west walls estimated between 12.5-13.5m.

The building was constructed directly on bedrock, Walls C4: 29 and 34 being free-standing; their large, in some cases almost 1.5m stones, bonded together. Between the perimeter walls, was a surface consisting of a mixture of nari plaster, cobbles, and beaten earth. Roughly in the center of the floor, was the entrance to a subterranean bedrock cave installation, which probably served as a storage facility, the lack of cement seemingly ruling out its function as a cistern. A stone basin (Locus C3: 48) was set into the floor, just north of Pillar C3: 27, southwest of the Storage Cave. Within the broad room, immediately above the surface, was an earth layer that yielded an assemblage consisting of a chalice base, two lamps, a carinated bowl, and numerous beads made of carnelian, faience, frit, and quartz.

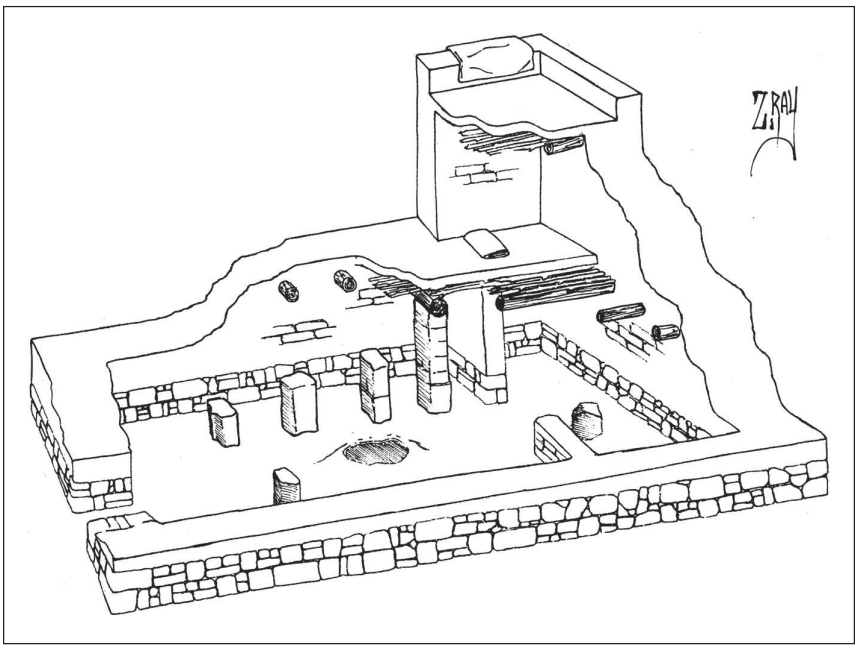
This phase appears to have ended with the collapse of the building, perhaps due to a flash flood, with water, silt and debris moving at a

considerable pace down from the acropolis, to the west of the building. The fact that its walls were built directly upon bedrock, without the benefit of foundation trenches to help support them, may have contributed to its collapse. In the broad room, there is a large stone (Locus C3: 50), *ca.* 0.80m wide × 0.40m deep, and 0.50m high, sitting on the surface. Its location, considerably out of line with the two pillars on the western side of the building, as well as its squat, somewhat tapering shape, would seem to rule out another pillar. This stone may have rolled down the hill from the acropolis in the flood that destroyed the house at the end of Phase 3, and hence represent part of the destruction debris, or alternatively, connected with the above-mentioned assemblage of artifacts, served as a standing stone.

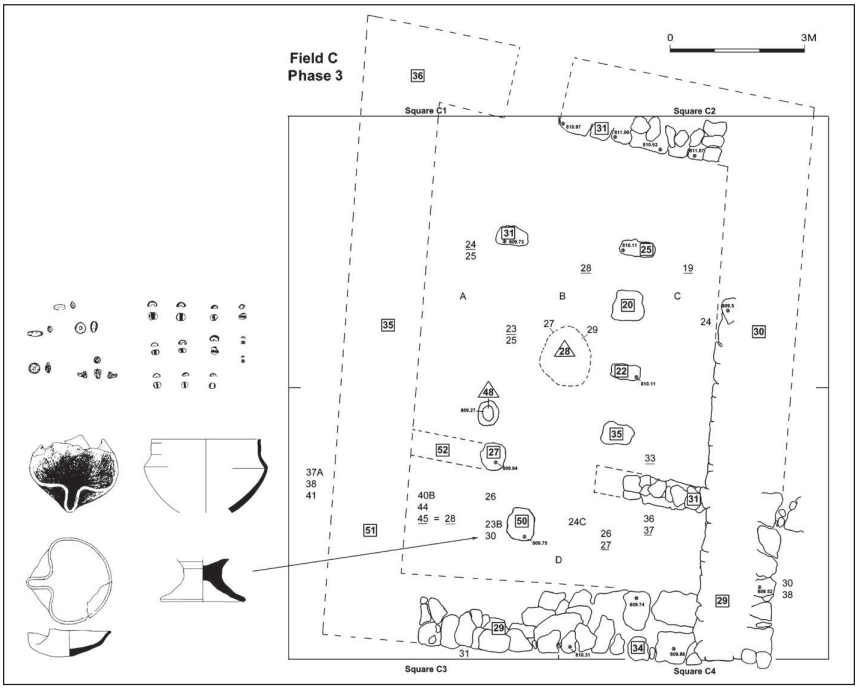
As previously mentioned, it would appear that the inhabitants of Phase 3 constructed a typical four-rooms house. The building, as reconstructed here, is *ca.* 130m^2, which is the average size of a rural house of this type. However, at the same time, is not out of line for an upper-class family with the economic means to maintain a large house in an urban setting (Faust 1999: 240, 245-46), especially since it is located next to the acropolis, where public buildings would have traditionally been erected (Faust 2003: 131, 2012: 53). The walls of this building are thick enough to have supported a second story (FIG. 2), but since the majority of the destruction debris, incorporated into the building in the following phase, were found only in the broad room, a reconstruction with a second floor only above this part of the Phase 3 building seems more accurate. If this surmise is correct, it would still have somewhat incremented the actual size of the building.

The assemblage of artifacts in the broad room (FIG. 3), including the chalice base, the lamps, the carinated bowl, and beads, all Category B cult objects, according to Schmitt's typology (Albertz and Schmitt 2012: 60-75), along with several nearby Category C cooking pots, located a short distance away from the stone basin embedded in the floor, would seem to represent some kind of domestic cult activity. If that is the correct, Zevit's behavioral correlates 3, 10? and 11, *i.e.* the ritual took place in a room set aside for its performance; food or drink were presented, consumed or libated; and votives may have been presented (Zevit 2001: 82), might have been associated with the presence of these artifacts.

The ceramics of Phase 3 represent the earli-



2. Isometric drawing of the phase 3 pillared house.



3. Phase 3 pillared house and cultic artifacts.

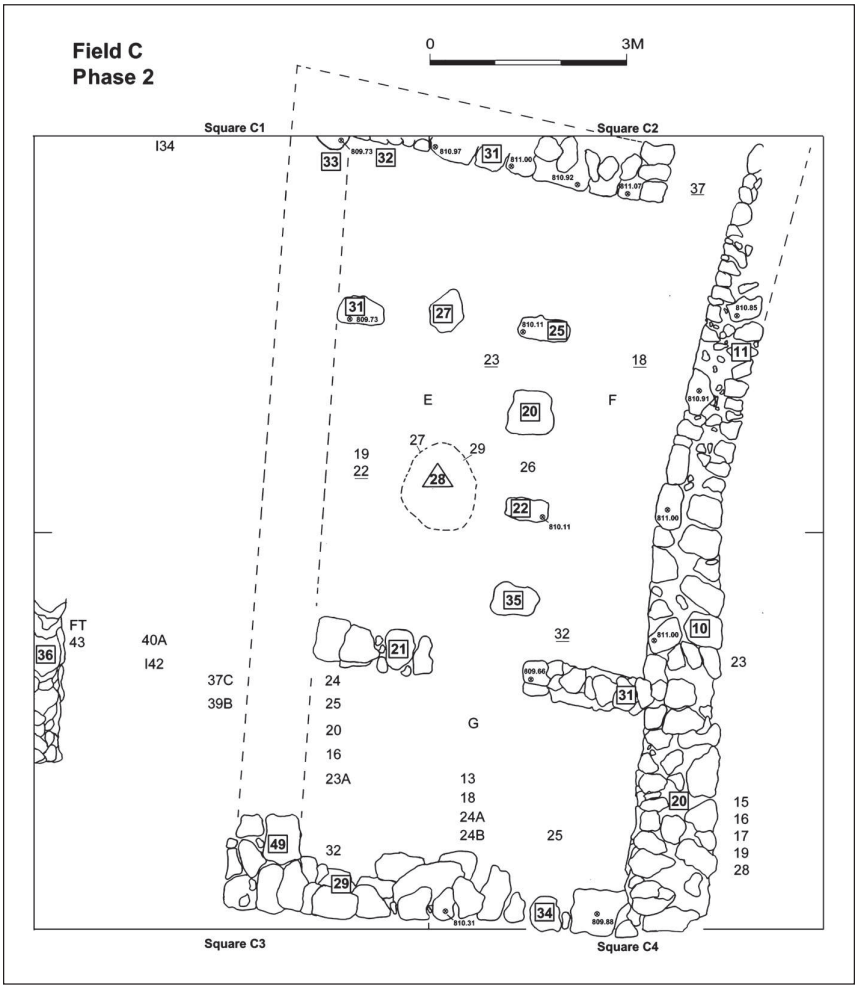
est *in situ* material found in Field C. While the majority of the pottery dates to Iron Age I and seems to be consistently connected with loci associated with the construction and use of the four-rooms house, the Iron Age II sherds within the destruction debris would seem to indicate a date of early Iron Age II for this phase.

Phase 2

It would appear that the damage to the Phase 3 building was considerable. When the inhabitants of Phase 2 rebuilt the pillared house (FIG. 4), they decided to remove the stone foundation courses of the western wall of the earlier building, as evidenced by Robber Trench C1: 34 (= C3: 42). They also removed the western end of the northern wall down to the entrance of the Phase 3 building. A short section of the western end of wall, on the south, was either destroyed in the event the ended the Phase 3 building, or was also removed at this time. A new western wall (C1: 33 = C3: 49) was laid, probably with stones mined from its predecessor, now a little over a meter to the east. The footing for this new wall was dug into the debris on top of Phase 3 floor, on the west. In addition, this wall partially covered the stone basin, set into the floor of the earlier building, indicating that the new western wall was laid upon the original (Phase 3) surface.

Overall, the new building was much smaller in size than its predecessor. In addition, although the remaining walls of the Phase 2 building were in some places realigned on top of the remaining courses of the earlier building, they were now somewhat narrower. The southern wall was now only 1.20-1.30m in width. The new eastern wall (C: 2, 11 = C4: 10, 20), now ranging only 0.70-1.30m in width, was laid on top of, but offset to the western edge of its 1.90m wide predecessor, on the southern end, but seems to have just about completely replaced the earlier wall on the northern end, now running diagonally to the northeast. The north end of the building, was now only .75m in width, down from an estimated 1.4m in the previous phase. The original, Phase 3, entrance was now blocked by Wall C1:32, forming a corner with the new western wall. The new 1.14m wide Phase 2 entrance was relocated to the northeast corner of the building, with a large, flat stone, at its base, that probably served as its threshold.

The eastern partition wall continued in use,



4. Phase 2 of the pillared building.

along with the addition of Wall C3:21, the latter serving the same function on the western end of the Phase 2 building. The pillars of the previous phase were also reused from the previous building, with Pillar C1: 31, now abutting the new western wall, perhaps serving as a pilaster. Pillar C2: 27 was added at the northern end of the building to help support the roof. Although more of the Phase 2 pillared house is extant than its predecessor, its precise dimensions are still in need of some reconstruction. The east wall measures 12.0m in length, with the reconstructed length of the west wall estimated at *ca.* 13.0m. Its north and south walls measure 7.75m and 7.25m long respectively. Overall, the Phase 2 building is a narrower, three-room subtype of a four-room house, with two long rooms (E and F) and a broad room (G).

It would seem that another building was constructed just west of the pillared house, with Wall C3: 36, serving as part of the eastern wall of that structure.

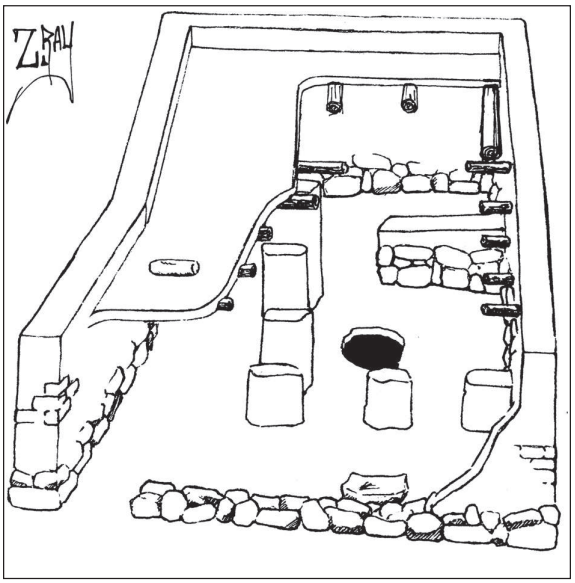
After removing most of the Phase 3 destruction debris within the building, the builders of Phase 2 laid a nari surface throughout the long rooms. The Storage cave continued in use, with its bedrock rim now aligned flush with the new floor. In the broad room, the builders apparently just tamped down the remainder of the mudbrick detritus and earth layers of the previous phase, for the floor.

The destruction of the building may have been the result of an attack upon the site, as at least twenty disarticulated skeletons were found in the bedrock storage cave, along with two ballistic stones, an axe head, and part of a horse figurine. On the surface, above it, an arrowhead, a dagger? blade, and two more ballis-

tics were found among an otherwise domestic repertoire, including a complete quern, among the debris. A roof roller, which fell with the roof debris, was also found. At the rear of the building, in the broad room, which was probably used mostly for storage, another ballistic was found, along with a large portion of a collared-rim pithos set in an upright position, and a complete basalt Iron Age lamp, were found among the destruction debris.

It would appear that the Phase 2 structure was a smaller, narrower (reconstructed at *ca.* 90m^2), three-room version of its four-room predecessor. This is typical for Iron Age II urban houses, which averaged 60-70m^2; the majority also being the three-room subtype of a four-room house (Faust 1999: 238, 246). Due to its relatively thinner walls during this phase, and a roof roller found in the destruction debris immediately below, it seems unlikely that the building had a second floor at this time (FIG. 5). There are numerous parallels, perhaps the closest being the Stratum V, House 9, at Tall as-Sa'īdīyah (Pritchard 1985: fig. 179).

Phase 2, like its predecessor, existed for a long period of time. The ceramic evidence would suggest that the pithos, found *in situ* in the destruction layer in the broad room, dates to early Iron Age IIA, while several black-



5. Isometric drawing of the phase 2 pillared house.

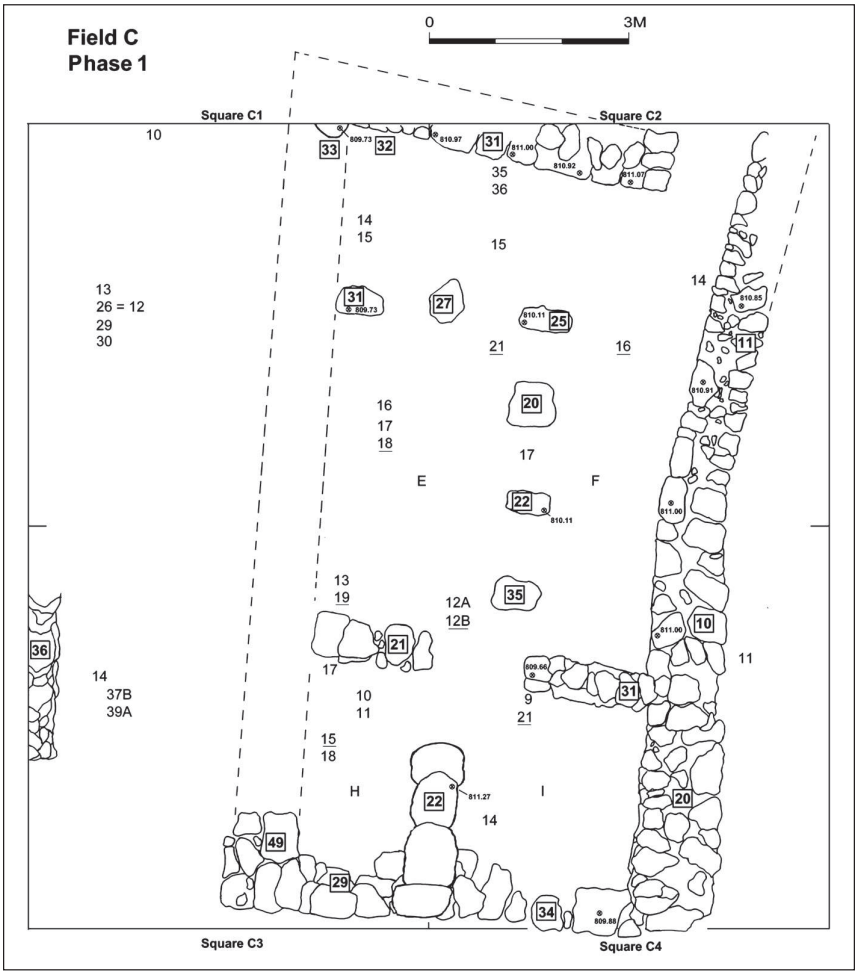
ware bowls date to the (early) sixth century BC (Herr 2006: 526, figs. 1:9, 2:13), suggesting an Iron Age II C date for this phase. Although out of context, the scaraboid-shaped *Naqab ben Sedeq'el* seal, with seventh century BC palaeography (Herr *et al.* 1997: 156, fig. 14), evidently belongs to this phase. The destruction of this building may have been connected with the Babylonian invasion of the area in 582 BC, mentioned in Josephus (*Antiquities* 10.9.7).

Field Phase 1

Following the destruction at the end of Phase 2, the pillared house was rebuilt again, this time slightly modified (FIG. 6). The builders of the Phase 1 reused all of the perimeter and partition walls of the previous phase. The pillars were also reused, dividing the building, as in the previous phase, into two long rooms (E and F). The entrance to the building remained in its northeastern corner. New to the building in Phase 1 was the subdivision of the broad room into two smaller rooms (H and I), with the addition of Wall C4: 22, built on top of a considerable amount of mudbrick detritus from the caved-in superstructure of the previous phase.

The builders of the Phase 1 pillared house brought in up to 1.40 m of earth fill, burying the destruction debris of the previous phase, putting the storage cave out of use, and creating a beaten-earth floor on top, in the long rooms. The entryway was filled with large stones and a layer of earth, even with the floor level. At the rear, in the broad room, earth layers were also added, filling in the gaps between the mudbrick destruction debris of the previous phase, and the partition walls, the uppermost of these layer used as the floor of these storerooms.

The Phase 1 building seems to have been destroyed by an earthquake. Massive amounts of debris were found, including a layer of mudbrick detritus, probably representing part of the superstructure; and rubble layers, indicating a southern direction for the landing of fallen ar-



6. Phase 1 of the pillared building.

chitectural debris from the northern and perimeter walls.

The Phase 1 pillared building, as noted above, was a minor modification of its predecessor. Several artifacts were found in association with the floors of this building, including an arrowhead, two ballistics, a gaming piece, and a figurine fragment. Phase 1 pottery is typical of the Late Iron II C/early Persian period in Transjordan.

Geologically, Jordan occupies part of the northwestern portion of the Arabian Plate. The Dead Sea Transform, a left-lateral strike slip fault, between it and the African plate, to the west, allows motion between the two plates, also causing tectonic activity (al-Isa 1991: 22-23; Klinger *et al*. 2000: 769). During seismic events there is northward horizontal movement of the Arabian Plate (Atallah 1991: 17- 18), with architectural elements tending to fall in the opposite direction, to the south. Many high magnitude earthquakes along the Dead Sea Transform have been documented and dated from sediment cores taken at three sites along the western shore of the Dead Sea, with the ‘Ayn Gedi core tracking the longest sequence. On this basis, we suggest that the event which destroyed the Phase 1 pillared house was a 7.5 magnitude earthquake that occurred in 525BC (Migowski *et al*. 2004: 306, Table 2).

Conclusion

The results of the excavations of the northern end of Field C, at Jalūl, are the remains of two superimposed domestic buildings, the earliest one a traditional four-rooms house, on top of which two phases of a three-rooms house were built.

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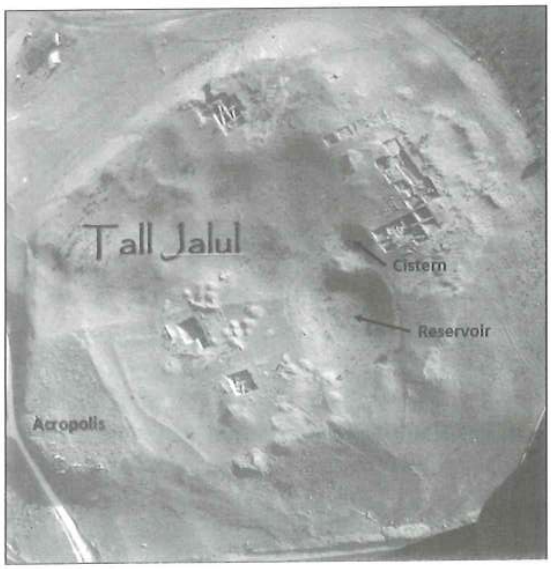
Water System of Tall Jalūl

Tall Jalūl is located 5 km east of Madaba, sitting on an elevated mound surrounded by wheat and barley fields and also by numerous orchards. It has a commanding view of the entire area controlling the trade routes and other movements whether military troops or different groups of people. The site attracted people from early history (Early Bronze Age) to settle there. Since access to water was one of the primary factors for settlement, it is very likely that the site had natural water source. Due to its close proximity to the desert, it is most likely that the site had a spring or water source which attracted the first settlers. Even before excavation started, based on the surface depression, it was evident that the site had access to water. This earthen depression is located in southeastern corner of the site, and measures approximately 35 meters in length and 25 meters in width (FIG.1). Above the northeastern corner of the depression there is a closed cistern[1].

Excavations at Tall Jalūl started in 1992 when Fields A and B were opened. In 1994 Field C was added while work continued in Fields A and B. The next season (1996) Field D, which was in close proximity to Field C, was opened. Excavation started on an elevated area located on the northeastern ridge of the site during 1999 which became Field E. During 2005, Field F was opened to investigate area just north of the acropolis. Next season, 2007, Fields G and H were added on the southern side of the tell to investigate a possible defense system of the



1. Tall Jalūl.

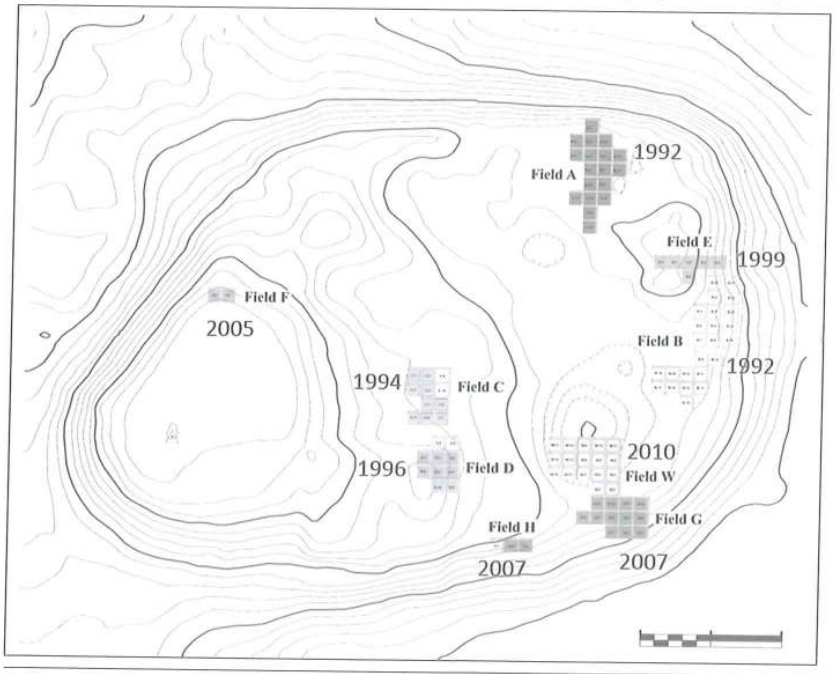
1. Construction of this cistern is not known. Most likely it was created at the time when open air reservoir went out of use during the Persian period. This however is only a speculation since cistern has not been excavated.

site. Finally, as a result of the discovery of water channel found in Field G, Field W was introduced during the 2010 season (FIG. 2)[2].

A "platform", south of depression, became area of interest due to several exposed stones, due to erosion, which looked like a wall and was designated as Filed G in 2007. During the course of the season several architectural features were discovered. The southeastern corner the city wall was discovered (G2. L5), dated to 10th Century BC, and also a water channel with its floor (G2. L38) and channel walls (G2. L4 and G2. L16) (FIG.3). During the following seasons it seemed clear that the channel comes from the area of great depression, which prompted the opening of the Field W in 2010. Since then 17 squares have been excavated in this field, where an open air reservoir was discovered. At first, the bottom of the reservoir was discovered in Square W5, and after excavating a probe into its floor it became evident that it consisted of several layers of compact lime plaster, which were most likely laid during different periods. Four distinct layers of plaster were visible, indicating as many reconstruction/repair stages during its use (FIG. 4). Since the fact that the floor sits on bedrock, it was impossible to find the probable date of its first construction. The entire reservoir was chiseled into bedrock where on it southern and western sides the constructors had to chisel for more than 2.0 meters (FIG. 5). The floor and the sides of the reservoir were plastered with a mixture of lime and crushed flint stone to create a compact and very hard surface. The eastern side of the reservoir was dug only one meter into the bedrock, and then a wall was built to increase the hight of the reservoir to 3.0 meters.

The reservoir sits on bedrock, and from the material found under its floor is impossible to date. For this reason, several squares (W2, W6, and W11) were opened outside the reservoir and adjacent to its eastern sides to find the date of its construction. Squares W2 and W6 brought the best results and enough material to project the time when the reservoir was built.

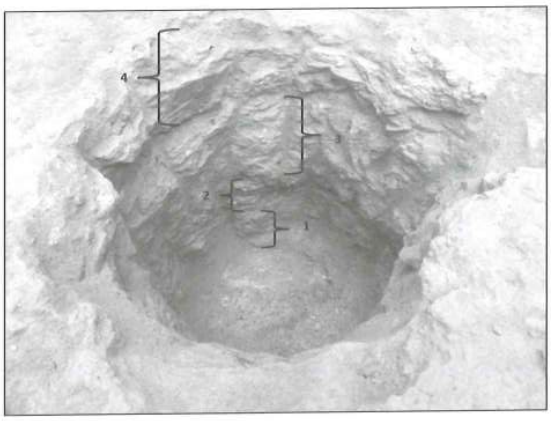
Square W2 was excavated all the way to the bedrock which was covered with 1.0 meter thick layer filled, with Early Bronze pottery sherds. The pottery assemblage was made of handmade pots consisting of flat base bowls, ledge handles, jugs with loop handles, and holemouth jars. Red



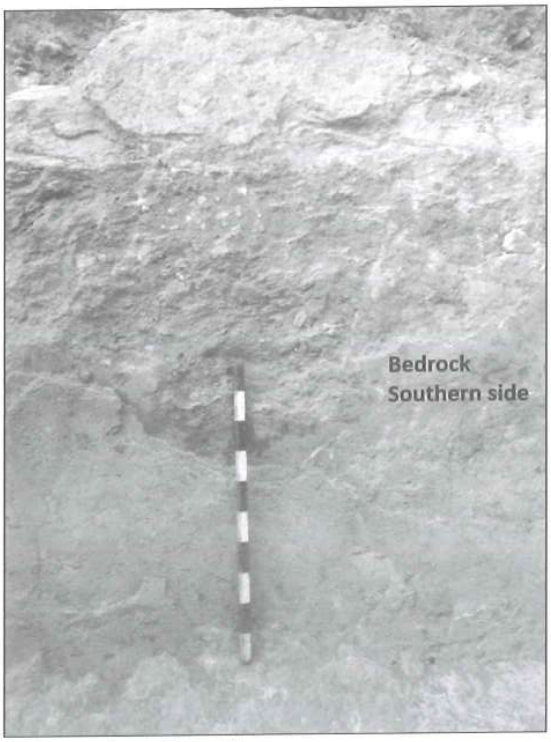
2. Topographical map.

2. For publications on the previous seasons of excavation, see the bibliography.

3. Water channel.



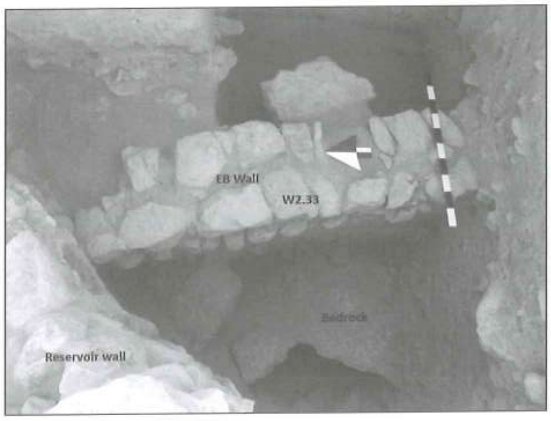
4. Reservoir floor.



5. Reservoir southern side.

and grey burnish were not found on any of the fragments, but net pattern burnish was found on one sherd. Above the Early Bronze Age debris, a small wall (W2.33) was found, that consisted of two courses, constructed from small and medium, roughly-hewn stones, lined in two rows (FIG. 6). The pottery found on floor of this building is very similar to that which was found under it, making this structure the oldest one found on the tell so far. It is most likely that the settlers of this period were attracted by presence of a natural water source to establish their settlement. The wall was partially ruined and destroyed at the time when reservoir was constructed.

above the early bronze age material, layers filled with late iron age i and early iron age ii were deposited. there is a complete absence of middle and late bronze material culture in between. the layer with late iron age I and early iron age ii ceramics was about 0.6 meters thick, above which the first of three floors were laid (FIG. 7). based on the pottery found under, and immediately above these floors, it is evident that they were constructed during different centuries. the earliest floor is dated to the 10th Century BC, the second to the 9th Century BC, and the third to the 8th Century BC it would seem that the upper layers of the reservoir's wall were robbed and it was impossible to find, in square w2, any connection between these floors and the reservoir wall. for this reason square w11 was opened, in 2012, to examine



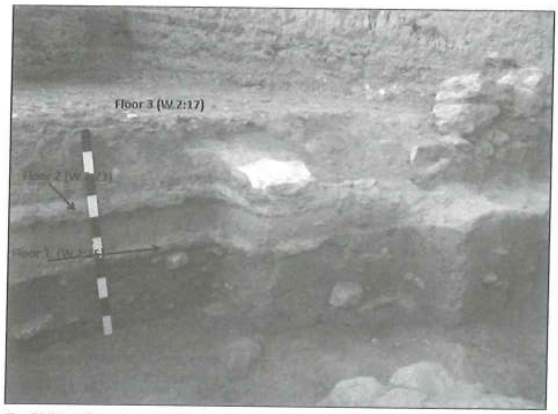
6. EB structure.

closely the same floors and layers and see if these floor sealed against the reservoir wall.

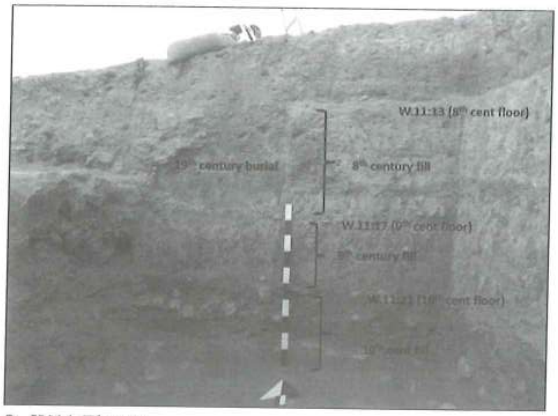
All three floors and layers found in Square W2 were also present in Square W11 (FIG. 8). This time, the first (10th Century BC) and second (9th Century BC) floors sealed against the reservoir wall, indicating its earliest construction during the 10th Century BC, with the wall slightly elevated when the 9th Century BC floor was established. The exact elevation of the reservoir wall is not clear since the top of its remaining stones are just 50 centimeters below the present surface. Whether the top section of the wall was robbed during the course of the time remains unclear. The third (8th Century BC) floor was disrupted by a 19 Century burial, and its connection to the reservoir wall is not present in this square (FIG. 8). These three floors were not created as floors within any architectural structure, but most likely served as paths or roads to provide a solid surface for those who were coming to get needed water from the reservoir. Stairs to the reservoir have not yet been found since only about half of the reservoir has been cleared of the fill which was deposited there during the centuries since the reservoir went out of use.

After the 8th Century BC floor went out of use, it was filled with 0.50 m of debris to create a surface, upon which a water channel was constructed (FIG. 9). The water channel was first discovered in Field G during the 2007 season of excavation. During the course of several consecutive seasons (2009-2012) it was revealed that the channel is directed toward the water reservoir, but before it connects, it turns north and runs paralleled with the eastern edge of the reservoir wall (FIG. 10). Since the northern section of the water channel is close to surface, its existence is limited only in fragmentary way. Also it is evident that the section of the water channel that exits the site is lower than its northern section by 0.73m, which indicates that its purpose was to drain water from the city limits outside the city wall. The channel is 0.50m wide and its walls are more than 1.0m high. Both walls and floor of the channel were covered with thick layer of lime plaster (FIG. 11) to prevent the water leakage.

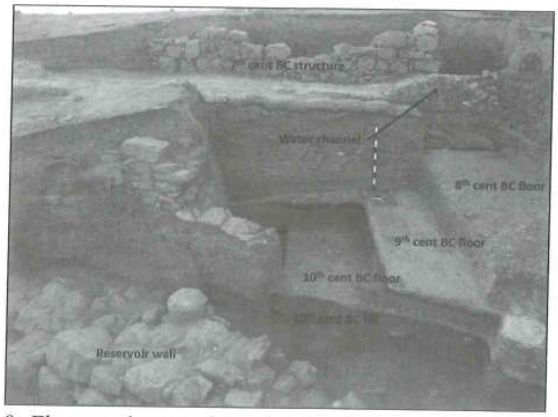
It appears that the floor of the water channel is almost 1.5 meters higher than the top of the reservoir wall (FIG. 10), indicating that the channel was not used to drain water from the



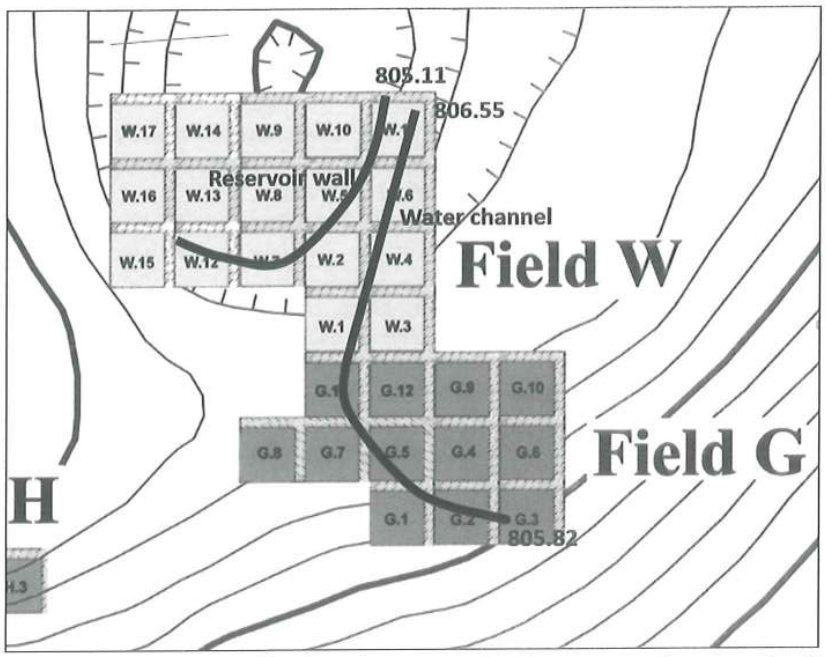
7. W2 Floors.



8. W11 Floors.



9. Floors and water channel.

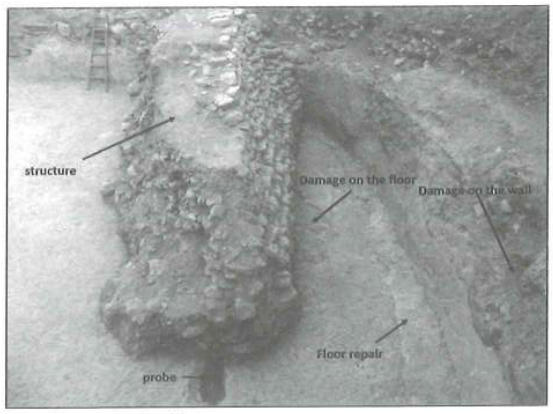


10. Reservoir wall and water channel.

reservoir. However, this is only correct if the present wall of the reservoir would not have been higher at the time of its use. Due to the fact that most of the walls throughout the tell suffered loss of its stones, by robbing activities, it would not be impossible to accept the fact that the reservoir walls were higher in antiquity than at present.

Based on the pottery assemblage collected above the reservoir floor, it is evident that it went out of use after the 7th Century BC. It seems that around that time the inhabitants of this settlement had problems keeping the water within the reservoir since there is evidence of floor damage in its southern section. Also southern wall of the reservoir seems to have suffered from the same problems. In addition, there is evidence of a plaster repair to the area where the floor meets the wall in the same section (FIG. 12). After all attempts failed to hold the water, the inhabitants decided to partition the reservoir by building a dam-like structure to isolate the unrepairable section (FIG.12). Before building this structure on the floor of the existing reservoir, the constructors dug a probe into the floor to test its foundations to make sure that it would hold the weight of the structure. The structure is partially preserved and measures 3.0m high and 3.0m wide at its base. It consists of two parallel walls with fill

11. Water channel.



12. Reservoir looking east.

placed between them. The southern wall was constructed on an angle, while northern wall appears to be built in straight up fashion. Due to its open air nature and capacity, it seems likely that the reservoir was supplied by the spring water. When full it could contain at least 3000 cubic meters of water. When the need for the reservoir expired (because of its unsustainability or decrease in population of the site) it was abandoned, and soon after[3], a closed cistern was built in the vicinity of the reservoir, but of much smaller capacity. Since the floor of the cistern is at least 4.0 m lower than the floor of the reservoir, it was possible to divert the spring water from the area of reservoir into the cistern.

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3. It is estimated that the cistern was built during the Persian period.

Raouf Abujaber

Conservation and Management "Three Historic Sites Completely Destroyed in as-Salṭ"

Government executives involved with the different aspects of archeology including the management of the affairs of the Department of Antiquities when the Emirate was established in 1921 were definitely a learned and well-meaning group. The Vanguard amongst them had their University education during the thirties and forties of the 20th Century at either AUB or the Damascus University. Not one amongst them, to my knowledge studied Archeology, but the late Dr. Abdul Karim Gharaybeh was the second Jordanian student to attend a University in England where he was awarded a Ph. D. in History by the London University.

Leading amongst this group was Mr. Wasfi Al-Tell who became Prime Minister on the 28th January 1962. There was then no Ministry of Tourism and the Department of Antiquities was directly attached to the Prime Minister's Office. He and few of his colleagues lived in as-Salṭ for few years to follow up their school in the only secondary school built in 1924. They knew the town well and must have felt a duty towards modernizing it. Modernization then, meant to us, doing away with old ways of life, including the demolition of old dilapidated buildings and the opening of New Wider Streets to accommodate the larger number of motorcars that were coming into the country.

And that is how the whole story started for the three oldest relics in town. These were in order of historical sequence, the castle *al-Qal'a*, the water spring *al-'Ayn* and the Government house *Sarāyā*. What remained standing of the castle after seven hundred years of intermittent service, was demolished altogether. Likewise the *Sarāyā* which was still being used by the Government Departments was brought down to the ground. *al-'Ayn* –the water spring– which use has come to an end after the water project in the town provided running municipal water supply through pipes to the population, was neglected and later demolished.

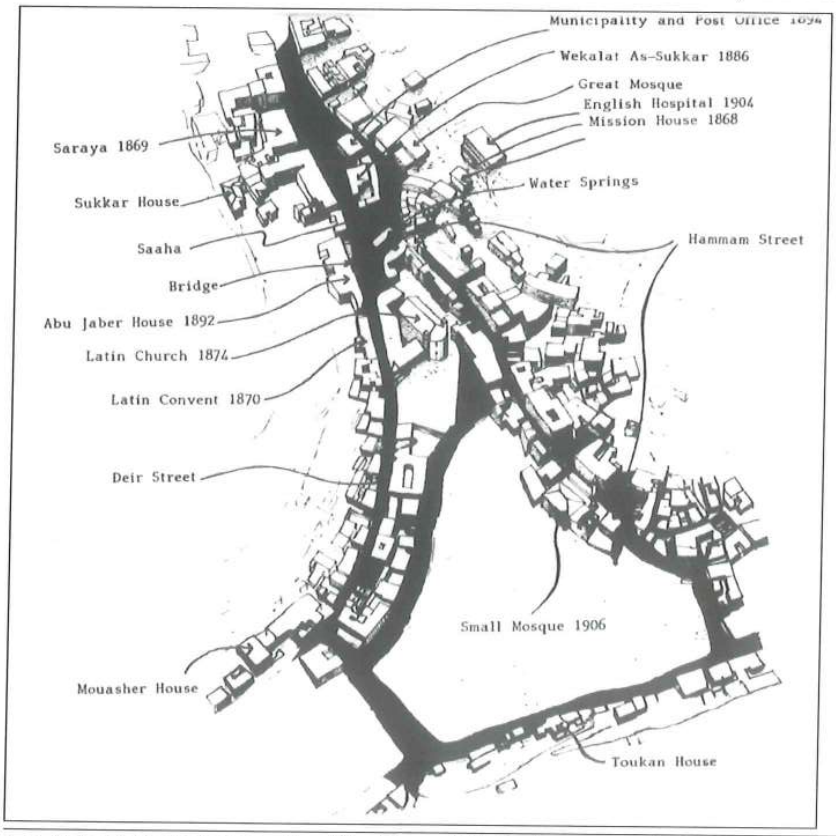
This sad episode in Jordan's history which happened during the second half of the twentieth century, will be documented in this study. The history of each of the three sites will be presented and the events that witnessed their disappearance will be registered in detail. Photographs of the three sites during different periods of their existence will also give the reader an idea about the historic and touristic grave

loss that our hometown suffered ever since.

However before we proceed any further we believe it is useful to give the reader an idea about the location of each site as it appears on the plan of the mid-town prepared by the as-Salṭ Development study program in the late 1980's. *al-Qal'a* does not appear but it's location is to the west of the *Sarāyā* –Government House–. It was built on the mountain rising between the Wādī al-Akrād and Wādī al-Maydān at a height of 780m. above sea level or 2600 feet. The *Sarāyā* was built in the street going up from the town's center to Wādī al-Akrād while the water springs – *al-'Ayn* is located in the *Sāḥa*- town square near the bridge (FIG. 1).

The oldest of these three relics is the Qal'a –the castle or citadel– which history goes back to the 13th Century. Around the year 1204 the King *al-Mua'dham*, son of King al-Adil the brother of Saladin built it. One of the stories about the reason for its construction is that the village of Kafr Hūdā, few kilometers west of as-Salṭ, had a clan called *Bano Rahman*. They attacked one of the king's caravans, plundered it and took few of the Sutlan's concubines captive. The king immediately attacked the village and demolished it. He wiped out its population to build the castle. On his death, king *al-Naser* took it over and it remained as part of his domain until 1224 AD. when it was taken over by the King al-Salih Najm ad-Dine Ayoub. When Saladin passed away in 1238 the citadel was part of his domain[1].

The second part of Ibn Shadad's story induces us to think that building it had another motive. Saladin was busy fighting the Crusades and needed such an outpost to watch their movement in Palestine. This seems to have more credence, when we note it has been always kept in the realm of Saladin's close family members. It was later taken by the Moguls and when they were defeated at 'Ayn Jālūt in 1260.



1. Top plan.

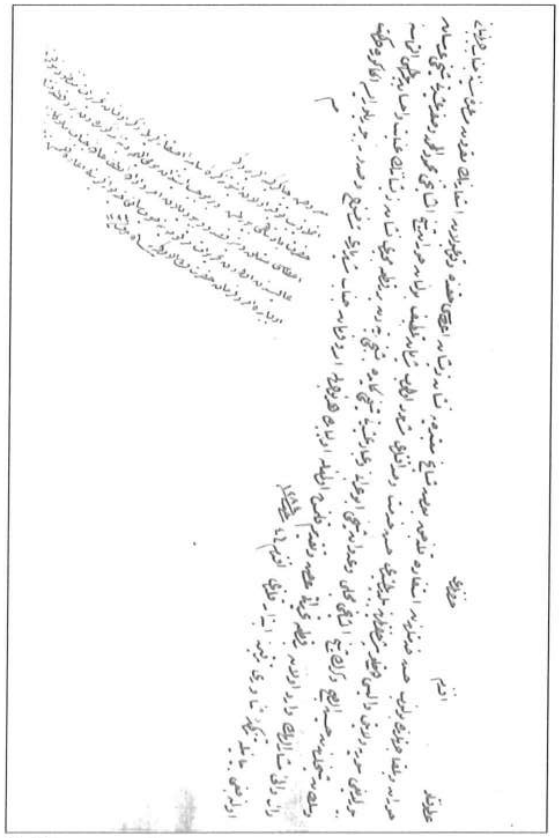
1. *al-A'alaq al-Khatira* in the mention of the Princes of *Bilad ash-Sham* and *al-Jazira*. *Iss Eddine al-Helali Ibn Shadad*. French Institute for Arab Studies, Damascus 1962: 83.

It became part of the realm of Mamluki Sultan Qutuz. Abu al-Fida, the Arab Historian however mentions another reason behind its building. He states that when the people of the area revolted, the King *al-Mu'adham* built the castle[2].

The castle, during the seven hundred years of its life, was an outpost of the Ayubids, the Mamluks and Ottomans. The whole region did not have any strategic importance when *Bilād ash-Shām* and Egypt were under one Command although it had some effect on the outcome of local fights between the different functions.

The earliest mention in modern times was when, the Governor of Damascus and the southern parts of Palestine and Transjordan, was ordered to subdue the area. In 1867 he appointed a *Qa'im Maqam* in as-Salṭ to supervise the new administration and collect taxes. After having subdued the town at the head of an expeditionary Force he resided with the Garrison of 150 troops in the castle. For the coming two years the countryside was quite. The Beduins of the region as well as the sedentary population seems to have been pacified. However in 1869 an alliance of the Bani Sakhr and the 'Adwan, the two largest Tribal federations, with a united force of around 2000 fighters pillaged ar-Ramthā on account of the refusal of its villagers to pay the *Khawa* or Beduin Tax. The Governor Rashid Pasha had to act and in May 1869, at the head of a large force of around 4000 men with artillery, entered the area and being asked for an *Aman* (Protective truce) by the leaders of the Beduin alliance, he subdued Salṭ and brought to an end the state of lawliness which prevailed until then. To win over the population he recommended awarding decorations to six dignitaries of the area. Amongst them were three of al-Balqā', and a copy of the Ottoman order with a translation in Arabic is hereby published with a picture of the castle then[3] (FIGS. 2, 3).

The role of the castle was diminished when the new *Sarāyā* was built in Midtown after 1869. It became the office of the *Qa'im Maqam* and the Departments of Police and Courts. Few photographs of the *Sarāyā* after the 1870's will be shown in an attempt to give an idea about the



2. Ottoman order.

3. Translation in Arabic.

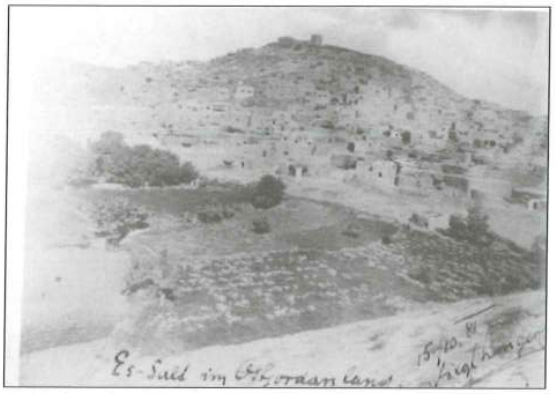
2.Taqweem Al-Buldan, Imad El-Dine Ismail Abu El-Fida, Sultan Press, Istanbul 1840: 288.

3.Pioneers over Jordan, Raouf Sa'd Abujaber Tauris and Co., London 1989: 37-39.

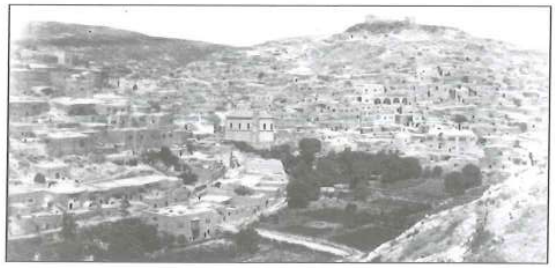
site during different dates and with special reference to the source. In this connection I wish to register my gratitude to Fr. Jean-Michel de Tarragon, the scholar and archeologist at the Ecole Biblique in Jerusalem for his assistance in this regard (FIGS. 4-9).

The historic site persisted until the 1980's when the Government and the municipality considered the possibility of clearing the site. A generous contributor Hamdu Al-Anis offered to build a mosque in its place. In 1985 the work was completed and the Mosque (see FIGS. 10a, b), started its work to the community.

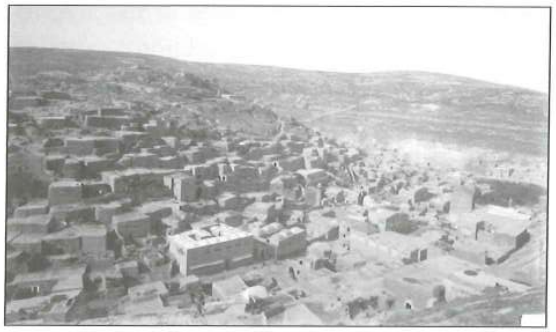
4. A photograph by the famous photographer Dumas dated around 1880 showing the empty grounds around the castle.



5. A photo by Langer dated 15.10.1881 with the title "Es-Salt in Ostjordan Land" showing the un-developed area around the castle.



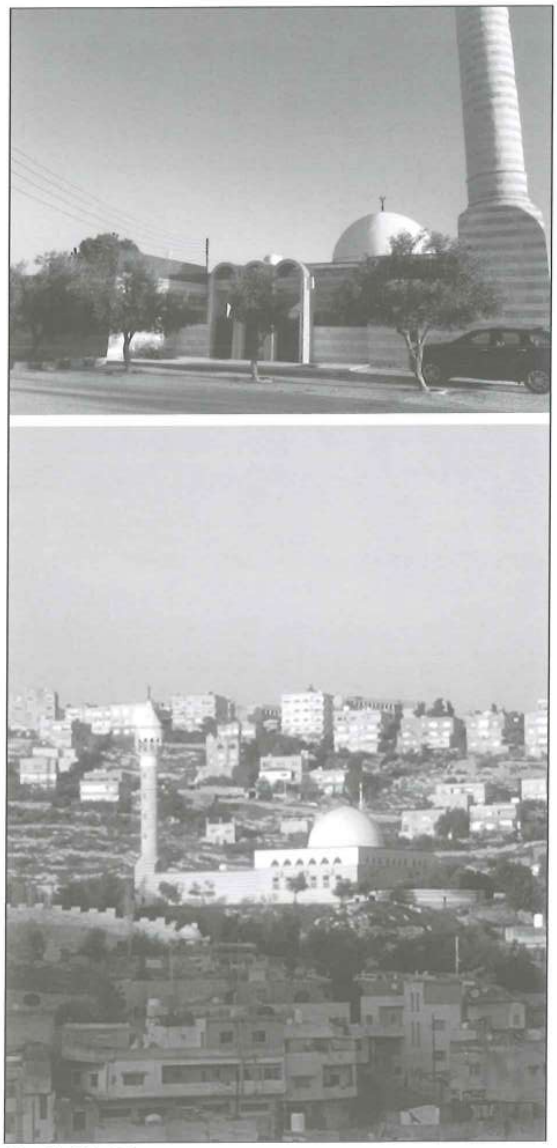
6. A photo from the "White Fathers" (Pères Blancs) from the Convent of Sainte-Anne, in the Old City of Jerusalem. Number: "18711-Ste A.-Cont. 624".



7. A photo from the Notre-Dame de France Convent, Jerusalem. Number: "12474-NDF-607". It is a nice glass-negative, which is now at the Ecole Biblique.

8. A photo from the Dominican Collection of glass-negatives of the Ecole Biblique. Number: "07332-1137". Taken by Father Savignac in 1904. It shows on the right side part of the Latin Church.

9. A photo by David Gordon Lyon taken in 1907 showing clearly the castle and the houses around it.



10a, b. The Mosque.

The Water Springs

The building of *al-'Ayn* is not documented and we could not determine any specific date for the construction of this useful public work. However I have two chronicles, the first which I mentioned in my book relates that a member of al-Far family who migrated to as-Salṭ from Nazareth in 1798 was commissioned to build the 'Ayn or Water Spring[4]. The other chronicle is similar but mentions him as Hanna al-Far, without a date[5]. Probably either al-Far built a crude water spring but the three outlets – the main 'Ayn the women's 'Ayn across the Saḥa and the Men's 'Ayn just next to the Gate of the Abujaber house were built later during the second half of the nineteenth century. There was an underground tunnel between these water sources and the castle. In my opinion the public works as were standing in the 1930's and removed later were built during Ottoman times after 1869.

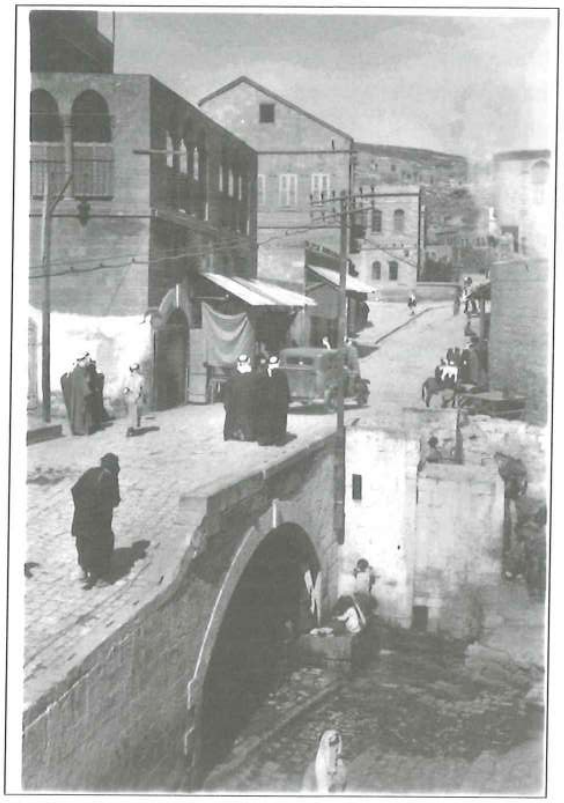
It is indeed a pity that there is only one photo for the 'Ayn which is now in the collection of the Latin Patriarchate in Jerusalem. The 'Ayn of Women and that of men seem not to have been photographed for special considerations and our endeavors to find any have been fruitless. However it is to be mentioned that the Bridge over the main 'Ayn-spring was part of the main street going into the town. When it was demolished, its surroundings became part of the main *Sāḥa* of the town. Likewise the women spring became the northern side of the *Sāḥa* while the Men's spring remained as part of the compound that is now the as-Salṭ Museum, previously *Dar Abujaber* (FIG. 11).

The *Sarāyā* – Government House

The construction of this public building must have been started few years after the Ottomans subdued the area to their control in 1869. We confirm this as Conder who surveyed al-Balqā' in 1882 wrote the following: "It is only within the last years that the Turkish Government has succeeded in obtaining a firm footing in this district, which was previously independent and paid no taxes. Once gained, the Turkish influence is not likely to be very soon lost, for a castle and a garrison and a Kurdish Governor keep the village beneath them in awe"[6].

To give an idea about the control position of the *Sarāyā* in the city of as-Salṭ we publish hereafter the photo taken from the Matson Photo

4. Pioneers Over Jordan,Raouf Abujaber, Tauris London 1989:27.
5. as-Salṭ Wa Jiwarha, Dr. George Tarrif Al-Safir Press, Amman 2009:67.
6. Heth and Moab, Claude Reignien Conder R.E. Richard Bentley London 1883:184.



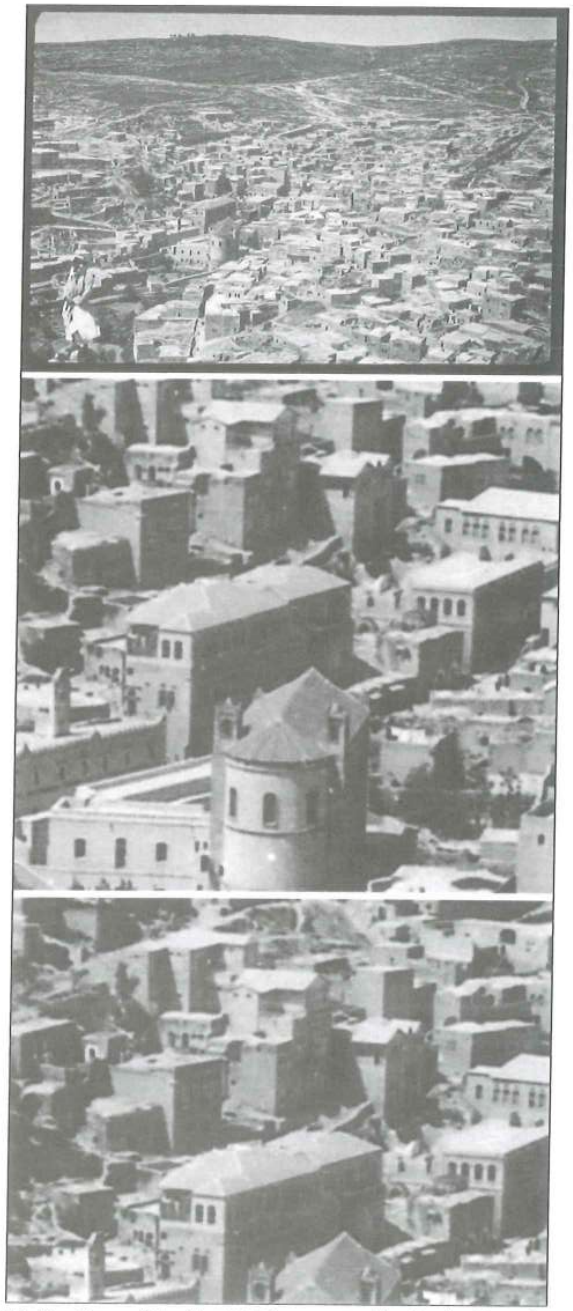
11. Photo of the Water-Spring in the collection of the Latin Patriarchate. Number: "LPJ, 1420". Taken by Father Médebielle around 1922. The house on top is part of the Abujaber House and then the house of the Bisharats and the *Sarāyā*.

service at the Library of Congress published after 1950. It shows the *Sarāyā* with its Grey Tile Roof in the midst of the photograph in direct line with *Dar Abujaber* – the Museum and the Bisharat houses with the Latin Church nearby (FIG. 11).

The enlarged center part of the photo appearing afterwards shows clearly the position of the *Sarāyā* from the East, after the Latin Church, the *Dar Abujaber* – Museum and the Bisharat Houses (FIG. 12).

The political events seem all to have been carried out in the *Sarāyā*. One of the earliest was held on 20th August 1920 when Sir Herbert Samuel, High Commissioner in Palestine and Transjordan addressed the Meeting with the proclamation of Great Britain to the Inhabitants of Transjordan (FIG 13a, b).

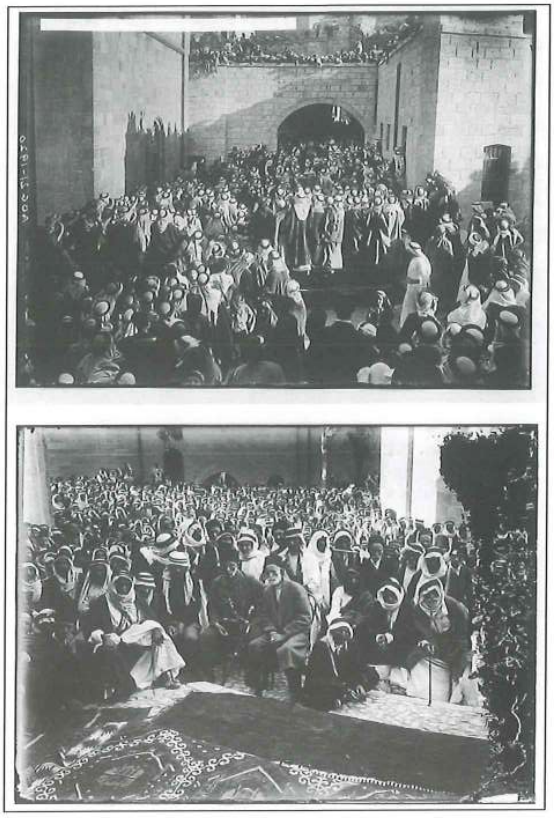
The first photo was created by the photo



12. Position of the *Sarāyā* from east after Latin Church, Dar Abu Jaber, the Museum and the Bisharat Houses.

Department American Colony and was drawn from the collection at the Library of Congress, the second photo likewise but with Matson as its creator. He gave it the title of Durbar in as-Salṭ August 21, 1920 which must have been the result of British tradition in India.

Political activity became more intense after

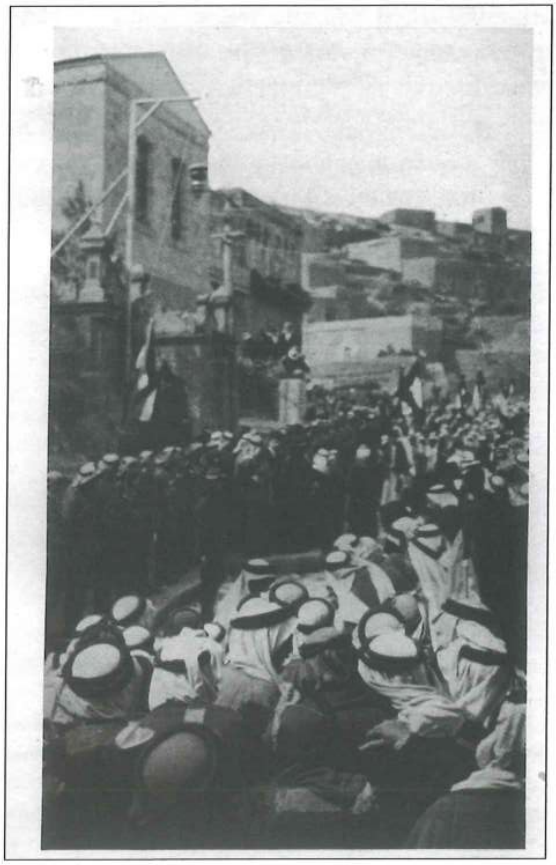


13. The Political events.

14. Prince Abdulla with some of his supporters and officials.

the arrival of Prince Abdullah and the writer Mary C. Wilson[7] published a photo of His Royal Highness with the new cabinet in front of the *Sarāyā* (FIG. 14).

Another important event is that depicted through a photo that has been published by an English traveler Ms. Steuart Erskine who visited



15. The celebration Anniversary of the Arabs Independence.

as-Salṭ in 1924. It is the celebration Anniversary of the Arabs Independence[8]. It shows the façade of the *Sarāyā* very clearly and is therefore the only record available to us (FIG. 15).

In the social field, the *Sarāyā* seems to have been the center for most events in the town. Three photos of such events, are hereby introduced (FIGS. 16-18).

This relic, in the center of the town, stood there for just over half a century as it was demolished in the year 1965. On the fifth December 1965, a defense order No. (42) was issued to evacuate the tenants from the 800 Sq. m of the Bisharat Houses and 441 sq[2] of the Nabulsi Houses next by, so as to add its area to the Building Project of a new Government House. The result of this sad end was completed and a new building was constructed. In August 1999

7. King Abdullah, Britain and the making of Jordan Mary C. Wilson, Cambridge Middle East Library, P 63.

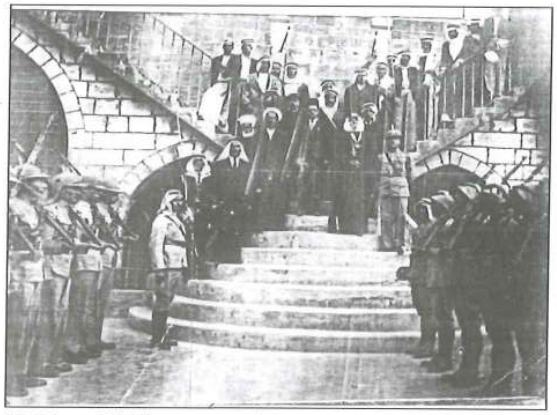
8. Trans-Jordan, Ms. Steuart Erskine, Ernest Benn, London 1924: 30.

I kindly asked my late friend Kamel Kawar to take some photos of the Abujaber House. Museum and the Government House and the enclosed photo shows the center of as-Salṭ in 1999 before the new demolition was made and new ideas for the site being considered (FIG. 19).

And so it came that relics that stood for hundreds of years like the castle disappeared without any consideration of their historical value with the only excuse being that all was made in good faith and in an endeavor to improve the outlook of the town which continues to be most important center of Transjordan's past.

16. Probably in 1936 a commemorative photo at the end of a celebration that was attended by all the important Government employees, dignitaries, Muslim and Christian Religious leaders in as-Salṭ and its province.

17. The Police Force headed by its head Commander Khalil Zaza in 1940 as published by al-Ra'i daily on 4th June 2012.



18. Photo kindly presented by a friend shows the Police Force giving Saluteat the Gate of the *Sarāyā* in 1942 to the Municipal Council, Religious leaders and dignitaries of the town.

19. Abujaber House. Museum and the Government House and the enclosed photo shows the center of as-Salṭ.

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Approaches to Nabataean Religion - Sculpture and Religion

When I first began researching the religion of the Nabataeans I followed the work of Jean Starcky and Fawzi Zayadine, who then dominated the field. The well-researched and structured article on Petra by Starcky (1966) laid the groundwork for the study of the Nabataean deities in the meaning of Nabataean religion. Almost all subsequent scholars rightly followed this work, which then culminated in Healey's monograph (2001). The latter still remains the best study on the subject. For the last couple of years, I have been arguing for an alternative approach which I follow here. I touched on some issues at the Washington conference (Wenning 2009) and then presented my ideas at the Berlin conference (Wenning 2016a). There are three fields of research which I would like to explain.

The Discussion of the Deities is not a Description of the Religion

In most studies of Nabataean religion, the focus is on a discussion of the Nabataean deities, based on J. Starcky's work. The deities are undoubtedly part of Nabataean religion and the best researched aspect so far. However, this is a limited view of what we can describe as the Nabataean religion. I have no complaints about the interest on the deities, which seems justified and this research ought to be continued. Almost all studies of the religion of the Nabataeans begin with a discussion of the deities. Their names are listed and discussed on the basis of epigraphical and literary evidence. Unsurprisingly, many of these studies have been conducted by Semitists. Nevertheless, to approach Nabataean religion we must consider more aspects of it, as was done by Healey (2001).

The quality and scope of Healey's study is such that many scholars believe that not much else can be said on the subject for the time being. While that may be true to an extent, this does not mean that we should not continue researching the subject and seeking alternative approaches. Some additional insights were made by Alpass (2013), based on new finds and research over the last 15 years. Despite criticising the traditional approach to the topic, Alpass himself follows this (Wenning 2016c). Healey wrote "*The Religion of the Nabataeans*" as a Semitist, and cannot be blamed for not incorporating more relevant archaeological evidence if such evidence has not been properly discussed.

There are undoubtedly many aspects of the religion that we will never know about due to a lack of texts describing certain topics. If the sources do not explain Nabataean religion extensively, there are two approaches to overcome this problem. The first is to consider parallels and models. It is no surprise that scholars of the Old Testament made a comparison with the religion of the Israelites, while Arab scholars utilised sources from the Koran and the period immediately before the rise of Islam. Both focus on the veneration of aniconic stones, but highlight the differences with Nabataean religion and elucidate quite different periods and contexts. This is equally true for ethnological approaches which compare the beliefs and religious practices of Arab Bedouin in the last centuries.

The second approach is to analyse the evidence more precisely and broadly than has been previously done. We know very little about Nabataean myths, beliefs and theology, but evidence of religious practices is reflected in the material culture. Of course, we must distinguish whether the evidence relates to individual worship, family and clan religion, official cults, dynastic or political activities, local cults or worship by foreigners. The interpretation of these practices needs more attention than it has received in previous research. Although some elements of cultic activities have been mentioned here and there, and although Healey considered them more comprehensively, often it involves a listing of religious monuments and a discussion of related terms. When monuments are analysed and described in greater detail one by one, rather than discussed in general, they can provide new information.

Sometimes it is constructive to review the early literature on this topic. The earliest description of "The religion of the Nabataeans" is found in Dalman (1908: 49-63). Brünnow and von Domaszewski (1904) listed the monumental tomb facades, while Dalman described carefully what he called the "rock-cut sanctuaries". This gave him a broad basis upon which to define Nabataean religion and to connect the epigraphical evidence with the monuments. Although Dalman is outdated, and his treatment is rooted in his time, he describes some features of religious practices which are lacking in other contributions. Neither Kammerer (1929), Robinson (1930) or Murray (1939) followed Dalman's broad presentation in their chapters on Nabataean religion. The discussion of Nabataean religion was at that time dominated by the new finds from Khirbat at-Tannūr from 1937 onwards until Starcky (1966) put the Nabataean deities into focus. Dalman's descriptions and summaries could have been the starting point for a more complete view of Nabataean religion.

Dalman compared the betyl with anthropomorphic sculptures, the *ṣalmā*, referring to the statue of Obodas Theos. He differed between the venerated devotional images and votive pictures of betyls in rock-cut niches or set up in temples, which were also venerated. The arguments for the conclusion of venerated rock-cut niches are installations at the niches and a bilingual inscription in a triclinium (Br. 465/D. 462), where *masgidā* is translated into Greek *proskynema*. This term literally means going down on one's knees following an Achaemenid custom, but expresses more generally an attitude of respect and adoration with lowering the head.

The installations at the rock-cut niches are numerous and diverse. Some features are self-evident, while others need interpreting. We must keep in mind that we are dealing here with family religion and individual veneration of tutelary deities. If a betyl was not rock-cut in the niche, it was possible to set a portable betyl into a groove in the floor at the back of the niche. Other small hollows in the floor of the niche allowed offering small gifts like fruits, grain or incense (FIG. 1). Small holes in the back of the niche above the betyl, and so-called double-holes or sand-glass cuttings at the edges

1. Votive niche with betyl and installations for offerings. Petra, northern slope of Jabal Khubtha (photo R. Wenning).

of the niches or nearby, could have been used to hang up flowers, festoons, textiles or more precious gifts like necklaces, bracelets or other jewellery. The bottom of the niche sometimes protrudes for the deposition of more offerings. Otherwise, various large rock-cut benches or ledges and steps allowed the deposition of offerings. A small rock-cut cup-hole with water below the niche gave the worshipper the opportunity for a ritual lustration of the fingers before touching the betyl. Large rock-cut water basins near the niches could either be used for purification or for storing water, which was needed for libations. At some niches a few steps lead up to them indicating the sacral sphere. At other niches the niche itself is cut above a massive protruding block or pedestal, which is to be interpreted as the *mōtab*. These features reflect the large *mōtab* we know from the Great High Place and the temples, and make the niches miniature sanctuaries. This is underlined by architectural elements in the frame of the niches. These features which I have mentioned refer to particular religious practices and illustrate Nabataean belief. Considering the large numbers of such votive niches at Petra, they are testimony of Nabataean piety.

The niches are only one example. The same could be demonstrated with triclinia or temples (Wenning 2017a). There are more than inscriptions and particular forms of rock, symposia and the *circumambulation*, processions and sacred meals, offerings and ex-votos. If we look at the monuments in more detail and go beyond classifying them as niches, altars, triclinia or temples, we can consider their function and their real "*Sitz im Leben*", their setting. This will allow us more insights into Nabataean religion. We can learn much more from the monuments by simply describing them carefully.

Local Religion Instead of Nabataean Religion

In my opinion, the usual treatment of Nabataean religion neglects the local aspects. By describing the Nabataean deities, a Nabataean belief was created. Such a belief is debated by Alpass (2013: 4-9), but this is an old debate. I do not agree with most of his arguments and do not like to comment on his study. Contrary to Alpass, I still believe that we are dealing with Nabataeans and a Nabataean religion, and that the Nabataeans are the moving force behind this religion. In general, I am more convinced by the reconstruction of Healey. However, I differ in one point from both: I believe that Nabataean religion is locally shaped, not regionally, like the inscriptions. We should take the regional character and local beliefs seriously and should no longer homogenize the sources from different regions, periods and contexts to reconstruct a Nabataean religion, at least not yet.

We must consider that many discussions of Nabataean religion belong to encyclopaedias or give an overview. Here it seems legitimate to collect all available data for a particular deity from various contexts and to compile the infor-

mation into an overall picture of the character of this deity. Locally we do not find seven or more supreme deities, which are presented in these articles as "the Nabataean deities". We find rather very few deities without a hierarchic pantheon, with the veneration of mainly one god or goddess with some associated deities. The supreme deities change from place to place and some appear to exist only in particular regions. This discrepancy in the general overview has been observed. The local differences were explained by referring to different social groups of worshippers, while it seemed that the structural system was the same everywhere independently of what name or aspect of a deity was present at a particular place. It may be that this assumption is a correct interpretation, although I am not convinced that the deities should have been almost interchangeable.

Nevertheless, we should still first interpret the local evidence site by site and check how it fits the general picture. We must also admit that the local deities deserve our undivided attention. I would like to emphasise that local deities are independent deities. It is this aspect that I feel we have to further investigate. At the same time we should avoid overloading the local supreme deity with all the information we have for a deity with this name from other places. The character of the local deity arises from the local evidence, from the needs of the local population or worshippers. Only after this is researched should we look for further aspects. Placing the local evidence at the top of research of deities and religious installations will lead to a better understanding of Nabataean religion.

Over the last five years I have studied the deities of Petra and have published several articles. Three basic contributions have recently been published (Wenning 2015; 2016a-b) which include key data on the supreme deities of Petra. In "*Great Goddesses*" I critically analyzed all the evidence for the female deities venerated at Petra; in "*The many faces of Dushara*" I revealed Dhushara in various contexts and aspects; and in "*Obodas Theos*" I studied the provenance and the development of a particular type of a deity.

I am fully aware of the special situation of Petra as the religious and political centre of the Nabataeans. We must differentiate between local supreme deities, local minor deities or family deities venerated by the inhabitants of Petra, and deities, which are not local deities, "the deities of Petra", but found veneration by Nabataeans from outside Petra or by foreigners. Among the local minor deities is the "*Lord of the stonemasons*" (Wadeson and Wenning 2014, 2015), who we believe is the tutelary deity of the stonecutters, perhaps Dhushara. We should not make a division between "foreign deities" and "Nabataean deities" based on their provenance. Otherwise Isis would be a "foreign deity", whereas she is an important local Nabataean deity at Petra. Among the deities who do not belong to the local deities of Petra, in my opinion, are Atargatis from Membidj/Hierapolis, although she is depicted in the Nabataean type of the eye-betyl (Lindner and Zangenberg 1993), and Ba'alshamin, the god of Manku (Wenning 2011: 287-288). In both cases, worshippers from Syria seem to be behind the donations. The votive niche on the way to the plateau of Jabal alKhubtha dedicated to "al-'Uzza and the Lord of the Temple" could refer to worshippers from Hegra (Nehmé 2005/06: 188-194). Niches decorated with a crescent could have been dedicated to the moon goddess al-Lat and then possibly refer to worshippers from Northern Arabia (Wenning 2016b: 517-518). We do not know who "The goddess of Hayyan" is, but the type of the face-betyl is imported from Southern Arabia (Wenning 2013: 343 Figs. 1a-c).

I see Dhushara as a single deity at the top of the local supreme deities, while others are associated deities. I have discussed the many faces or aspects of Dhushara at the Berlin conference so will not repeat here (Wenning 2016a). The only other male deity at Petra besides Dhushara was Obodas Theos. This deity is much more im-

portant than previously believed (Nehmé 2012; Salameen and Falahat 2014; Wenning 2015). I have demonstrated that the Sidonian type of Eshmun was chosen to depict Obodas Theos at Petra (FIG. 2). Fifty percent of all known statuary of this type has a Nabataean context (19 items). The origin of both deities is local.

Dhushara could be connected with other deities, for example his mother al-'Uzza. I doubt that she was his consort. There is little evidence of al-'Uzza at Petra, especially when we put aside the eye-betyls (Wenning 2016b: 512-516). Most, but not all, eye-betyls will have represented al-'Uzza. al-Kutba, Atargatis, Isis, and possibly Dhushara, are evidenced in exactly the same way (Wenning 2001: 83-84). While there are traces of a certain veneration of al-Lat at Petra, there is no evidence that she was one of the great goddesses there (Wenning 2016b: 516-518). Isis in fact has the greatest amount of evidence among the female deities at Petra (Wenning 2016b: 519-524). She seems to have been the most popular deity beside Dhushara. This seems to be restricted to Petra. It could be that Isis was of some importance in the dynastic cult. This could have also been the case concerning Tyche, but to a smaller extent (Wenning 2016b: 524-525).

A Critical Consideration of the Sculptural Evidence

Surprisingly it was not the great amount of sculpture (a total of about 100) found in the excavations of P. J. Parr and the Department of Antiquities between 1954 and 1967 in the centre of Petra (Parr 1957), nor was it the richly illustrated volume "*Deities and Dolphins*" (Glueck 1965) which led to the integration of sculpture in the research of Nabataean deities. However, it was the first time that Nabataean figural art was introduced more broadly into the discussion of Nabataean religion. In order to classify the sculptures at Khirbat at-Tannūr and to interpret the various types and motifs, Glueck referred to a broad range of parallels,

2. Relief bust of Obodas Theos. Mā'īn, village (photo H. Merklein).

including several from Petra. His book is often taken as a model for the interpretation of Nabataean sculpture, but it has not been given the same importance in the discussion of Nabataean religion. However, Glueck's aim was to interpret the sculpture of Khirbat at-Tannūr, not to conduct a study of Nabataean religion. The first major step in integrating Nabataean sculpture into the discussion of Nabataean deities took place with the publication of the "*Lexicon Iconographicum Mythologiae Classicae* (*LIMC*)", beginning in 1981:

1981. J. Starcky, Allath, in *LIMC* I: 564-579.
1984. C. Augè, Ares (in peripheria orientali), in *LIMC* II: 493-498.
1984. F. Zayadine, Al-'Uzza Aphrodite, in *LIMC* II: 167-169.
1986. H.J.W. Drijvers, Dusares, in *LIMC* III: 670-672.
1994. C. Augè, Seeia, in *LIMC* VII: 704-705.
1997. P. Linant de Bellefonds, Nike (in peripheria orientalia), in *LIMC* VII: 879-882.
1997. F. Zayadine, Hermes/al-Kutbay, in *LIMC* VIII: 616-619.
2009. F. Zayadine, Isis à Pétra, in *LIMC* Suppl. 1: 297-299.

This was also an integration of Nabataean sculpture into Classical Archaeology, which occurred at the same time as exhibitions on the Nabataeans in Europe (since 1970). The latest general studies of the sculpture include those of El-Khouri (2010) and McKenzie and Reyes (2013).

Nevertheless, the problem has not been the integration of the sculpture into studies of Nabataean religion, but how to interpret and use it. There is a general trend in Roman Near Eastern Archaeology to interpret figural depictions of the local deities in an *interpretatio Graeca*, which means for example that a depiction of Zeus will be taken as the representation of the local male supreme god. Although this model of interpretation does work in some cases, it does not mean it is always the correct classification. I have demonstrated the problem at the Berlin conference concerning the identifications which were proposed for Dhushara (Wenning 2016a: 194-200). Misinterpretations can occur if sculptures are interpreted only by motif or type. The best example for such a misunderstanding is the huge bust of Jupiter, which was interpreted, among others, as Sarapis and Zeus-Dhushara. At the Berlin conference I indicated that this bust could be the planet god Jupiter, and concerning some Nike reliefs we should expect a monumental frieze of the planet gods at Petra (Wenning 2016b: 195) (FIG. 3). L. Tholbecq presented a reconstruction of such a frieze at a conference at Brussels and connected it to the Temenos Gate in Petra (Tholbecq and Delcros 2017). Therefore, the bust of Jupiter is a Graeco-Roman subject and there is no reason to connect it to Dhushara.

A few bilingual inscriptions which translate the names of Nabataean deities into names of Greek deities are taken as an argument for the *interpretatio Graeca*. Again, we must be cautious. The evidence is slight and some of the bilingual inscriptions are found outside the Nabataean kingdom. There it seems that the Nabataean deity was rather explained to the people and visitors of these places as a god or goddess like the local deities familiar to the foreigners. For example, an inscription from Cos, dated to AD 9, connects al-'Uzza with Aphrodite. The inscription was found near the sanctuary of Aphrodite Pandemos and Aphrodite Pontia. This context seems to be of importance, but I have a problem accepting that all sculptures of Aphrodite found at Petra should be interpreted as al-'Uzza, especially those dating to the 2nd/3rd century.

3. Bust of the Planet God Jupiter and Nike. Petra Church R 18 (photo R. Wenning).

Beyond the often discussed monuments and supreme deities there are a few reliefs referring to deities which have not been noticed before. In the Festschrift to J. F. Healey, I published three formerly unknown votive reliefs with an upraised snake (Wenning 2012) (FIG. 4). The idea is of protection by the snake-god and a protection against snakes bites, although we are not able to give the deity a name.

It remained more accidental that sculptures were used in the discussion of Nabataean deities. Often the sculptures were barely more than an illustration of the deities. This is reflected as well in the fact that the context of the illustrated sculptures was rarely considered in the way it should be. In general, unlike the inscriptions, local sculptures were not yet understood as another source for the study of Nabataean religion, although there are many contributions which go in this direction. A selection of mainly always the same sculptures is shown at the exhibitions. The Basle-Leiden-Amman exhibition on "*Petra- Wonder of the Desert*" was an exception with a broad range of exhibited sculptures. Although these are clearly the "goodies" and it is quite understandable that they are shown, the majority of Nabataean sculpture is either less well published or completely unknown. An all-embracing consideration of the sculpture has

4. Rock-cut relief of a snake. Petra, Wādī Qanṭara (photo D. Kühn).

never been undertaken.

Sculptures of Ancient Petra (SAP)

Due to the situation described above and the wish to protect the sculptures by documentation, the project "Sculptures of Ancient Petra (SAP)" was initiated. Considering the political situation in the Middle East it seemed preferable to postpone the publication of my niches-surveys for a while and to begin work on the sculpture. In October 2013, the Director General of the Department of Antiquities of Jordan, Dr. Monther Dahash Jamhawi, kindly agreed to a proposal I made on behalf of the Institut für Altorientalische Philologie und Vorderasiatische Altertumskunde of the Westfälische Wilhelms-Universität Münster and the German Research Association (DFG) to document all sculptures of ancient Petra. By including Prof. Dr. Thomas Maria Weber-Karyotakis, this became a joint project with the Institute of Archaeology of the University of Jordan. The Dean of the Faculty of Archaeology and Tourism, Prof. Dr. Maysoon al-Nahar, kindly accepted this cooperation. Dr. Monther and various members of the Department of Antiquities, including Aktham O. Abbadi, Jehad Haorun, and Mohammad A. al-Marahleh, Dr. Emad Hijazeen and Tahani as-Salhi of the Petra Park Authority have been helpful with the permits and making working conditions efficient. I would like to thank all of them, as well as my colleagues who conducted excavations at Petra and kindly allowed me to integrate their sculptural finds into the SAP project.

The project will continue until 2019. The first description of the SAP, including an extensive bibliography, is published by Wenning (2017b). The catalogue includes all figural sculptures made in stone, plaster, bronze and bone. Terracotta figurines are excluded because they have been treated elsewhere. While the plain betyls, floral decorations, figural vessels and figural pictures on lamps, coins, seals and frescoes are not included, they are considered. The documentation will be organized by find-spots in chronological order of their research, first those in the centre of Petra, then the valleys and suburbs around Petra. This helps to preserve complexes. The catalogue will be put into a data-bank (FileMaker) with additional photographs after publication.

<u>List of the first expeditions to Petra with the amount of newly discovered figural sculptures</u>

Survey E. Brünnow/A. von Domaszewski 1897, 1898; publ. 1904	23
Survey A. Musil 1896, 1902; publ. 1907	2
Survey G. Dalman 1904, 1906, 1907, 1909, 1910; publ. 1908, 1912	20
Survey by T. Wiegand 1916; publ. 1921	5
Excavations by G.and A. Horsfield 1929, 1934-1936; publ. 1938-1941	11
Excavations A. Conway/W. F. Albright 1929, 1934; publ. 1935, 1960, Conway HP	1
Excavations by M. A. Murray/J. C. Ellis/J. A. Saunders 1937; publ. 1940	4

Survey N. Glueck Kh. Braq 1937; publ. 1939	1
Excavations DoA/P. J. Parr/D. Kirkbride 1954-1956, street, gate, publ. 1957	9
Excavations P. J. Parr/P. C. Hammond 1958-1959, street, Katuta, gate, Qaṣr, city walls	12
Survey P. J. Parr/C.-M. Bennett 1959, Kh. Braq	2
DoA 1960	1
Survey P. J. Parr/C.-M. Bennett 1960, W. Abu Olleqa/Isis	1
Survey P. J. Parr/J. Brown 1962, high loculi/Br. 772	5
Excavations DoA/P. C.Hammond 1961-1962, publ. 1965, theatre	5

After four seasons of documentation in Petra, 2013-2016, the catalogue now contains approximately 750 figural sculptures. 78 are made of marble, 54 of bronze, 65 of stucco, and 11 of bone. Up to 128 objects are sculptured in the round, 583 are worked as reliefs. 97 reliefs belong to rock-cut reliefs and 391 belong to architectural reliefs. 112 sculptures are still *in situ*. Another 64 sculptures are lying in the field. Many of the sculptures are broken or damaged by iconoclasm or other reasons. Many sculptures which have been exhibited or stored formerly at the Amman Archaeological Museum were returned to the Petra Museum in 2014, where preparations for a new larger museum are in progress.

The large number of architectural reliefs at Petra has been realized by other scholars who have based their own projects on it (Adrian, Delcros and Tholbecq 2013). The late C. Augé, J. Dentzer-Feydy and P. Linant de Bellefonds researched the sculptures from the Apsidial Monument. M. Sharp Joukowsky will present further sculptures in her "Great Temple" Volume III. The finds from the Petra Church are discussed by M.J. Roche 2001. L. El-Khouri (2010) published a small catalogue of the stone sculptures from Petra with 113 entries. S.G. Schmid has discussed aspects of the Petraean sculptures on several occasions. There are many other smaller contributions in the excavation reports. The finds from Khirbat at-Tannūr and Qaṣr adh-Dharīḥ allow further large corpora of Nabataean-Roman sculptures.

I prefer to speak of "Petraean sculptures" instead of "Nabataean sculptures", because "Nabataean" describes a style, which would exclude many of the "Petraean sculptures". "Petraean" as a toponymic term is always better than any "ethnic" term. Nevertheless, "Nabataean" is useful for local sculptures from the period of the Nabataean kings. On the other hand, a Nabataean style continued down into the late second century AD as we can see from the French excavations at the Apsidial Monument in the Temenos of the Qaṣr al-Bint. Here I prefer to use the term "Provincial Era" instead of "Roman", while "Roman" could refer to sculptures earlier than 106 AD and especially to imports. It is not the aim of the SAP to define a Nabataean style and establish its development, but the SAP can hopefully present those sculptures which are needed for such a definition to be determined in the future.

Dating the Petraean sculpture is still a problem and the term "Nabataean" has contributed to this. The Snake Monument (Br. 302) dated to the late 2nd century BC predates the beginning of the real production of local sculpture. We can establish the timeframe for when this production started by comparing the beginning of Nabataean coinage in 35 BC and the emergence of Nabataean terracottas in the last quarter of the 1st century BC and the relief of Isis from the Wādī Siyyagh, dated to 26/25 BC. But most Nabataean sculptures date to the 1st century AD (Wenning 2016d: 54-58). We also start to recognize that many sculptures belong to the Provincial Era. With the sculptures from the

frieze with the Planet Gods and those from the Apsidial Monument we now have a good basis for comparison to describe the techniques and treatment of local sculptures from this period. Of course, most of the marble sculptures are imports from the Roman period (FIG. 5), but the majority of the sculpture dating from the 1st and 2nd century AD is locally made. When Strabo, Geogr. 16.4.24 mentions "*moulded works are not produced in the country*" he was misled.

The number of sculptures with religious subjects is strikingly high at Petra, forming at least one third of all sculptures. Therefore, an analysis of these monuments can be another source for the discussion of the deities of Petra and Nabataean religion. It is too early to present an analysis here, but some statistics can perhaps demonstrate the potential for further research. There is a small group of figures in the rock-cut niche-reliefs and another one with the rock-cut tombs. Of the 106 bust reliefs most are busts of deities. Beside the deities there are some mythological figures. 30 monuments depict Erotes and 16 monuments depict Tyche-figures with cornucopia. Both refer to the prosperity which is secured by the deities. 19 Medusa-monuments demonstrate the apotropaic aspect, although the Medusa degenerated more and more into an ornament. The figural capitals with winged lions, elephants, goats and eagles expressed protection and power. The number of animals and mixed creatures totals 100 (FIG. 6).

For each of these figural sculptures we have to first research the "*Sitz im Leben*", before we can continue with an interpretation. All the above subjects will be discussed in the documentation in separate paragraphs, where other figural depictions and sources will also be considered. I am certain we can gain much more information from a closer study of the sculptures in the various fields of the religious, political and social world of Petra and the Nabataeans[1].

5. Torso of the Small Herculaneum Woman, Roman import, marble, Petra Museum (photo R. Wenning).

6. Architectonic relief of a griffin, Petra, Complex of the Temple of the Winged Lions (photo H. Merklein).

1. I would like to thank Lucy Wadeson for commenting and proofreading of this article.

List of subjects among the Petraean sculptures (2016)

Zeus	9 items	Obodas	4	Nymph	2
Apollo	3	Moon-God	3	Dioscuri	1-2
Artemis	3	Isis	11-12	Muse	1
Athena	5	Harpocrates	6	'Rankenfrau'	5-6
Ares	4-8	Osiris	1	eagle	16
Aphrodite	13-16	Sarapis	3	lion	45
Hermes	10	Bes	1	elephant	5
Heracles	4	Sphinx	5	goat	4
Dionysus	9	Eros/Putto	30	dolphin	4
Helios	1-2	Maenad	1	snake	6
Nike	13-14	Medusa	19	camel	5
Asklepius	1-2	Nereide	3	horse	3
Tyche/-figure	16	Hippocampus	6	mask	67
Cronos	2	winged lion	5	eye-betyl	22-29
al-Lat	1	herm	7	incense block	8-15
Atargatis	1	Amazon	6		

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Rokitta Krumnow

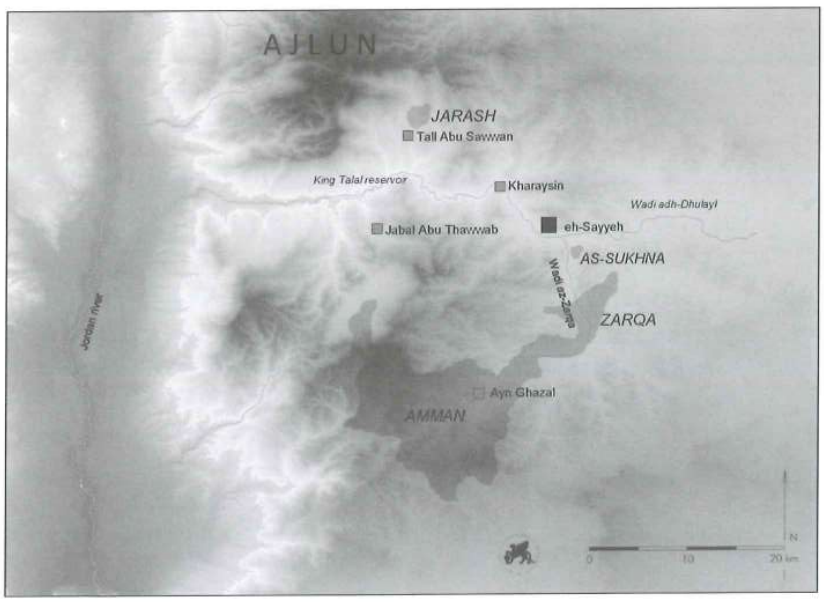
The Chipped Lithic Artefacts from the Neolithic Settlement of al-Ḥusayyah. A Preliminary Assessment

Introduction

The Neolithic site of al-Ḥusayyah is located south-east of the 'Ajlūn Mountains and *ca.* 8km north-north-west of the city of az-Zarqā', next to the water bearing Wādī az-Zarqā' (FIG. 1).

The site was discovered in 1993 during the Wādī az-Zarqā' / Wādī aḍ-Ḍulayl Survey by Palumbo and colleagues (Palumbo *et al.* 1996). Excavations in 1997 and 1999 established an occupational sequence dating from the 8th to the 6th Millennium cal. BC (Kafafi and Palumbo 1997; Caneva *et al.* 2001; Bartl and Kafafi 2015b, with references therein).

The site has since then been heavily disturbed by the construction of the road between Zarqā' and Jarash and recent agricultural activities. The Neolithic settlement is located on a relatively steep slope, and covers an area of about 400 by 200 m on the northern bank of Wādī az-Zarqā'. The topography of the settle-



1. Neolithic sites in the Wādī az-Zarqā' catchment area (map: DAI, Orient Department, Th. Urban, using SRTM data V2 CGIAR-CSI 9 m Database).

ment is characterized by two wadis running in a north to south direction into the Wādī az-Zarqā' that divides the site into three parts – one western, one eastern and one central part.

The site size is estimated to cover more than 10 hectares (Kafafi *et al.* 2000: 703), although the entire area might not have been permanently settled (Bartl and Kafafi 2015b: 20). The size and the long chronological sequence, covering the LPPNB, PPNC, Yarmoukian and probably Chalcolithic, provides an opportunity to investigate the intra-site developments and stratigraphic-chronological questions, and in particular the transition from the early to the late Neolithic.

This potential led to a reopening of excavations in 2013 by the Orient Department of the German Archaeological Institute and the Queen Rania Institute of Tourism and Cultural Heritage of the Hashemite University in Zarqa', and later the Institute of Archaeology and Anthropology of the Yarmouk University in Irbid. The renewed excavations were directed by Karin Bartl and Zeidan Kafafi in close cooperation with the Department of Antiquities of Jordan (Bartl and Kafafi 2014, 2015a, 2015b, 2016). 13 Trenches of various sizes were opened during three seasons of fieldwork between 2013 and 2015 (FIG. 2).

Architecture and Stratigraphy

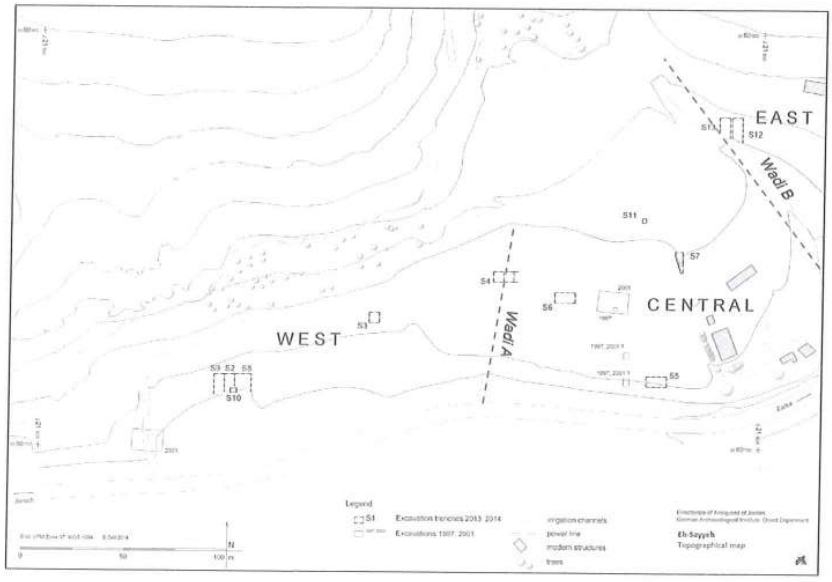
In the western area, five trenches (S1, S2, S8, S9 and S10) were excavated and three levels of occupation phases have been identified.

Phase I (upper level) comprises substantial architecture with curvilinear walls and a lime plaster surface (Bartl and Kafafi 2015b: 22). In the second phase (middle level), a rubble layer was uncovered below the lime plaster surface, and architectural remains in this phase differ completely to that found in Phase I. Here an elliptical structure measuring approximately 2.60 by 1.50 m, which was built of large and medium unhewn boulders, was found with a small opening in the eastern wall. This structure also has indications of a corbelled ceiling. A fire-place full of charcoal, two pits and a silo also belong to this phase (Bartl and Kafafi 2015b: 22-23).

A few Yarmoukian pottery sherds were found in deposits outside of the building that are also believed to belong to Phase II.

The lowest Level III has been excavated in a small sounding at the southern end of the Western area down to virgin soil (S10). Shallow pits dug into a plaster floor were found in the upper part of this sounding (Bartl and Kafafi 2015b: 24).

Comparisons for the structures in the western area, and in particular the elliptical building, can



2. al-Ḥusayyah, topographical map with excavation areas (map: DAI, Orient Department, Th. Urban).

be found in the vicinity of the site, *e.g.* at 'Ayn Ghazāl (Rollefson and Kafafi 2013). However, very similar structures are also known at various settlements in the eastern basalt desert, including at Wisād pools about 200km to the east of al-Ḥusayyah. Here buildings that are accessible through "creeping holes" are designated either as residential buildings (ghura huts) or as graves (*nawamis*) (Rowan *et al.* 2015: 178-179).

In the eastern area, Squares 12 and 13, which were adjacent to each other and located immediately east of the Wadi, were excavated. Square 12 contained no substantial architecture or installations, but remains of a hearth and a possible plaster floor that had been heavily disturbed.

Square 13 contained a possible wall (?) running north-west to south-east. The wall was only preserved in two rows and most of it had collapsed.

In the southern part of Square 13, some larger stones covering an elliptical structure that was 2.50 m long, 1.80 m wide and 50 cm high were excavated. The structure was completely preserved and had not been disturbed. It was constructed within a pit, which was clearly visible in section. The walls consisted of two courses of large stones that had been carefully placed on top of each other. It had a small niche at the south-eastern edge but no entrance. The interior was well made in contrast to the rougher outer surface of the stones, which was probably due to its construction within a pit. The top of the structure had been completely covered by closely laid large stones. The interior did not reveal any individual layers or depositions. Instead the excavated fill might be interpreted as intrusive since it was very loose and contained only a few small stones and lithics (Bartl and Kafafi 2015b: 25-26).

The function of this installation is rather difficult to interpret. Its size and shape could be indicative of a storage facility. However, comparisons can be found at Neve Yam near Haifa, which dates to the Wadi Rabah period of the 6th/5th millennium BC. There individuals have been found within the structures and they thus served as graves (Galili *et al.* 2009: fig. 8, Bartl and Kafafi 2015b: 26).

Finds

Pottery

Pottery was found in almost all areas, covering the periods between the Neolithic and the Islamic periods. This points to the occasional use of the site even in the post-Neolithic periods, particularly in the Chalcolithic and Early Bronze Age. Pottery typical of the Yarmoukian period derive predominantly from Square 4, and a very small percentage was also found in the western excavation area. Characteristic decorations are red-slipped surfaces and incisions of herringbone patterns. The simple spectrum of shapes includes pots, bowls and cups (Bartl and Kafafi 2015b: 26, fig. 13-14).

Small finds

Further findings include various objects for everyday needs, including numerous bone tools for processing leather or textiles, such as awls, needles, and spatulas, and heavy duty tools such as grinding stones and pestles for processing plant foods. Some rare finds include a pierced ornament made of mother-of-pearl and a bead made of bone.

Chipped stones

The majority of the finds are chipped lithics (TABLE 1); more than 8000 lithic artefacts were found during the excavation. The preliminary analysis of primary production focuses on one sounding (Sounding 4), while the secondary products are presented in more detail.

Table 1. The lithic assemblage from al-Ḥusayyah from 2013–2015.

Saison	2013	2014	2015	Total
Tools n	1976	1981	1233	5190
Total n	5450	1996	1306	8752

Raw Materials

The raw material supply in that area is known through geological maps, as well as a survey conducted in 1996 (Palumbo *et al.* 1996: 383). A recent short raw material survey conducted in the vicinity of the site and the observation of the material near Jabal al-Qal'ama al-Gharbi, southeast of al-Ḥusayyah, have shown that the material used at the site is mostly of local and regional origin. The flint nodules and pebbles are mostly fist-size, sometimes up to 20 cm in diameter.

Dark brown and light brown fine grained flints are the dominant raw materials used in all excavated trenches. Coarse grained flint is only very rarely used as is pinkish flint. 17 raw material variabilities have been distinguished (TABLE 2). Only one piece of obsidian has been found (Square 10, Season 2014).

Table 2. Raw material variability at al-Ḥusayyah

1. Dark brown, fine-grained flint.	10. Dark grey, fine-grained flint.
2. Dark brown, medium-grained flint.	11. Dark grey, medium-grained flint.
3. Light brown, fine-grained flint.	12. Whitish, coarse-grained flint.
4. Light brown, medium-grained flint.	13. Whitish, fine-grained flint.
5. Brown, fine-grained translucent flint.	14. Red, fine-grained flint.
6. Pink (Huweyjir?) flint.	15. Red, coarse-grained flint.
7. Grey, fine-grained flint.	16. Reddish-brown, fine-grained flint.
8. Grey, medium-grained flint.	17. Purple, fine-grained flint.
9. Light brown, coarse-grained flint.	

Primary Production

The analysis of primary products comprises the chipped lithics from Sounding 4, which can be dated to *ca.* 6,300 *cal.* BC. Debit age products are dominated by flakes and blades. Bladelets occur infrequently and the tool: debris ratio is 6:1 (TABLE 4).

The composition of primary products shows that all major stages of core reduction were carried out on-site, which is true for all Soundings.

Nearly all stages of core reduction, maintenance, and core abandonment have been attested (TABLE 3); these are crested blades and core tablets, core trimming elements, and exhausted and transformed cores.

Single striking platform cores, naviform cores, bidirectional blade cores, cores with more than two striking platforms, change of orientation (90°) blade and flake cores, blade cores, and amorphous cores occur.

Table 3. Attested *chaîne opératoires* at al-Ḥusayyah (grey=attested, white=not attested).

	Unidirectional and Bidirectional Blade production Tabular flint	Blade/Flake production on Tabular/ nodular flint	Flake/Blade production on Nodular flint
Raw material procurement			
- chunks/ wadi pebbles			
Core preparation			
- primary elements			
Core reduction			
- crested blades			
- primary core tablets			
- core trimming flakes			
- debitage (bidir.) lades)			
Core maintenance			
- core tablets			
- plunging blades			
Core abandonment			
- exhausted cores			
- transformed cores			
Secondary production			

Flakes constitute the most prominent category of debitage in all squares, followed by blades, chips and bladelets (TABLE. 4). Twisted blades from bidirectional knapping are also found. Bidirectional blade technology is well attested by the frequent occurrence of Y-blades

and bidirectional blades. Three reduction sequences are attested: the main reduction sequence produced flakes from single-platform and amorphous cores, while a second sequence produced blades from small, single-platform (and some of them even prismatic) cores, and the third producing bidirectional blades from naviform or opposed platform cores. These cores were exploited intensively and some of them were reused for the production of bladelets or as heavy duty tools like hammers. The presence of an additional sequence for bifacial tools is attested by the presence of large thin flakes together with bifacial spalls.

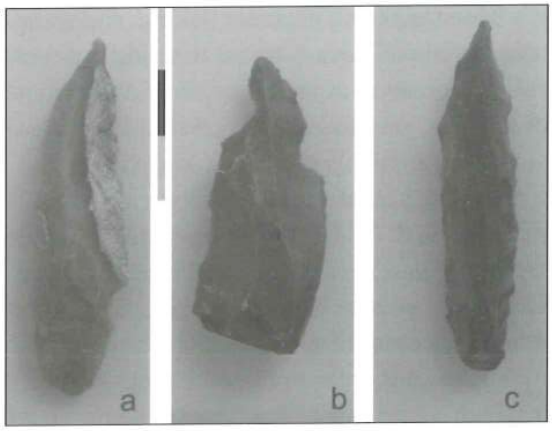
Table 4. Primary product tabulation of Sounding 4.

Primary products	**N**	**%**
Flakes	1866	44%
Blades	276	6%
Bladelets	88	2%
Chips	776	18%
Burin spalls	6	0%
Core-trimming Elements	528	12%
Cores	34	1%
Debris:Tool Ratio	6:1	
Total	**4252**	**100%**

Secondary Production

More than 3800 tools were analyzed. In all soundings non-formal tools dominate (see TABLE 5), making up at least 33% and at the most 68% of the assemblage. Especially retouched flakes and retouched blades have to be mentioned (20-50%), while notches are present with between 3 and 10%.

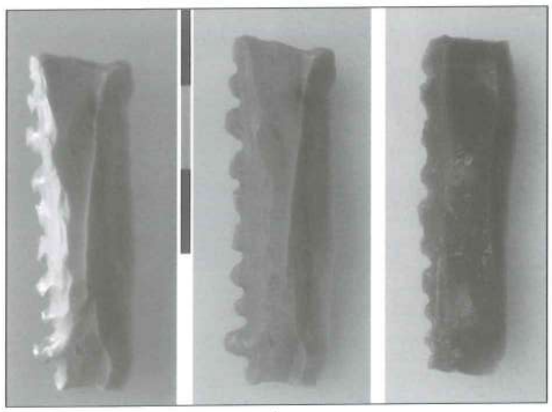
Following the non-formal tools, perforators dominate the formal tools category with 16-50%. A total of 1,480 perforators have been found (S1-S10). They show a lot of variances, including simple, double and multiple, fine and coarse, long borers, and awls. The most common tool is the awl with a short tip made on small chips and flakes fashioned by mostly unifacial direct retouch, rarely with alternating retouch and sometimes by burin-like facets (FIG. 3).



3. Drills from al-Ḥusayyah.

Sickles are rare at es-Sayyeh. 41 sickles (1.1%) were found and are predominantly of Yarmoukian type, *i.e.* deeply serrated blade implements (FIG. 4). Heavy sickle gloss is visible along the working edges, sometimes only attested on small areas since the blades had been re-sharpened. (Caneva *et al.* 2001: 107) mention the occurrence of black spots of mastic on the surface of sickle implements from the late 1990 excavation. However, the sickle implements of the recent excavations did not show black spots but chalky/plaster (?) remains, hinting at the use as elements to be inserted in a shaft.

Some tabular and cortical knives and dagger fragments have also been found. The tabular flint knives are probably made of imported raw material, from thin tabular flint with cortex on both sides. Most of the items are broken, either naturally or on purpose. The cutting edge



4. Sickles from al-Ḥusayyah.

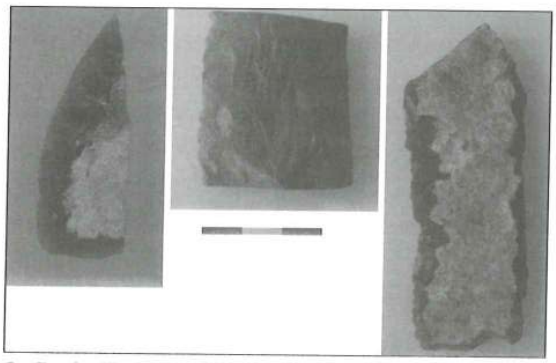
has been shaped by pressure flaking, and sometimes even polished. Cortical thinning is a typical phenomenon at al-Ḥusayyah. Another type of knife is long blades shaped to a lens cross-section by bifacial pressure flaking (FIG. 5).

Arrowheads are rare and form only 2.2% of the toolkit. Al-Ḥusayyah projectiles include 'Amuq points, Byblos points, Nizzanim points, Herzliyah points, HaParsa-points, and transverse projectiles (FIG. 6).

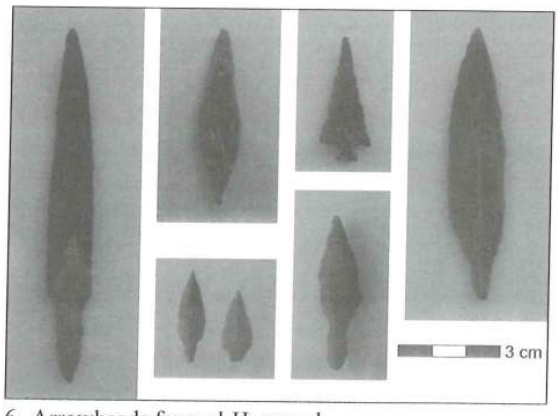
The majority of the projectiles are small with a weigh of less than 3 g, though some larger 'Amuq points are also present. The points were shaped by a very elaborate pressure retouch on the dorsal face, while the ventral face has usually been left unretouched.

Transverse arrowheads occur infrequently, while a special kind of triangular fragment is attested in 50 items. The majority had been snapped from a blade, though triangular fragments of cortical knives and flakes are also found (FIG. 7)[1]. The technique used is comparable to that of the side-blow blade-flakes of the northern Levantine Late Neolithic (*e.g.* Nishiaki 2000), but there these pieces are usually made of obsidian[2]. Two side-blow blade-flakes of flint have been found at al-Ḥusayyah and fit well within this interpretation. However, it is still unclear if side-blow blade-flakes are tools or blanks. Some authors argue for multifunctional purposes[3], others for them being debris from the production of sickle segments (Vardi and Gilead 2011: 354, with references). However, since some pieces have been snapped deliberately from cortical knives[4], or even broken into triangles without any sharp edge they might have been for a still unknown special purpose.

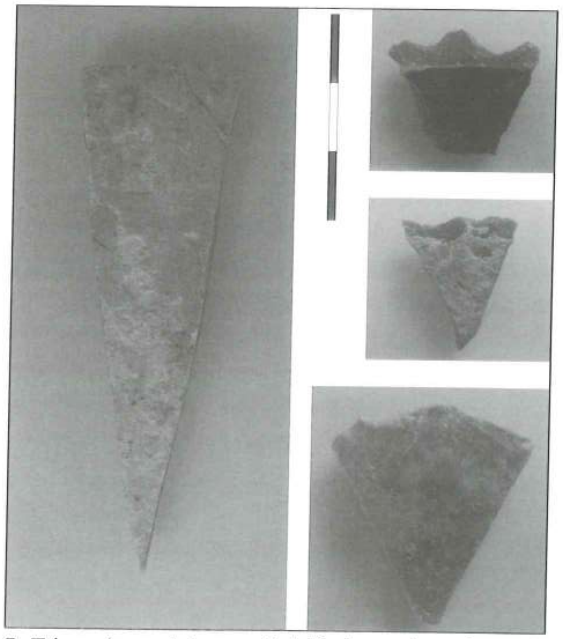
Bifaces are rare at al-Ḥusayyah; only three items have been found so far. They were produced from local material, carefully flaked and have remnants of polish, which attests to re-



5. Cortical knives and dagger fragment from al-Ḥusayyah.



6. Arrowheads from al-Ḥusayyah.



7. Triangular and trapezoidal blade sections from al-Ḥusayyah.

1. Similar pieces are also known from the PPNB and Late Neolithic site of Mushash 163 (Rokitta-Krumnow in prep.).
2. Recent investigations have shown that these items are also found at the PPNB site Abu Gosh (Khalaily *et al.* 2003) and at some Chalcolithic sites (Vardi and Gilead 2011) in high numbers.
3. Crabtree 1974 (cited in Braidwood 1983: 264, Anm. 10).
4. Triangular fragments of bifacial knives are also known from Shaar HaGolan (Matskevich 2011: fig. 8.6).

sharpening (FIG. 8).

Burins occur infrequently at al-Ḥusayyah (*cf.* also Caneva *et al.* 2001: 108). They were made on natural surfaces or breaks, on truncations, and some dihedral burins and transverse burins are also present.

Scrapers were all manufactured from local raw material. Double patina appears on several artefacts and shows recycling of older artefacts. End-scrapers on blades are common, though side scrapers on flakes occur more frequently. Some thumbnail scrapers have been found as well.

Discussion

The techno-typological analysis of the flint assemblage from all squares at al-Ḥusayyah shows that the major categories of the very late PPN (FPPNB/PPNC) and early Pottery Neolithic are represented at the site. The evidence for complete reduction sequences indicates a house-hold based *ad hoc* flint industry. The dominance of flakes and flake cores, as well as the decline of the naviform core-and-blade technology shows the shift from blade to flake technology. But it also shows, however, that bidirectional technologies are still in use in Pottery Neolithic assemblages[5].

8. Bifaces with polished working edge from al-Ḥusayyah.

Opportunistic handling was invested in the shaping of cores and many nodules were knapped without any preparation. This is also true for the majority of the tools, which were simple expedient types, produced mainly on flakes and most probably based on local household production. Nevertheless, arrowheads, daggers, and sickle blades continued to be shaped on standardized blades as in previous periods. Standardized blades from bidirectional knapping, combined with the use of elaborate pressure retouch, may hint at a certain degree of craft specialization or at itinerant craftsmen[6]. The extraordinarily high number of drills and perforators without hardly any evidence of what material was perforated (only two beads

Table 5. Tools at al-Ḥusayyah according to squares (without Squares 11-13).

		Sounding 1		Sounding 2		Sounding 3		Sounding 4		Sounding 5		Sounding 6		Sounding 7		Sounding 8		Sounding 9		Sounding 10		Total	
	Tool class	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Non-Formal-Tools	retouched blade	74	15	102	23	79	27	77	12	17	39	61	26	41	20	244	23	106	26	25	33	826	21.3%
	retouched flake	74	15	93	21	49	17	72	12	8	18	25	11	18	8.7	221	21	91	23	8	10	659	17.0%
	notched blade	25	5.1	5	1.1	9	3	8	1.3	3	6.8	10	4.3	5	2.4	53	5	18	4.4	1	1.3	137	3.5%
	notched flake	22	4.5	21	4.7	12	4.1	14	2.3	2	4.5	10	4.3	7	3.4	58	5.5	23	5.7	2	2.6	171	4.4%
	multiple tools	20	4.1	7	1.6	4	1.4	33	5.3	0	0	6	2.6	3	1.5	32	3	18	4.4	1	1.3	124	3.2%
	Subtotal	215	44	228	51	153	52	204	33	30	68	112	48	74	36	608	58	256	63	37	48	1917	49.5%
Formal Tools	heavy duty tools	8	1.6	5	1.1	3	1	5	0.8	0	0	2	0.9	2	1	10	0.9	1	0.2	0	0	36	0.9%
	arrowheads	2	0.4	5	1.1	1	0.3	9	1.4	1	2.3	2	0.9	2	1	10	0.9	0	0	0	0	32	0.8%
	dagger	1	0.2	4	0.9	1	0.3	3	0.5	0	0	0	0	2	1	4	0.4	4	1	0	0	19	0.5%
	transverse arrowheads/TBS	0	0	5	1.1	4	1.4	15	2.4	0	0	1	0.4	5	2.4	19	1.8	5	1.2	0	0	54	1.4%
	sickle	0	0	3	0.7	8	2.7	4	0.6	0	0	3	1.3	6	2.9	14	1.3	2	0.5	1	1.3	41	1.1%
	burin	6	1.,2	6	1.3	6	2	17	2.7	2	4.5	3	1.3	7	3.4	34	3.2	6	1.5	1	1.3	88	2.3%
	scraper	18	3.7	23	5.2	9	3	32	5.2	1	2.3	8	3.4	13	6.3	39	3.7	9	2.2	3	3.9	155	4.0%
	perforators/awls	225	46	162	36	104	35	319	51	7	16	103	44	91	44	313	30	121	30	35	46	1480	38.3%
	picks	10	2.1	3	0.7	7	2.4	10	1.6	3	6.8	1	0.4	3	1.5	1	0.1	1	0.2	0	0	39	1.0%
	bifacials	1	0.2	2	0.4	0	0	3	0.5	0	0	0	0	1	0.5	1	0.1	0	0	0	0	8	0.2%
	Total	486	100	446	100	296	100	621	100	44	100	235	100	206	100	1053	100	405	100	77	100	3869	100.0%

5. As has been already observed from other sites like Sha'ar Hagolan (Barzilai and Garfinkel 2006; Barzilai 2010: 287), or in north Syria at Shir (Rokitta-Krumnow 2010).

6. Whether or not conducted by part-time, full-time, or itinerant craft-specialists (see *e.g.* Quintero 2010, 97; Quintero – Wilke 1995; Rokitta-Krumnow 2013; Barzilai and Khalaily 2016) cannot be discussed here.

have been found) is quite puzzling[7]. Maybe perishable materials like wood, leather or bone had been worked with these tools. However, perforating seems to have been a daily practice at al-Ḥusayyah.

Comparisons for the flint industry (especially concerning tile knives, dagger, and projectiles) can be found in a wide area covering the Levantine coast (*e.g.* Ziqim, Garfinkel *et al.* 2002; 'Asqalan (Ashkelon), Perrot and Gopher 1996; Wadi Karkara (Nahal Betzet) II in the Akko plain, Getzov *et al.* 2009) and the Negev (*e.g.* Hamifgash, Goring-Morris 1993; Kvish Harif, Rosen 1984), the Hula valley (*e.g.* Beisamoun, Khalaily *et al.* 2015), the Bādiyah (*e.g.* Wisād Pools, Rollefson *et al.* 2013; aḍ-Ḍuwaylah, McCartney and Betts 1998) and the Zarqa Valley (*e.g.* Abu Sawwan, al-Nahar 2013; 'Ayn Ghazāl, Rollefson 1990). However, the best comparisons are found at coastal sites like Ziqim (Garfinkel *et al.* 2009) and 'Asqalan (Ashkelon) (Dag 2008, Tab. 15) and may reflect similar toolkits for similar needs. Further investigations are needed here (see also Rokitta-Krumnow, in prep.).

With regards to lithic and pottery finds, the main settlement periods of the site are probably the PPNC and the Yarmoukian. This is substantiated by several C_{14}-dates dating between *ca.* 6900 to 6400 *cal.* BC, which points to the beginning of the appearance of pottery in the Southern Levant. The lithic finds exhibit several comparisons with contemporaneous settlements over a wide area, although local adaptations and traditions make the differences between these settlements. This is also true for the architectural structures discovered during the new excavations; local elements with links to neighbouring areas have been attested (Bartl and Kafafi 2015: 28).

Acknowledgments

I wish to express my gratitude to Christoph Purschwitz for providing constructive comments and suggestions on earlier drafts of this paper. I would also like to thank Cecilie Lelek-Tvetmarken for checking the *English* in the manuscript and Karin Bartl for her help and the possibility to carry out this research.

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Nabataean and Late Roman Domestic Complexes at Petra

For understandable reasons, prior archaeological investigation of Petra has focused on its extraordinary public monuments. But this has resulted in a glaring ignorance of Petra's non-elite population, including domestic structures. This is not to suggest the total neglect of non-elite domestic structures at Petra. In fact, the earliest scientific excavations at Petra by Murray and Ellis and by the Horsfields excavated several cave complexes so commonly used for domestic purposes (G. and A. Horsfield 1938; Murray and Ellis 1940).

Peter Parr excavated apparent domestic structures just north of the city wall on the North Ridge but these results were never published beyond brief mention in a preliminary report (Parr 1986). In fact, Parr himself must be credited with calling for more focus on Nabataean domestic structures many decades ago (Parr 1965). In the 1980s Zeitler conducted a small-scale but significant excavation of a 1st century BC. domestic structure near al-Kubtha (Zeitler 1989, 1990).

Nehmé published an important study of a cave-house (Nehmé 1997). Nevertheless, even Judith McKenzie's 1990 monumental monograph on the architecture of Petra could devote only minimal attention to the city's domestic architecture, given how little was actually then known (MacKenzie 1990: 105-08). Otherwise, the only major published excavation of a residential area at Petra is the complex atop az-Zanṭūr (Bignasca *et al.* 1996). However the evidence uncovered by the Swiss team certainly suggests that this was originally an elite residence, interpreted as a *villa urbana*. The later Roman domestic structures from az-Zanṭūr have also been published in some detail (Kolb 2000). Kolb has also published a useful synthesis of Nabataean domestic architecture, differentiating between rupestrian and free-standing structures (Kolb 2007). Nevertheless, the need for more evidence from domestic contexts at Petra is clear. This in part led my co-director, Megan Perry, and I to organize the Petra North Ridge Project to focus on the non-elite population of Petra. It aims to address this topic by excavating apparent domestic structures and some of the fifty or more rock-cut shaft tombs that dot the ridge. This paper focuses on the former aspect of the project, summarizing selective results from three field seasons between 2012 and

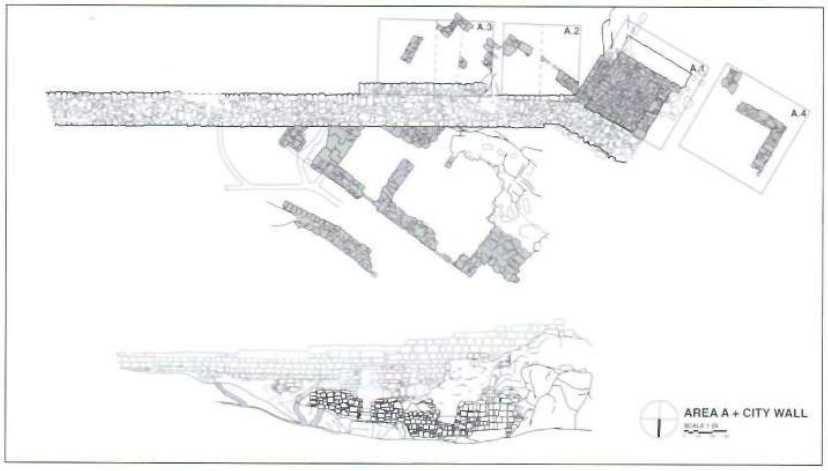
2016[1].

Thus far we have excavated portions of four domestic complexes on the North Ridge (FIG. 1). Two of these were uncovered during soundings of the city wall in Areas A and D. Excavation in 2012 in Area A uncovered several rooms constructed on bedrock in the 1st century AD. (FIG. 2). This complex straddles the later city wall, which cut through the structures. Parr had excavated the structures north of the city wall decades ago but never published anything beyond a brief preliminary report (Parr 1960). Thus we re-measured and redrew the structures Parr had exposed and added them to the plan and elevation of our newly excavated structures south of the city wall, which together originally formed one complex in the 1st century AD. The walls and doorways were built of rough stone masonry but their internal stratigraphy had mostly been removed, apparently by construction of the city wall around the turn of the 2nd century (Parker and Perry 2013).

Excavation in 2014 of two trenches in Area D, well east of Area A, also exposed an apparent Nabataean domestic structure, probably of the 1st century AD., once again heavily damaged by erection of the later city wall (FIGS. 3-5). The city wall, as in Area A, sliced right through the early domestic structure, leaving two isolated segments on both sides of the city wall. This structure lies nearly on the crest of the North Ridge.

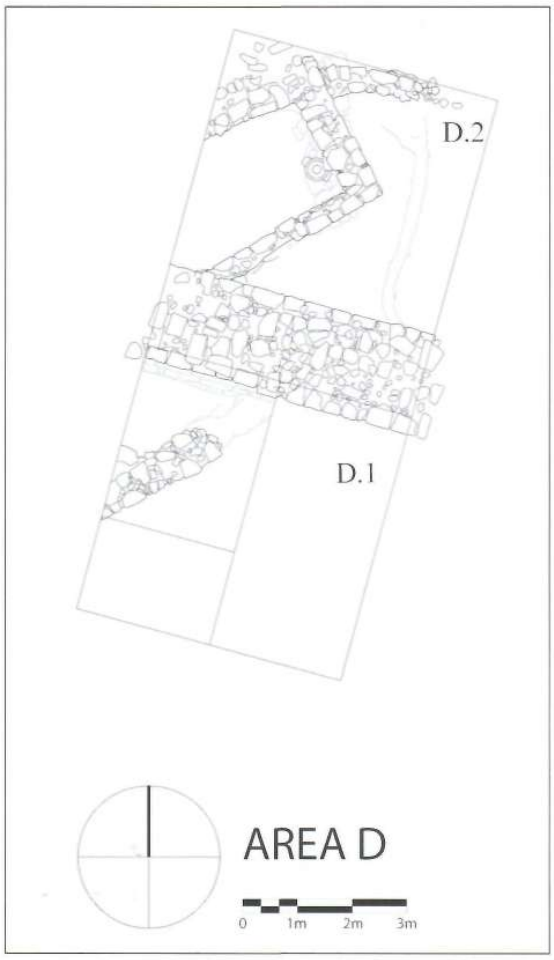
Two other domestic complexes, excavated as Areas B and C, yielded much more evidence.

1. Site plan of Petra North Ridge with excavation areas of the Petra North Ridge Project. Domestic structures lie in Areas A, B, C, and D.



2. Plan and elevation of Area A. The structures below (north) of the city wall were excavated by Parr but were essentially never published, apart from a sketch plan and brief description.

1. For published preliminary reports on the project, see Parker and Perry 2013; Parker and Perry 2014; Parker 2016; Perry 2016; Parker and Perry 2017.



3. Plan of Area D.1-D.2, illustrating early 2nd century city wall cutting through a 1st century A.D. Nabataean domestic structure.

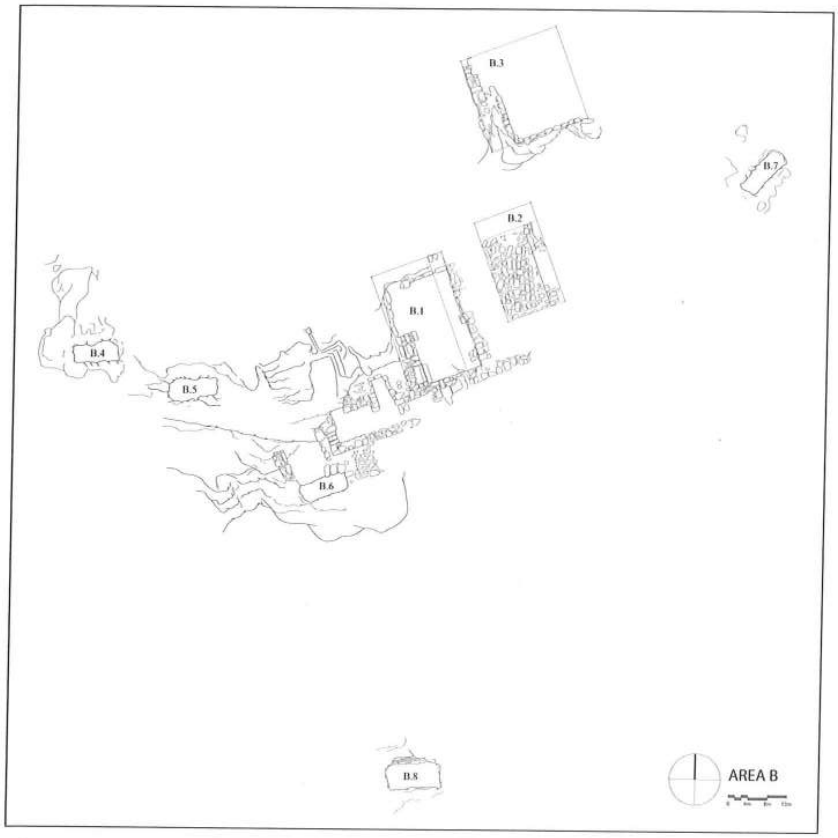
4. Photo of Area D.1, showing remnants of the 1st century A.D. Nabataean house in the foreground and the later city wall, which cut through the house around the turn of the 2nd century, in the background. View to N.

5. Photo of Area D.2, showing remnants of the Nabataean house in the foreground and the later city wall (partially resting on bedrock) in the background. A basalt millstone is visible in the lower left of the photo. View to S.

Because the salient results from the Area B complex have been published in preliminary form (Parker and Perry 2013), I will merely summarize the key results from this area and instead focus largely on the results from Area C[2].

The Area B complex lies on the southern slope of the ridge, overlooking Petra's main colonnaded street (FIG. 1). Excavation of three trenches revealed that occupation began in the early 2nd century (perhaps shortly after construction of the northern city wall) and ending in the 4th century, with massive collapse of the walls, perhaps due to the 363AD earthquake or its related aftershocks. We excavated two adjoining rooms (B.1-B.2) as well as an adjacent walled courtyard (B.3, FIG. 6). All these structures incorporated bedrock either as the foundation or in some cases serving as lower portions of its masonry walls. One room was paved by a beaten earth floor while the other room had a plaster floor, both laid directly over bedrock. A domestic function is suggested by a substantial oven constructed in B.2 by two reused ceramic storage jars, one set inside the other and filled with ash (FIG. 7). The interior room walls and/or ceilings of either this room or perhaps an upper story were once covered by white wall plaster decorated by bright red paint. The pos-

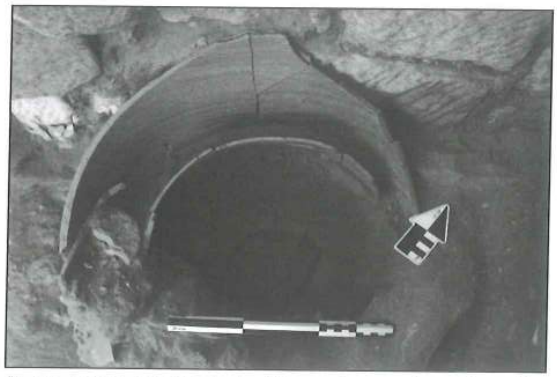
2. Area A in 2012 was supervised by Abigail Turner. Area B in 2012 and 2014 was supervised by Carrie Duncan, who also supervised Area C in 2014. Russell Gentry supervised Area D in 2014 and Area C in 2016. I am grateful to all our team members for their splendid excavation and meticulous recording in these areas that makes this paper possible.



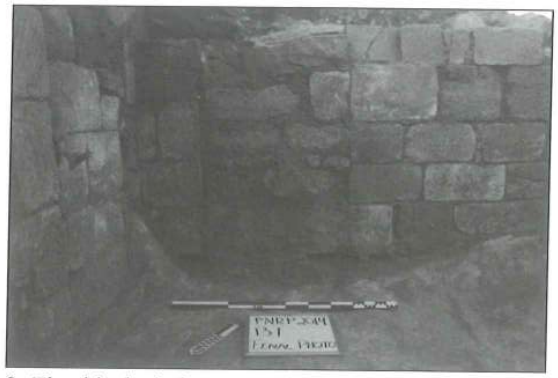
6. Plan of Area B. Note that the domestic structures in trenches B.1, B.2, and B.3 were built among earlier shaft tombs (mostly 1st century BC/1st century AD).

sibility of a second story is suggested by a stone staircase built into the SW corner of this room. A drain at the base of the common wall between the rooms permitted water to flow from the eastern room through the wall, down into a channel cut into the bedrock, and out the front door of the western room. A doorway that once connected the two rooms through their common wall was blocked with masonry at some point (FIG. 8) before a final catastrophic destruction, apparently the earthquake of 363AD (FIG. 9).

But it is Area C that has produced the most substantial and significant evidence for domestic life on Petra's North Ridge (FIG. 1). The ultimate goal in Area C was to expose the entire horizontal layout of a single, non-elite domestic structure. Four trenches (C.1-4) were laid out side-by-side, encompassing wall lines visible



7. An oven constructed of two fragmentary jars, the smaller fitted inside the larger, constructed against the north wall in Room B.1.



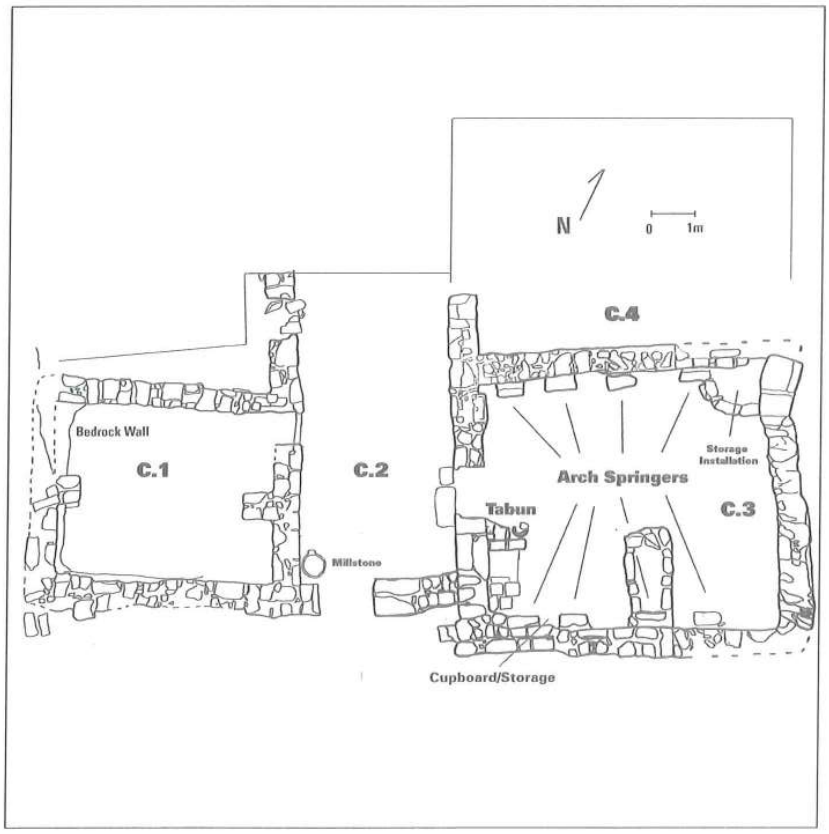
8. The blocked doorway which originally connected Rooms B.1 and B.2. View from Room B.1 to east.

9. Fallen masonry, still closely aligned, within Room B.2, probably the result of the 363AD earthquake.

on the surface prior to excavation (FIG. 10). Excavation reached bedrock in all four trenches and revealed the plan of the structure. Primary access was through a doorway in the southern wall leading into a central corridor (C.2). From the corridor one could access doorways into three rooms: one to the west (C.1) and another to the east (C.3). A third doorway on the western side of the corridor, north of room C.1, provided access to a third (unexcavated) room or perhaps served as another external entrance. Excavation in C.4 was also conducted north of C.2 and C.3 to determine the northern limit of the building and explore an exterior space associated with the house.

The structure was built of roughly coursed masonry but often incorporated bedrock outcrops as foundations for these masonry walls. Doorjambs were typically of higher quality masonry and flanked stone thresholds. Roofing arches (one in C.1, four in C.3), the paucity of roof tiles, and some 35 iron nails and spikes recovered from the building suggest flat roofs of timber planks resting on the arches.

The date of construction remains somewhat enigmatic, although probably in the early 2nd century AD Recovery of a coin of Trajan dated to *ca.* 114 from the occupation layer over the earliest floor in Room C.1 suggests that the complex was possibly erected soon after the Roman annexation of 106. The complex remained in use through the 2nd and 3rd centuries and into



10. Plan of the Area C domestic complex.

the 4th century until suffering significant damage, apparently in the 363AD earthquake. It was then largely abandoned, apart from a brief squatter occupation in the ruins of room C.3 in the late 4th century, apparently when it was still partially roofed.

The C.2 corridor provided both access to the house from the south and gave internal access with doorways to both adjacent rooms (FIG. 11). The main entrance to the complex was apparently located in the southern end of C.2. Most significantly, entrance to the complex was modified at some point after initial construction by the addition of a wall to create a doorway in the south. In the southeast corner of the corridor was a cooking installation enclosed by a stone semi-circle; faunal remains suggest household level butchery, primarily sheep and goat. In the southwest corner was a basalt grinding mill. A doorway in the western wall of the C.2 corridor gave access to the smaller western room (C.1, *ca.* 4m E-W × 3m N-S). Similar to the construction in Area B, the west wall of the western room incorporated bedrock rising up slope to the north and thus reducing the number of stones in each course towards the north (FIG. 12). The east and west walls both bonded to piers which supported a central roofing arch, after which the west wall gave way entirely to bedrock to the north. Some walls in C.1 preserved plaster on their faces.

Trench C.1 yielded significant occupational remains, including stratified ceramic evidence for construction in the early 2nd century AD. Just above bedrock was a beaten earth floor which appears patchily across the room, particularly where the bedrock is uneven or dips. An oven was built against the face of the north wall. The oven was constructed of a flat piece of limestone as its base, two unhewn boulders to brace the exterior edges and several ceramic tiles. The exterior was packed with mud mortar and sherds and the entire installation was plastered in place against the northern room wall. Adjacent to this cooking installation was an assemblage consisting of a wooden handled knife, oil lamp, and articulated fish skeleton lying on this floor (FIG. 13).

Across the central corridor to the east was

11. Photo of the central corridor (C.2), view to south. Note the doorways into C.3 (on the left), C.1 (upper right), and the unexcavated room (lower right). A basalt grinding mill is visible just to the right of the southern entrance into the corridor.

12. Photo of the western room (C.1), view to N, after removal of all deposits down to bedrock. Note the springers for roofing arches on the north and south walls and the doorway giving access to the central corridor.

the entrance to the much larger room (*ca.* 6.5m E-W×6m N-S) excavated as C.3. Some of its architectural features appear secondary to original construction but still within the Late Roman period (FIG. 10). The walls of this room were plastered. Four parallel arches springing from piers built against and extending from the northern and southern walls supported the roof (FIG. 14). A curved wall built against the northeast corner of the room apparently served as a storage installation. A plastered niche, apparently a cupboard, was constructed in the south wall between two plastered piers that served as arch springers (FIG. 15). The cupboard includes ceramic tiles plastered into the sides as shelves. The lower shelf remains *in situ*, while another tile could very well be that dislodged from the upper portion, where a slot for another shelf is clearly visible. While the construction date of the cupboard cannot be ascertained, it was clearly used right up until the destruction of the room, based in part on the presence of a 4th century cooking pot found nearby which had apparently fallen from one of the shelves in the final destruction, likely the seismic event. In the southwest corner of the room, another storage installation, floored with ceramic tiles, was built against the west wall. Just to the north of this installation was an oven (*tannur*), comprised of three ceramic jars with their original lower body removed and then one set inside another (FIG. 16). The oven was filled with ash which was removed for flotation analysis.

As seen in Room C.1, a thin layer of soil, patchily preserved, had been laid over bedrock within this room. Overlying the original floor was a sequence of thin occupation layers, the latest pottery from which was early Late Roman (2nd century). Occupation continued through the 3rd and into the 4th century, ending once again

13. Photo of the oven in Room C.1. The remnants of the oven are in the upper left of the photo. An iron knife with its partially preserved wooden handle and a ceramic oil lamp are visible just above the medium-sized meter stick. A completely articulated fish skeleton is visible just to the left of the smallest meter stick.

14. Photo of Room C.3, view to W. The entrance into the room from the C.2 corridor is visible in the upper center of the image. To the left of the doorway is a partially preserved oven and farther left is a plastered storage installation. The four arch springers are visible against the north wall on the right of the image. The semi-circular storage installation, partly obscuring the easternmost arch springer on the north wall, is visible in the lower right (northeast corner) of the room. A rectangular storage installation projects from the south wall (on the left of the image) into the room.

15. Photo of a plastered niche, apparently a cupboard, constructed in the south wall of Room C.3 between two plastered arch springers. The cupboard included ceramic tiles plastered into the sides as shelves. The lower shelf remains *in situ* where a slot for another shelf is clearly visible in the upper portion. View to S.

16. In the southwest corner of the room, another storage installation, floored with ceramic tiles, was built against the west wall. Just to the north of this installation was an oven (*tannur*), comprised of three ceramic jars with their original lower body removed and then one set inside another.

with massive deposits of tumble, likely from the 363 AD earthquake. However, it appeared that one or more of the arch springers in this room stood for some time after the seismic event, as the eastern portion of the room witnessed some squatter occupation within the ruins followed by significant evidence of dumping within the room, all still within the late 4th century.

Finally, Trench C.4 was excavated north of the complex both to determine its northern limit and, if identified, to sample some exterior space just outside the structure. Complete removal of massive layers of tumble (again dated by associated pottery to the mid- to late 4th century) revealed two soil layers, possibly created by episodes of dumping, along with a round stone press and a few other artifacts, overlying bedrock.

The stratigraphy suggests that the massive amount of tumble in the complex is likely the result of two discrete collapse events. Perhaps this is explained by two seismic events, *i.e.* the initial earthquake in 363AD and another soon after, perhaps that of 419AD which also ended occupation at az-Zanṭūr across the valley.

What does this evidence suggest about "ordinary" domestic life in Petra in this period?

A part from a rather spectacular gold ring with a garnet inlay (which it should be stressed derives from a post-occupation context), the artifactual and organic evidence from the Area C complex is rather mundane. Not surprisingly, the botanical and faunal evidence is typical for the region. Sheep and goat were the overwhelmingly predominant animal foods, with minor sources such as chicken and their eggs. Wheat and barley dominate the botanical record along with the typical fruits (olive and grape) and legumes (lentil and chickpea). In short, there was otherwise little evidence of exotic foods apart from some fish, likely imported from the Red Sea.

This picture is complemented to a large extent by the associated ceramics, recovered in large quantity from the complex. There is a notable paucity of imported pottery, both fine table ware and transport amphorae. There were only a handful of imported fine ware sherds. This includes imported fine ware from the earlier period (*i.e.* Sigillata wares, such as Eastern Sigillata A, n=13, although admittedly production of ESA was already in decline by the early 2nd century when the Area C house was constructed) but also later periods (*i.e.* African Red Slip, n=22, plus a single sherd of Egyptian Red Slip). The inhabitants seemingly preferred the local Nabataean fine ware, which the complex yielded in large quantities (n=551) and which was still in production in the 2nd to 4th centuries. Yet the vast majority of these sherds (*ca.* 90%) date before the Roman annexation and thus is likely to be residual. In short, there appears to be only limited use of even the locally produced fine ware within this house.

A similar picture emerges for the imported amphorae, presumably reflecting imports of wine, oil, and garum but virtually absent in any but token amounts from this complex. A mere 72 sherds of imported amphorae were recovered from the complex. Many of these derived from layers overlying the collapsed debris and thus may not even be associated with the occupation of the Area C house. The complex did yielded about a dozen sherds of the Peacock and Williams Class 47 amphora, presumably docu-

menting wine imported from the Aegean in the 3rd or 4th centuries (Peacock and Williams 1986: 193-195). Especially noteworthy is a puzzling virtual absence of Gaza amphorae, despite the fact that caravans routinely traveled from Petra to Gaza carrying aromatics from Arabia and could presumably have returned to Petra with amphorae filled with the famous white wine of Gaza. The inhabitants of this complex apparently relied primarily on their own local olive oil and wine.

Other associated artifacts from the Area C complex are also suggestive of domestic life. The structure yielded 34 stone mortars or grinders from both rooms and the central corridor, mostly fragmentary but a few complete and most of imported basalt. Seven stone pestles, three hammer stones, a knife and a spoon all suggest food preparation associated with the cooking installations in both C.1 and C.3. A loom weight and four spindle whorls suggest household textile production, normally "women's work". A kohl stick and a few pieces of jewelry (*e.g.,* an earring, three finger rings, three bracelets, and a fibula) also may suggest domestic occupation. The house also yielded fragments of nine ceramic figurines, both zoomorphic and anthropomorphic. Some 25 bronze coins were scattered throughout the house but were mostly too corroded for close identification. They do suggest some level of participation by the inhabitants in a monetized economy, as one would expect for an urban center in the Roman Near East.

Is all this surprising for a housing complex that sat on prime downtown real estate in this great city, directly above the main street and with a spectacular view of the civic center? In short is this evidence for the non-elite nature of the inhabitants of this housing complex? Skeptics will surely remark that Petra lacked direct access to the sea and thus one should expect fewer luxury imports at a landlocked site and thus with significantly higher transport costs. Yet this is belied by evidence from the az-Zanṭūr domestic complex directly across the valley and overlooking the main street from the south. Here the Swiss team found much more evidence of imported fine wares, even including some Western Terra Sigillata from Italy, totally absent from our Area C. The original *villa urbana* at az-Zanṭūr, with its luxurious appointments including Pompeian-style wall frescoes, must have been an elite residence. This view is lent further support given its location directly above the Royal Pool and Garden Complex and the so-called "Great Temple" (especially if, as some believe, this was originally a palace of the Nabataean kings). Our Area C domestic complex, as well as the less well preserved examples from Areas A, B, and D, all simply pale by comparison. But this is also compelling evidence, in my view, that these housed non-elite inhabitants.

One further point might perhaps explain why the North Ridge was a less desirable location for living within downtown Petra. As noted above, the ridge is pockmarked by at least 50 rock-cut shaft tombs. Our excavations suggest that these were a cemetery of family tombs in the 1st centuries BC and AD but went out of use soon after the turn of the 2nd century, *i.e.* right after the Roman annexation of 106AD. This is presumably explained by the imposition of Roman law which forbade human burials within the newly constructed city walls. One wonders what it might have been like to live among these tombs, with the constant smell of decaying corpses in the 1st and into the early 2nd centuries. No wonder the Nabataeans were famed for trafficking great quantities of incense! Some portion of these imported aromatics probably was burned to help disguise such smells when living on the North Ridge.

This argument remains tentative, as the evidence recovered to date is still undergoing analysis. For example, analysis of faunal and botanical evidence is still at an early stage. But thus far the evidence suggests that the domestic complexes on the North Ridge are in fact yielding an intriguing picture of non-elite domestic life in the heart of Petra.

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The Ritual Landscape of Murayghāt: The Excavation

Introduction

The Ritual Landscape of Murayghāt project studies the area of Murayghāt, situated in central Jordan close to Mādabā. The project consists out of two main components, the landscape study and an excavation. At the same time it is also a field-school of Copenhagen University and a salvage project.

The large dolmen site of Murayghāt has been known for many years and was mentioned by several early travellers (Irby and Mangles 1985: 465-66; Conder 1889: 184). Later visitors reported Chalcolithic as well as Early Bronze Age pottery there and made some surveys in the area (Mallon, Koeppel and Neuville 1934; Harrison 1997; Dubis and Savage 2001; Savage and Rollefson 2001; Savage and Metzger 2002; Savage 2010). Three quarries in the direct neighbourhood of the site are still expanding and threaten the dolmens (Savage 2010; Scheltema 2008). This danger has subsided slightly, as the Department of Antiquities and the Jordan Government have bought the dolmen fields west of the central knoll. A large number of dolmens have, however, already disappeared. Other disturbances were caused by both agricultural and pastoral activities on and around the central knoll. The Ritual Landscape of Murayghāt is thus also a salvage project that will document as much of these unique monuments as possible. Projects concerning cultural heritage management have only been planned on a small scale so far, but will play a larger role during the continuation of the project.

The Site

The site is formed by the central knoll (Area 1; FIG. 1) that is surrounded by low hills to the north (Area 3), west (Area 4) and southwest (Area 5 and Area 6). A road east of the knoll separates it from a field that runs towards the steep sides of Wādī Mā'īn. This field (Area 7) contains some rather large dolmen and continues northwards until the *ḥajar al-Mansūb*, a large standing stone, *ca.* 1km from the centre of the central knoll; the stone has been mentioned in all earlier reports of the site. The northern hill (Area 3) is nearly eaten up by the northern quarry, but these activities that also threatened the south-western hill (Area 5) have stopped

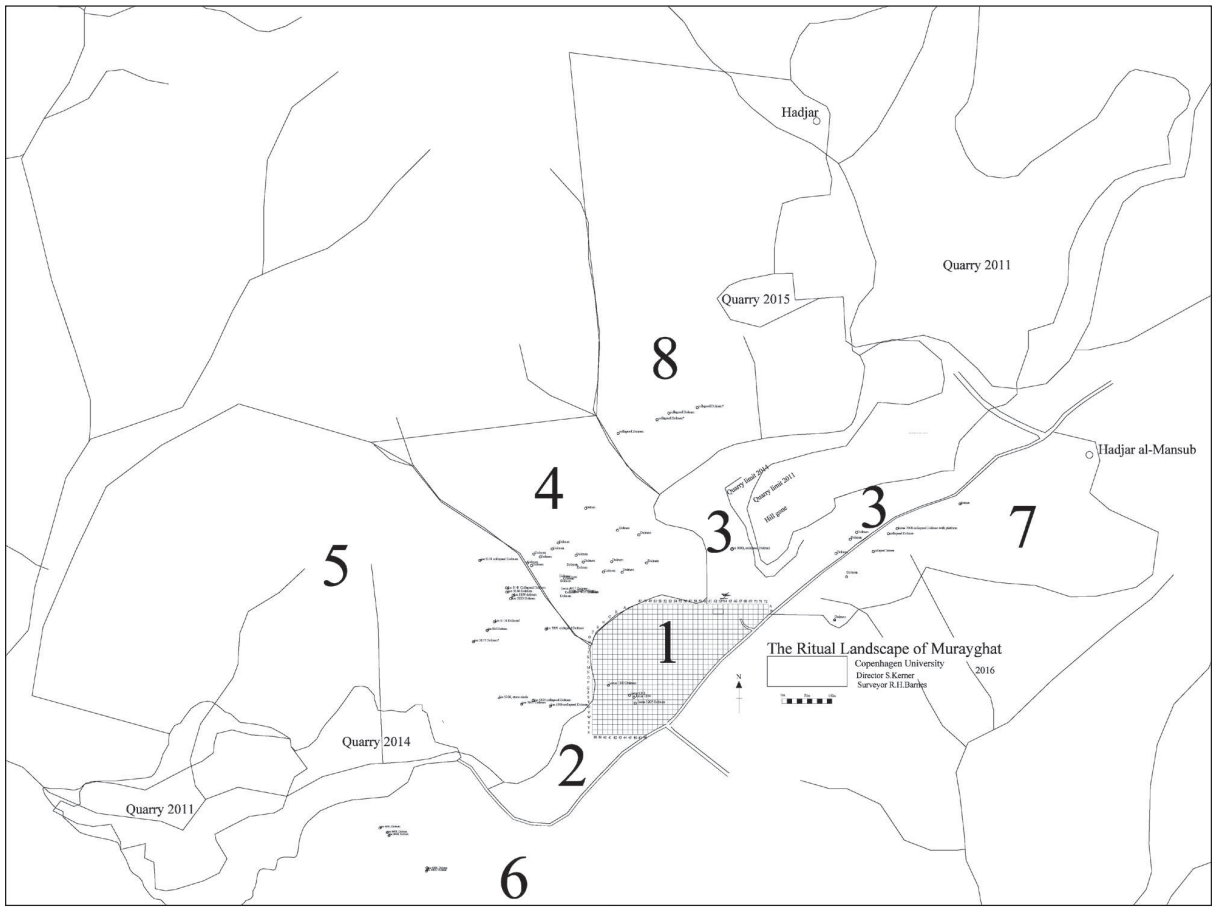
in 2015, resulting only in natural erosion. The quarries still work to the west and the south. Along the road (in Area 3 and 7) are some broken down dolmen; according to the information by the local population, some of these have been blown up during the last decades. Some disturbance is thus still continuing in area 6 and 8. The modern road might well indicate that Murayghāt had always been at an important position, where the entrance towards the Wādī Mā'īn and thus the Jordan valley was possible.

The Survey

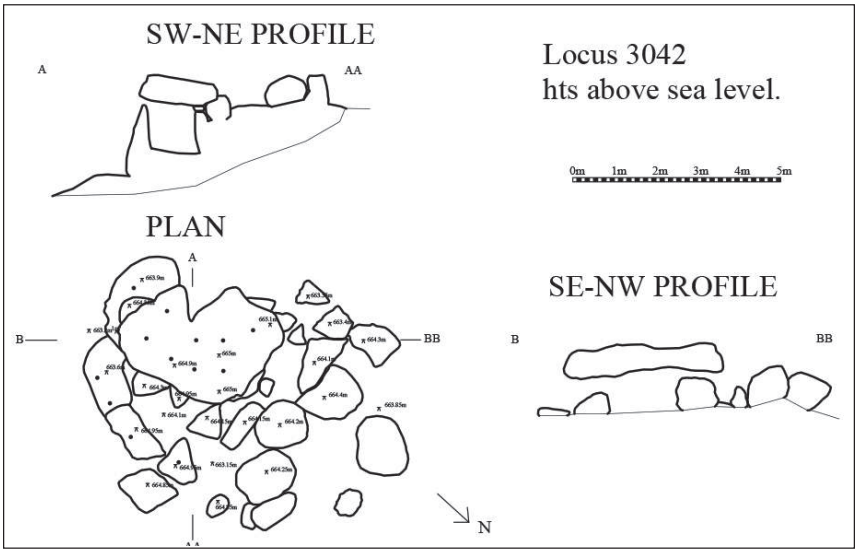
The systematic survey of the surrounding of the central knoll has been carried out in five different areas (delimited by natural and cultural borders such as wadis or roads). Each has been subdivided into fields, which were systematically surveyed and all cultural structures were documented.

Area 3

Area 3 is the smallest of the survey areas (FIG. 1), just north of area 1 and occupying the remains of the hill around the northern quarry. Several stone concentrations have been found there, some might be destroyed dolmens, but some could also be the result of the neighbouring quarry activities, which would have rolled large stone boulders over the top. Four small caves have been found, which are all relatively small and might have been artificially cut. Four dolmens have been documented and the largest dolmens are positioned along the road (L.3042, L.3043, L.3044), so on the lower slope of area 3. Only L.3042, with 14sqm a large example (FIG. 2), was well preserved with its roof-stone still *in situ*, while the broken down side-stone slabs are the last remains visible from L.3043 and L.3044. In the eastern fields L.3000 and L. 3010, also on lower ground, numerous cup-marks were found.



1. Map showing all areas in Murayghāt (H. Barnes).



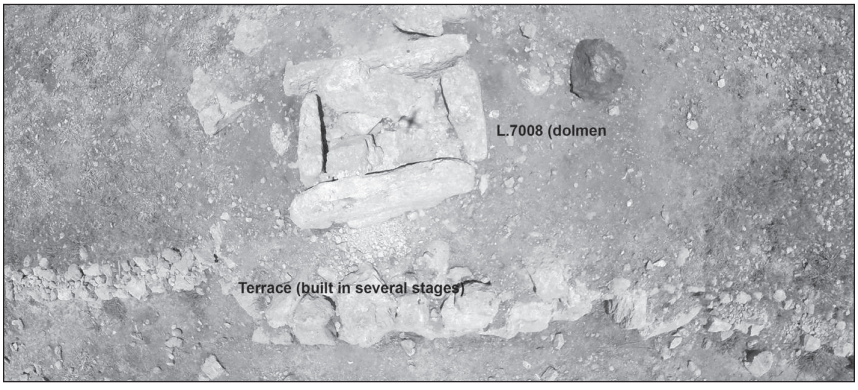
2. A large dolmen in area 3 (L.3042) – (H. Barnes).

Area 7

Area 7 is situated east of the modern road and contains some of the largest dolmen of the area. One of the dolmens is further downslope towards the steep Wādī Zarqā' Mā'īn, and does not allow any line of sight to the central knoll of Murayghāt (and is rather singular in this). five dolmens have been found, of which only L. 7001 is complete, while all others are collapsed (L.7002, L.7004, L.7005, L.7006). the outmost north-eastern corner of area 7 is formed by *ḥajar al-Mansūb* (L.7007, scheltema 2008; savage 2010), the large standing stone widely visible. one other large stone, either being originally part of a dolmen or a former standing stone, was also documented (L.7003). the dolmen in area 7 are clearly built on artificially formed terraces, as can be seen for L. 7008 (FIG. 3). the eastern part of area 7, sloping into the Wādī Ma'īn will be surveyed in the next years.

Area 4 and 5

Area 4 and 5 are to the west of the central knoll and can be divided into a number of geographical or geological zones: a ploughed field at the bottom of the eastern slope and steep slopes toward Wādī Murayghāt as well as steep slopes to the side wadis. One of the side *wadis* divides area 4 and 5 from each other. The lower parts of the steep slopes are only partly covered with soil, from which the steep bedrock layer rises up as a cliff (up to *ca.* 10-15m) to the lowest rock terrace at mid-slope, which is formed by slightly less hard rock formations. There are several rock terraces forming the slope of both areas up to the hilltop, some might have been artificially enhanced. The survey fields were



3. Area 7: Dolmen L. 7008 on artificial terrace (photo distorted) - (S. Kerner).

usually arranged along these geographical formations. The Murayghāt project has counted over 90 dolmens here, of which 23 dolmen are complete and *in situ* or only very slightly disturbed, while 55 of them are collapsed, but can quite certainly be considered dolmen. In area 4, twelve dolmens have been documented completely, while the remaining ones have only been registered. These 12 dolmens are mostly arranged along the terraces.

Central Knoll

The central knoll encloses *ca.* 3.5 ha and is limited in the west by Wādī Murayghāt (flowing into the Wādī Mā'īn) and in the east and south-east by the street towards Wādī Mā'īn. The northern edge of the knoll is limited by an artificial rubble wall, formed by bulldozing activities since the 1970s. The knoll itself consists of hard limestone bedrock, a material that breaks in relatively straight slabs, easy to use for the construction of dolmen without the need of much further work, with some slightly less hard limestone overlaying it.

A net of 10×10m squares was laid over the site and *ca.* 40% have been surveyed, documenting the visible bedrock, lines of standing stones, cup-marks and assembling surface collections. The central knoll shows two possible circular alignments on the highest point on the bedrock (O-P/50-51). From there a good view is provided to the surrounding areas, almost all dolmen on the hills (area 3, 4, 5, 6 and 7) would have been visible from that point, or better that point would have been visible from nearly all dolmens on the surrounding hills (kerner 2017). The *ḥajar al-Mansūb*, however, is not visible from that location. Other structures on the central knoll are four large horse-shoe shaped arrangements, of which HS1 (P-Q/47-48), HS2 (I-J/55-56) and HS4 (F-H/54-55) appear on the northwestern and southwestern side of the central knoll. Only HS 3 is on the northeastern side of the knoll (E/61-61) and thus directed towards the larger dolmen along the modern road. the dating of HS3 is very uncertain, it might be a much later construct used as an animal pen. Another very large horseshoe-shape (HS5) just south of hs4 was recognised in the geo-magnetic survey carried out in 2015 (only small parts of it are visible on the surface).

Several rectangular structures have also been documented. The R2 (F51) and R3 (J/50–51) are again on the western side of the central knoll on the flatter area outside the immediately visible bedrock. They are built from smaller stones and on flat, even ground. The R1 is built from large standing stones and on the bedrock east of the hilltop (H57). The south and west of the central site is delimited by a wall which has for most parts an interior and exterior face. On the eastern slope of the central knoll are two other double walls visible forming an entrance-like structure (L57 and K58), while the western slope again has an entrance like structure, where two larger standing stones form a gap in a longer wall made from orthostats (O49).

Three possible dolmen are inside the surrounding wall, one well preserved dolmen is south of the wall. The latter has *ca.* a dozen cup-marks on the top of the roofing stone. Over 40 cup-holes have been documented; there is a concentration of them along the edge of Wādī Murayghāt, where in some cases groups of five or more have been found (FIG. 4)[1]. They are usually around 15 to 20cm in diameter and of differing depth (up to 60 cm deep, although most are shallower).

The survey on the site showed very fragmented pottery material dating mostly into the MBA and EBA, but with some material from the Late Antique and Islamic periods. The squares from E-H/53-56 produced stone tools of Neolithic origin, while the other surveyed areas brought a mix of MBA and EBA material.

1. Their function is still not entirely clear as several of them do not look like the typical more shallow mortar or even grinding facilities as described *e.g.* by van den Brink (2008).

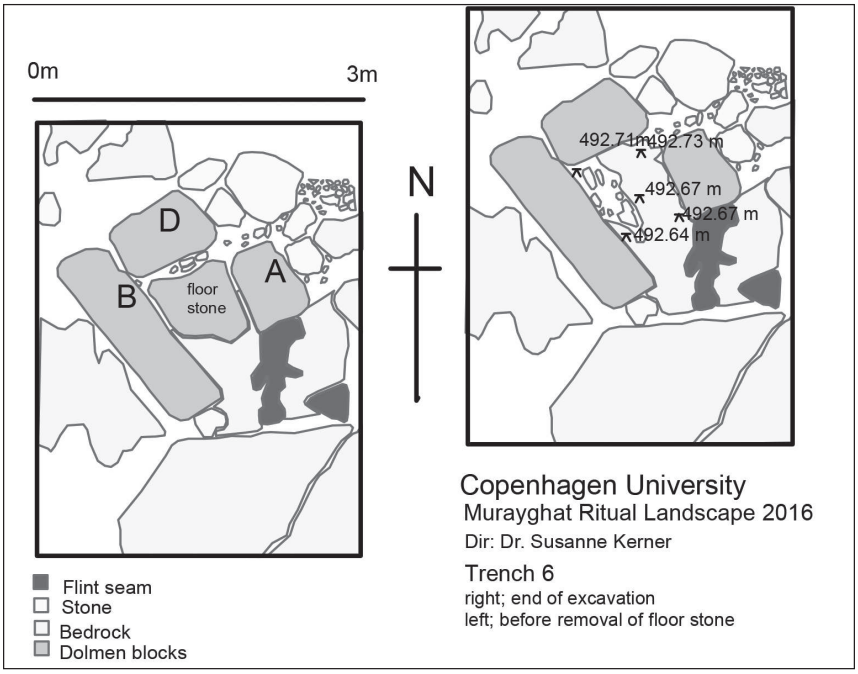
4. Example of cup-marks on western edge of central knoll (S. Kerner).

Dolmen Excavation

Only one dolmen has been excavated so far. The specimen was a broken dolmen, situated in area 1, on the actual central knoll (FIG. 5). A group of possibly three dolmens, two being very ruined and therefore not clear in their portrayal as dolmen, existed south of the central circles. The dolmen L. 1205 (Trench 6) was standing but incomplete, which allowed easy access. The side-stones enfolded the floor-stone very tightly, causing considerable difficulties, when the floor-stone was removed with the side-stones still standing. Smaller stones were used to wedge the larger ones in place. EB I material was found in the fill layers, as well as some finger bones.

Dolmen in Murayghāt

All together 122 dolmen have been recorded, but not all have been documented in detail. The dolmen are mostly consisting of one side-stone slab (sometimes two), one capstone and a floor-stone.They can be built on a platform and some show the last remains of a surrounding circle.



5. Trench 6: dolmen excavation (L. 1205) (H. Barnes).

The dolmen in Murayghāt occur mostly in two different sizes, they are either 2-3m long or longer than 4.5m, the latter forming the exception.

All dolmen studied so far have been empty, and most of them, even the still standing ones, are in a state of disorder that does not allow a secure interpretation of front or back. It is therefore very difficult to make decisive statements about the orientation of the dolmen. The dolmens in Murayghāt in their majority point towards the centre of the site, but not all follow this rule. The direction of the dolmen opening, as far as that can be determined, is also every so often governed by the location of the dolmen on the terraces along the hill slopes.

Excavations

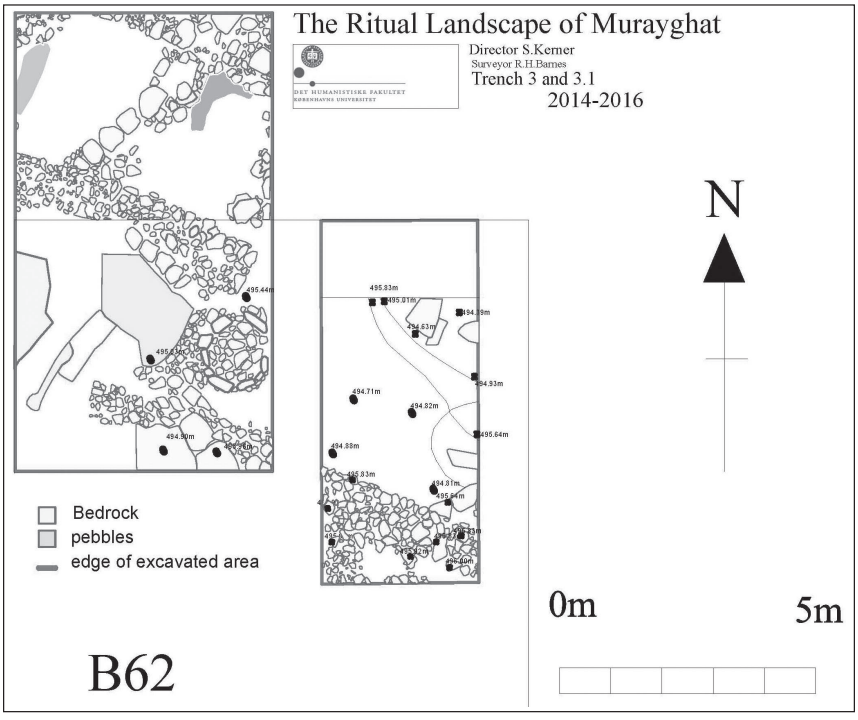
Five other trenches have been laid out on the central knoll itself and in its direct surrounding. The **Trenches 1** (O49) and **2** (N49) were each *ca.* 30 square meter and on the top of the central knoll, close to two lines of standing stones. Regrettably work on those trenches had to be stopped after only seven days; it was thus only possible to uncover surfaces of cobbled stones and a potential wall (Kerner *et al.* 2017).

Trench 3 and 3.2 (A62/B62) have been opened with just over 50m^2 and led to the excavation of some late Antique, very scant remains in the uppermost layers, several, but disconnected layers of Middle Bronze Age material and some Early Bronze Age remains before the virgin soil.

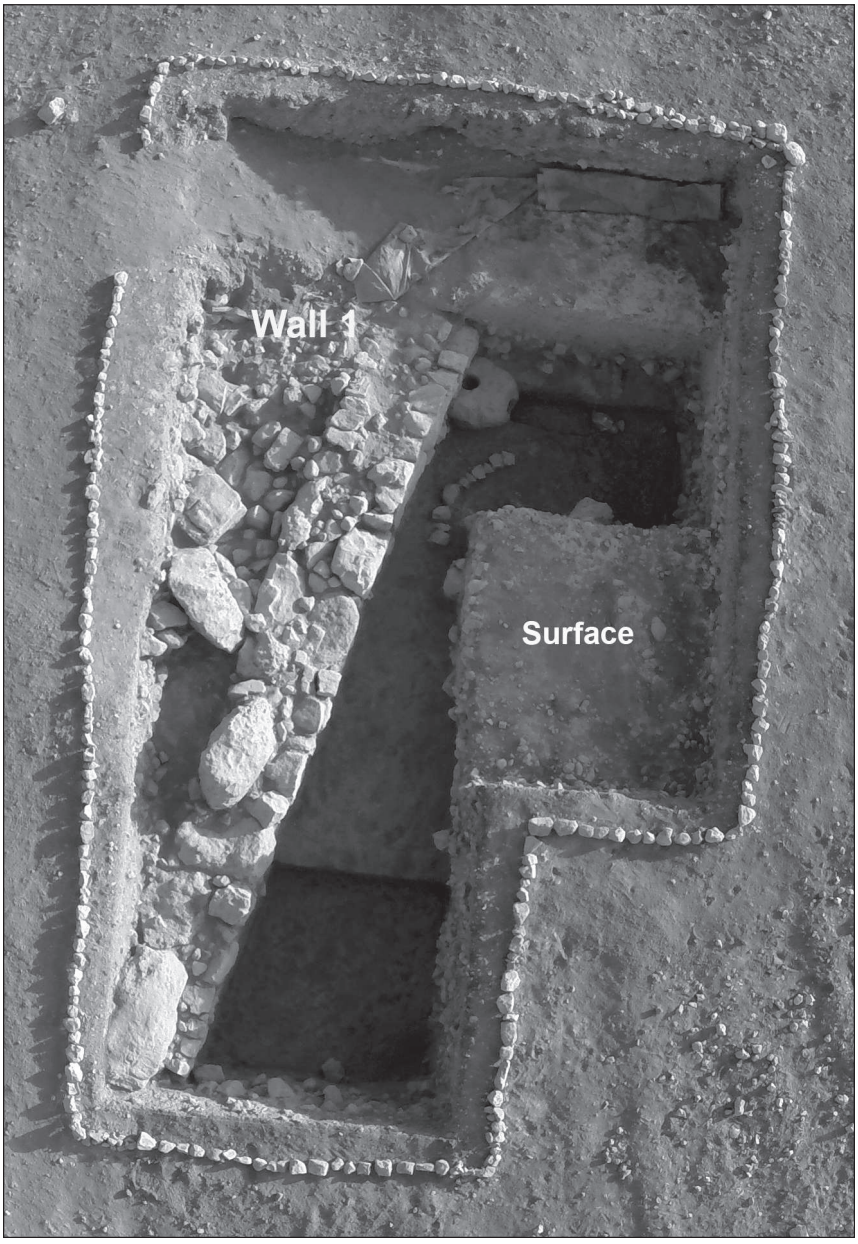
The latest MBA wall (wall 7, L.1457) consists of middle-sized and larger stones (FIG. 6), held together with a clayish matrix. The whole wall leans slightly, but appears solid and was excavated up to 1.2m height. The fill north of the walls was partly ashy, also including ashy pits. Smaller walls from different MBA phases filled large parts of the trench (FIG.7), partly connected by a surface, which was more an open air surface than an inside floor. One very well preserved stone lined pit is part of the earliest MBA occupation.

The EBA material, consisting of pottery and stone-tools, the former in a very fragmented state, appeared in fill layers without any architectural association.

Trench 4 and 4.2 (B63/C63) has been excavated since 2014 with an entire size of just under 50 m^2. Again a very late, large wall was



6. Plan of Trench 3 and 3.2 (combination of excavation results 2014-16) with small scale walls and stone-lined pit (H. Barnes).



7. Aerial Photo of Trench 4 and 4.2 (2016 photo distorted) – (S. Kerner).

found directly under the surface, followed by a very broken, grey crust (L. 1338, L.1308, L.1330 and L.1321) covering both a large wall (wall 1), a clayish, nearly sterile layer, which gave the impression of being flooded in, and several fill layers. The fill layers both above and below the crust dated to the MBA (FIG. 7).

Underneath Wall 1 was a very large limestone block situated (L. 1360 at least 65×55cm) with one hole each on top and in the front. The top-hole is flat bottomed and has straight walls (a post-hole?), while the one in the front is more in the shape of a cup-hole with narrowing walls.

The large double-faced Wall 1 (L.1307) is made of mostly large natural boulders and a few squared blocks with a smaller rubble core. In the eastern face of the wall, which is the only face exposed so far, there is mostly only one course remaining, though in places there are two courses. Interestingly, this east face is quite straight and relatively flat-faced, as if stones had been chosen carefully because this face of the wall was intended to be visible. In contrast, the top of the west face being just visible, is

not very straight and there does not seem to be any attempt to create a flat face. Only one long stone stretches across the whole width of the wall, otherwise it is a double-faced wall. There are small stones between the boulders, and presumably some sort of mud mortar to fill the gaps.

Discussion

Although a dating of the dolmen in Murayghāt still proves very difficult, due to the robbed out state of the structures, an Early Bronze Age date can be assumed. The indications are the dates for other trilithon dolmen (Fraser 2015; Polcaro 2013; Polcaro *et al.* 2014), the scant indications from the excavated dolmen L. 1205 and the existence of EBA layers in the excavations. There are strong indications for a connection between 4th Millennium BC sites and dolmen fields (Fraser 2015; Prag 1995). The interesting fact of a strong MBA re-use of the site might be closely connected to the dolmen fields. One has to realise that the dolmen, once they were constructed, would have changed the landscape forever. While humans shape landscape, landscape also effects humans; objects and subjects constitute each other (Thomas 1996). With such landscaping the people also made statements about their presence, leaving an imprint on the land. The dolmen fields around Mount Nebo also point towards both a connection between an EB I settlement (Conder's circle) and a later re-use, when several of the smaller circular structures were built (Mortensen and Thuesen 1998; Thuesen 2009). The dolmen are on ground that would not have been useable for agriculture, *e.g.* nearly the entire area 2 in Murayghāt, still used today for growing wheat, is free of dolmen[2].

The excavations have not yet provided an extensive Early Bronze Age settlement, which might be expected to have existed with the dolmen. The character of the Middle Bronze Age occupation as excavated so far, indicates an area intensively used for cooking, preparing and possibly storing of food (the most common single pottery form is a cooking pot) without being necessarily domestic (FIG. 9). The walls do not form private dwellings, they have far more the character of demarcation walls and possibly larger structures (with upper walls made from different material than stone).

Summary

The settlement activities in Murayghāt might start during the PPNB indicated by a concentration of stone tools found on the western part of the central knoll. The main activity periods on the central knoll and in the excavation are the Early and Middle Bronze Age, the latter with mostly domestic activities. The dolmen date most probably into the EBA period. There are Late Antique activities on the site, very likely connected to the use of several caves as tombs; and a later re-use in the Mamluk/Ottoman period, which is substantiated by a small amount of pottery and pipe fragments on the central knoll.

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Wādī al-Jarra Dam Rehabilitation Project, Petra

Introduction

The project agency responsible for the Wādī al-Jarra Dam Rehabilitation Project was Petra National Trust. The project funder was the American Ambassador's Fund. The project was directed over all its extension by the author.

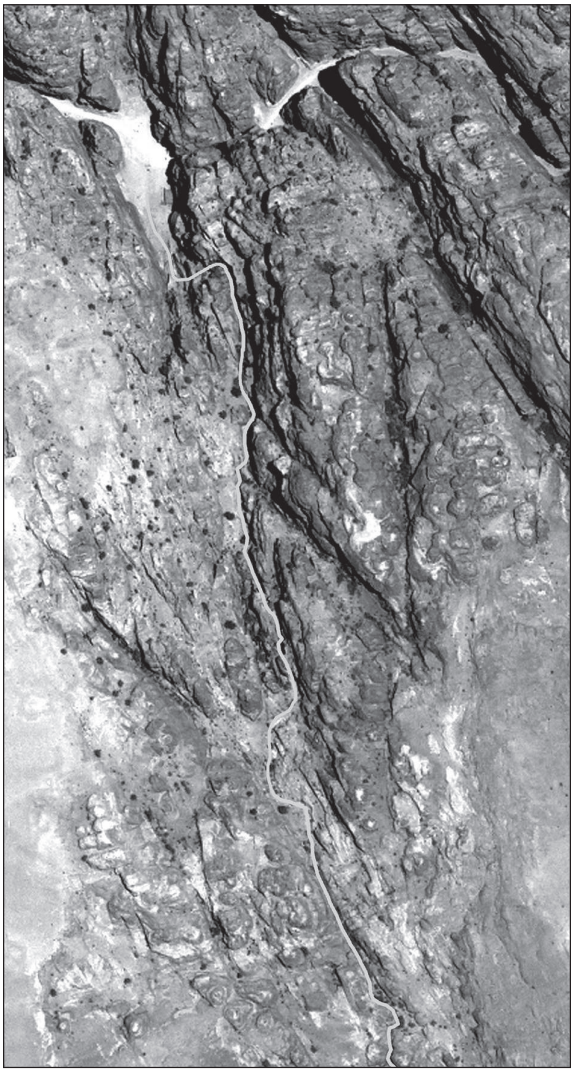
The Results of The Surveys 2005 – 2006

The Water Drainage in Wādī al-Jarra Before the Interventions of the Nabataeans.

Wādī al-Jarra is the longest *wadi* leading from south into the Wādī Mūsā, the main natural drainage channel of the Petra region; hence it is the biggest feeder of runoff water into the Sīq, al-Khaznah Courtyard and the Outer Sīq area during winter storms. Before the construction of the Nabataean flash-flood retention system the runoff water from the southern slopes draining into Wādī al-Jarra was completely channeled along the narrow and steep eastern branch of the *wadi* (FIG. 1). The much wider western branch of the *wadi* had no natural connection with the southern section of the main *wadi* and hence got only the vertical precipitation. Due to the topographical parameters of the eastern branch of Wādī al-Jarra the runoff water from heavy rainfall reached an extremely high level and velocity. Both of these factors resulted in an enormous flood energy, causing serious inundations and bottom scouring in the area of the later al-Khaznah Courtyard. As long as the Sīq and the Outer Sīq were not yet used as one of the main arteries for any traffic to or from Petra and as long as no constructions existed in the area of the later al-Khaznah Courtyard, the runoff water drainage system from Wādī al-Jarra as given by nature didn't have a great impact on the use of the territory by humans and animals. The only precautionary measurement to be taken by passers-by was to avoid the area during flash-floods and to wait for more suitable weather conditions.

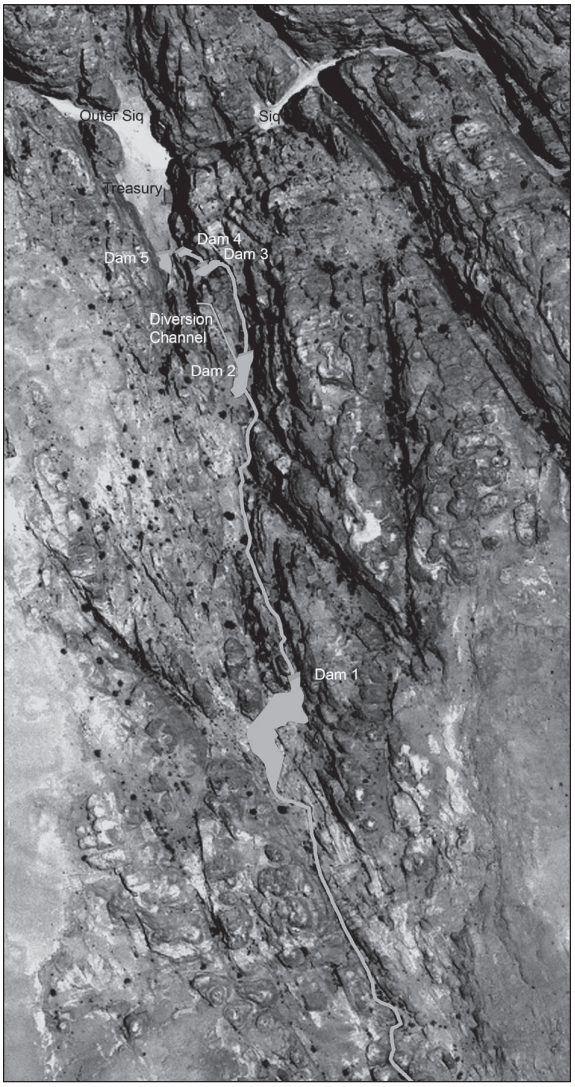
The Water Drainage in Wādī al-Jarra after the Interventions of the Nabataeans

At the beginning of the 1st century BC Petra started to change slowly from a Bedouin encampment into a stone-built city. In the middle of the 1st century BC, under the reign of Malichus I, Petra was completely redesigned as the capital of Nabataea, following plans and models of Hellenistic cities in Asia Minor and in Ptolemaic



1. Satellite view of the lower, northern sections of Wādī al-Jarra, al-Khaznah Courtyard, the Sīq and the Outer Sīq with indication of the natural water drainage stream (Satellite image courtesy of D. Comer, insertion U. Bellwald).

Egypt. In order to protect the inhabitants of the remodeled city and its new buildings from the disastrous impacts of inundations, an ambitious flash-flood retention system was planned, designed and implemented as part of the community's overall infrastructure. This system aimed at retaining, channeling, diverting and stilling down the runoff water from the rainfalls during winter time in order to prevent the city and its inhabitants from any threat caused by flooding. Due to the results of the archaeological research in the Sīq and its adjacent areas from 1996 to 2011 it is known that the flash flood retention system was planned around 50BC and mainly realized between 50BC and 25BC (Bellwald 2003: 75). As al-Khaznah Courtyard became a major key element in the design of Petra as the capital of Nabataea, Wādī al-Jarra had vitally to get into the focus of any efficient flash flood prevention measurements. The intervention realized by the hydraulic engineers of the Nabataeans during the 2nd half of the 1st century BC in Wādī al-Jarra may be considered as the real masterpiece of the entire flash flood retention system of Petra (FIG. 2). As the results of the survey conducted by the author on behalf of Petra National Trust 2005-2006 have shown (Bellwald 2008: 76-86), the layout of the flood retention construction in Wādī al-Jarra consists of a sequence of 5 main dams, followed downstream by stilling basins, auxiliary dams for the complete closure of the retention basins, spillover and diversion channels. Dam Nr. 1 is located approximately 390m to the South of the inlet into al-Khaznah Courtyard and has to be considered as the key element of the entire system, as it has by far the most extended retention capacity. Barrier Nr. 2 was built to dam up the outflowing water from barrier 1 in order to divert it from the narrow eastern branch of the gorge into the wide western section. For that purpose a channel was hewn into the surface of the rock terrace separating the eastern section of the gorge with the western branch. The diversion channel has an overall length of 42m; its width varies from 134cm at its northern to 214cm at its southern mouth. Its depth reaches down to 5.4m at the northern mouth. The dams Nr. 3 and 4 were built for retaining and hence further stilling down the down-flow velocity of the remaining water volume running off along the narrow eastern section of the gorge before reaching al-Khaznah courtyard. Dam Nr. 5 was by far the highest, widest and therefore most imposing construction of the entire system. It was built in shape of a 90° angle wall and closed the inlet of the wide western branch of

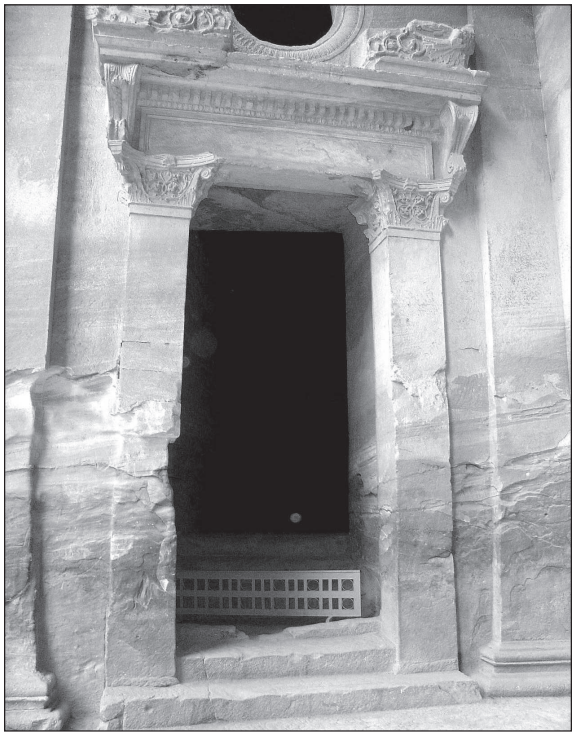


2. Satellite view of the lower, northern sections of Wādī al-Jarra, al-Khaznah Courtyard, the Sīq and the Outer Sīq with indication of the flash flood retention system built by the Nabataeans in the 2nd half of the 1st century BC (Satellite image courtesy of D. Comer, insertions U. Bellwald).

Wādī al-Jarra into al-Khaznah courtyard. Its main function was to retain and to still down the water diverted by the channel besides dam Nr. 2 and to secure its controlled outflow into al-Khaznah courtyard.

The Scope of the Wādī al-Jarra Dam Rehabilitation Project

Since the collapse of the Nabataean flash flood retention system in the earthquake of 363AD, all the ancient constructions in al-Khaznah courtyard have been destroyed and swept away, including the sophisticated drainage channel network assuring a safe and non-destructive outflow of the storm water retained by the lowest dams Nr. 4 and 5. By the centuries the entire courtyard has been backfilled by more than 3m of rubble. This huge backfill works like an enormous sponge, retaining a huge amount of the runoff water sweeping in during the rainy period. In the warm seasons part of this water stored in the underground of the courtyard penetrates into the porosity and capillarity of the sandstone cliffs, rises up and finally evaporates. In the evaporation level the salts dissolved in the water crystallize. As the dimensions of the salt crystals are much bigger than the diameter of the pores and capillaries in the sandstone, the natural voids are bursting and the surface of the cliffs and hence also of the monuments like the treasury are eroding (FIG. 3).



3. View at the doorway in the southern wall of the entrance hall of al-Khaznah, showing the heavy erosion of the sandstone, reaching almost half of its height. This erosion is due to the crystallization of salts during the evaporation of the rising ground humidity in the void of the stone structure in the warm seasons (Photo U. Bellwald).

In order to stop such a destructive process, al-Khaznah Courtyard has to be excavated in the future to its ancient Nabataean level. Before this excavation may be started, the impact of flash floods on al-Khaznah Courtyard has to be reduced sustainably. Such a drastic reduction may only be achieved by excavating, restoring and reconstructing the original Nabataean flash flood prevention system.

The project started in autumn 2011 is thought to be a first step of a much more extended project aiming at the complete rehabilitation of the full system as built in the 2nd half of the 1st century BC. The area of dam Nr. 3 was chosen as a model project for step 1 because it includes all different aspects of excavation, conservation and restoration work and despite its limited extension may be a first, but remarkable contribution for increasing safety to the monuments around and tourists visiting al-Khaznah Courtyard.

The implementation of step 1 in the area of main dam Nr. 3 was thought to provide the project team with all basic information in regard to the history of the construction, the destruction and the abandonment of the flash flood protection system, to the conservation and restoration methods, to the hydrological parameters for an efficient organization of the work execution and to the integration of the project results into the use and frequentation of al-Khaznah Courtyard site.

The Results of the Excavations 2011-2012 and 2014

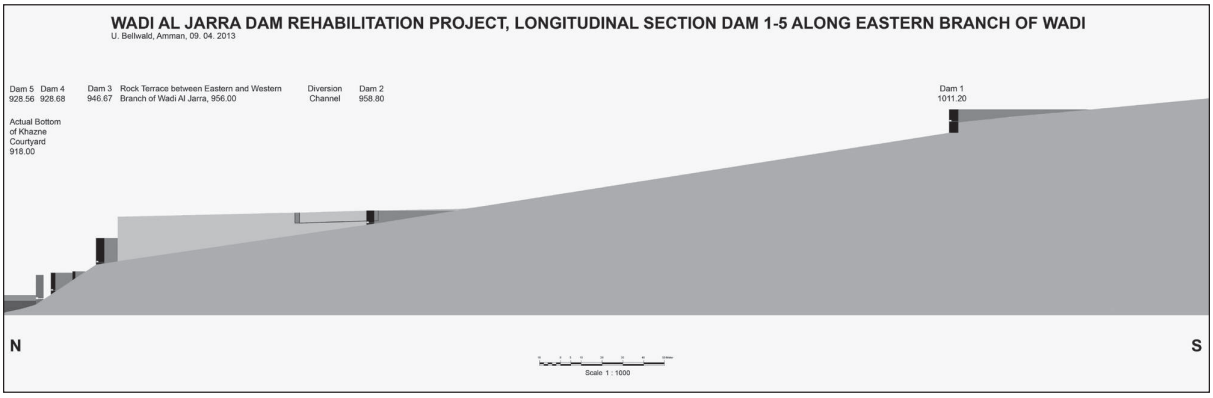
The Elements of the Flash-Flood Retention System

Already the surveys preceding the excavations have clearly shown that dam nr. 3 takes a very distinguished position in the sequence of the flash-flood retention system in Wādī al-Jarra[1]. Its location on a rock terrace directly above the inlet into al-Khaznah Courtyard is at a crucial point in the outflow of water from Wādī al-Jarra: Between dam nr 1 and dam nr 3 the course of the *wadi* has the shape of a narrow, almost straight gorge, extending over a length of 414 m with a difference in height of 65.98 m, which equals a slope of 15.93%. The combination of the straight course, the steep slope and the fact of being wedged in between the cliffs is giving rise to a very high outflow velocity of the runoff water inside the section of Wādī al-Jarra between dams nr 1 and 3. From dam nr 3 down to the original pavement of al-Khaznah Courtyard the distance is only 29.8m and the difference in height 19.74m, which equals an extraordinary slope of 66%. Dam nr 3 was therefore built at a location of a striking escarpment where the slope of the runoff water outflow was suddenly increased by more than four times (FIG. 4).

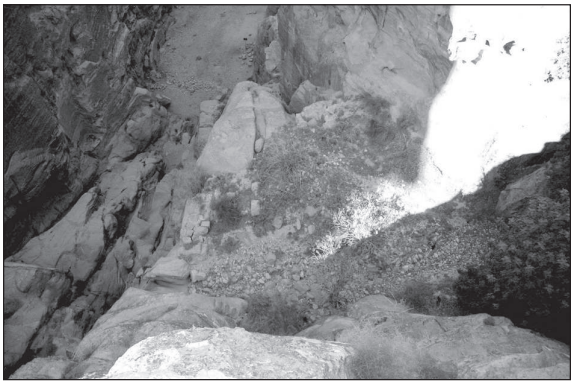
The exact location where dam nr 3 was built benefitted from a very distinguished topographical situation: At the inlet of Wādī al-Jarra into the rock terrace its straight course was broken twice in the shape of a Z before leaving the terrace in the direction of al-Khaznah Courtyard. Flowing straight down from South to North the outflow water bounced against a cliff and was hence diverted to the West, where, after a distance of 30 m it bounced against another cliff and only then it flew out from the terrace down to al-Khaznah Courtyard. Taking advantage from the reduced velocity of the twice diverted outflow water the Nabataean hydraulic engineers closed the exit from the terrace with dam nr 3, intending to reduce further its outflow velocity and hence reducing its destructive energy (FIGS. 5, 6, 7).

Originally the dam had a height of approximately 12.9m. As the uppermost layer of the masonry is nowadays lost by erosion, the actual height of the dam from its crest to its bottom is 12.45m (FIG. 8). The excavations in 2014 have clearly shown that the constructive interventions inside the catchment basin upstream dam nr 3 were minimal and mainly restricted to a narrow outflow channel with a depth of 50cm and a width of 85cm at the bottom of the natu-

1. A short presentation of dams nr 3 and 4 has first be given in: Farajat S. and Falahat H. No date. The Role of the Nabataean Hydraulic System in the Protection of the Monuments at Petra, in Siti e Monumenti della Giordania.

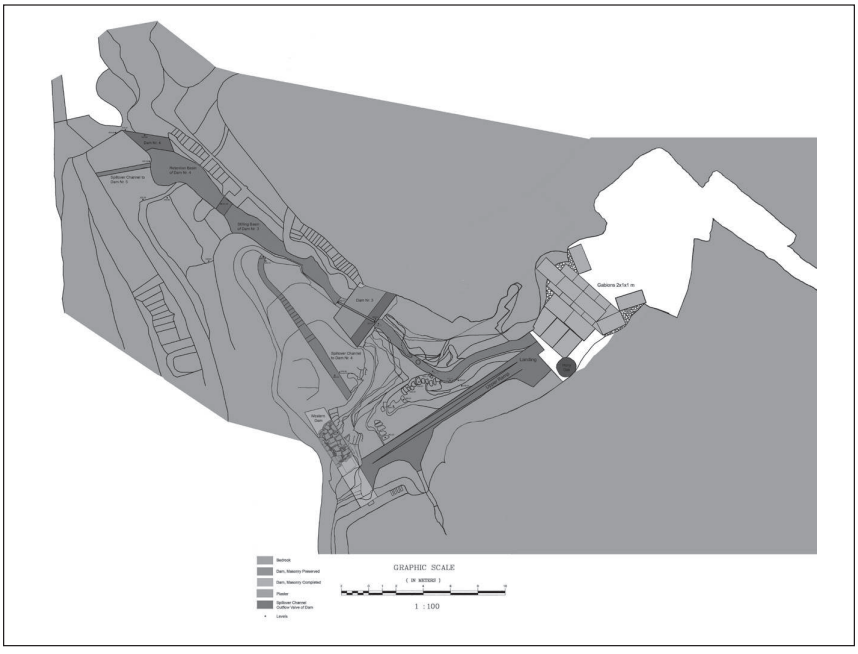


4. Longitudinal section along the main axis of Wādī al-Jarra from dam nr 1 down to the inlet into al-Khaznah Courtyard. The drawing shows perfectly the location of dam nr. 3 on top of the escarpment falling down to the bottom of the Courtyard (Drawing U.Bellwald).

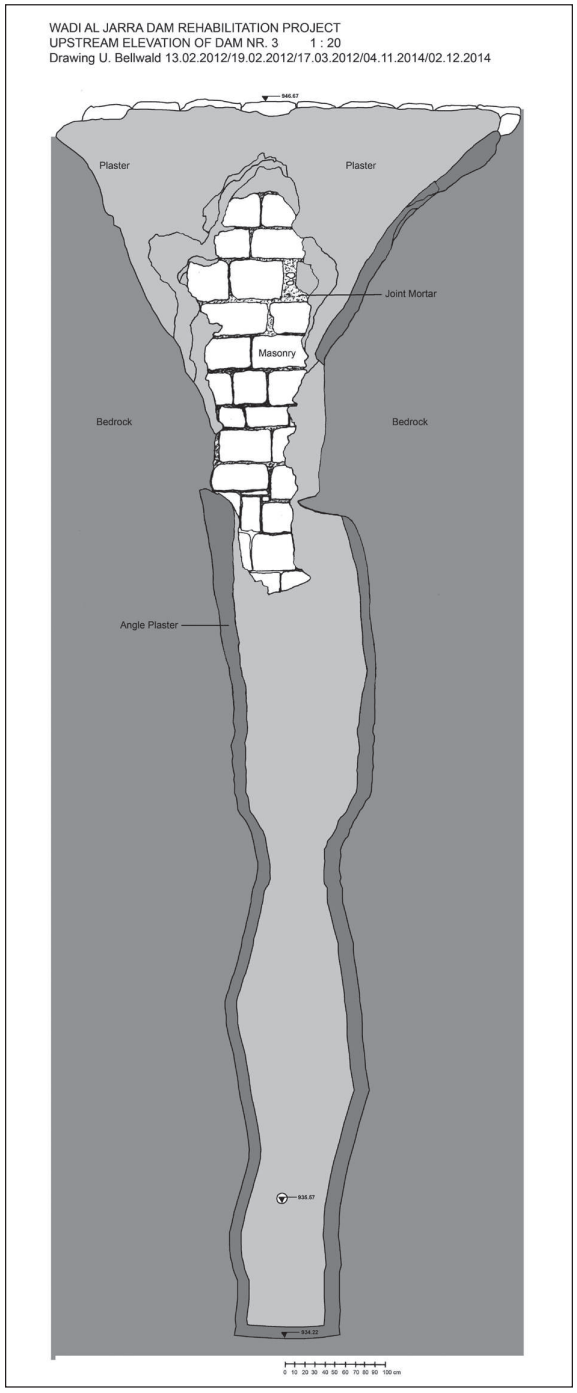


5. View from the rock terrace of the diversion channel below the second dam onto the catchment basin of the third dam. Photo taken in June 2005 during the first survey study. It shows the area before excavation started (Photo U. Bellwald).

6. View from the rock terrace of the diversion channel below the second dam onto the catchment basin of the third dam photograph taken on December 11th, 2014 upon completion of the excavation (Photo U. Bellwald).



7. Site plan covering the area of dam nr 3 and dam nr 4 upon completion of the excavation, showing the outflow of the runoff water along the channel at the bottom of the retention basin upstream dam nr 3, through the outflow valve in dam nr 3, along the stilling basin downstream dam nr 3 into the retention basin of dam nr 4 and finally through the spillover channel from dam nr 4 to the wide western branch of Wādī al-Jarra. The plan reproduced here is not to scale (Drawing U.Bellwald).



8. Elevation of the upstream face of dam nr 3 upon completion of the excavation of the retention basin. The plan reproduced here is not to scale (Drawing U. Bellwald).

ral *wadi* bed (FIGS. 7, 11). Besides this outflow channel and a stone collection tank with a depth of 1.5m and a length of 3.5m in front of the upstream bottom of the dam no other features for increasing the storage capacity of the catchment basin could be verified. The only contribution for increasing the retention capacity of the catchment basin upstream dam nr 3 was the construction of the small auxiliary dam on top of the western cliff. As the surface of the bedrock flanking dam nr 3 was approximately 2 m higher than the top of the western cliff, the western delimitation of the catchment basin had to be elevated by a dam to the same level in order to prevent the runoff water from spilling over to the western branch of the *wadi* (FIG. 16).

The close examination of the masonry of dam nr 3 has given that, due to learning by doing, it was built in two phases: As the flanking cliffs at the location where the dam was built were very close to each other (the maximum width at the top line of the dam being only 4.78 m) and even conical in shape with the wider opening upstream, the constructors thought a dam with double sided coursed ashlar masonry in a thickness of 80cm would be sufficient for withstanding the water pressure. This was obviously to the case, as several displaced sandstone blocks in the downstream face of the first dam are attesting. As no cracks in the mortar embedment around the displaced blocks may be detected, the damage must have hit the dam even before the lime mortar was carbonized, which means shortly upon completion of the construction. The dam-builders were therefore obliged to reinforce the dam considerably by extending its thickness downstream by 2.36m in the main body and by 1.92m in the uppermost 2.6m. After such intervention the total thickness of the dam squeezed between the conical shaped cliffs reached 3.16m which proved to be sufficient, as no damages in the masonry due to excessive water pressure occurred anymore (FIGS. 6, 8). In order to make the dam water proof its upstream elevation was completely plastered with a hydraulic plaster built up in four layers, reaching a total thickness of approximately 5cm (FIG. 8).

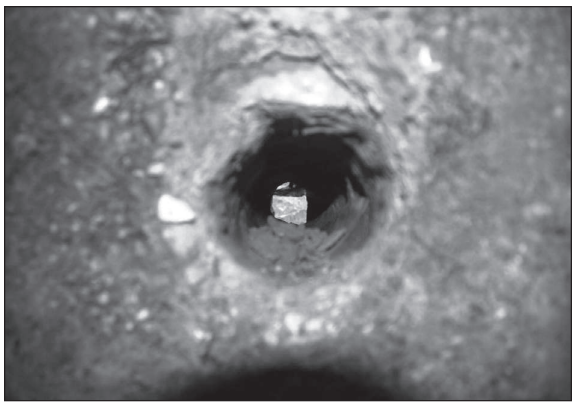
Between the ground and the top layer the mix of the lime mortar adopted varied mainly

in the characteristics of the aggregates, which were very rough in the first and rather fine in the top layer. For assuring a perfect adhesion between the layers, layer 1-3 had a very irregular, rough surface, whereas the top layer was meticulously smoothened down. In order to prevent the plaster from being weakened by cracks, crushed charcoal and pottery shards were added to the mortar mix. As a result of the addition of crushed charcoal, which was acting like color pigments, the plaster got a distinctive grey appearance. The plastering was not only restricted to the surface of the dam, but also covered the joints towards the bedrock. In order to avoid any water infiltration along the joints, these were diagonally covered with thick layers of plaster, filling grooves and fissures in the adjacent surface of the bedrock and using rock pinnacles as protective covers. For assuring a constant outflow of the runoff water from the catchment basin an outflow valve was inserted into the masonry of the lowest part of the dam. The valve is only a spare opening with a diameter of 10cm crossing the masonry slightly sloped towards the downstream face with no insertion of terracotta pipes. Its position is in the vertical axis of the dam, 1.35m above its bottom for protecting it from being obstructed by stones which were held back in the tank at the end of the outflow channel (FIGS. 8-10). For hindering mud from backfilling the stone collection tank a small barrier was built inside the outflow channel. Its location was 7m upstream the main dam, its height 85cm and its thickness 20cm (FIGS. 7, 11).

As the interior of the catchment basin had to be cleaned from the alluvial deposits after every winter rain season, a maintenance staircase had to be built for reaching its bottom. The steps of this staircase were hewn into the surface of the western cliff, starting at the northwestern abutment of the small western dam (FIGS. 6, 7, 12, 13).

The width of the single steps ranges between 50 and 60cm, the depth has an average size of 25cm and the height is around 16cm. As the up-

9. View onto the lower part of the upstream face of the main dam with the outflow valve (Photo U. Bellwald).



10. View from the retention basin through the outflow valve at the bottom of the dam in direction of the treasury (Photo U. Bellwald).

11. View from the top of the main dam down into the outflow channel at the bottom of the retention basin (Photo U. Bellwald).

permost steps of the stairs had common joints with the masonry of the western dam, they were integrated into the surface plaster of its masonry. The plaster of the western dam was built up in the same technique as at the main dam, its mortar mix being identical. Conditioned by the structure of the bedrock, the maintenance staircase consists of four flights of steps, arranged in an elongated S-shape, winding down with totally 34 steps from the crest of the western dam to the rim of the outflow channel. A second staircase for assuring maintenance was built in downstream direction along the eastern cliff of the main dam. It starts at the northeastern abutment of main dam crest and leads down for 6m along the eastern cliff in one straight flight of steps until it reaches an almost square landing. From the landing a short second flight of only 3 steps leads to the edge of the gorge (FIGS. 6, 7). As absolutely no traces of a solid construction could be found, the opposite rim of the gorge had to be reached by wooden planks which were temporarily put in position only upon requirement. The end of the second maintenance staircase along the eastern cliff below dam nr 3 corresponds with the end of the spill-over channel in the opposite cliff. This spill-over channel has its mouth at the rim of the rock terrace between dam nr. 3 and the small western dam, its width being average 60 and its depth 30cm. For reducing the velocity of the outflow water the central section of the channel is elaborated as a cascade of 13 steps. The main section of the spill-over channel is straight in course with a length of 10.5m, at the end it is curved and bends for 90^{o} towards the rim of the terrace, from where the water was precipitating into the lower part of the stilling basin downstream the main dam (FIGS. 6, 7).

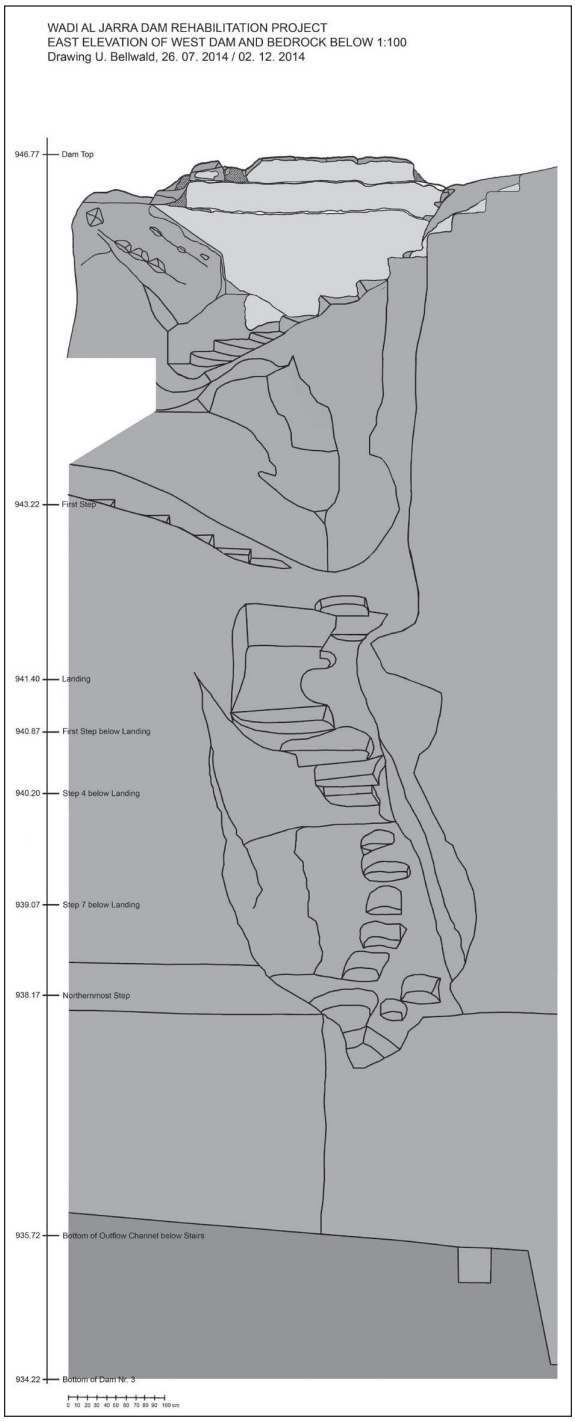
The stilling basin, built for taming down the energy of the water splashing out from the outflow valve or falling down from the spill-over channel, has a length of 10 m and a maximum width of 1.7m. At its downstream end it was closed by a barrier which had a height of 1.4 m and a thickness of 80cm (FIG. 7). In order to enable the workmen to get up to the area where dam nr 3 and its auxiliary constructions had to be realized, a walkway with stepped sections had to be built, starting at the southern end of al-Khaznah Courtyard, first following the western cliff of the western branch of Wādī al-Jarra, then continuing in its central part and from there crossing over to the East, where a narrow walkway was hewn in a vertiginous height into the cliff, without any handrail or similar safety measurements. For preventing unauthorized people from reaching this walkway, it could only be reached with help of a ladder. From the narrow walkway a flight of 4 steps was leading down to the work site (FIGS. 6, 7).

In a distance of 18m and 14.4m lower dam nr 4 was built at the very inlet of Wādī al-Jarra into al-Khaznah Courtyard (FIG. 17). It has a height of 8.9m, a width of 3.5m at the top and a thickness of 94cm at the eastern and of 2.3m at the western abutment. From the catchment basin upstream dam nr 4 a spill-over channel leads in a straight course into the western branch of Wādī al-Jarra (FIGS. 6, 7). As in dam nr 3 the outflow valve at the bottom of dam nr 4 ends in a rectangular valve chamber. A maintenance staircase hewn into the eastern cliff leads from the level of al-Khaznah courtyard up to the crest of dam nr 4.

The Finds

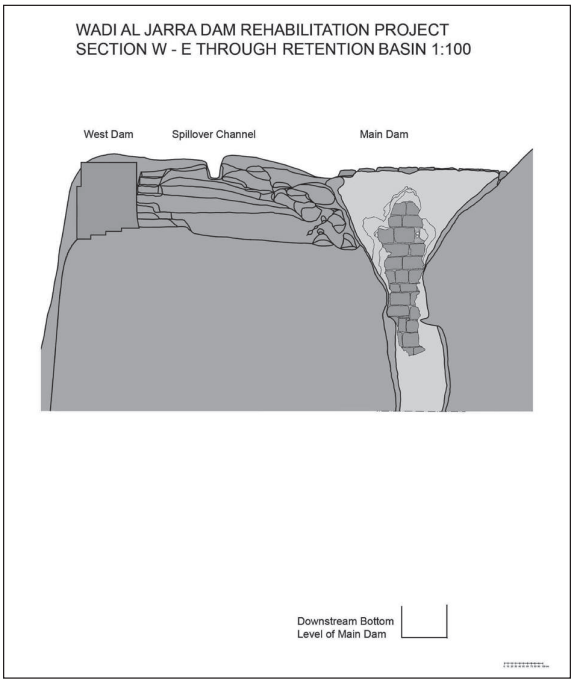
With the full excavation of the retention basin upstream dam nr 3 an enormous amount of single finds was unearthed, almost all pottery, very few objects from glass, metal or stone and only 3 coins. Among the many striking archaeological records revealed by the excavation work was the stratigraphy (FIG. 21): It showed up that only the top layer with an average height of only 30-50cm consisted of flood rubble containing stones of all dimensions, from boulder to small gravels, but almost no sand, because which was driven away by the water flow. From the top layer of flood rubble down to a depth of 265-85cm the stratigraphy consisted exclusively of completely sterile layers of fine, muddy sand without any finds. The only exemption from this record was a deposit of large, well-dressed ashlar blocks made from red sand-stone which came to light immediately inside the dam at a depth of 70-90cm below the dam crest. Tool-marks and fragments of lime plaster made it obvious that these blocks were washed down by flash-floods from a collapsed construction located upstream dam nr 3. The first finds were excavated at a depth of 265-85cm, again in layers of fine, muddy sand. All among the few finds in these layers were pottery shards which may be dated to the 2nd century AD.

From the depth of 285-545cm below the main dam crest the sand layers revealed an enormous amount of pottery shards which may be dated to the late 1st until the early 2nd century AD. The layers from a depth of 545 down to 645cm contained masses of pottery shards which may be dated to a period from the early to the late 1st century AD. The dating of the pottery finds is confirmed by a coin of king Aretas IV and queen Shaqilat minted 20-40AD, which was found among the pottery shards in a depth of 635cm. The following layers in a depth between 645 and 750cm revealed a huge amount of pottery shards which may be dated to a period spanning from the late 1st century BC to the early 1st century AD. The lowest layers from a depth of 750cm to the bottom of the dam at a depth of 1245cm were literally packed with pottery shards which may all be dated to the last quarter of the 1st century BC. Only one single



12. Elevation from the bottom of the outflow channel up to the top of the western dam upon completion of the excavation of the retention basin. The plan reproduced here is not to scale (Drawing U.Bellwald).

13. View from East onto the Western dam and the maintenance stairs leading down into the retention basin (Photo U. Bellwald).

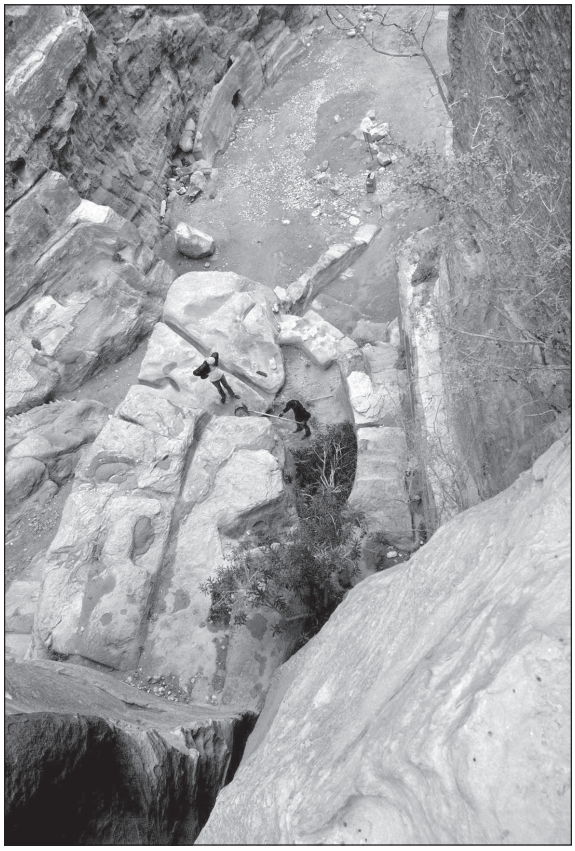


14. Section W – E through the retention basin. The plan reproduced here is not to scale (Drawing U.Bellwald).

15. View onto the crest of dam nr. 3, assembly of orthogonal photo shoots. The illustration shows well the double sided masonry of the first dam (bottom) and its downstream extension (top) (Photo U. Bellwald).

fragment of a painted fine ware bowl dating to the mid of the 1st century BC was discovered at a depth of 1215 cm inside the outflow channel. The second striking archaeological record was the discovery of totally 7 votive deposits (FIGS. 18, 19, 20), all of them consisting of a great number of vessels of various types, mainly unpainted fine ware vessels, some painted fine ware bowls and some large coarse ware pots or jars. The single fine ware vessels in the votive deposits were meticulously piled up with the large ones at the bottom and the small ones inside or above the large ones. At the end the piles of fine ware vessels were covered and hence protected by large scale coarse ware pots or jars (FIG. 20).

16. View onto the fully exposed and cleaned crest of the western dam in April 2012 (Photo U. Bellwald).



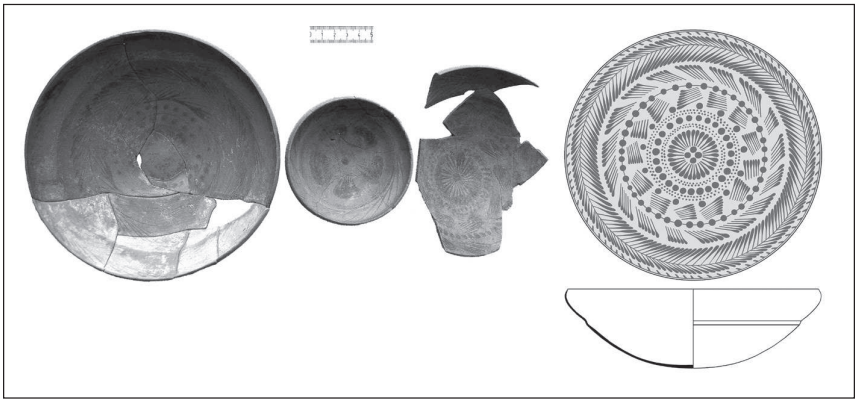
17. View from the top of dam nr 3 down onto dam nr 4 and al-Khaznah Courtyard, photograph taken on November 25th, 2014 (Photo U. Bellwald).

A third striking archaeological record was the discovery of a great number of completely preserved, unbroken vessels. This fact is even more astonishing if the depth where the vessels were found is taken into consideration: Most of the completely preserved, unbroken vessels were excavated in the lowest layers at a depth between 750 and 1245cm, where the pressure of the backfill above was extremely high. Furthermore it has to be hint at the fact that many of the completely preserved vessels were not excavated as part of a votive deposit, but as single pieces. The fourth striking archaeological record is the observation, that all coarse ware vessels have been used for preparing food before having been buried in the deposit inside the catchment basin. Al of the coarse ware vessels still were covered by a thick and dense layer of soot at their bottom, proving that they had been standing in a fire just before having been deposed. The soot layer was such heavy that it still painted our fingers in black during the recovery of the vessels. The fourth striking archaeological record was the identification of a very big number of vessels of throw-out ware, misfired, lousily turned on the potter's wheel, pushed in by fingers before firing or otherwise deformed. The fifth striking archaeological record was the detection of several bottoms of broken, unpainted fine ware bowls which were serving as circular game chips. The sixth striking archaeological record was the discovery of a certain number of painted and unpainted fine ware bowls in toy size; all of them dating to the last quarter of the 1st century BC with the exception of one dating to a period between 20 and 70 AD (FIGS. 19, 20).

A First Interpretation of the Finds

The fact that the lowest layers of the stratig-

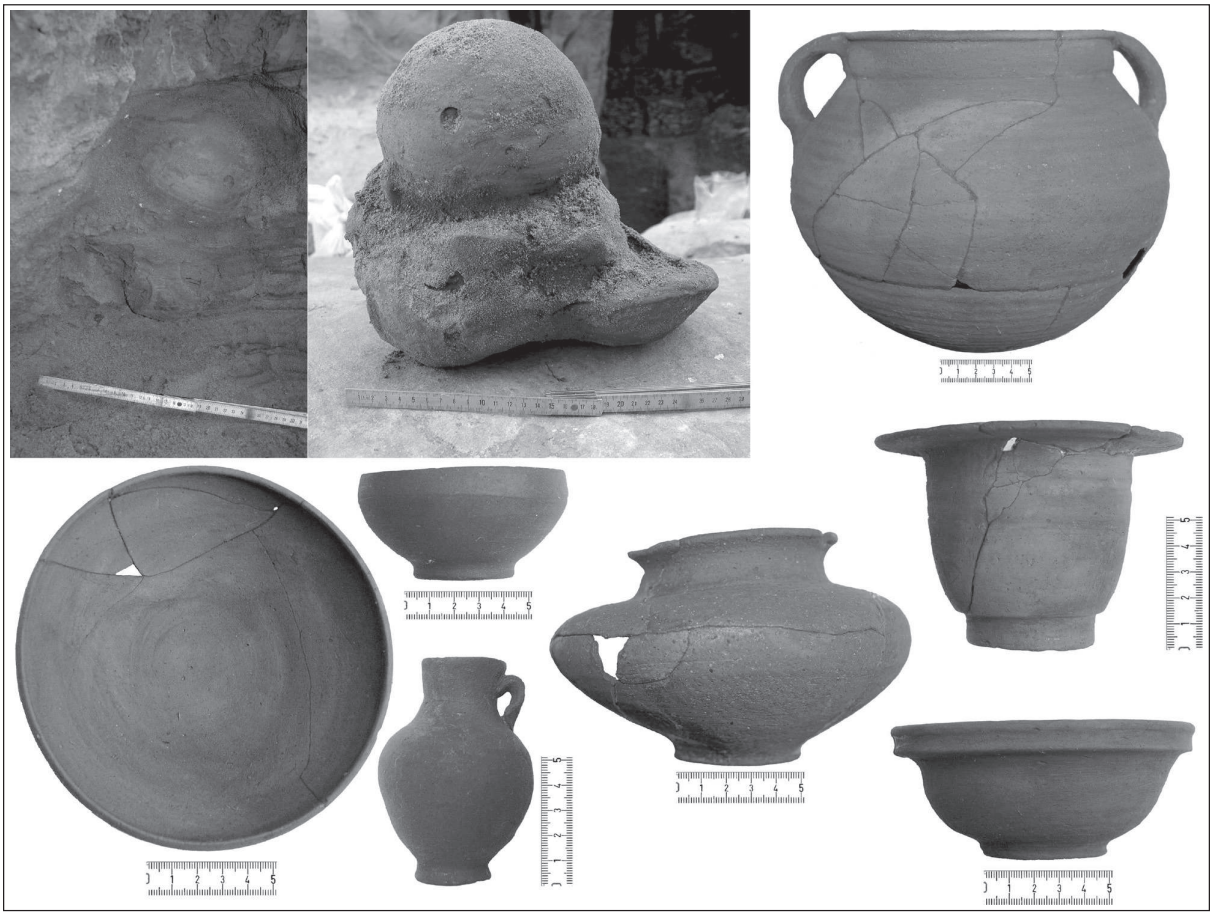
18. Layer 4 of a votive deposit of ceramic vessels excavated on September 29th, 2014 (Photo U. Bellwald).



19. Painted fine ware drinking bowls found in layer 3 and 4 of the deposit. They represent phase 2b and date to the last quarter of the 1st century BC (left). Reconstruction drawing of the large painted bowls (right) (Photos and drawings U. Bellwald).

raphy (FIG. 21) at a depth between 750 cm and the level of the bottom of the dam at a depth of 1245 cm are fully packed with pottery dating to the last quarter of the 1st century BC proves that dam nr. 3 was fully operational at that period of time, which means that it must have been built between 50 and 25 BC. Such a result corresponds perfectly with all results from the Sīq excavations where all dams closing the adjacent *wadis* and faults proved to have been constructed in exactly the same period (Bellwald 2003: 75). The subsequent layers of fine sand sediments, again fully packed with pottery shards in a depth between 385 and 750cm reveal, that the retention basin upstream dam nr 3 was further backfilled by natural sedimentation and used as a deposit for the leftovers of ritual activities accompanied by meals. Following the dating of the excavated pottery shards these activities must have been performed from the late 1st century BC throughout the entire 1st century AD until the early 2nd century AD. The uppermost layers are completely sterile with absolutely no finds, proving that besides the natural backfilling with fine sand no other activities took place at the site. Such a result corresponds perfectly with the outcome of the excavations in the area of the Madrass High Place (Bellwald and Keller 2003: 96-97) and the Obodas Chapel (Tholbecq 2005: 299-311, 2008: 235-254), where activities came to an end at exactly the same period.

In conclusion, the archaeological excavation work in 2011-2014 has shown that the retention capacity of dam Nr. 1 and the effect of the diversion channel from dam Nr. 2 into the wide western branch of Wādī al-Jarra was such efficient, that maintenance for dams Nr. 3 and 4 was already reduced since the late 1st century BC and throughout the entire 1st century AD.



20. Votive deposit of ceramic vessels excavated on November 11th, 2014 at the lower end of the outflow channel in front of the upstream face of dam nr 3. Photograph taken *in situ* (above left) and after recovery (above center). The coarse ware cooking pot covering the deposit upside down after restoration (above right) and some of the well preserved vessels of the deposit (below). All vessels may be dated to the last quarter of the 1st century BC (Photos U. Bellwald).

Latest with the beginning of the 2nd century AD the maintenance work for both dams in the lowest section of the narrow eastern gorge was heavily neglected and hence the retention basins upstream the dams were more and more backfilled by fine sand sediments. When the disastrous earthquake of 363AD took place, both retention basins were almost backfilled to the height of the dam crests. The sandstone blocks from dams 1 and 2, which collapsed during the earthquake of 363AD were swept down by floods and some of them were retained by the uppermost section of the preserved masonry from dam nr. 3, laying on top of the sand layers of the backfill accumulated in the retention basin since the 1st century AD. The archaeological excavation work in 2011-14 has furthermore clearly shown that the flash flood retention system in Wādī al-Jarra was no more restored and rebuilt after the partial collapse during the earthquake of 363 AD. Therefore during rainfall in winter time the runoff water took again its natural outflow along the narrow eastern gorge of Wādī al-Jarra. As the retention basins of dams nr. 3 and 4 were at that time already completely backfilled, the runoff water spilled over the preserved dam crests. Later, the outflowing storm water scoured a channel into the backfill material along the southern rim of the retention basin upstream dam Nr. 3, partially destroyed the masonry of the western auxiliary dam and, by natural erosion of the weak sandstone, grinded a valve into the cliff separating the eastern section of the gorge with the wide western branch of Wādī al-Jarra. This situation didn't change any more until nowadays.

WADI AL JARRA DAM REHABILITATION PROJECT
STRATIGRAPHY OF CERAMIC AND OTHER FINDS

Depth below Main Dam Crest	Various Finds	Phase Painted Fine Ware	Phase Unpainted Fine and Coarse Ware	Time Period
70 cm	Sand-Stone Ashlar Blocks			Earthquake Debris 363 AD
365-385 cm		3b		2nd century AD
385-435 cm			3a, 3c	Late 1st-2nd c. AD
385-435 cm		3a, 3b	3a, 3b, 3c	Late 1st-2nd c. AD
435-470 cm		3b	3a, 3b	Late 1st-2nd c. AD
470-525 cm		3a	3a, 3b, 3c	Late 1st-2nd c. AD
525-545 cm			2a, 2b, 3a, 3b, 3c	Late 1st-2nd c. AD
545-605 cm		2c, 3a	1, 2a-c, 3a-c	Early-late 1st c. AD
592	Votive Deposit	2c, 3a	1, 2a-c, 3a-c	Early-late 1st c. AD
605-645 cm		2c	1, 2a-c	Early 1st c. AD
635 cm	Bronze Coin Aretas IV			Minted 20-40 AD
645-650 cm		2b, 2c, 3a	1, 2a-c	Late 1st c. BC- early 1st c. AD
650-700 cm		2b, 2c, 3a	1, 2a-c	Late 1st c. BC- early 1st c. AD
700–750 cm		2b, 2c	1, 2a-b	Late 1st c. BC- early 1st c. AD
750-800 cm		2b	1, 2a-b	Last Quarter 1st c. BC
760-800 cm	3 Votive Deposits	2b	1, 2a-b	
800-850 cm		2b	1, 2a-b	Last Quarter 1st c. BC
850-900 cm		2b	1, 2a-b	Last Quarter 1st c. BC
840 cm	Votive Deposit	2b	1, 2a-b	Last Quarter 1st c. BC
900-1000 cm		2b	1, 2a-b	Last Quarter 1st c. BC
1000-1050 cm		2b	1, 2a-b	Last Quarter 1st c. BC
1045 cm	Votive Deposit	2b	1, 2a-b	Last Quarter 1st c. BC
1050-1100 cm		2b	1, 2a-b	Last Quarter 1st c. BC
1075 cm	Votive Deposit	2b	1, 2a-b	Last Quarter 1st c. BC
1100-1150 cm		2b	1, 2a-b	Last Quarter 1st c. BC
1150-1200 cm		2b	1, 2a-b	Last Quarter 1st c. BC
1200-1245 cm		2b	1, 2a-b	Last Quarter 1st c. BC

21. Table showing the stratigraphy in relation with the respective pottery finds, their type and their dating (Drawing U. Bellwald).

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The Northeastern Petra Project: An Assessment

Introduction

This presentation concerns the final results of the survey phase of the Northeastern Petra Project (NEPP). The project is sponsored by Deutsche Forschungsgemeinschaft, the Cluster of Excellence "Topoi" and Humboldt University in Berlin, and is directed by the three co-authors. The survey area is located NE of the confluence of the Wādī al-Maṭāḥah and the Wādī Mūsā, on the high hill overlooking the eastern end of the Colonnaded Street, and directly west of the Palace Tomb in Petra (FIG. 1). The site is *ca.* 450 x 400 m and is generally known as Rujum Umm aṣ-Ṣunaydīq. Although a number of large structures once existed in this area, these were only briefly reported by the explorers of Petra in the early 20th century (*e.g.* Brünnow and von Domaszewski 1904: 318-

1. The Petra Valley: 1. Town of Wādī Mūsā; 2. The Shara mountains; 3. The so-called "Great Temple"; 4. The NEPP Area (by S. G. Schmid).

319; nos. 412-415; Musil 1907, map following P. 343; Dalman 1908: 314-329; Bachmann *et al.* 1921: 32-33), and never properly documented. To redress this significant ommission, the NEPP conducted six intensive survey campains between 2010 and 2016. Specifically, the activities included the description, the measuring and photographing of the ruined structures, the documentation of the ruins using the advanced, electronic methods in order to provide a reliable map of the area, the documentation of extant architectural decoration blocks, and the collection of surface ceramics. The preliminary results of the fieldwork have already been published (Schmid *et al.* 2012; Fiema and Schmid 2014; Schmid *et al.* 2015).

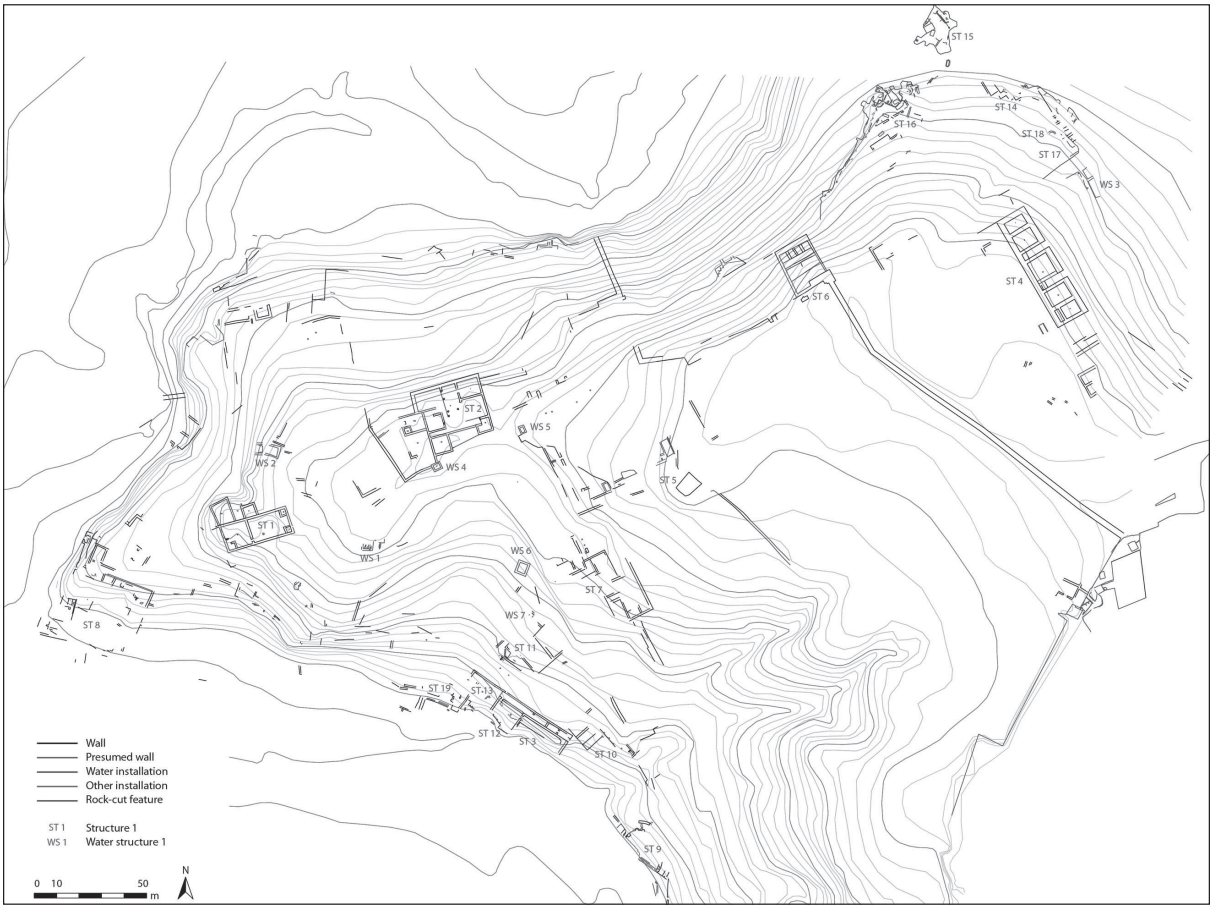
Site Description

The NEPP area enjoys a unique location in the valley, dominating the entire city center and its main communication axis, and being visible from all over the city. Four significant factors characterize the area. The Nabataean diversion of the Mūsa stream from the Siq into the Wādī Mudhlim and then through the Wādī al-Maṭāḥah into its original bed in the city center resulted in the creation of a separate quarter of the city, defined by the Wādī al-Maṭāḥah, the Wādī Mūsā and the facade of al- Khubtha. Secondly, the monumental steps to the top of al- Khubtha, that begin in the NE corner of the NEPP area, provided access to the cultic installations on top of Jabal al-Khubtha but could also have served as an emergency exit from the city. Thirdly, the area is directly connected to one of six aqueducts of Petra, the al- Khubtha conduit, which starts in modern Wādī Mūsā town, leads directly to the NEPP area and meets there a huge cistern which utilizes the water catchment system of the Khubtha massif. These two systems (aqueduct and runoff collection) could be used separately and together. Finally, at the spot where the Khubtha massif borders the survey area, there is the Palace Tomb - the largest and most decorated façade of Petra.

Except for the central-eastern and the NE parts of the area being relatively flat, the ground generally slopes down toward the surrounding wadis, featuring an uneven, disarticulated and often very steep surface. Altogether 19 structures were identified, generally marked by considerable stone tumbles (FIG. 2). Structures 1-13 and 19 are large, multi-roomed buildings or tight clusters of rooms and walls, with numerous architectural elements on the surface, while Structures 14-18 are smaller clusters of walls and rock-cut features. Basically, only Structure 5 and, to a certain degree, Structures 2 and 7 are located on a relatively even ground, the other 16 structures are on the slopes. Yet this difficult terrain was most successfully adapted through the massive use of retaining walls and artificial terracing, in order to create an area both convenient for construction and visually attractive.

A number of water-related structures, often partly built, partly rock-hewn, indicate that water was used not only for practical reasons but also for landscape-decoration. Examples include the distribution tank (WS 1 - *castellum divisorum*), interconnected basins set on different levels, whether as a progression of settling tanks or purely decorative (*e.g.* WS 2), and basins or small pools (WS 4-7) lined with hydraulic mortar, presumably utilitarian but also perhaps decorative or even cultic.

The NEPP recorded 943 architectural decoration elements inside or around the structures. The blocks range from numerous doorjambs, through column drums, bases and capitals, including blocked-out Nabataean types and highly decorative Attic-Ionic types, pilaster bases and capitals, to the elements of entablature (FIG. 3). The majority of the surface ceramics dated to the later 1st century BC-1st century AD, including large number of Eastern *terra sigillata* ware. Decorative marble fragments and mosaic tesserae were also found during the survey. Combined with the stylistic dating of architectural blocks found in the area, the construction and the main occupation phase of



2. The final (2016) plan of the NEPP architectural complex featuring large, monumental structures (ST 1-13, 19), smaller structures (ST 14-18) and larger water installations (WS 1-7) (by M. Holappa and J. Falkenberg).

3. Nabataean pilaster capital found during the NEPP explorations (by M. Dehner).

structures in the NEPP area should be dated to the late 1st century BC - end of the 1st century AD, although the presence of post 1st century ceramics indicates that the area continued to be occupied after the annexation of Nabataea in AD 106.

Preliminary Interpretation and Parallels

Although the interpretation of the site can only be improved by excavations of some structures, a tentative hypothesis can be offered here. Important is the determination of the nature of occupation in the NEPP area, and of the function of the structures there. At first, the area enjoins unusual, isolated yet strategically superior location within the city centre, is self-sufficient in terms of water-supply and is easily defensible. Secondly, and as compared against other areas in the Petra Valley, the occupation in the NEPP area appears distinctly uniform with regard to the utilized architectural design, the decorative repertoire, as well as to surface ceramic material, all datable to the late 1st century BC-1st century AD Thirdly, the majority of the NEPP buildings are characterized by the monumental architectural design which consistently

better reflects a high degree of ostentatious display, representation and opulent life-style rather than purely utilitarian habitation. Finally, the architectural decoration is of the highest quality, most favourably comparing with that of other public structures in Petra while mirroring the prevalent trends in the luxurious architecture of the eastern Mediterranean. It is then plausible to suggest that the NEPP area enjoins characteristics which are unique in Petra, potentially reflecting social distinction of the residents as well. Thus the interpretation of the area invites a single overarching hypothesis rather than separate ones offered to each structure. Rather than isolating the NEPP structures, it is more reasonable to consider these as components of a single architectural complex, ostensibly of a palatial type and preseumably occupied by the Nabataean elites.

Regarding Nabataean aptitude for syncretic architectural solutions and their ability to absorb and successfully transform or modify foreign cultural influence, it may be expected that Nabataean palatial-type residences would combine the dominant and most fashionable elements of architecture and decoration prevailing in the Mediterranean at that time (see Schmid 2009A: 337-341; Tholbecq 2007: 137-138, for foreign influences on Nabataean architecture). Such proposition is supported by the results of the International Wādī Farasa Project which, since 1999, has been exploring one of Petra's most remarkable and significant funerary complexes, the so-called Soldier's Tomb complex (*e.g.* Schmid 2009B). The excavations there demonstrated that the overall design, decorative program and the functioning of such complexes were apparently very closely related to the luxury architecture of the Hellenistic and the Early Roman Mediterranean, *i.e.* rich villas and palaces. It is therefore reasonable to assume that if the Nabataeans consciously patterned the architecture of their major funerary complexes on examples of opulent palatial residences of the Ptolemies, Seleucids, Herodians or Romans, the residences of Nabataean elites should at least partially reflect the same external influences and fashion.

It is thus further suggested that the NEPP complex could possibly be identified with the Nabataean royal quarters. Notably, the passages in Flavius Josephus (*JA*14, 4 [16]; *BJ* 1, 2 [125]) imply that by the mid-1st century BC, Petra was considered a royal city where their kings resided. With regard to the main *urbanistic* features of the area, *i.e.* being a large sector separated from the rest of the city, and enjoying clear advantages in terms of the dominant location, water supply, visibility, defensibility, access, the NEPP complex strongly resembles the *basileia* - the royal quarters - in the Hellenistic cities such as Antiochia, Seleukia, Babylon, Aï Khanoum, and Alexandria in Egypt (see Hoepfner and Brands 1996; Held 2002, for the characteristics and examples of Hellenistic *basileia*). In such case, the Palace Tomb would ideally be the tomb and/or heroön of the kings of Petra within the *basileia*, as in other Hellenistic royal quarters.

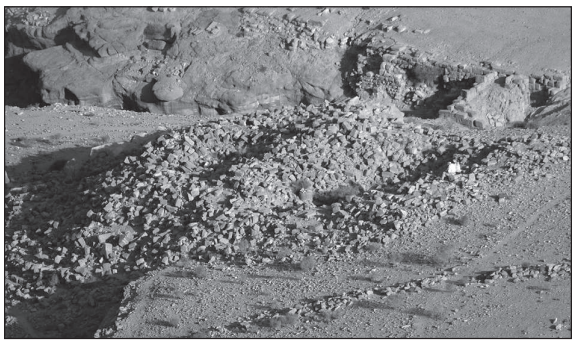
Generally, Hellenistic *basileia* displays a relatively compact, orthogonal spatial design set in rectangular frame. However, the NEPP complex features no common orientation, symmetry or axiality enjoined by major structures; rather they follow the topography of the area, being dispersed throughout, and generally without any compelling functional connection between each other although there are some exceptions to the latter (*infra*). Perhaps an orthogonal design and a formal spatial relationship were never fully intended in Petra due to the difficult terrain. Only the southern buildings, located in the sloping area, display a certain degree of spatial and functional association, as well as gradual changes in their orientation corresponding to the orientation of the valley. If then the *basileia* at Petra was designed in an intentionally dispersed form, the influence of other types of luxurious palatial residences of the period must be considered (*e.g.* Nielsen 1994; Foerster 1996),

such as the Hasmonean-Herodian palaces. For example, the Herodian palaces in Jericho, the Western Palace at Masada and the Herodium complex feature dispersal of structures but only to a certain degree (for discussion, see Netzer 2001, 2009; Förtsch 1996). In fact, some Late Republican /Early Imperial Roman palaces and suburban villas designed for *otium* may provide good parallels in terms of more dispersed arrangements of leisure buildings and a more informal overall design. Such examples may include the late 1st century BC large *villa marittima* Pausilypon near Naples (Günther 1913; Varriale 2007), Domitian's *villae* at Castel Gandolfo and by Lago di Sabaudia (Mielsch 1997, 70-74; Hesberg 2009), as well as other luxurious residences of the Roman elites. Evidently, the scattered location and lack of common orientation for most of the NEPP structures is intentional as it brings a relaxed informality to the design. Such solution, allowing for seemingly "Empty" B spaces, invites gardens, parks, pools, porticoes and pavillions, for which parallels can also be found in Achaemenid royal residences (see, *e.g.* Nielsen 1994: 49-51, 2001; Mielsch 1997: 117-128).

With the underlying assumption that the NEPP architectural complex may be interpreted as a palatial, possibly royal, quarter, the individual structures invite some preliminary interpretation. Structure 1 enjoys the best location in the NEPP area, overlooking the entire valley (FIG. 4). Furthermore, considering the probability of the second storey accommodating the architectural members of the smaller size, the building, in its early phase, could have been a large, rectangular hall, which might have served as a main reception/banqueting space of the complex and the structural as well as decorative parallels include the Palazzo delle Colonne in Ptolemaïs and the First Herodian Palace in Jericho (for discussion of these, see Förtsch 1996: 83-87).

Structure 2, probably the principal building at the site, might have served a number of representational functions (FIG. 5 Left)**.** Its central part resembles the "compact" form of the main structures at Masada and the First Winter Palace at Jericho, the Ptolemaïs "Palazzo" and some Seleucid governors' palaces, characterized by linear, closed architecture, a multitude of small rooms often associated with corridors, and only a few larger *oeci* (Nielsen 1994: 204). The standard element in the Hellenistic palatial architecture, *i.e.* the peristyle courtyard, usually two storey high and with the upper order in smaller size, is relatively small in Structure 2. It appears here in combination with two rooms flanking a central space, all located in the northern part of the structure and a large room on the eastern side, perhaps the main audience hall. The latter, being also two storey high and with two orders of different size, may recall opulent palatial *oeci*, just like the great andron in the Palace of Pella, Baugruppe II, (Hoepfner 1996: 33-36, figs. 25, 29; Nielsen 1994: 88-91) although in Structure 2 it is entirely open on its western side.

Structure 9 is a decorative, leisure pavillion (possibly a nymphaeum), located exactly in the point of Petra's topography where the N-S approach axis from the outer Siq is dramatically changed into a more E-W axis of the center of the city. Therefore, the main function of Structure 9 was to visually ease the change in the axiality of the area through the skillful 3-dimensional combination. The visually pleasing transition from the straight into the perpendicular perspective is furthermore underlined by the overall design of the building, its elegant



4. Structure 1. View from SE (by M. Dehner).

internal appearance and marble decoration. The building is not a perfect semicircle, as previously reconstructed, but rather a somewhat flattened "Teardrop" – again an intentional visual effect (FIG. 5 Right).

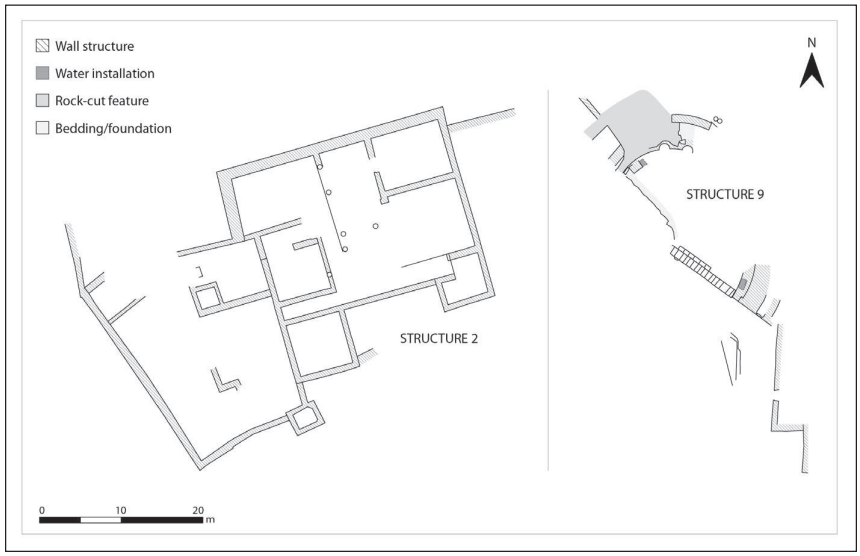
For other structures there is a preference for utilizing hill slopes by creating massive substructures and artificial terraces. These devices dramatically accentuated the constructions on several levels, but were equally practical solutions to exhibit the raised buildings. The southern buildings (3, 10, 12, 13, 19) obscured the slope through a series of façades set on different levels, and played an important rôle in defining this complex against the overall design of the city (FIG. 6). Structure 10 might have been the central element in the design of the southeastern part of the NEPP complex, *i.e.* a monumental stairway to the complex, associated with a propylon and the façade-buildings mentioned above, possibly reflecting such structures in some Hellenistic palaces, as, for example, the southern façade of the *basileia* at Pella (see Brands 1996: 62-67, for relevant examples).

Residential/Recreational buildings or pavillions include Structures 6 and 4. The central location of Structure 5 is indicative of its importance even though its appearance and function are ambiguous. Perhaps it was an elevated, open-air sanctuary platform approached by staircases, a kind of a Semitic *motab* ostensibly associated with the abundance of water. If so, it would manifest the Nabataean propensity for mixing fashionable foreign influences with native traditions and symbolic meaning.

Conclusions

The NEPP complex appears as an unique hybrid. Its location and function point to a connection with Hellenistic *basileia*. The spatial organization, which includes a "Theatrical" layout, an organic use of landscape, an emphasis on the views generated, a setting of structures on slopes or cliff-edges, and a multitude of recreational installations, finds reflection in some Hasmonean/ Herodian country palaces and Late Republican–Early Imperial *otium* structures. Yet, the comparison is more with the *concept* than with the specific design. This means that Structures 1 and 2 find affinities with some Hellenistic prototypes and the Judaean palatial residences, but neither the type nor the organization of such palaces provide a comprehensive parallel, even if the architectural decoration repertoire of NEPP complex reflects the styles and fashion characteristic of that *milieu* (1st century BC-AD in the East).

As for the urban hierarchy at Petra and the current opinion on the royal residence there, the "Great Temple" complex (the royal au-



5. The plan of Structure 2 (left) and Structure 9 (right) (by M. Holappa).

6. Structure 3 (Center) and Structure 10 (Right). View from SE (by M. Dehner).

dience/banqueting hall and *paradeisos*) in the city center was possibly intended as a more ostentatious, public and "official" display of Nabataean kingship while the NEPP complex, if indeed royal, appears more as a private and the habitual residence of the king. The former displays traits adopted from Herodian and Hellenistic architecture while deliberately demonstrating Nabataean kingship as rooted in the tradition of the Achaemenids and Alexander (for discussion, see Kropp 2009: 55-57; Schmid 2013: 261-264). On the other hand, the hypothetical royal residence in the NEPP area was also meant to impress through its exceptional location and appearance, but the monumentality lay more in the overall development of the area rather than in specific structures. Its isolated and defensible context points to a degree of seclusion, as if underlining a desire for privacy and relaxed elegance. The components appear to combine the official, utilitarian, recreational, and traditional, perhaps cultic, aspects. Despite its fashionable Hellenistic-Roman veneer, manifested in the architectural design and decoration, the complex also harks back to previous traditions (*e.g.* Achaemenid) mixed with local elements such as the use of water and the landscaping of the rocky terrain.

The results of the NEPP investigations also encourage a re-examination of the nature of occupation in the valley. Undoubtedly, the location and the actual arrangement of the palatial complex on the NE hill bore heavy impact on the development of the overall urban concept in Petra. Despite its seemingly "Isolated" location, the NEPP complex clearly dominated the entire valley, and its architectural design served to define the fast-growing urban center. For anyone proceeding down from the Siq and continuing along the Colonnaded Street, the appearance of the complex must have produced an unforgettable impression of a single, preeminent feature. In addition to its dominance in the urban fabric of Petra, the NEPP complex would have instilled awe and admiration and would, undoubtedly, generate clear message referring to the Nabataean monarchy and its cultural heritage and allegiance. Undeniably, the "Cityscape" of Nabataean Petra, dominated by a single street with important display buildings on each side may allude to the wealth generated by mercantile enterprise while highlighting spectacular religious establishments serving both locals and visitors. But there seems to be more to it than just a commercial success turned into a flourishing metropolis. Josephus' designation of Petra as a "Royal City" should mean more than just a city where a king resided, one adorned by temples, public buildings and palaces. The Nabataean Petra then becomes more like a physical embodiment of Nabataean kingship, one which, in the context of the political and cultural aspirations of the Nabateans, should be seen as a showcase of Hellenization.

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The Rites (Duties) of Worshipping Among the Nabataeans

Introduction

The Nabataeans are associated with Gods as they were seeking to please them believing that they more competent than humans. It was for the worshiper to seek attention of Gods, exerting all possible means and methods, expressing veneration and awe, so in return it will bestow upon the worshiper its blessing and welfare (Ali 1968: 197).

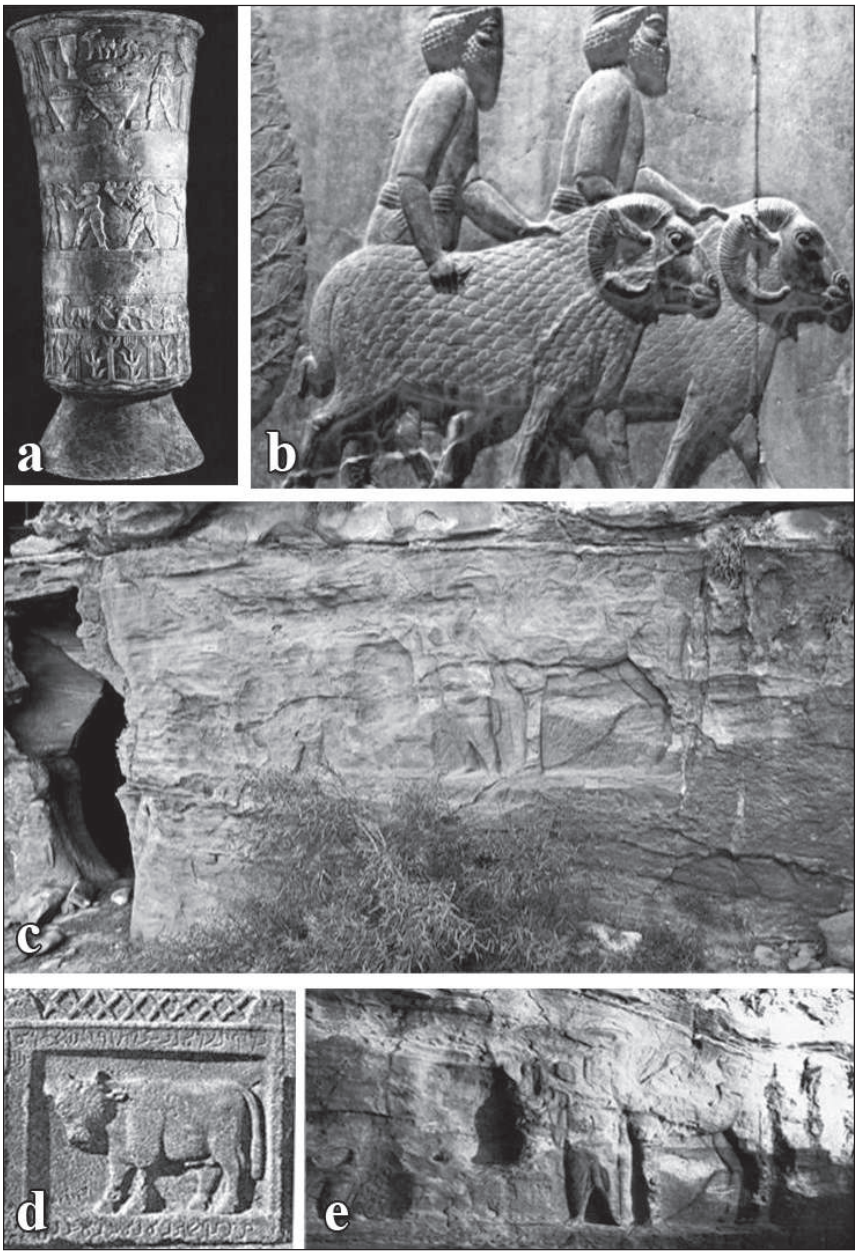
Through this concept humans were considered to be slaves of the Gods, it was the duty of the "slave-worshiper" to provide duties and obligations imposed by the religious life to the Gods at certain times of the year, or on religious occasions, such as offering to the Gods vows and offerings as part of a preliminary ritual to worship. By sacrifice, the worshiper convinces the Gods that he had presented the most precious thing possessed in order to satisfy it, and he did not forget nor overlooked it, and it will respond to him whenever appealed to them, and he had done the duties imposed or desired to them, served them and implemented its orders and rules to the best of his knowledge and interpretation over fixed days or months or seasons set by priests. The worshiper thus expected the Gods to be willing to hear his complaint, fulfill the demands he has and as part of the Gods' duty, which requires of him to visit the temples and be blessed by the Gods and make vows and offerings, and pray and learn the rituals of *Hajj* (al-Jarim 1923: 118-124; Ditlef 1958 :227).

Vows

Vows constitute the manifestation of belief in the spirituality of the Gods, and the vows are just an expression of a conditioned promise (at- Tabari 1954: 91-93). As matter of fact, the vow is but a contract between two parties, the first being the vower who offers the promise to commit to the implementation of a condition or a group of conditions, while the other party is the God or the Gods, which shall commit to the implementation of the requirement or of the vower (Ali: 192). Such practices were common within the inhabitants of Mesopotamia (Alabaster Vase from Warka) as evident of the vow pot shown in (FIG. 1) (Frankfort 1969: 10 plate 3). It shows that this asceticism worship may have been also practiced by the Nabataeans. Vows were divided into two parts: The first material offerings such as sacrifices that are well

reflected in the artistic sculptures held (Ali: 192) by the Nabataeans positioned at the monastery (*ad-Dayr*) (Mckenzie 1990: 172), which is one of the most prominent religious sites location as shown in (FIG. 2).

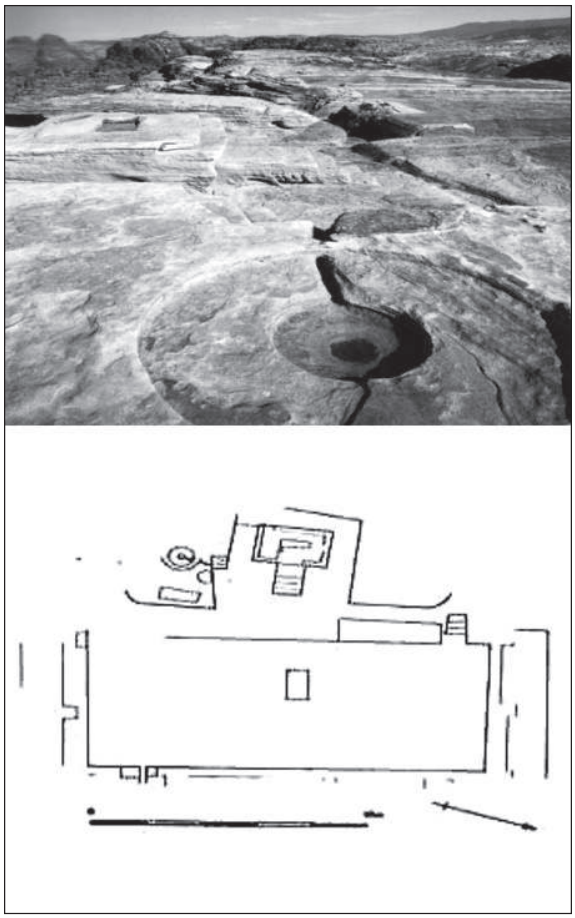
The word or pronunciation (Msgd) or (Msgd‘) (LP: 38, 24), which is “Mosque” is very indicative. This is mentioned in the Nabataean inscriptions, which means the altar, significant of the place where to slaughter of sacrificial animals. (CIS: 350/3-4; Cantinea 1930: 22, 137; az-Zabidi 1965 vol. 1: 403). This was interpreted in the linguistic sense as dwelling (perhaps dwelling of the Gods) (az-Zabidi 1965 vol. 8: 183; Ibn Manẓūr 1956 vol. 10: 396-397) or the forehead and perhaps (*Qibla*) direction to Holy Macca, which convey the Holy saying: “And (He revealed) that the *masjids* are for “Allah” the mosques are for God” (Surat al-Jinn verse: 18). Also present in the Nabataean text is the word “try ‘Mḥrmt (RES: 2093-1) and Mḥrmt’ (CIS II: 158. 1, 5, 6; RBL: XIV 199 f. 215-1)” which means trace or Holy placement, (CIS II: 158. 1, 5; RES: 2094; Starcky RB: LXIV) a



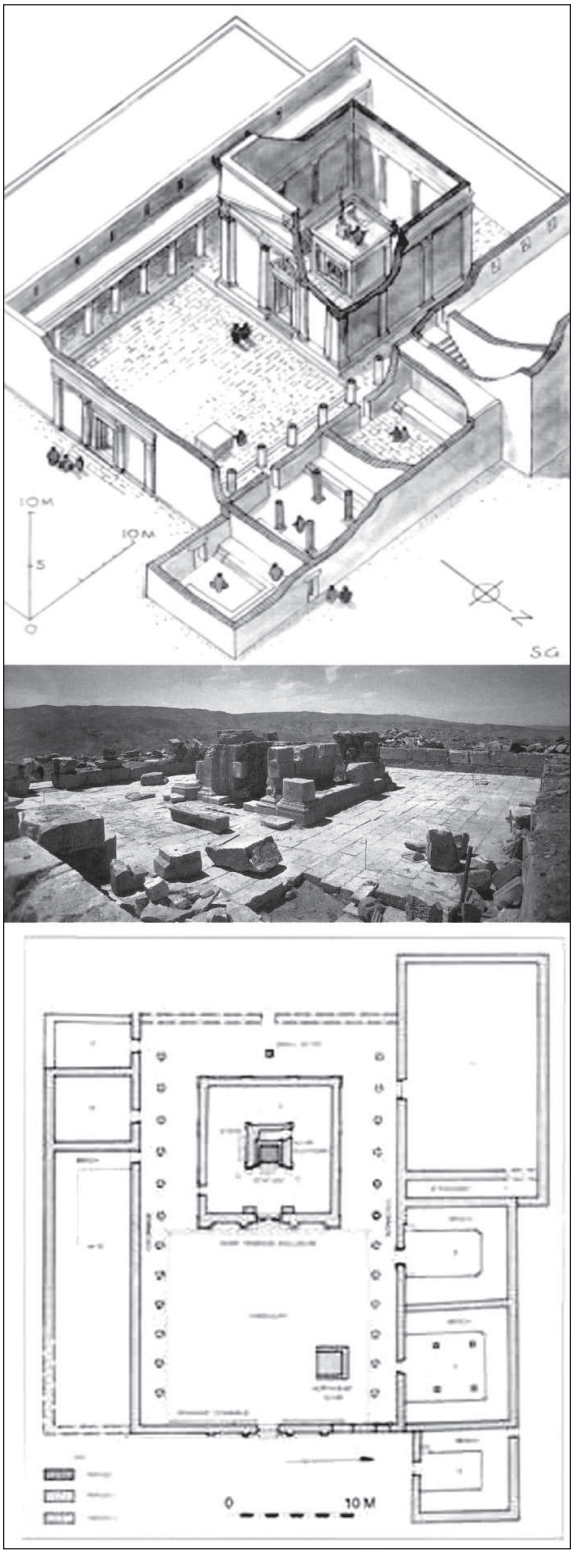
1. a. The Arts of Summer (Parrot, A. 1961: 49). b. The persoonal photo. c. It provided me (by Taylor, J.E.). d. Semitic Inscription (SÎ. Littmann, E.: 94). e. The camel relive at the Dayr.

2. The water engineering and irrigation system of the Nabataeans. (al-Muhisen, Z. 2009: 69, L49).

word used to refer to the altar's bench, for the alter is a flat bench on which the sacrifice offered by devotees is slaughtered to appease the Gods of the city thus the blood of sacrificial animals flows over that bench.(az-Zabidi vol. 1: 403) Other types of sacrifice alters also exist independently of the temples, such as the case of the existing building on the upper D top of the mountains from the city Petra, at the opposite side of Mount al-Khubtha, attributed the altar to the first century AD, at the center of the courtyard a platform altar is erected perhaps the purpose of its establishment is to place the sacrifice on top of it. This form has been associated with another form of altar reached by a staircase and is surround from the four sides with benches for seating the devotees and in the western side of the altar inferred the existence of a place to slaughter sacrificial animals, in addition to the presence of a bench with a unique design based on a circular base in connection with a hole accessible channel through which the blood of sacrificial animals and ends at the basin that collects the flown blood (FIG. 3) in addition for having a place for the storage of water may be used for the purposes of washing and abolition.(Mckenzie 1990: 172). Another alter set up by the Nabataeans at the apsidal of Khirbat at-Tannūr dating back to the second century AD, with the presence of places to drain the blood of sacrificial animals through clay pipes are also working to drain excess water that collects at that position, also located near the altar a pool which might have been used for washing in its water from the slaughter of sacrificial animals, (Glueck 1938: 11-13) same can be said at the apse of Rum Temple and dating to the first century AD, for alters were not only used for the slaughter of sacrificial animals, (Tholbecq 1998: 245) but also were used to put statues of the main city deity as can be deduced from the remains of the Temple of the Winged Lions. This indicates the existence of the remnants of the base of the altar still standing at the aisle of the temple in addition to the presence of cistern for storing water, which are used for the purposes of washing and disinfection (Hammond 1975: 22). It has come off the bench altar standing at the temple precincts as referred to by linguists as the altar dedicated to the idol, or it may be the idol to whom the offerings and vows



3. a, b. Petra. (Taylor, J. 2005: 83).

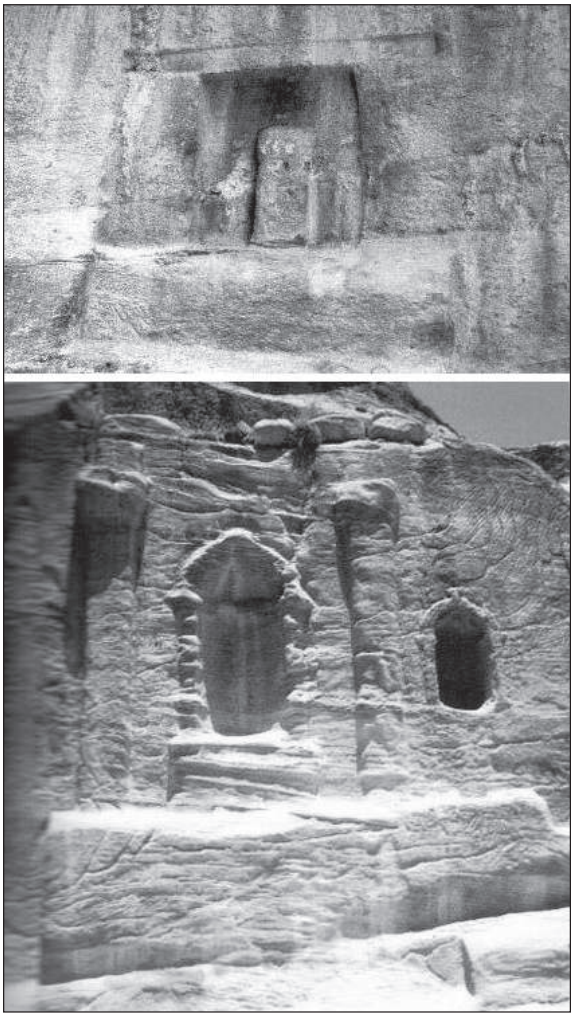


4. a, b, c. Complex plane of Khirbat at-Tannūr (Mackenzie, J.S. Petra 2003: 172-173).

and gifts are made, (al-Zabīdī vol1: 403) or it may be the altar of Temple Khirbat at- Tannūr[1] (FIG. 4) of the alters standing at the premises of the Holy room, which is thought to be the place the statue of the God was set, same can be said about the Nabatean Temple at Rum, (Zayadine 1998: 256) although most excavators of those temples named the altar as "*Mihrab*" (Michalowski 1970: 18) meaning niche for prayer, considering them cavities used to put statues of deities where "especially as they most honorable position in the construction and the highest room in the location and sublime place and the direction of the "*Qibla*" the direction of the prayer" (Ibn Manzur vol1: 296).

Same can be said about alters by which the worshipers give offering in the form of a carved stone considering them gifts , having a form of a sculpted stone the bearer can be moved from one place to another as indication for the sanctity of the alters at which they are placed, the carved by one person or more as an expression for gifts and offerings that were donated by philanthropists to that deity (Teixidor 1968: 85) an alter has been found at the temple of Nabataean Khirbat at- Tannūr, on the faces of the altar a symbol of beam light sculpted on the stone body in relief (Gluck 1938: 10-17; 1965: 193-209), the symbol can be also the embodiment of the machine, as dozens of alters engraved were found on which on one of its facets or more mention of on God or more than one Nabataean God, there could be consistence between the symbolic description with the Nabataean inscriptions carved on the facet of those alters (CIS: 176, 350, 3-4; LP: 38; RES: 38, 3676) as in (FIG. 5), or vows is the form of establishment of mosques as homes of the Gods in order to give safety to the lives of providers of these vows or the work of complementary parts of the house of God (the temple), or the work of sculpture to highlight different aspects of the deity (CIS: 526, 490; LP: 182).

1. The head of Zeous, the God was found under the rebels of the temple. Nabatean inscripts were also found mentioning the God arrow, whose task is similar to God Ḥaddad, which challenges the God Baalshamin, as the God of thunder, lightning and tornadoes, more to see: Gluck 1938: 15-18; Savignace 1973: 408.



5. a. Large betyl in the hollows for a stone entablature visible. b. The niche below the entrance arch on the north side of the Sīq (Bellwald *et al.* 2003: 43.51).

Second moral vows: Expressed in worship and celibacy and service at the houses of worship where some parents used to warn their sons to a God thus making him a servant of the house of God, therefore, it was not stranger to that nicknamed son of the God who he was vowed to serve or to have a group of people devoting themselves for the Gods. It can be deduced from the scripts related to vows that they were an inevitable consequence created by Nabataean human need embodied in his vision the possibility of influencing the Gods with these vows, and make it tend to response to his request (Ali vol6: 192) and in order to solve the problems that accompanied his life, the Vower presents his vow to the Gods[2], because he is certain that the Gods are able to achieve his demands and solve his problems, otherwise he would have never approached the Gods with his vows (CIS: 526, 490; LP: 182; JS:172).

Offerings

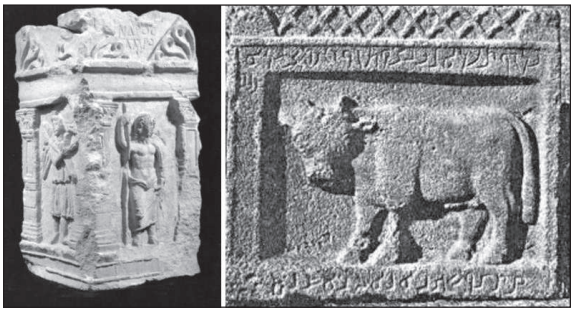
Known as the offerings of various materials or the sacrifices made in different occasions, reflects human feelings and sense for the Gods, they are his-speaking tongue in his religious life, has been marked by two types the first holds religious significance, and the second is reflected in the form of gifts and offerings (Rose Nekarten 1990: 13-15) for the religious character takes the form of pleasing the Gods, because the life aspects, and all that accompanying that belongs to the Gods, on the basis of the principle of human deficit and the feeling in not being able to achieve compatibility between the inner world and the world of the outside community, and to achieve the aspirations of the soul, all that create a self-sense of venerating the Gods and that drives the human to be a servant of the Gods (Rose Nekarten 1990: 13-15), provides its offerings because they prolong life as discerned from Nabataean texts, which mention the word "Qrb" as compatible with the linguistic origin of an offering (RES: 83, 3676), the types of Nabataean offerings have been divided between providing the sacrifice of camels (الجِمال) (CIS: 157) as in (FIG. 6), and perhaps art sculptures support the interpretation of the word, and between the submission great noble constructions in the form of mosques or be complementary parts of the buildings houses the Gods (FIG. 7) or charitable work such as digging dam or channel as can be read in one of Nabataean (RES: 3676; LP: 24, 69).

Prayer

One of the most important religious ritual that is worshipers performed in front of his idols,

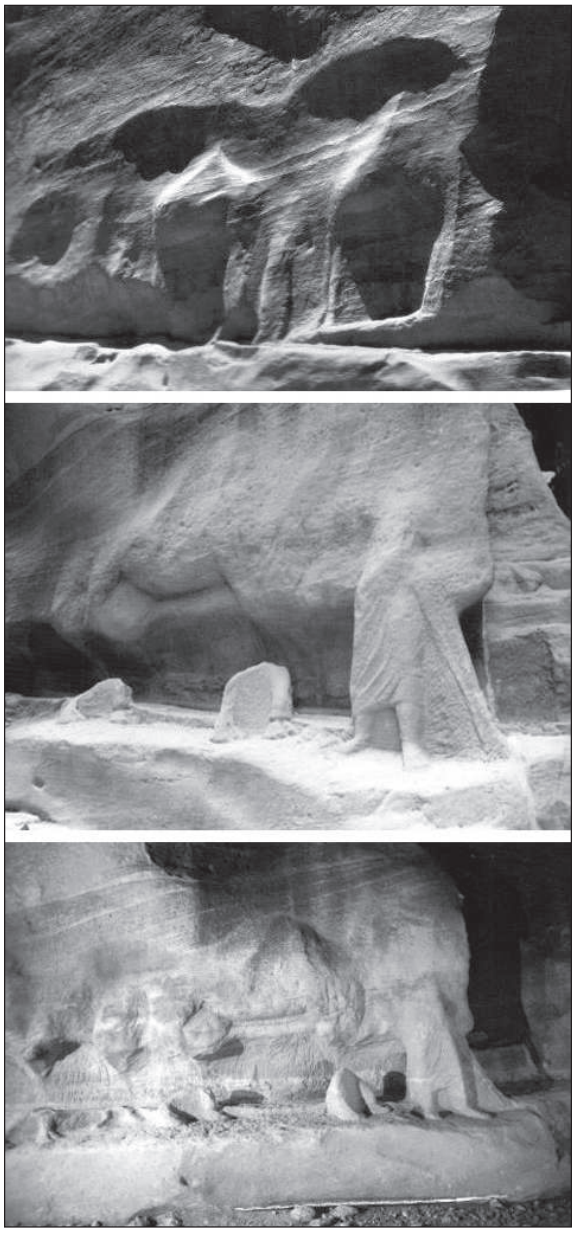
2. The Nabatean test included various texts about worshipping included the religious rituals encompassing the vows. More to see: LP:100; RES: 1450; CIS:185.

6. a, b. Semitic inscription (Littmann, E.: 38; LP: 90).



7. a. (Graff, D. 2003: 67). b. (Littmann: 94).

which identified their positions in houses of worship, for what is a temple but a place house those Gods (al-Hout 1979: 141), since the Nabataean inscriptions expressed a common word “Bryk” (CIS II 491-2, 590, 861, 868-1, 875-1, 871, 878; BASOR XV: 13no31c, 1, 871, 878; BASOR XV: 13no31c; MS: 116, ARNA 54RES: 1427) “Qdmy” to rise (early), to stand up” (BIA X: 55-4) or “Qm” (RB XLII: 415-5; BASOR XVI: 227-81-5; RAO VIII: 242) which is one of the formulas emerging to pray, for the prayer, is but expressional tool for the call to prayer, (Habib 1979: 162-163) which is performed by lifting of the right hand depicted in those postures artistic sculptures at the Sīq leading to the city of Petra, as well as the Goddess sitting and placing its hands on its knees, (al-Sa‘adoun 1988: 156-162; Burckardt 2012: 63) as in (FIG. 8), as a sign expressive for that call which invite its worshiper and bids them to perform their devotional obligations, for the prayer, is but an important part the worshiper must have it taken into con-



8. a. Lower group of the camel caravan one of the drovers is visible between the two camels, relief at the Dayr (Bellwald, U. *et al.* 2003: 41). b. The rock canal of as-Sīq runs behind carving of camels led by a person. (al-Muhisen, Z. 2009: 176). c. The upper group of the camel caravan with the front drover on the right (Bellwald, U. *et al.*: 41).

sideration. (al-Matar 1999: 80-84). In addition to Nabataean inscriptions reference to the word "Msgd" (RES: 2052-1) or "Msgd'" (CIS II: 161-176-1, 1851, 188-1, 190-1, 218-1; RES83-1,676-1, 2051-1, 82), "linguistically derived from kneeling and from it prostration prayer may mean places of prostration (al-Zabīdī, vol. 2: 371). Where the word prostration "Sajda" of them came the Surah as-Sajdah (the prostration) -سورة السجدة- Holy Quran, the word "to prostrate" and its linguistic derivation came in the religious aspect is contained in several Surahs of the Holy Quran and of them (Holy Quran, Surat Fussilat 24: Verse 37).

Pilgrimage

Pilgrimage is defined linguistically as coming and intent, it was said pilgrimage to the House because they used to perform the act each year (al-Zabīdī vol2: 16-17) in the month the pre-Islam Arabs knew as Dhul-Hijja (That of the *Hajj*), and the Pilgrimage date are not performed on the account of the solar year, (al-Alusi 1896: 21, 77, 213), devotees of these holy pilgrimage has inadvertently to seek blessing from them, and become closer, as the devoted worshiper performs standard religious rituals, according to the regulations and rules of the specific assets of the *Hajj* and addressing the Gods humble begging prayers beseeching the Gods to accept that pilgrimage. (ad-Diyarbakri 1884: 106). It is also found in the Nabatean written scripts the use of the spelling *hggw*, the plural for the Nabatean word that is found in the linguistic as *hujjaj* (CIS: 680, 1172: 2. LI 1500, 1842- 1,3107; Litmann BSOAS 1953: 13-14. Cantineau II: 93-94; Khraysheh, PNN: 76-77. Glossary: 50) Among other things mentioned in the inscriptions in the region surround aṣ-Ṣafā read the phrase "hurried a pilgrim from *Mina* to *Mecca*" and this phrase has expressional implications of the annual return of pilgrims from *Mina* to *Mecca* phrase, (Desso 1959: 122-131), has been secured in line with expressive language specifically the word pilgrimage mentioned above. But what is referred to by some Greeks and Romans historians about the existence of the temple on it are inscriptions, the Nabataeans used to go for the purpose of pilgrimage every five years, (al-Alusi: 72, 77, 212-213) the arrival of one of the pilgrims from a remote Roman country and his return to it after *Hajj* performance, which is performed in spaced intervals and text indicates as following "I pulled away and then returned to the country rum" (Desso: 129), and the return to the speed of the pilgrims (*Haj*) from *Mina* to *Mecca*, which we hinted to we find the phrase "the pilgrims ran from *Mina* may carry a religiously context (Desso: 129-130), may comply with the linguistic definition of the word pilgrimage mentioned above, and with what Greeks and Romans historians mention secondly that the Nabataeans pilgrimage (*Hajj*) was conducted twice per year, first with the beginning of the year and lasts one month, and the second at the end of the summer (al-Alusi vol. 3: 122-213), and may be related to the trip of winter and summer, from "for the accustomed security of the Quraysh". Their accustomed security [in] the caravan of winter and summer" (Surat Quraish, verses 1-2)[3], which was performed among the Arabs and Nabataeans every year is a figment of the pilgrimage which is not so, but some of them seem to stay in *Mecca* markets until the month pilgrimage to perform it before heading back home after he sought the two matters gain and pilgrimage (Ali vol6:350). Temples Nabataean schemes, especially the central ones have added an important aspect of the rituals of worship and of the process of circling or rotation is one of the rites of the pilgrimage, which included schemes such temples, particularly those campus area surrounding the corridors of the Holy Ḥaram of the Nabataeans only for a part of the rites of *Hajj*[4], reflected in cycling which is performed restrict around the holy places the artistic carvings has added, from the

3. "For the accustomed security of the Quraysh their accustomed security [in] the caravan of winter and summer" Surat Quraysh verses 1-2.

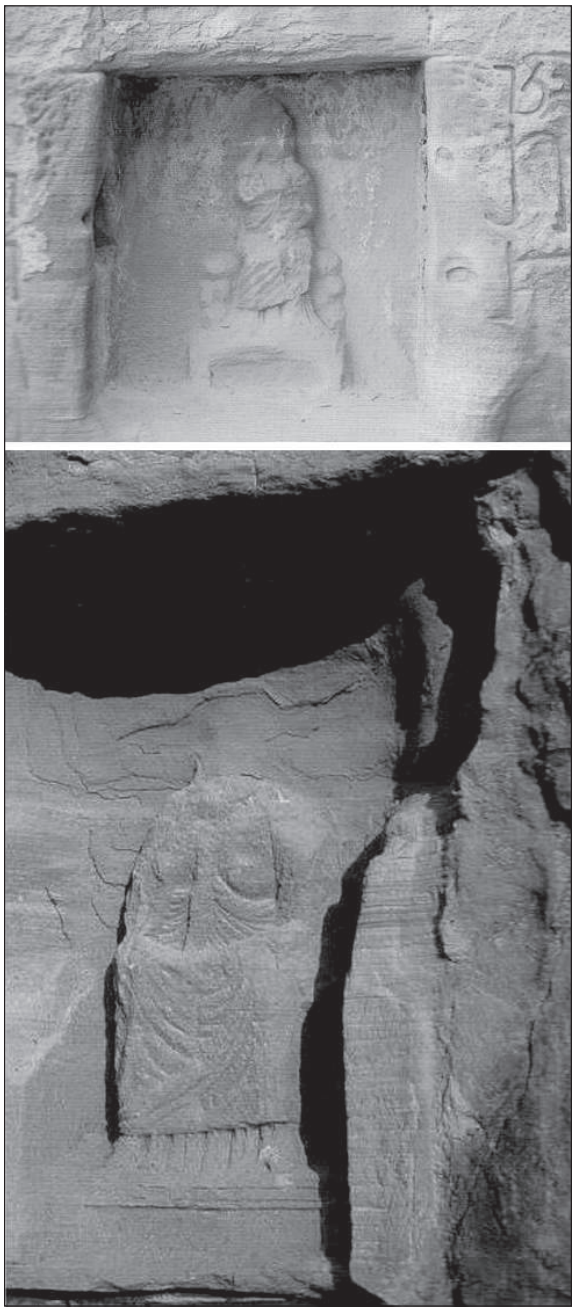
4. There are a lots of samilaries between the ally ways surrounding the earlier mentioned temple and the temple of Khirbat at-Tannūr and that of adh-Dharīḥ, that of Ramm. They all have the same circular move and the U shape as the Latin Language, more to see: al-Muheisen, Z. and Villeneuve, F. 1990. Khirbat adh-Dharīḥ Nabataean site in Wādī al-La'bān. *ADAJ* 34: 12).

city of Petra at one of the sides of the Sīq aspects when a scene is carved showing a group of camel caravans in front of them is a person who drove them and behind them three people and one camel carries something unclear due to erosion (FIG. 9) (Netzer 2003: 7-8).

Perhaps the sculptures of the city of Palmyra indicate the scene of circling and seen at the lentil which is set above the surface of the column capitals on the sanctuary of the temple of the God Bel, the largest divine complex in the city of Palmyra (FIG. 10), a scene depicting the Palmyrian circulation, which includes deity but carried inside Hodge under a colored dome in red on camel-back and in front of it are the priests and worshipers sweater and priestesses in religious dress adjective symbolic, and circling, (Colledge 1967: 34-35) which was going on at the temple of God Bel, but through the corridors surrounding the sanctity (al-Buni 1978: 163), through certain times of the year as clarified by historical sources, in order to perform *Hajj* or circumambulation (as-Semsati 1965: 66), and who knew linguistically rotation of the person around a place of placements and roam about the thing or the place where he began it and returning to the starting point (Ibn Manẓūr: vol4: 296-297), but the circumnavigation process or turn is performed only when at the holy places and the best of those places is *Ka'bah* (Safar 1974: 334, 421), in addition that the Arabs had many *Ka'bah*t the pilgrims frequented annually at certain times, then تعتر offering vows are given and offerings to deities around the *Ka'bah* deities, roam around and then leave after they have performed all the rituals for the *Hajj* (Smith 1894: 112), were probably carried out the rituals of *Hajj* in the non-specific days of the year[5], which were called by historians as the smaller pilgrimage, which is defined as part of a circumnavigation the worshiper pay by pilgrimage as part for the people to perform these performances. (at-Tabari vol. 2: 105).

Feasts

The word holidays in the Arabic language is derived from the word holiday, when he returns from the general meeting on the usual form, (az-Zabidi vol. 2: 438) and in the season's holiday period before Islam where the sacrificial offering and offers the best gifts were shown, and the varieties of food and sacrifice, the priests come to perform religious rituals to be adopted



9. a. Wādī as-Siyāgha, Petra. b. Seated Goddess of Wādī ad-Dalū on the way to Jabal Hārūn. (Zayadine, F. 2003: 63).

5. Perhaps in Jabal Hārūn, more to see (Taylor, j. 2005. Petra: 139).

10. Personal Photo.

at these events which was divided between the festival takes place in the season or a specific month, and the celebration gala victory (Abdul-Wahid 1985: 207-219; an-Naimi 1976: 25-75), as illustrated in the Nabataean inscriptions "the Nabataeans celebrated the festival which is held every four years one time for the God Dhūsharā" "on schedule in January 6, he was born to a mother virgin" where there were no written signs decrees of the ceremonies of that holiday (Starkey 1970: 12).

Festivities Nabataean was organized twice a year in the first of the spring period and the second period in the fall, one of the most popular holidays in the cities of the Arabian Peninsula before Islam (Glueck 1965: 26).

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Who Owns the Past: Jordanian Archaeological Masterpieces at the International Museums

Introduction

Until the last recent decades archaeologists paid a little attention to the question: who owns the past?. More than fifty years ago most archaeologists working in the Ancient Near Eastern sites came either from Europe or the USA, and their political and economic domination allowed them an almost automated right to acquire antiquities and excavate sites all around this region of the world.

After World War II, former colonies became independent states eager to uncover their own past and to control all matters related to their heritage. As a result of this, several questions arose, such as, should antiquities acquired from western museums during the colonial era returned back to their lands of origin?

Moreover, according to the former Jordanian Bye-laws of Antiquities (earlier than 1. 5. 2004), the excavators who were digging at sites in Jordan have been allowed to share the excavated finds with the Department of Antiquities of Jordan. This means, that the excavators acquired their share of excavated objects legally, and were free to hand these objects to their affiliated institutions and international museums. However, this was only stopped only in May, 2000 upon directions were made by the General Director of Antiquities late Fawwaz al-Khreisheh.

Another factor must be mentioned in this regard, which is, that before the 1967 Arab-Israeli war, the West Bank of Jordan belonged to the Hashemite Kingdom of Jordan. Moreover, before the 1967 war started, all non-Jordanian archaeological centers had their bases in Jerusalem. In addition, the Palestinian (Rockefeller) Museum accommodated all objects excavated at the West Bank, and some of the East Bank sites. This means that several colleagues used to storing or exhibiting their finds either at the institutions they belonged to, or at the Rockefeller Museum. Examples might be given from the Dead Sea Scrolls and the Tulaylāt al- Ghassūl, Bāb adh-Dhirā‘ and Rizqā.

In addition, before the end World War I (1916/1917), most of the Arab countries subjugated to the Ottoman reign. During the almost 400 hundred years of Ottoman domination, several explorers, travelers, surveyors and excavators paid visits to this region, and conducted many archaeological fieldworks. As a result of this several archaeological objects were purchased or transported to museums in Europe and

North America, even perhaps, without the permission of the Ottoman governmental offices. In addition, few objects were presented to the kings and rulers of the European countries by the Ottomans, such as the al-Mushatta Façade.

Nevertheless, during the 19th and 20th century's several archaeological Jordanian masterpieces were transported to several international museums and institution either legally or illegally, or even taken by force as a result of the 1967 war. Below, we present a list of only ten examples of such objects.

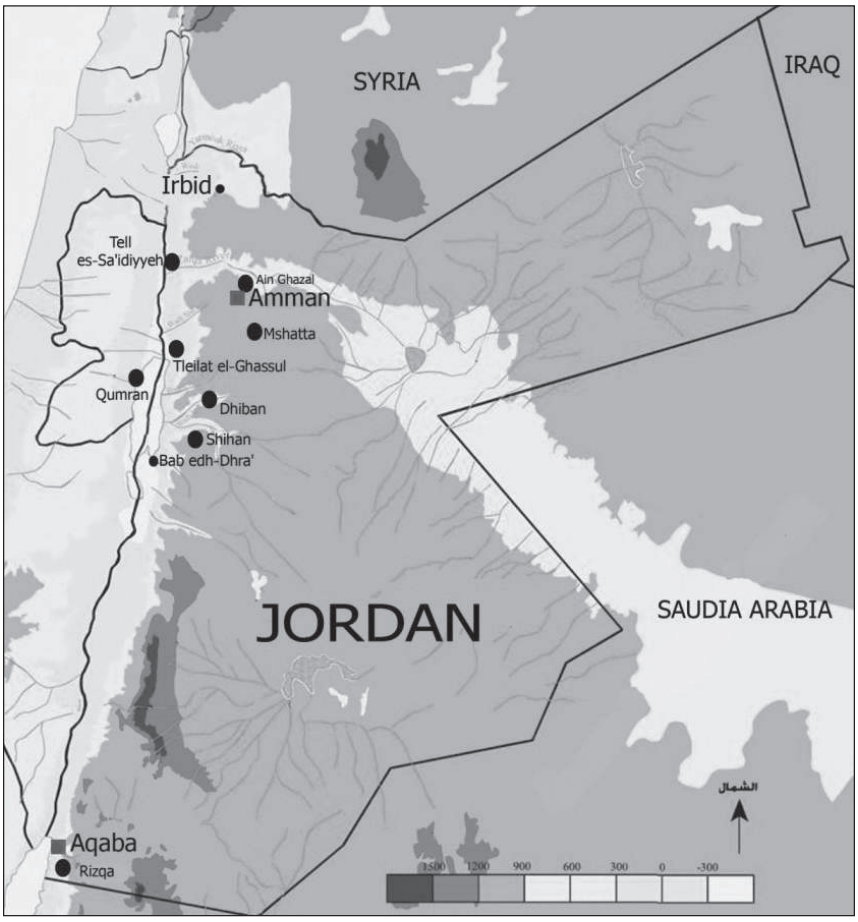
It is clear that the above listed objects covering a long period of time started from Neolithic to the Islamic periods, and originated from Jordanian sites covering most of Jordan (FIG. 1).

Where are they Now?

It should be noted here, that objects transported to museums in Europe and North America during the last centuries, were not only

Table 1: Showing Some of the Jordanian Archaeological Masterpieces at the International Museums.

No.	Ottoman Period	Agreements	Conflicts/War
1.	al-Mushatta		
2.	Shīḥān Stele		
3.	Mīsha' Stone		
4.		'Ayn Ghazāl Statues	
5.		Tall as-Sa'īdiyya Jewelry Box	
6.		Tulaylāt al-Ghassūl Chalcolithic Fresco	
7.		Bāb adh-Dhirā' Pottery Pots	
8.			Bāb adh-Dhirā' Pottery Pots.
9.			Rizqā Idols.
10.			Dead Sea Scrolls.



1. Map of Jordan.

originated from the Arab lands, but several masterpieces of art and archaeological objects were also transported from other parts from the world. For example, the marble sculptures from the façade of the Parthenon, the great fifth century BC temple that crowns the Acropolis in Athens was taken to the British Museum and the Egyptian Museums in Berlin holds the famous bust of the Egyptian queen Nefertiti.

To discuss, we present below ten examples of archaeological masterpieces which are they either stored or displayed at several international museums or institutions.

Table 2. Museums Accommodating Jordanian Archaeological Masterpieces.

No.	Masterpiece	Museum	Figure
1.	al-Mushatta Façade	Pergamum/ Berlin	2, 3
2.	Shīḥān Stele	Louvre/Paris	4
3.	Mīsha‘ Stone	Louvre/Paris	5
4.	‘Ayn Ghazāl Statues	Louvre Paris+ British Museum/London	6
5.	Tall as-Sa‘īdiyya Ivory Cosmetic Box	British Museum/ London	7
6.	Tulaylāt al-Ghassūl Wall Paintings	Pontifical Biblical Institute of Rome/ Jerusalem	8
7.	Bāb adh-Dhirā‘ Pottery Pots	Smithsonian/ Washington	9
8.	Bāb adh-Dhirā‘ Pottery Pots.	Rockefeller-Palestinian Museum/ Jerusalem	10
9.	Rizqā Idols.	Rockefeller/ Palestinian Museum/ Jerusalem	11
10.	Dead Sea Scrolls	Shrine of the Book/ Jerusalem.	14

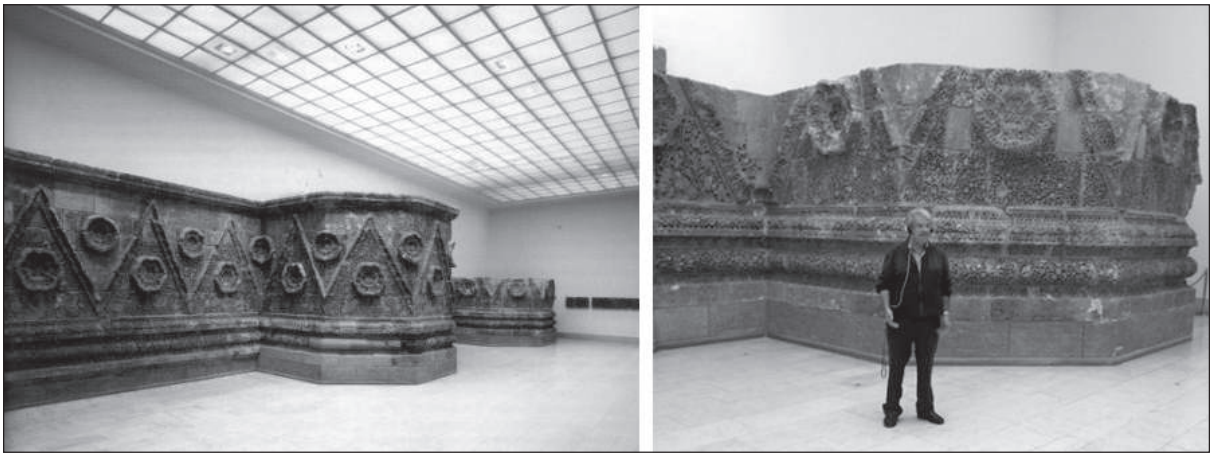
Qaṣr al-Mushatta Façade

During the Umayyad Period (661-750 AD) Jordan continued o prosper, as was the case during the Byzantine Period (324- 636 AD); this is due to the fact that it was in a short distant to the capital Damascus and locates on the pilgrimage route from Bilād ash-Shām to Mecca. The major Byzantine/Classical sites in Jordan such as Amman and Jarash continued to be occupied, and the Umayyad Caliphs constructed a number of castles and palaces in the desert, at many areas, one of them was Qaṣr al-Mushatta.

Qaṣr al-Mushatta had been built by the Caliph Walid II around AD 743-744, although it was never completed, but it has been considered to be the largest Umayyad Palace in Jordan. Today, it locates just to the north of the Queen Alia Airport’s north runway, and about 32 kilometer southeast of the Capital Amman. The palace is surrounded by a square enclosure wall measuring 144 meters on each side, having 25 semicircular towers. As a matter of fact two of them, which were built at the southern entrance of the building of the palace, are hexagonal in shape.

The building has an entrance gate in the southern façade, which was decorated with carved stonework. The only remaining evidence are some pieces of carved stone with floral, animal and geometric motifs. Most of the ornate carving were sent to Berlin -as a gift from Sultan Abdul Hamid to the Kaiser Wilhelms II after his visit to the Holy Land in 1898, and it can be seen today at the Museum für Islamische Kunst at the Pergamum Museum- Staatlische Museen zu Berlin. Indeed, many thanks are due to the colleagues of the Museum für Islamische Kunst for keeping this masterpiece of art safe for over

2. Qaṣr al-Mushatta, Aerial Photo.



3. Qaṣr al-Mushatta Façade at the Pergamum Museum/Berlin.

one hundred years, and for presenting it to millions of visitors from all the world.

Shīḥān Stele (Musée du Louvre, AO 5055)

A carved basalt stone was found at Rujm al-ʻAbd, located between Dhībān and Shīḥān, in 1851 (Pritchard 1954: 2269). In 1964 it was transferred by R. Dussaud to the Louvre Museum in Paris.

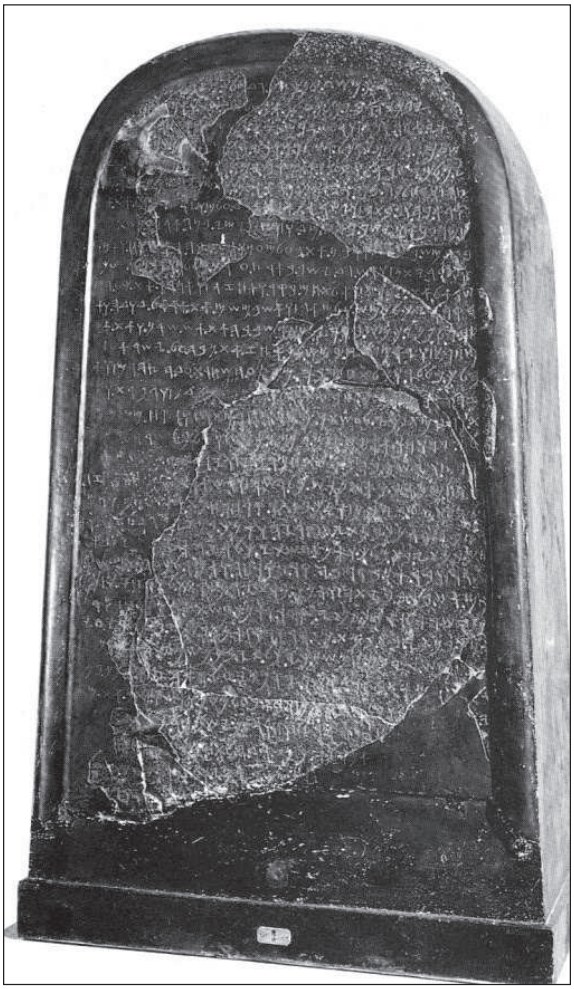
The relief carved into the stone represents a male figure standing in profile. It has been interpreted as a god, a warrior, or a king. The figure is 103cm high and 58 cm wide, wearing a short skirt with a belt at waist, and a scroll head-dress which resembles these hic appear on the Hittite seals (Tufnell 1953: 161). The figure is holding a javelin, 60 - 70 cm in length with a leaf-shaped blade, and the javelin is pointed down-wards. Parts of the legs of the figure are missing because the lower part of the stone is broken.

Albright dated this relief to the last phase of the Early Bronze Age *ca*. 26th-23rd century BC, noting Egyptian influence (Albright 1961: 79). Tufnell considered it to be from the EB-MB Age, and she dated it to *ca.* 2700-2000BC, comparing the style of the javelin to others which have been found at Jericho, Tall Bayt Marsīm, Tall ʻAjjūl and Tall ad-Duwayr from the EB-MB period (Tufnell 1953: 166). Matthiae (1962:80) thinks that it is from the MBIII period, comparing it with others found at Tall Bayt Marsīm and Tall Balāṭa. Finally, Alt (cited in Matthiae 1962:80) referred it to the 12th century BC, which seems to be more acceptable than the previously suggested dates. Unfortunately, no ceramic evidence is available from the site of the discovery.

4. Shīḥān Stele (Musée du Louvre, AO 5055).

Mīsha‘ Stone (Musée du Louvre, AO 5066)

In 1851, the Church Missionary Society (CMA) started its missionary activities in Palestine by sending F.A. Klein to Jerusalem. Klein was German but had grown up in Strassburg, a French city located in the province of Alsace on the French-German borders. Klein's first travel through Transjordan was in 1868, as he visited many cities, towns and villages, but in his first reports there was no mentioning for a visit to Dhībān and the discovery of the Mīsha‘ Stone (Graham 1989:49). However, in this trip his protector in this trip was Sattam son of Shaykh Fandi al-Fayez (سطام فندي الفايز). Klein and Sattam visited in August, 1868 the tribe *Bani Hamidi* was encamped in Dhībān. During that stay the sheikh of Bani Hamidi expressed his well to show Klein an inscribed stone which is only about ten minutes walk from the Bedouin camp. As they arrived there, Klein started measuring the stone, examining it and mad a sketch of it. Klein descried the stone as the following:"a basaltic stone, exceedingly heavy, with a thirty four line inscription facing upward" (cited in Graham 1989: 50). It has been cited that four men turn the stone over but found no inscription, rounded at both the top and the bottom, measuring 113cm in length, 70cm in width and 30cm in thickness. In addition, since it became dark Klein could not copy the inscription except of few words from several lines at random (Petermann 1870: 640).



5. A Reconstructed copy of the Mīsha‘ stone.

After Klein's return to Jerusalem, he reported to the German Prussian consul in Jerusalem (H. Petermann) , and to three others about the stone. On August, 29, 1868, the German consul wrote to Berlin inquiring whether the director of the Royal Museum was ready to pay 100 napoleons to acquire the stone and he was positively answered.

The news about the Mīsha‘ inscription spread all over the European missions in Palestine (the British and the French) and it has been mentioned that the French knew about it in spring of 1869. The French consul Clermont-Ganneau assured that he had known about it long time ago before Klein. Clermont-Ganneau was the first person responsible for the first public announcement of the stone, and that was on October 20, 1869.

After receiving the positive answer, the Prussian consul in Jerusalem, Petermann, asked Klein about the best course of action to take regarding the stone. Klein contacted Shaykh Bani Sakhir Fendi al-Fayez and asked his help to acquire the stone. For his bad luck, Fandi al-Fayez left to Damascus, and after his return back home. Moreover, it seems that Petermann did not give up. Thus, and in March 1869 he asked an Arab teacher (Saba Qa‘war سابا قعوار), who was known to the bedouin to leave to Dhībān. He informed him that he will pay the demanded amount of money (100 napoleons) in

installment, 50 napoleons at first and the rest as soon as the stone will arrive to Jerusalem. This messenger returned back to Jerusalem and informed Petermann that the *Bani Hamidi* had hidden it from him first, but as they showed to him they raised the price to 1000 napoleons.

It seem that in spring 1869, the British Captain Charles Warren and the French Cerement-Ganneau knew the results of the German- Bani Hamidi negotiations. It has been published that *"... the Frenchman asked Warren if he knew of such an inscribed stone, and Warren replied that he did, but that he had stayed out of the matter, since the Prussians were busy with it. Clermont Ganneau noted later that he approved of Warren's reserve in the matter and acted similarly"* (Graham 1989: 57).

Both were surprised that the Germans and up to that time did not do an impression of the inscription. This invited Clermont-Ganneau in determining to obtain this inscribed stone and a squeeze of the inscription. To do so, he sent three Arabs to Dhībān and received people of *Bani Sakhir* and the result was obtaining the impression of the stone. By the end, Clermont-Ganneau obtained a squeeze of the inscription and paid from 400 *mejidiyes* for Shaykh ʻĪd al-Fayez (Graham 1989: 60).

In mid October 1869 Saba Qa'war appeared in the Prussian Consulate in Jerusalem announcing that the Shaykh of Beni Hamidi namelly (Ahmed Bin Tarif) had agreed to sell the Stone to him for 120 napoleons. Saba Qa'war left with the sum to Bani Hamidi, and the *Shaykhs* agreed to release the stone to him for the agreed-upon price. At this point, a problem arose: Shaykh Qablan (الشيخ قبلان) of the *ʻAdwan* tribe and through his territory the stone would have to be taken refused to allow passage to the stone. To solve the problem the The Prussian's consul found himself obliged to ask for a help from the Ottoman *wali's* in Jerusalem, Nablus and Beirut will for interfering in guaranteeing safe passage for the stone. Afterwards, news arrived to the Prussian Consulate that the stone had been destroyed by Bani Hamidi. After that the Prussian Consulate took no further interest in claiming the stone.

It seems that Clermont-Ganneau refused to think that the stone had been destroyed, and began reading the inscription from his impression. Actually, on November 25, 1869, E. M. Comte de Vogüé arrived in Jerusalem, discussed with Clermont-Ganneau about his latest interpretation of the text inscribed on the stone. de Vogüé declared himself ready to help in arranging the publication of the results of Ganneau's study of the inscription. In the meantime, Clermont-Ganneau contacted Warren and asked him to forget about the story of Shaykh ʻĪd al-Fayez, that the stone had been destroyed. But instead, Warren assured him the destruction. Several meetings and consultations were held amongst Clermont-Ganneau and Warren during the first half of January 1870, and on the 15th of the same month Warren and Clermont-Ganneau received excellent squeezes of the two largest fragments, in addition to small fragments of the stone, which some of them were inscribed. Nevertheless, all the fragments were purchased by the French Clermont-Ganneau who was the one to read and interpret the text inscribed on the stone. Cleront-Ganneau kept all the stone fragments and the squeezes at the French consulate in Jerusalem and then transported to Paris, where he reconstructed and translated the text of the inscription. Several scientific publications were published by Clermont-Ganneau (1870A, 1870B, 1870C, 1876, 1887).

The story of the Mīshaʻ Stone's discovery and interpretation during the second half of the nineteenth century is full with evidence that there was a big awareness that this archaeological feature would be of great significance to scholarship. As it was expected from the beginning, that the inscription will add more information the study of the history, ethnography, geography, mythology, linguistics and paleography of Jordan.

Finally, three European nations were in-

volved in the matter of Mīsha‘ Stone discovery and study. This may reflects the dangerous consequences of politicizing archaeology and added fuel to the debate over the accuracy of the historical narratives in the Bible.

‘Ayn Ghazāl Statues

Two caches of MPPNB (Middle Pre-Pottery Neolithic B *ca.* 7250-6500BC “Uncalibrated Date”, lime plaster human statuary were revealed at the site of ‘Ayn Ghazāl in 1983 and 1985. Details of their construction techniques and form have appeared in several studies (Grissom 2000; Grissom and Tubb 1995; Schemandt-Besserat 1998; Tubb 1985). Based of the stratigraphic location of the two caches, it seems that the 1983 one could be older than that one from the 1985. However, the radio carbon dates obtained by analyzing charcoal chunks from two deposits do not show a big difference in age. These are as follows:

The 1983 cache dates:

6750+/-80BC (Uncalibrated) = 7723+/-122BC (Calibrated).

6710+/-10BC (Uncalibrated) = 7654+/-121BC (Calibrated).

The 1985 cache dates:

6570+/-110BC (Uncalibrated) = 7580+/-110BC (Calibrated). (Grissom 2000:26) stated that the 1985 cache was buried after the above mentioned date.

The two caches include about 32 pieces as the following: 15 full sized statues standing to about 1m high; 12 one headed busts; 3 two-headed busts and two fragmentary heads (Schmandt-Besserat 1998: 1-2). Also they seem to belong the same conditions of the archaeological contexts, in other words, each was laid in a pit dug on purpose for their deposit. Both were buried under the floor of a long abandoned houses and their general orientation was east-west, except for the bust in Cache 1 which they were placed crosswise below the statues.

Although they are different in date, separated by approximately two or three hundred years, but they have many things in common such as the location, material, technique, style and orientation.

A brief description of each cache is presented below separately.

The 1983 Cache

This cache was uncovered in a pit dug under a floor of an abandoned house in the Central Field of ‘Ayn Ghazāl. It consists of 25 pieces including (13 standing statues and 12 one headed busts). It seems that they were in condition when they were laid in the pit. They were built by building up by coating an armature of reeds by lime-plaster. They are flat and almost of two dimensions. The back is almost straight and their thickness is arranging between 5cm and 10cm.

It has been suggested that the statues from both caches were placed in an upright state except for one of the two-headed bust (Cache 2) that has a rounded bottom. In this cache, the genitalia is shown perhaps only in a single example and was depicted with pudenda and the female holding her breasts.

The representations of the members of the statues are different in size from one to another, for example the head has been emphasized and represents two-fifth of the total size of the first cache; and the neck is oversized. The facial features are striking and the eyes were decorated by adding a line of bitumen.

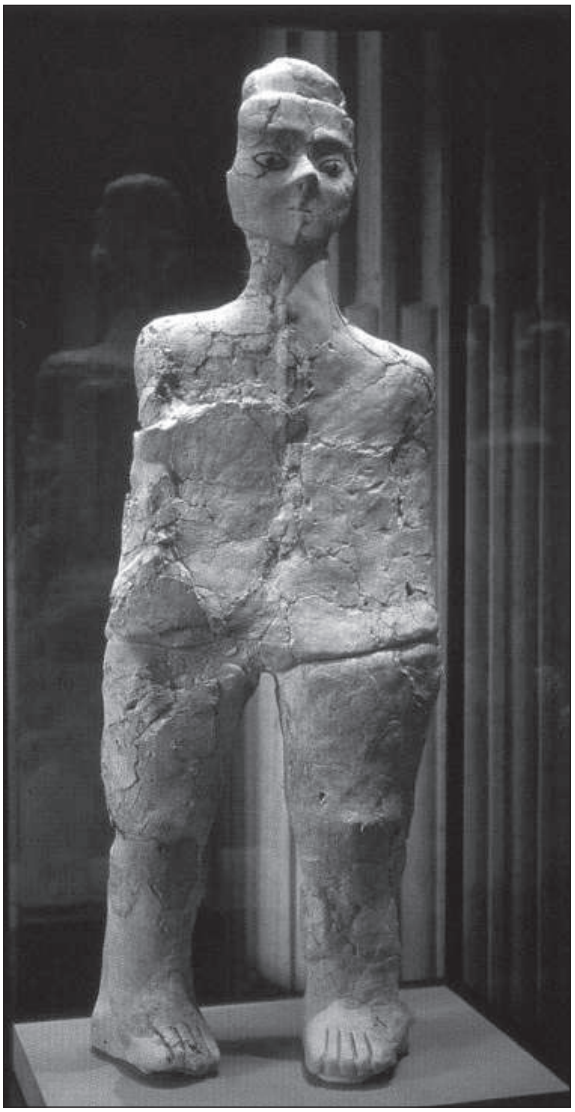
The tall of the standing statues of the 1983 cache is ranging about 84cm compared to 100 cm in the 1985 cache. Also the height of the busts ranged 35cm in height, while it measures *ca.* 88cm in the second one (Schmandt-Besserat 1998: 3).

The Department of Antiquities of Jordan signed an agreement with the British Museum to reconstruct and restore this cache of statues. Fortunately, several statues were reconstructed and some of them are on display at the Jordan Museum in Amman, and the Museum of Jordanian Heritage of Yarmouk University in Irbid.

In the meantime, and according to the agreement, two statues were presented, and currently on display at the British Museum. Moreover, the work on this cache still unfinished due to the less of financial resources and still in London.

The 1985 Cache

This cache of statues was observed in the upper profile of the bulldozer cut in the Central Field during the last days of the 1984 season of excavations. Based on an agreement signed with the Departmen of Antiquities of Jordan, it was only block- lifted in 1985 and then transported to the Smithsonian's Museums in Washington D.C. in the United States for digging, reconstructing and conserving (Grissom 2000). The reassembled cache consist of five statues two of which representing standing males, three two-headed busts and three plastered faces (Grissom 2000). In addition, unattached fragments including two other heads are recognized.



6. The 'Ayn Ghazal Statue on loan at the Louvre Museum.

Luckily, the 1985 cache of statues was completely restored by the Smithsonian and all reconstructed ones were returned back to Jordan and are on display either at the Amman Citadel Museum or at the Jordan Museum, in Amman. To mention, the Jordanian Government signed an agreement with the Louvre Museum which allowed the museum to have one of the statues on loan for a long period of time.

The analytical study indicates that they were made of local lime-plaster. Reeds were bounded with unspun cordage in bundles that assembled together forming standing statues or busts figures. It seems that the statues were laid horizontally during the fabrications, and they were made in stages by adding the lime plaster to the reed- bundles. Also, it may be that to finish the complex of standing statue, legs were made separately and joined to the rest of it. Grissom thinks that they may have been accessorized with wigs, clothing or other material to give them human appearance (Grissom 2000:25). Also, the eyes bear traces of black bitumen decoration to give them more attention.

The excavated 'Ayn Ghazāl statues are considered among the world's oldest known large-scale statues and dated to the seventh millennium BC (uncalibrated). In fact, the meaning of these statues still unclear due to the fact that they were deposited in pits when no longer wanted for their original purpose. In addition no more of this type of statues has been excavated in contexts dated to a period later than the PPNB in general to help in understanding their function. Moreover, people built them up were preliterate to leave us something written about them explanation.

Apparently, (Schemandt-Besserat 1998:10-11) discussed the function of these statues thoroughly and questioned three possibilities: Gods? Ancestors? or Ghosts? She concluded "Based on iconography, the ʻAyn Ghazāl "monumental" statuary may well have featured mythical protector figures, responsible for life and fertility. The ʻAyn Ghazāl statues are testimonies to the everlasting endurance of symbolism. The symbol of motherly nourishment may be viewed as a creation typical of the beginning of agriculture" (Schemandt-Besserat 1998:14).

In this regard it should be noted that the first discovery of similar statues was recognized at Jericho (Garstang 1935). Also, plaster fragments of statues were encompassed at Nahal Hemar Cave to the southeast of the Dead Sea (Bar-Yosef and Allon 1988).

Tall as-Saʻīdiyya Ivory Cosmetic Box

Tall as-Saʻīdiyya is a large double mound occupying around 10 hectares, located in the central Jordan Valley, approximately 2km. east of the Jordan River, on the south side of Wādī Kufranja. The east is higher than the western one and measuring 40m above the present surrounding plain level. Based on the results of surveys and excavations conducted at the site it has been decided that it was continuously occupied from the Chalcolithic to the Byzantine periods (Tubb 1997: 452; 1991:181-194). However, the archaeological excavations conducted between the years 1964 and 1967 by the University of Pennsylvania Expedition (Pritchard 1980; 1985), and between 1985 and 1992 by the British Museum expedition yielded a variety of archaeological items indicate society›s affluence. One of these finds is an ivory cosmetic box found inside a bronze bowl and dated to the Late Bronze Age (Philip 1991:105, Fig. 127).

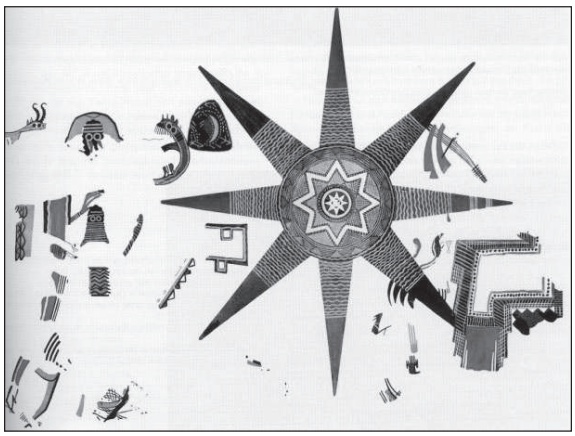
7. Late Bronze Age Ivory Cosmetic Box excavated at Tall as-Saʻīdiyyah and on display at the British Museum.

This ivory cosmetic box was given to the British Museum expedition as their share of the finds excavated at the site. In other words, it has been legally handed over to the museum and became part of its archaeological collection.

Tulaylāt al- Ghassūl Wall Paintings

The famous Chalcolithic site Tulaylāt al-Ghassūl is situated at the southern end of the Jordan Valley, about 6km to the east of the Jordan River and 5km from the northeast corner of the Dead Sea. It lies 290-300m below the sea level (Hennessy 1997:161) described the site as follows: *"When the site was founded, the area was swampy and settlement was made on a sand bank in the midst of slow-moving fresh water. It was surrounded by a rich growth of reeds, mosses, alder, and sedge"*.

The archaeological excavations conducted at the site indicated that it was occupied dur-



8. Wall painting from Tulaylāt al-Ghassūl left back in 1967 at the Pontifical Biblical Institute in Jerusalem.

ing the Late Neolithic and Chalcolithic periods (*ca*. from 4500 to 3500BC). It was a very large settlement during the Chalcolithic period and occupied an area of approximately 20-25 hectares (Hennessy 1989:230-241).

Walls were often plastered and painted, more than twenty replasterings and repaintings were counted on some walls. The paintings represent drawings of stylized human and animal representations, stars and geometrical designs (Mallon, Koeppel and Neuville 1934: Pls. 66-71; Koeppel 1940: Pls. 5-8; Cameron 1981). These wall painting were first uncovered during the 1929-1938 excavations conducted by the Pontifical Biblical Institute in Rome (known as the Franciscans). They transported part of these wall paintings to their residence at their institute in Jerusalem, meanwhile the rest was taken to Amman and at present on display at the Jordan Museum.

The Jerusalem wall paintings collection include one of the most beautiful representations, which is the colored star surrounded by stylized human, animal and geometric figures. Unfortunately, and as a result of the 1967 Arab-Israeli war it has been left back at the Pontifical Institute building in Jerusalem (Jehad Kafafi: Personnel Communication). Thus, it is a Jordanian property and has to be return to Jordan.

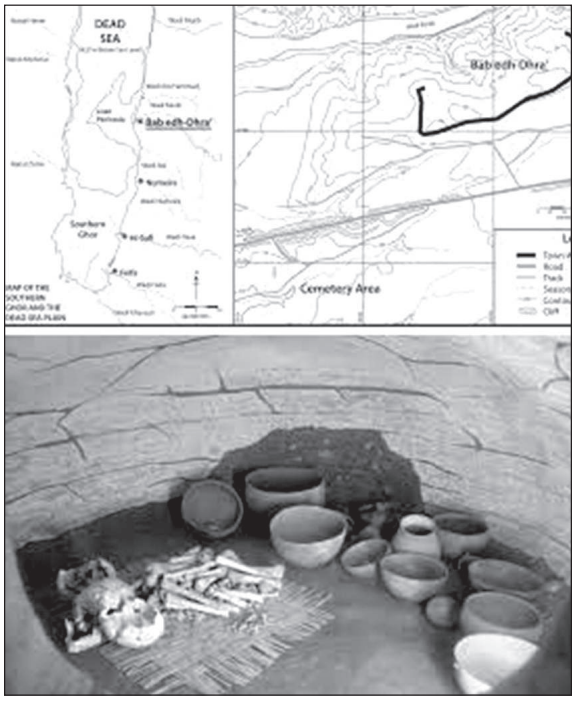
Bāb adh-Dhirā‘ Pottery Pots

The Early Bronze Age site of Bāb adh-Dhirā‘ is located on the plain southeast of the Dead Sea, exactly in the *Lisān* area. It has been occupied for over one thousand year and the site consists of two part: the walled city and the cemetery. The site was visited , surveyed and excavated by many individuals and institutions. The excavations undertaken by Paul Lapp (1965-1967) concentrated on the cemetery, but also several trial trenches were dug inside the walled city (Schaub and Rast 1989). More excavations were conducted by Walter Rast and Thomas Schaub (1975-1981), and the results of the fieldworks indicated that the site was first occupied during the Early Bronze Ag I and continued up to the end of the EBIII when it was destructed. However, the site was reoccupied during the EBIV returning to village life (Schaub 1997: 249; Rast and Schaub 1981).

As a result of these excavations at Bāb adh-Dhirā‘ a large quantity of pottery pots and other archaeological objects were encountered, especially in the grave-yard. In addition, a large quantity of the Bāb adh-Dhirā‘ pottery assemblage was illegally excavated by the treasure hunters and smuggled outside Jordan, especially to Israel. Apparently, and after re-evaluating the problem, we have identified two collections of this repertoire;

1. An assemblage which has been given to the excavators, as their share, according to the Jordanian Antiquity Bye-Law and they were on display at the Smithsonian Museum.
2. The collection left back at the Palestine (Rockefeller) Museum in Jerusalem as a result of the 1967 Arab-Israeli war. It is obvious that this assemblage is a Jordanian property and Jordan must acquire it.

As regard to the Bāb adh-Dhirā‘ pottery pots



9. A reconstructed Bāb adh-Dhirā‘ tomb at the. Smithsonian Museums in Washington.

10. A general view of an excavated tomb at Bāb adh-Dhirā‘ with *in situ* pottery vessel.

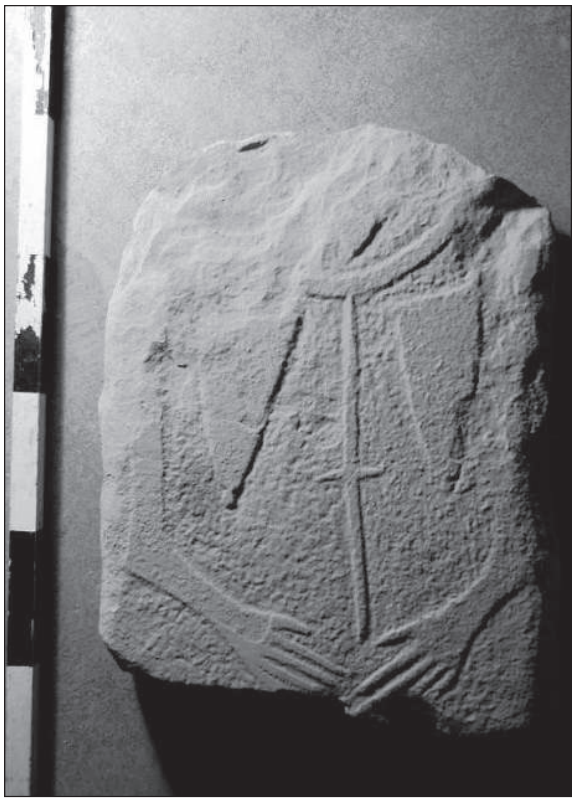
excavated found by the illicit excavations and smuggled to the black market, alas we cannot claim it back, but we must try our best to stop such illegal excavations. In fact, it is not only the site of Bāb adh-Dhirā‘ that has been robbed by the treasure hunters but also many other sites in the region such as al-Naqi‘ at Ghawr aṣ-Ṣāfī.

Ancient Arabian Ancestor Idols from Rizqā

The site Rizqā is located in the extreme southern side of Jordan, south of the city Aqaba, around 3 kilometers from the Saudi borders, and approximately 18 kilometers south and slightly west of Wādī Rumm. The site was surveyed and sounded by a small team led by Diana Kirkbride during the sixties of the last century (Kirkbride 1969A: 116-121, 1969B: 188-195). Kirkbride mentioned that she recognized in the center of a wide valley lined by cliffs of shape and color lay a large circle outlined by a wall of long thin stone slabs mostly buried by sand, some of which were carved in a shape of human faces (Kirkbride 1969A:117). The circle was about 20 meters in diameter, and almost oval in shape. Several burials surrounded and surmounted by stones were found in the vicinity of the circle.

As a result of the excavation operation done at the site, Kirkbride uncovered a pre-Islamic sanctuary, which was completely destroyed by a war. In addition, it has been suggested that after the destruction of the sanctuary, the devotees of the sanctuary came back and tided up the smashed remains and arranged them in a proper way. However, it seems that after a period of time the sanctuary had been neglected and the upright slabs were used as a quarry for burials. (Kirkbride 1969A:121) assumed that these carved figures *"... were memorial to the dead erected in a special, probably tribal sanctuary"*. The carved representations belonging to males and females. One of the figures shows a female with a spindle lying between her breasts.

11. A male and a female representation found at Rizqā. Two carved sand stone slabs.



12. A woman with her spindle.

Actually some of the uncovered slabs were inscribed by Thamudic inscriptions, which perhaps indicate that the sanctuary belonged to a Thamudic tribe (Kirkbride 1969B: 192) argued that those inscribed slabs were inscribed after the destruction of the sanctuary and they have to do with the individual burial cairns, which pos-date the destruction.

The Thamud tribe lived in these deserts of Arabia from about the fifth century BC.

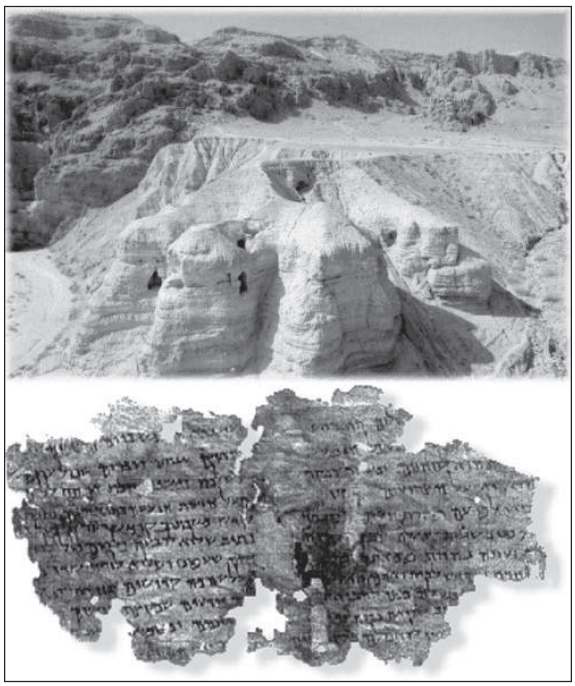
The aim of this paper is not to discuss those above mentioned idols, but to shed light on that they were taken to Jerusalem before the Arab-Israeli war in 1967 and left at the Rockefeller/ Palestine Museum in Jerusalem. It might be announced that due to the fact that they were excavated at a Jordanian site, Israel has to give them back to Jordan.

The Dead Sea Scrolls

The term "Dead Sea Scrolls" is assigned to the documents and literary texts uncovered at sites extending on the western shore of the Dead Sea. These texts were written in three languages: Hebrew, Aramaic and Greek. The first scrolls were found at Qumran by the bedouins "Ta'āmrah" and appeared in the summer of 1947 in Bethlehem. Excavation operations in Cave 1 started in February 1949 (Wise 1997: 118), but resumed in 1952 after the West Bank of Jordan united with the East Bank and formed the Hashemite Kingdom of Jordan.

Caves 4 and 11, which was uncovered and excavated in 1956 yielded some of the most important and complete scrolls. Actually, it is not our aim o discuss the content of the scrolls, but to mention the role that Jordan played in discovering sand studying them. Our main source information about this subject is the publication of the late Mahmoud al-'Abidi, then assistant to the General Director of Antiquities in Jordan (al-'Abidi 2010); (al-'Abidi 2010:270-285 Arabic) mentioned the Jordanian Government paid around fifteen thousand Dinar for acquiring the uncovered scrolls for the Palestinian Museum in Jerusalem. In addition, the Jordanian Government invested a lot of money for excavating the caves of the scrolls, and buying several logistics to preserve them in a very good condition. Moreover, the Jordanian army helped a lot in searching caves might contain scrolls. In addition, the Jordanian Government formed a scientific committee to study the texts of the scrolls. But the most important issue is that the Jordanian Government issued a law based on the Jordanian Antiquities Bye-law no. 33 issued in 1953 that the "Jordanian Government has the right to compensate all the Dead Sea Scrolls and all site in which they were uncovered or to be uncovered".

13. A Thamudic inscription uncovered a Rizqā.



14. A general view of some of the Qumran caves.

Unfortunately and as a result of the Israeli occupation of Jerusalem in 1967, Israel and by force put its hands on the scrolls. This deed was completed by building up a special museum for them, namely: "Shrine of the book". Thus, and due to the facts mentioned above, it might be argued that property of the Dead Sea scrolls belongs to Jordan and not to Israel.

Conclusion

We think that for the time being one should ask how and why these archaeological masterpieces were taken out of Jordan and brought to European and American Museums, before we ask to bring them back home. As a matter of fact, to answer this question we should know that not all of these objects were stolen from Jordan, but they were removed in different ways: governmental agreements, presents, trade, treasure hunters and war.

1. Archaeological objects taken during the Ottoman reign over Arab countries (before 1921); examples are the Mīsha‘ stone and the al-Mushatta Facade.
2. Archaeological objects taken outside Jordan according to agreements: ‘Ayn Ghazāl Statues, Tall as-Sa‘īdiyya jewelry box, and several other objects.
3. Jordanian archaeological objects that were on display at the Palestinian Archaeological Museum (Rockefeller Museum) in Jerusalem before the 1967 war (Dead Sea Scrolls, Rizqā Idols, part of the Tulaylāt al- Ghassūl fresco, and some other pottery objects from Bāb adh-Dhirā‘).

This paper aims, first, to present archaeological information about those masterpieces and their values as a part of Jordanian heritage. Second, it will raise a discussion about what is better for Jordan: to ask international museums to give those objects back to Jordan or to keep them on display for a large universal audience. If they are returned, a solution of which the author is not in favor, are we capable of protecting, conserving and maintaining them for the generations to come? However, we stress here that those masterpieces were left at the Palestinian Museum in Jerusalem must returned back to their original country, Jordan.

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