THE HASHEMITE KINGDOM OF JORDAN

STUDIES IN THE HISTORY AND ARCHAEOLOGY OF JORDAN IX

Studies in the History and Archaeology of Jordan

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IX

Department of Antiquities
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**HIS MAJESTY KING ABDULLAH THE SECOND BIN AL-HUSSEIN
OF THE HASHEMITE KINGDOM OF JORDAN**

HIS ROYAL HIGHNESS PRINCE
EL-HASSAN BIN TALAL

STUDIES IN THE HISTORY AND ARCHAEOLOGY OF JORDAN IX: CULTURAL INTERACTION THROUGH THE AGES

Contents

SYSTEM OF TRANSLITERATION

TABLE OF CONFERENCES

SPEECHES

H.R.H. Princess Sumaya Bint El-Hassan
Dr. Alia Bouran
Dr. Fawwaz Al-Khraysheh
Prof. Adel Tweissi
Dr. Alan Walmsley

Ina Kehrberg 31
GERASA AS PROVIDER FOR ROMAN FRONTIER STATIONS: A VIEW SEEN FROM LATE ROMAN POTTERS' WASTE AT THE HIPPODROME AND THE UPPER ZEUS TEMPLE

Aleson MacQuitty 49
RURAL SETTLEMENT ON THE KARAK PLATEAU: KHIRBAT FARIS

Randall W. Younker and Katharine Koudele 53
CAMEL PETROGLYPHS IN THE WADI NASIB AND THEIR IMPLICATIONS FOR THE USE OF CAMELS IN THE LATE BRONZE AGE

Jerome C. Rose, Mahmoud El- Najjar, Dolores L. Burke 61
TRADE AND THE ACQUISITION OF WEALTH IN RURAL LATE ANTIQUE NORTH JORDAN

Suzanne Richard and Jesse C. Long, Jr. 71
KHIRBET ISKANDER: AN ARGUMENT FOR ELITES IN THE EARLY BRONZE IV PERIOD

Abdel Sami Abu Dayyeh 83
A LIST OF THE AMMONITE KINGS ACCORDING TO CULTURAL AND POLITICAL INTERACTIONS

Raouf Abujaber 89
THE JORDANIAN COUNTRYSIDE AS A CORRIDOR FOR POPULATION MOVEMENTS AND TRADE

Adeib Abu Shmais 97
NOTES ON THE OLD WATER SYSTEM AND THE INTEGRATED OF JORDAN FUTURE

Douglas R. Clark 103
CULTURAL INTERACTION THROUGH THE WINDOWS OF THE FOUR-ROOM HOUSE AT TALL AL-'UMAYRI

Debra C. Foran 113
A LARGE URBAN RESIDENCE FROM LATE BYZANTINE AND EARLY ISLAMIC MADABA

Jennifer E. Jones 123
CRAFT PRODUCTION AND LANDSCAPE AT THE EARLY BRONZE AGE SETTLEMENT AT AL-LAJJUN, JORDAN

Gerrit van der Kooij 133

IRRIGATION SYSTEMS AT DAYR 'ALLA

Mika Lavento, Paula Kouki, Sarianna Silvonen, Heini Ynnilä, Mika Huotari 145
TERRACE CULTIVATION IN THE JABAL HARUN AREA AND ITS RELATIONSHIP TO THE CITY OF PETRA IN SOUTHERN JORDAN

Leslie A. Quintero, Philip J. Wilke, and Gary O. Rollefson 157
AN EASTERN JORDAN PERSPECTIVE ON THE LOWER PALEOLITHIC OF THE "LEVANTINE CORRIDOR"

John Peter Oleson 167
NABATAEAN WATER SUPPLY SYSTEMS: APPROPRIATENESS, DESIGN, AND EVOLUTION

Thanasis J. Papadopoulos 175
THE HELLENIC ARCHAEOLOGICAL PROJECT OF THE UNIVERSITY OF IOANNINA IN JORDAN: A PRELIMINARY SYNTHESIS OF THE EXCAVATION RESULTS AT GHAWR AS-SAFI AND TALL AL-KAFRAYN (2000-2004)

Leslie A. Quintero and Marc W. Hintzman 193
WOODWORKING IMPLEMENTS FROM NEOLITHIC 'AYN GHAZAL: TOOLS OF CHANGE

Stephan Schmid 205
NABATAEAN FUNERARY COMPLEXES: THEIR RELATION WITH THE LUXURY ARCHITECTURE OF THE HELLENISTIC AND ROMAN MEDITERRANEAN

Thomas M. Weber 221
ECHOS FROM MT. PARNASSOS REPRESENTATIONS OF MUSES IN THE DECAPOLIS

Chang-Ho Ji and Jong Keun Lee 233
THE HELLENISTIC PERIOD IN THE DHIBAN PLATEAU: A QUANTITATIVE ANALYSIS

Glenn J. Corbett 241
THE IMPACT OF LONG-DISTANCE TRADE ON THE PASTORAL-NOMADIC POPULATIONS OF SOUTHERN JORDAN AND NORTHWESTERN ARABIA DURING THE IRON AGE

Thomas Schaub 247
MUD-BRICK TOWN WALLS IN THE EBI-II SOUTHERN LEVANT AND THEIR SIGNIFICANCE FOR UNDERSTANDING THE FORMATION OF NEW SOCIAL INSTITUTIONS

Bethany J. Walker 253
THE POLITICS OF LAND MANAGEMENT IN MEDIEVAL ISLAM: THE NORTHERN JORDAN SURVEY, 2004

Ghazi Bisheh 263
THE UMAYYAD MINARET AT AL-QASTAL AND ITS SIGNIFICANCE

Charlotte Whiting 269
VARIATION IN LATE IRON AGE CERAMIC ASSEMBLAGES IN SOUTHERN JORDAN: 'EDOMITE' POTTERY RECONSIDERED

Øystein S. LaBianca 275
GREAT AND LITTLE TRADITIONS: A FRAMEWORK FOR STUDYING CULTURAL INTERACTION THROUGH THE AGES IN JORDAN

Moh`d Salhieh and Mahmmoud Al-Jbarat 291
LAND USES AND THEIR EFFECT ON THE DEMOGRAPHY OF REGION: A STUDY OF THREE DIFFERENT AREAS IN THE SOUTH OF JORDAN; ASH-SHAWBAK, UTHRUH AND BIR ABU DANNA

Robert Wenning 299
THE SOCIAL-CULTURAL IMPACT OF TRADE RELATIONS: THE CASE OF THE NABATAEANS

Gabriella Di Rocco 307
JULIAN OF ASCALON'S TREATISE AND ITS IMPLICATIONS FOR RESEARCH AND CONSERVATION OF JORDAN'S ARCHAEOLOGICAL HERITAGE

Ueli Bellwald 315
THE HYDRAULIC INFRASTRUCTURE OF PETRA: A MODEL FOR WATER STRATEGIES IN ARID LAND

Ignacio Arce 325
QASR AL-HALLABAT: CONTINUITY AND CHANGE FROM THE ROMAN-BYZANTINE TO THE UMAYYAD PERIOD

Robert Schick 345
AL-HUMAYMA AND THE ABBASID FAMILY

P. M. Michèle Daviau and Christopher M. Foley 357
NABATAEAN WATER MANAGEMENT SYSTEMS IN THE WADI ATH-THAMAD

Fawzi Zayadine 367
THE DAMASCUS-ROADS IN THE MEDIEVAL PERIODS

Zbigniew T. Fiema 379
OBSERVATIONS ON THE BYZANTINE CHURCH AT JABAL HARUN NEAR PETRA, JORDAN

Zeidan A. Kafafi 389
LATE BRONZE AGE SETTLEMENT PATTERNS NORTH OF THE AZ-ZARQA' RIVER

Matthias Grawehr 397
PRODUCTION OF BRONZE WORKS IN THE NABATAEAN KINGDOM

Kay Prag 405
WATER STRATEGIES IN THE IKTANU REGION OF JORDAN

Philip J. Wilke 413
HOUSING AND TRANSPORT AT THE ORIGINS OF NOMADIC PASTORALISM

Romel Ghrayyib and Maria Elena Ronza 423
ARCHAEOLOGICAL EVIDENCE OF WATER DISTRIBUTION AND QUARRYING ACTIVITY AT QASR AL-HALLABAT

Martha Sharp Joukowsky and Christian F. Cloke 431
THE PETRA GREAT TEMPLE'S WATER STRATEGY

David F. Graf 439
TWO-HUMPED CAMEL DRACHMS: TRAJANIC PROPAGANDA OR REALITY?

Peder Mortensen and Ingolf Thuesen 451
INVESTIGATING "CONDER'S CIRCLE" AT 'AYN JADIDA, NEAR MOUNT NEBO

Jaimie L. Lovell 457
THE WADI AR-RAYYAN ARCHAEOLOGICAL PROJECT (WRAP): INVESTIGATING THE CHALCOLITHIC – EARLY BRONZE AGE TRANSITION

Bill Finlayson 467
SEDENTISM AND THE VILLAGE: SOCIAL MOTIVATIONS FOR THE BEGINNING OF FARMING

Burton MacDonald 475
WATER STRATEGIES IN THE SOUTHERN GHAWRS AND NORTHEAST 'ARABA

Fawzi Abudanh 485
THE WATER SUPPLY SYSTEMS IN THE REGION OF UDHRUH

Dieter Vieweger 497
THE 'GADARA REGION PROJECT' ARCHAEOLOGICAL AND ARCHAEOMETRIC INVESTIGATIONS

Giuseppe Claudio Infranca and Maysoun AL-Khouri 503
WADI AL-USAYKHIM: STRATEGIES OF USE AND VALORISATION OF THE DESERTIC LAND OF AL-BADIYA THROUGH THE ARCHAEOLOGICAL HERITAGE

System of Transliteration from Arabic

Consonents

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

Long Vowels		*Short Vowels*	
ا، ى	ā	َ	a
و	ū	ُ	u
ي	ī	ِ	i

Common Nouns

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

THE INTERNATIONAL CONFERENCE ON THE HISTORY AND ARCHAEOLOY OF JORDAN

Conference	*Theme*	*Venue*	*Dates*
I	The Hisory and Archaeology of Jordan from the Earliest Prehistoric Times to the End of the Ottoman Period	University of Oxford / Oxford - UK	25-31 March 1980
II	Jordanian Environment: Geographical and Historical	Department of Antiquities - ‘Amra Hotel / ‘Amman - Jordan	4-16 April 1983
III	Trade, Communications and International Relations throughout the Ages	University of Tübingen / Tübingen - 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 Technology / 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, Cutlure 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/U.S.A	23-28 May 2007

Bism Illah Al Rahman Al Rahim

Excellencies, Ladies and Gentlemen,
Dear friends of Jordan,

The Last three conferences in the series of triennial international conferences on the History and Archaeology of Jordan were held aboard, the sixth in Torino in June 1995, The seventh in Copenhagen in June 1998, and the eighth in Sydney in May 2001. Now that the conference has returned to Jordan, it is a distinct pleasure to extend a warm welcome to you all - those who participated in the previous conferences, as well as those who are joining us for the first time. The return of previous participants in our Triennial conferences assures continuity of what they must feel to be a worthwhile endeavour, while the presence of scholars participating with us for the first time provides new insight. We thank you all for your interest and valuable contribution. For me, it is a singular pleasure to be here to meet old friends, and hope to make new ones.

The series of triennial International Conferences on the Archaeology and History of Jordan, initiated by HRH Prince El-Hassan, has become an excellent vehicle for fostering cultural exchange and a venue for sharing knowledge and insights with as wide an audience as possible. It is apparent from the publications of the proccedings of previous conferences that since that first conference, which was held at Oxford University in March 1980, the archaeology of Jordan has experienced significant change in its methods of retrieving data and in its theoretical underpinnings. And this, in no small measure, is due to the efforts of archaeologist working in the country.

The idea behind the initiation of these conference was to take pause from the turrnoil of events in the world, and recognize the achievements of the past and their relevance to the present. It has been hoped that conferences such as this will act as springboards not only for the academic cross-fertilization, but also for the furtherance of dialogue between world cultures. Of course non of us can change history, especially the history of the cataclysmic wars that raged and unfortunately still raging, throughout the Middle East region, as East and West faced each other; but I believe we can absorb the lessons of the past to reinvigorate the present for the betterment of all. We have recognized that for too long, our region has been bogged down in a tragic effort to live in mono-

ɔgue rather than dialogue; hence was the importance of promoting inter-cul-ɹral dialogue as an essential component of the new required agenda.
'hroughout history, Jordan has been a crossing – point upon which various urrents have converged, and a vibrant center where races, religions and lan-uage blended and interacted to create a well – balanced life characterized y a cosmopoliotan outlook. This outlook is best reflected in the verses of Ieleager of Gedara – present Umm Qays – (flourished ca. 90 B.C.) when he ays:
' you are Syrian, Salaam!
' you are phoenician, Naidius!
' Greek, khairel All say the same.

ɩt the same time when Meleager wrote these verses, the Nabataeans were ying to assimilate the experiences of neighboring civilizations in an en-ghtened manner and to offer their own contribution to the culture of man. 'hose gifted people, in whose capital this conference is being convenced, ıaintained their land reclamation endeavours in close conjunction with their ading activities, which required peace and stability. Bow as them, stability ; essential for developing agriculture and promoting trade.

think Petra is a very appropriate venue for your conference this week and ery much hope that you'll have many fruitful discussions, and that you'll njoy your stay in Petra "the rose red city half as old as time".

ı conclusion, I would like to extend my heartfelt thanks to all those who ave prepared this conference and to the scholars whose contribution will ırther its success.

'hank you

Your Royal Highness, Princess Sumaya Bint Al-Hassan,
Your Excellencies,
Respected Scholars,
Ladies and Gentlemen,

I would initially like to welcome you warmly to Jordan and thank you for accepting the invitation to attend the opening ceremony of this extraordinary scientific gathering " the 9th International Conference on the History and Archaeology of Jordan on the campus of Al-Hussein Bin Talal University. I take this opportunity to mention that the establishment of this University was initiated by the Hashemites with a clear vision for this university to be a fountain of scientific knowledge and learning in Ma'an, a city that is dear to us all. Ma'an embraced the Great Arab Revolt, which led to freedom and independence under the reign of King Abdullah I, may God rest him in peace.

Please allow me to warmly welcome the scholars and archaeologists who have endured the hardship and troubles of travel and accepted the invitation to meet in our beloved country. These scholars and archaeologists have committed themselves to thoroughly studying and researching the history of this country. The results of their studies and researches will greatly benefit a huge number of interested people in this field, and discussing themes and subjects of paramount importance, which will show us many aspects of Jordan's culture, history and Jordan's effective role in the cultural interactions.

Esteemed scholars and archaeologists,
I am totally convinced that you will discuss the themes and subjects of the conference seriously and thoroughly. I am saying this because you know that this country was a home of cultures which flourished many thousand years ago. Many neighboring cultures interacted on the soil of Jordan, which has been proved beyond doubt by the numerous archaeological discoveries and finds in 'Ayn Ghazal, Pella and Dayr 'Alla , which were in continuous contacts and relations with the ancient cultures of Egypt, Mesopotamia and Anatolia. In addition, the archaeological excavations at the Citadel in the heart of Amman have revealed the culture of the Ammonites who excelled in sculpture, painted pottery production, construction of towers and writing in Aramaic script. They were influenced by neighboring cultures, such as the Aramaic culture in Syria, the Assyrian culture in Mesopotamia. The Ammonites were also influenced by the Edomites and Moabites who established cultures that

layed an instrumental role in shaping the history of the Levant and the area ı the northern Arabian peninsula.

he Arab Nabateans settled in this area of our country in the sixth century BC. hey established a culture extending from Arabian peninsula to Naqab desert, inai and Huaran plains. The spreading of the Arab script was attributed to ıem from which the Arab scrip developed later. They dominated the world ade between the East and West in a period when their state flourished. In the ext few days you are going to meet in their capital, Petra, a unique architec-ıral achievement, which has contributed considerably to our understanding nowledge of the history and civilization of a nation that had a central role in istory of mankind.

ı the light of the above, it is imperative that the Ninth International Confer-ıce on the History and Archaeology of Jordan be held in Jordan so that the cholars and archaeologists from around the world can discuss review the searches and theories that reveal the roots of Jordan's culture and its trade lations with neighboring cultures to enable us to have a vision for future enerations, to form our cultural identity and to realize the vision of His Maj-sty King Abdullah II in raising a generation being conscious of its history ıd cultural heritage and able to proceed with the ongoing building process f our beloved country.

ı conclusion, I would very much like to express my thanks and gratitude to ıe Department of Antiquities of Jordan and Al-Hussein Bin Talal University ır organizing this conference.

Your Royal Highness Princess Sumaya Bint El-Hassan, here on behalf of His Majesty King Abdullah II
Your Excellencies,

Dear Colleagues,
We, as scholars and researchers, are meeting today under the Royal Patronage, with which His Majesty King Abdullah II has honoured us. We also feel honoured to have here Her Royal Highness Princess Sumaya Bint El-Hassan representing His Majesty the King. She is an excellent archaeologist, who has never failed to support both archaeology and archaeologists and to actively participate in their field projects, activities and conferences. Our sincere thanks and gratitude to His Majesty and Her Royal Highness.

Your Royal Highness,
Dear Colleagues,
1 am very pleased that this conference is held on the campus of this university, which bears the name of His Majesty the late King Hussein Bin Talal. The Hashemites have always had a vision for this university to be a source of science, knowledge and a symbol of freedom of speech here in Ma'an. Ma'an is dear to us all because of its glorious history during the Great Arab Revolt. This city with its kind and generous residents witnessed and experienced the historical meetings of His Majesty King Abdullah I Bin Al-Hussein with the brave sons of this nation, who were determined to gain independence that the Jordanian people have been enjoying ever since.
We, as Jordanians, highly treasure the anniversary of independence and the efforts and endeavours of the Hashemites in having regained our freedom. Also, as archaeologists, we are proud that the first International Conference on the History and Archaeology of Jordan was held at the initiative of His Royal Highness Prince El-Hassan Bin Talal at Oxford University nearly twenty-five years ago. He is also the initiator of the International Conference on the History of Bilad ash-Sham as well as the International conference on the History and Archaeology of Jordan. We highly value the unfailing support to archaeologists by His Royal Highness, to whom I am pleased to express our deep respect and gratitude.
I would like to take this opportunity to warmly thank the esteemed scholars and archaeologists for their tireless efforts and considerable contributions to the excavation, study and preservation of the archaeology of Jordan. They have endured the hardship and difficulties of travelling to Jordan to make

this conference successful and to continue the tradition of organizing it. My thanks and gratitude are due to Al-Hussein Bin Talal University, its President Prof, Dr. Adel Tweissi and its staff members for their enormous efforts and invaluable contributions. I wish to thank Her Excellency Dr. Alia Bouran for her continuous support to archaeology and archaeologists. I would like to conclude by thanking all staff members of the Department of Antiquities of Jordan who have been diligently working on preparing for this conference.

Your Royal Highness Princess Sumaya Bint Al-Hassan, Representative of His Majesty King Abdullah II, Patron of the Conference
Your Excellencies Distinguished Guests
Ladies and Gentlemen

May Peace and God's Mercy be upon You
I seize this opportunity to welcome you at Al-Hussein Bin Talal University and have the honour to host you in this academic forum in Ma'an and Petra, the dearest parts of our beloved country. It is in these two memorable regions that culture and history first originated. I welcome you all to this University which proudly bears the immortal name of the maker of the modern Jordan.

Your Royal Highness, Representative of His Majesty - Distinguished Guests
This conference, patronized by His Majesty King Abdullah II, confirms the extent of how deep and responsive is the philosophy of the contemporary state of Jordan in coping with the latest developments in all walks of life. It is the philosophy of adhering to Jordan's heritage and defending the values and history of human culture, which Jordan emhodies as one of the brightest images. This is in addition to clinging to all possible means towards modernizing the state and society, enhancing the values of achievements as well as bridging up the present with the past.

This conference has been the fruit of a constructive cooperation between the Directorate of Archaeology and Al-Hussein Bin Talal University, stemming from the persistent endeavours to adopt and support all cultural and academic activities that promote building human intellectual potentialies, thus contributing in reactivating the national revival project. No wonder, then, that the 9th International Conference on Jordan's History and Archaeology has been held on its native land since it first started in Oxford 1980. Over two and a half decades, the conference has been held in various cities and continents, conveying Jordan's cultural message and humanitarian heritage. Such a message which summarizes the history of culture on the Jordanian soil with all the depth, continuity, and richness in diversity and unity.

Your Royal Highness, Representative of His Majesty - Ladies and Gentlemen
Al-Hussein Bin Talal University is witnessing a considerable turning point in

its history, where preparations are painstakingly under way to move into the-new permanent campus. With the beginning of the new academic year (2004-2005) four new colleges will see light and be added to the existing three colleges. The number of majors will also rise from 14 to 41. Consequently, the University will witness a substantial increase in the numbers of both students and teaching staffmembers.

Compared to other Jordanian universities, AHU will be the pioneering university in opening new majors such as Mining Engineering, Environmental Engineering, Marine Sciences, Tourism, and Hotel and Resorts Management. In so doing, the University will take a remarkable step in realizing its slogan represented in "Seeking Excellence". It is this orientation that the University has adopted and has reapt the fruits of this policy which can be seen in the academic expertise, scientific research philosophy, the relation between the University and the local community, and the University's direct contribution in promoting the surrounding environment.

In this context AHU has taken into account the establishment of a specialized college of Archaeology, Tourism and Hotel Management whose permanent campus (near Petra) will be completed by the end of this year. For the first time in Jordan, this college will provide an opportunity to teach archaeology in an ancient and archaeological environment that paves the way before students and researchers to theoretical and practical training and direct application of knowledge. The University has also established the first center specialised in archaeological research, namely "Nabatean Center for Archaeological Studies" which will provide appropriate scientific environment for Archaeological excavations, reconstruction and maintenance, practical and theoretical research studies, a library exclusively devoted to Nabatean and Jordan's antiquities, and scientific labs equipped with the latest techniques in Archaeology. We hope this center will establish durable relations with the academicians in the fields of history, archaeology, and the relevant sciences.

Realizing the great role the University plays in consolidating the roots of national adherence and enlighting the new generations with the achievements of the founders of Jordan, AHU (in cooperation with the respective Royal Committee) currently endeavours at restoring King Abdullah I Palace and turning it into a number of museums that tell the story of the evolution of the Jordanian state.

Your Royal Highness
Distinguished Guests

Jordan, being described as the cradle of heritage, Archaeology, and cultures, due to the various epochs, cultures and human achievements it has witnessed over thousands of years, is, today, a crucible for cultural interaction, cultural continuity and stability geared by the sagacious Hashemite leadership. This has made Jordan a unique model of stability in a region fraught with events, instability, wars and turrnoils.

This conference, being held on the Jordanian soil and devoted to touch upon the cultural interaction, is but another manifestation of Jordan's strife in bringing about means of knowledge, human continuity, and consolidating the roots of cross-cultural dialogue.

Your Royal Highness, Representative of His Majesty,
Distinguished Guests
I reiterate my welcome to you at this University and wish the conference all success.

May Allah bless you all and May Allah bless Jordan under the leadership of His Majesty King Abdullah II.

Your Royal Highness
Your Excellencies
Distinguished guests
Colleagues and friends

It is, without doubt, a very great honour to have been asked to present the opening keynote address at this, the Ninth International Conference on the History and Archaeology of Jordan. First and foremost, I would most like to thank our generous hosts:

1. The conference's patron, HM King Abdullah the Second,
2. The Jordanian Department of Antiquities under the very able leadership of Dr. Fawwaz al-Khraysheh,
3. And last – but not least – the President and staff of al-Hussein University, where we are today.

Thank you, everyone, on behalf of all the delegates present at this fine gathering. Moreover, how delightful, also, that this, the ninth conference, is back in Jordan, the country whose people have given great encouragement and shown such friendliness to the many international teams working here. 'Giving' is a Jordanian virtue and we as recipients are always grateful. To everyone, many thanks.

We are indeed fortunate to be splendidly accommodated in nearby Wadi Musa, itself just a short distance away from Jordan's gem of a heritage site, Petra. Everyday while we are here, and I suspect long after, Petra will loom as a forceful reminder of Jordan's significant and ancient contribution to the development of cultures in the region, and the dynamic multi-directional interchange that has occurred between these cultures over many historical periods. The location for this conference on cultural interaction was an inspired choice. Petra is but one clear example of our theme, and I will proffer a few others that come to mind in a minute or two.

Firstly, however, I would like to consider some of the more general concepts that might arise during our deliberations over the next few days. These are not just relevant to the past, to us as historians and archaeologists, but also have immediacy and a bearing on this modern age – an age all too frequently characterised in the West by a negative image couched in terms of a "Clash of Cultures".

Few will doubt these are troubled times, but how are they to be observed and defined? The very act of categorisation will determine responses: misunderstand the symptoms, then the responses will be wrong, and the situation compounded – that is, made worse, much worse. We see that, regrettably, every day on our televisions.

Can history help us to understand such misguided intellectual processes? In archaeology and history, the progression of arguments is no different. Start with the wrong assumptions, then the subsequent research designs will be poorly formulated and misdirected. The research conclusions will, accordingly, be very suspect. Keeping in mind this cautionary comment, we can now begin on the return path to the subject of our conference.

Much Western scholarship, when dealing with non-European societies past and present, has been couched in terms of opposites. Let me emphasize a few of these relevant to our deliberations. By which I mean the opposites of:
- East verses West,
- Islam verses Christianity,
- Paganism and Judaism,
- The Desert and the Sown,
- The ordered Classical city in contrast to the chaotic Oriental city.

Yet, how valid are these concepts? More centrally, how useful are they to scholarship? Are they simply European mental constructs born out of 19th century colonial experiences, void of historical relevance? The late Edward Said in his seminal book *Orientalism* challenged these very approaches and, while perhaps not a perfect book, brought such concepts into serious question. He highlighted the error of seeing things in simple contrasting terms of black and white, and the ultimately destructive outcome of assuming a 'them' and 'us' mentality, unfortunately still so apparent today.

East verses West, barbarity against civilization – behind this approach is a philosophy that the forging of a cultural identity (and, in today's terms, a national identity) is achieved through conflict and can only be understood from that perspective. I would suggest that this erroneous approach reveals an intellectual confusion that obscures – not illuminates – history.

We can, gathered here in Jordan, celebrate over eight decades of Jordanian archaeology, but what have we learnt, and what is its contemporary relevance? Are there important questions and outcomes that not only inform us of Jordan's past, but are also directly relevant for its present and future? I am sure there are, and some of these questions are to be considered in our meetings over the next five days. I would like to take this opportunity to mention a few of these as we start.

The conference's main theme clearly sets out what should be our principal objective: cultural interaction. Not conflict, note, but interaction. This need not deny the presence of conflict, instances of which history is sadly littered. However, conflict is but one part – albeit a destructive part – of the history of social exchange, and while individually dramatic is not, in itself, culturally productive. So, how can we identify and comprehend cultural interaction?

There are many factors to be considered in this meeting: geographical, environmental, political, ethno-tribal, settlement, resources and economic. Individually and collectively each had – and still has – a profound impact on the ways cultural interaction took place and their social impact in pre-modern times. Let us look at how some of these issues are to be approached in this meeting in a little more detail.

The land – its topography and exploitable resources – was, clearly, always going to be a major influencing factor in the cultural evolution of Jordan. Eroding from the geological formations of the Jordan valley, human development stretching back over half a million years can be observed as worked hand axes in the landforms. There also in the Jordan valley, major cultural strides in human history, based on the cultivation of plants and animals, were initiated in the Natufian period.

From these tentative beginnings emerged an agricultural Neolithic society, as the session on Farming in Jordan: origins, adaptation and development will investigate. And not just as an economic issue, for the papers also address the cultural implications of farming, from the beginnings to Nabataean and Roman times.

Strategies by which Jordan's varied resources were exploited in the past were also dependent on the land, and likewise were to influence social relations over the different parts of the country. From the Bronze Age to the Islamic Middle Ages, human interaction with the land – economically, socially and demographically – had significant cultural implications, as the session on settlement patterns and exploitation strategies will explore.

The interaction between a society and the natural features of the world in which it was placed was a two-way street. One only need to remember the devastating environmental impact of Roman-period mining in wadi Finan – the dangerously high lead levels of which are still with us today – to be reminded of this. The application of water strategies in a water arid land were both cultural in their devising while affecting the societies that devised them.

For an Australian, with two children living on the world's driest continent, such issues are imperative. As a recent report concludes, the rivers supplying Sydney's water are in serious decline and may collapse unless people dramatically change their excessive ways. Sydney now uses 34 gigalitres a year more from dams than is safe and the report warns that this could blow out to 89 gigalitres by 2011 unless action is taken. It's not much better elsewhere in Australia: the respected environmental scientist Tim Flannery predicts Perth in West Australia is likely to become a "ghost metropolis" of the 21st century as rainfall decreases and consumption increases. The city already seems to be beyond economically sustainable levels, with no solution.

The question is: did such dilemmas face ancient cultures as well? Also, how did they respond to changes to their environment, caused by natural and human agencies? How do we, as archaeologists, recognise and measure this? I am not an environmental catastrophist, but the interaction and reaction between cultures and their environment can not be ignored in the archaeological record.

DR. ALAN WALMSLEY

We now turn to other influences on cultural interaction. The transit of peoples through the human corridors of Jordan and the ways they travelled in all periods of history had a profound impact on the social development of the country. The *badiyah* as a corridor – not a barrier – opened Jordan to significant influences to the north, east and south often overlooked in a Mediterranean-oriented Western scholarship tradition. On the other side of the country, the wadi Arabah rift may pose a challenge for modern road builders, but how relevant was a two-laned highway to the pre-modern traveller? Little, one imagines.

Thankfully, a number of important papers in this conference look beyond such narrow perspectives, reaching deep into neighbouring territories in a consideration of long distance trade freed of modern political boundaries and the socio-cultural impact of these commercial relations. What were the social benefits of such relations beyond the commercial; that is, where did the dangers lie? Like all modern relations, there must have been both, but how did societies decide which were which – that is, which were beneficial, and which posed dangers?

One can only speculate on the process of social formation at a port like Aqabah between Roman and Islamic times. Like modern Aqabah, its cultural reach would have been enormous given the extent of its interregional trade. How did the port town assimilate these diverse cultural influences, or were there parallel ways of life and a plurality of social institutions in one town? Probably, and this is perhaps the way we should be looking at all past cultures.

In all these considerations, how things moved (by which I mean people, objects and ideas) was just as important. In the arid zones, the camel must loom large, and undoubtedly its use as a pack animal – in addition to its other values – opened up the transport of people and ideas throughout Arabia. Here lay the real revolution of camel travel, ultimately transmitting culture and ideas between China and its companion empires in the West across the bleak deserts of Central Asia. Commerce, exchange and the demands of elites drove the connections; the camel and its framed pack saddle provided the means. No wonder the camel attained an almost icon-like status.

Economic production within sites and regions also interacted with extant cultural structures. Commercial specialization in a few agricultural and/or manufactured products may have provided an economic edge for particular communities: the Nabataeans, Jarash in different periods, or Early Bronze al-Lajjun. The social and political impact of such 'entrepreneurial' activities (if that is the right world) is difficult to fathom, but Jarash would suggest it was both fabulously successful yet could also be catastrophic for both elites and the masses if things went wrong.

The role of governing elites in promoting – intentionally or otherwise – cultural interaction through monitoring production and by installing the institution of gift exchange has been a decisive factor in the development of complex societies. In many historical periods, ritual has provided a formalised social framework for human interaction, allowing extensive exchange between, at times, quite different and even opposing groups. For in its formulation, ritualized social exchanged produced a controlled and culturally non-threatening environment, and allowed relations between otherwise potentially hostile entities. Hence the socially unifying role of religious pilgrimage and the annual markets at religious sites in pre-Islamic Arabia, and the ground such activities laid in the formation of the Islamic state.

'Networking in the Neolithic', Chalcolithic exchange, urban entities in the Bronze Age, and the role of Hallabat – in such network nodules at different historical periods the function was the same: the use of central places for forming and binding social structures within a community through ritual behaviour born out of a mixture of politics and economics. The bonding of Jordan's social matrix in the past relied upon proactive elites, grounded in an effective and successful economic model.

There are many ways that a conference dedicated to investigating cultural interaction at different times in Jordan's pre-modern history has contemporary relevance, as I have already mentioned. But in the area of cultural resource management, the connection is clearly apparent and unquestionably important. Here we are dealing with the everyday interface between archaeology, history and the public, both local and visiting.

Sites and museums are being transformed by modern demands, which at times are conflicting in there requirements. I must confess the refurbished British Museum in London appears to me more a café and book shop than a repository for antiquities and the dissemination of information, but maybe I am simply getting old. Unlike that other European obsession, zoos (which have successfully reinvented themselves), museums still seem to be seeking contemporary relevance, which is admittedly somewhat difficult considering the speed of modern change.

Here in this conference, the workshop on new museums in Jordan is eagerly welcomed. It is something that we as archaeologists working in Jordan should and would wish to contribute to, if our input could be useful. Museum studies and Cultural Resource management issues need to become increasingly incorporated into the teaching program of archaeological degrees. Not that we would all become experts in the field (a singularly frightful thought), but to increase awareness of the subjects.

We can not avoid the fact that the archaeological heritage has become an important contributor to modern state building, for all peoples are interested in their country's past. Yet they also need to see contemporary relevance. As archaeologists and historians, we need to acknowledge a responsibility here that assists in the honest portrayal of past cultures in their many facets, but in a modern way.

Our central theme, to which I need to return to conclude, is cultural interaction through the ages. From the art produced – which represent people's own cultural portrayals of themselves – to how Jordan was seen by outside travellers, there are many ways of observing cultural interaction. Even in economic and commercial activities, communities exposed a cultural attitude that can be identified and defined by modern scholarship.

The impact of contact in different times evoked different responses, usually benign by the adoption of regulating social customs to control contact, but sometimes forceful or even violent; these are the events that history often remembers, but cultural change was more driven by the willing acceptance of new ideas, not those enforced upon the reluctant. Our papers will consider many interesting examples: the deliberately Persianising architecture of late Umayyad Amman citadel, Hisban, Madaba, of course Petra, the Decapolis cities, the tribal epigraphy of the *badiyah*, and so on.

May I make one final point? A conference like this to an outside observer might appear as little more than a confused series of disjointed bits of rapidly presented information. Yet the bits can, and do, become a whole: in museums, displays at the sites and in publications, such as Russell Adam's projected book *Jordan, an archaeological reader,* an offshoot of the successful *Archaeology of Jordan* volume. The challenge is to disseminate the information; but this is the role of educators, for the material is already there.

The value of a meeting such as this is incalculable. Many here will go away and incorporate what they have learnt in their teaching and bring it to their publications. A conference like this is also a good venue for 'brainstorming', when new research questions are defined and put into action. In my experience, each conference produces a 'quantum leap' in knowledge and understanding, in which the material evidence is assessed increasingly unburdened from past misconceptions.

Your Royal Highness, Your Excellencies.
Academic endeavour relies upon – and has always relied upon –institutional support for its existence and advancement. Many current governments in the Western World have much to learn from Jordan's commitment to education and learning, especially in the fields of history and archaeology. I am not the one to tell you that the value of learning is deeply embedded in Islamic culture. By contrast, Western support for learning until modern times was, it can be argued, the result of a fearful dread of another European "Dark Age". Today, what we really have to fear is the arrogant belief of Western society and its political leaders that such a Dark Age will not return. History, at least, should tell otherwise.

Your Royal Highness, Your Excellencies, Distinguished Guests and Colleagues.

Long may this conference series continue! It has relevance and importance. We thank you, once again, for your dedicated support and your trust in our work, which we are pleased to offer in Jordan over the next five days.

Thank you.

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Gerasa as Provider for Roman Frontier Stations: A View Seen from Late Roman Potters' Waste at the Hippodrome and the Upper Zeus Temple

Introduction

While the current rebuilding of the Jarash Hippodrome is designed to host mock gladiatorial shows and chariot races, the original second century structure of Gerasa is better known to scholars from early explorations of Gerasa (Müller 1938) but mostly through Antoni Ostrasz' excavations of 1984-1996, his architectural restorations and publications on the circus (Ostrasz1989, 1991, 1993, 1995, 1997 and fc). The monument is equally well known among researchers for its secondary and long history of occupancy by potters' and other workshops and for its ceramics. The study of thesse has occupied the writer over the last two decades (e.g. Kehrberg 1989, 1992, 1994, 2001b and fc). This is not because of any exceptionally splendid pottery and lamps made there but largely due to their sheer abundance as a result of 400 years of uninterrupted pottery manufacture on a scale not known from other Jordanian Decapolis cities in the Roman and Byzantine periods. Generations of hippodrome potters and their families lived at the site and were engaged in ceramic manufacture at a magnitude comparable to workshops in the western Roman provinces and the pottery factories associated with the Roman military establishments.

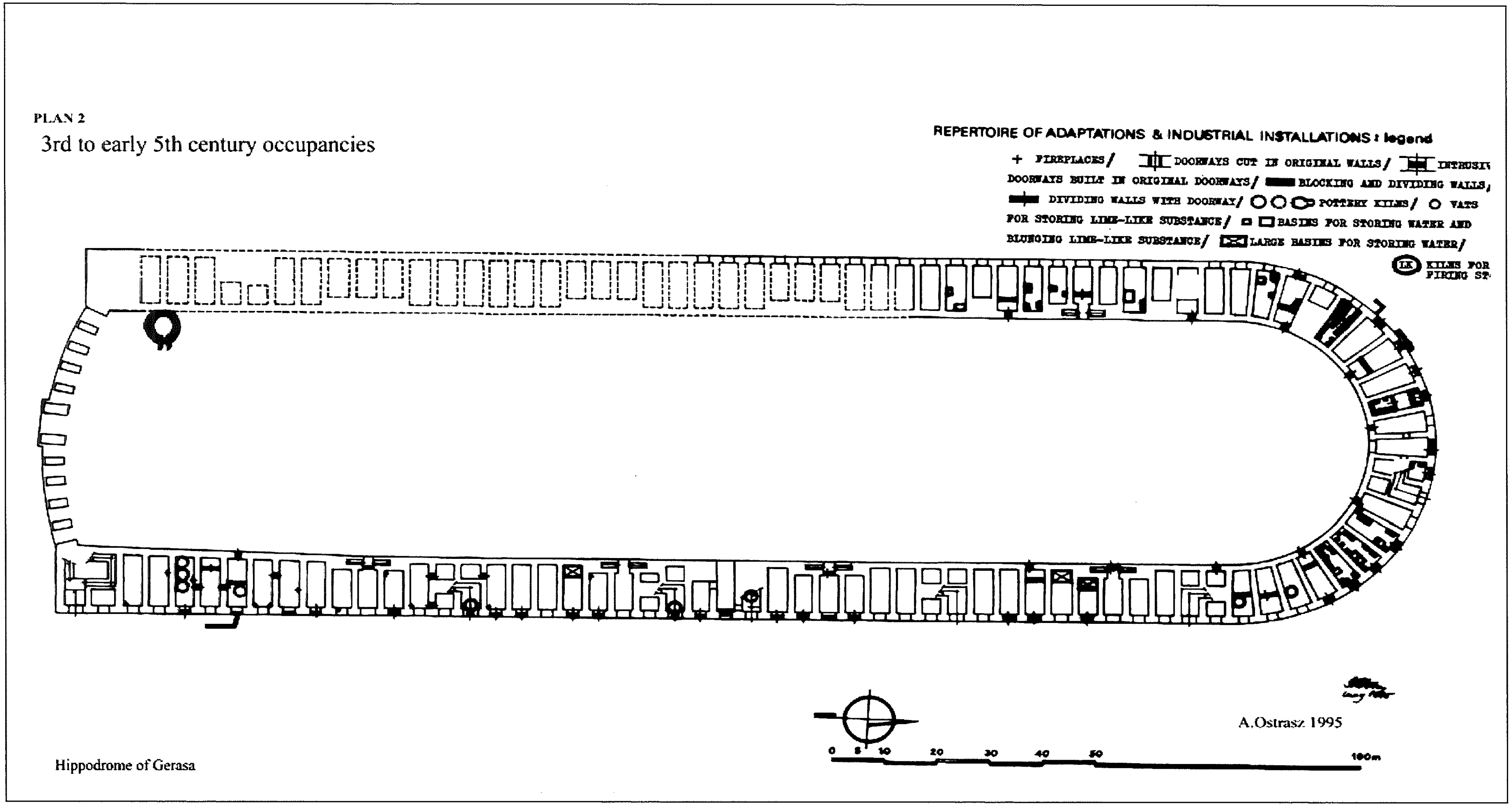
The pottery and mould-made lamps in Figures 2 – 10 come from a Late Roman pottery kiln dump in the Hippodrome chamber E2 excavated in 1990 (HCh90.E2.2) (FIG. 1), and from another similar dump excavated in 1998 at the Upper Zeus Temple/ North Temenos (JTZ98). The examples have been selected from their assemblages for their relevance to this paper, rather than their typological range or representative scale within each context.

A delay in publishing the whole Hippodrome corpus[1], coupled with subsequent work on other monuments of Jarash, has provided a rare opportunity to explore new materials and ideas in depth. The culmination of time and opportunity enabled the writer to review accepted norms of classification methods applied to ceramic studies of classical periods and their [lack of] historical applications. This paper presents one of these enquiries, not a conclusive result, its main aim is to encourage new approaches in historical research for Jarash by exploring other possible interpretations of pottery, using examples from the Hippodrome and the Upper Zeus Temple excavations.

The Pottery and their Contexts

It was clear from the onset of excavation in chamber E2 of the Hippodrome that we were dealing with a very large and comprehensive deposit of discarded misfired Late Roman pottery. This dump was waste from a pottery workshop, not a secondary residual accumulation, and made it possible to close gaps and expand the hitherto known typological range of third-forth century common ware pottery from Gerasa. It also emerged that some key forms that had been considered chronological "hallmarks" for the early Byzantine period now had to be revised (see below). This was mainly brought about by the overwhelming quantity and homogeneous quality

[1] My preparations for the publications of the ceramic study from the east cavea chamber 2 excavations and other hippodrome corpi were severely interrupted in the 1990s. It is fortunate, therefore, that I had already made available my work on the hippodrome corpus and catalogue studies to A.-M. Rasson-Seigne for her thesis on Roman pottery; she presented the material in a chapter on the Hippodrome in the manuscript of her thesis. The complete excavation report of chamber E2, the finds corpus, pottery catalogue and detailed discussion including associated finds will appear in volume 2 of the final Hippodrome publications, on which I am now working (Kehrberg fc). The computerisation of my drawings and figures for this paper I owe to Sophie Vatteoni.



1. Groundplan of the hippodrome in its second phase of use after chariot racing: top plans of late roman and early byzantine workshop installations in the caveaa (a.A. Ostrasz 1995).

of the pottery types in a primary and well-dated assemblage. The relationship between types in the assemblage, associated finds and the sealed context itself secured a reliable basis for methodological revision of classical typologies[2].

A cluster of over 30 Late Roman coins found in the last, or upper third, layer of the pottery dump in chamber E2 provided the basis for a chronological revision of types. One coin was only in circulation during the first decade of the forth century which gave a ceiling date for the end of the dumping of ceramic waste in chamber E2[3]. A scatter of other, including earlier Late Roman, coins found throughout the pottery dump put the first dumping of pottery waste within the later part of the third century; the excavated deposit was over 3m in height spreading over the whole width of the steps in vomitorium type B (see FIG.1:a) and had spilt through the doorway onto the dirt track outside the cavea[4]. The misfortune of a series of earthquakes, which destroyed the hippodrome in antiquity, proved to be our good fortune: 'Protective layers' of tumbled architectural blocks and seat stones sealed the contents inside the chambers of the cavea and protected them from contamination. Careful removal of the tumble for the study of the architecture gradually brought to light these as so many other undisturbed occupational sequences of the building (Kehrberg and Ostrasz 1997).

There is no room to adequately present the Late Roman and secondary history of the Hippodrome and its workshops described in preliminary accounts (see e.g. Ostrasz 1989, 1991; Kehrberg 1989, 2001b; Kehrberg and Ostrasz 1997), and the final publications of studies resulting from the 1996-2000 IF[A]PO project of the Upper Temple of Zeus Complex, cannot be anticipated here. However, the 1997-1998 excavations [summarised briefly by the director of the overall project, J.-P. Braun (Braun 1998), and their pottery finds studied by the writer] are relevant to the discussion in this paper[5]. In the present study, references will be made to a large, homogeneous Late Roman pottery dump deposited at the North Temenos of the upper temple which shares most types of the Late Roman repertoire with the assemblage from Hippodrome chamber E2: both deposits compose the ceramic corpus for an investigation of Gerasaean trade with Roman frontier stations in northern Jordan. As for absolute dates, a "lost purse" containing 155 coins sealed the deposit at the bottom level of the North Temenos fill and dated the pottery assemblage within to the late second and early third century (Augé 1998)[6].

Single elements of Late Roman pottery typologies are not the subject of this enquiry: they have already been discussed with other examples from the same two contexts in an earlier SHAJ paper (Kehrberg 2001a). But some points, which arose from the aforementioned examination are summarised here because of their relevance to dating or categorising forms based on comparisons with single types from different sites – frequently with no quantitative indication in the assemblage or reference to the whole deposit of the context:

Chronological problems in comparative studies of similar contexts can be created artificially 1) by employing rigid frameworks to homogenize typologies for dating and 2) by reapplying single forms (chronological type forms or prototypes) as chronological pointers for other deposits without considering their original context. One solution to this deceptive dating method lies in avoiding random attribution of single types from homogenized typologies for concise dating; the other lies in integrating object studies and their typologies with the whole deposit and correlating their research to the overall enquiry from the onset of the project.

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2 In the majority of classical typologies, one example of a pottery type - be it rim, base or handle - was perceived as representative of the total number and accorded its generic place in an assemblage by absence/presence. This was then perpetuated in comparative studies for other assemblages.

3 The corpus of the Hippodrome coins will be written up by C. Augé and J. Bowsher in volume 2 of the Hippodrome publications, see Kehrberg fc.

4 The original spill in front of E2 and like many deposits from other chambers had been bulldozed in the 1960s-70s to make a dirt road for townspeople and a heliport north in front of the hippodrome. This action destroyed other ancient features like a lime kiln complex and it is feared, workshops or associated structures whose traces have been exposed when extending access roads for public use.

5 The 1996-2000 excavations of the upper Zeus Temple complex, in which I took part as resident archaeologist and ceramicist, were part of the architectural studies for restoration undertaken by IF[A]PO and directed by J.-P. Braun. The ceramic waste deposits from the Upper Zeus Temple complex are not unlike hippodrome assemblages and have been part of my broader enquiries into chronological classifications versus productions - and more recently, trade with the Roman frontier outposts.

6 The coins of the Upper Zeus Temple excavations are studied and will be published by C. Augé. In his preliminary account, Augé noted that the latest coin dates to 206-209AD while the majority of the 155 are Decapolis coins of the Gerasa mint of the earlier part of the second century.

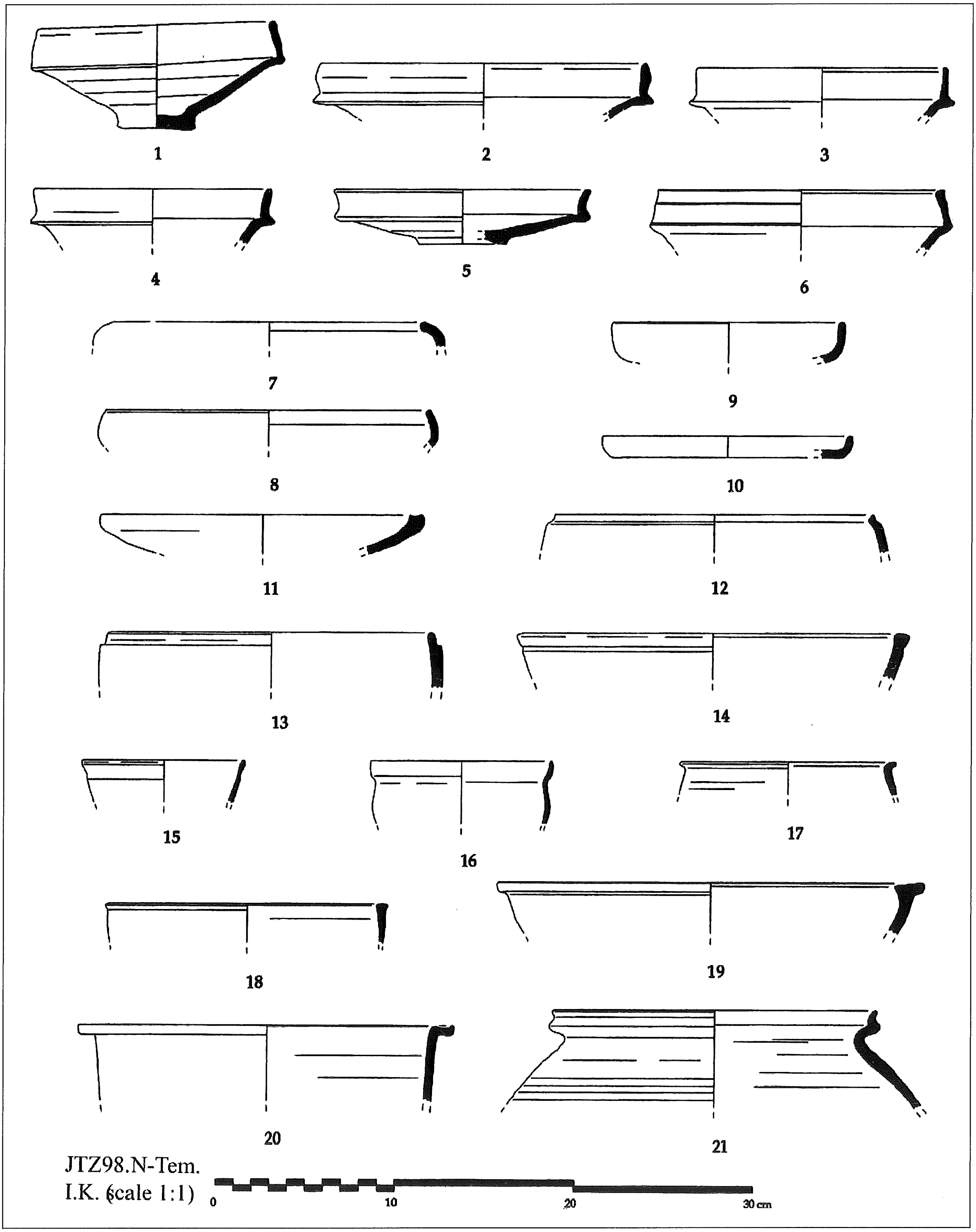
Figures 3, 5, 7, 9 and 10 representative pottery forms, which occurred in bulk at the Hippodrome and especially in chamber E2, where they are securely dated to within the later third and early forth century (see n.6). Figures 2, 4, 6 and 8 represent similar pottery forms dated by their context at the North Temenos of the Upper Zeus Temple to the later second and early third century (see n.6). The Late Roman common ware pottery and lamps illustrating all figures belong to the standard Gerasa 'red ware' of that cultural period, with either a thin slip or dip-wash fired or misfired from pinkish beige to red to grey (carinated cups, see below). Larger bowls usually come with a thicker and often slightly burnished slip and second applied dip-wash; the platters and pans shown here are examples of Gerasa's derivatives of Pompeian Red Ware. As may be expected, the juglets and bottles are of the same ware and fired, or misfired (as in our contexts), at various shades of red to beige-brown to grey and slurried with occasional dip-wash. The production mode and standard are the same for both contexts and forms.

The two kiln waste sites are only a few hundred metres apart, within sight of each other, and each deposit was of the same kind. In other words, we have very similar research criteria with regard to origin, context, quantity, matrix of forms, quality and ceiling dates of later third/early forth and later second/early third respectively. One may posit a working span of about 20 – 30 years per potter and the pottery workshops at the Hippodrome and near the upper Zeus Temple complex must have had at least one generation overlap or bridging generations, or knowledge of each others' productions.

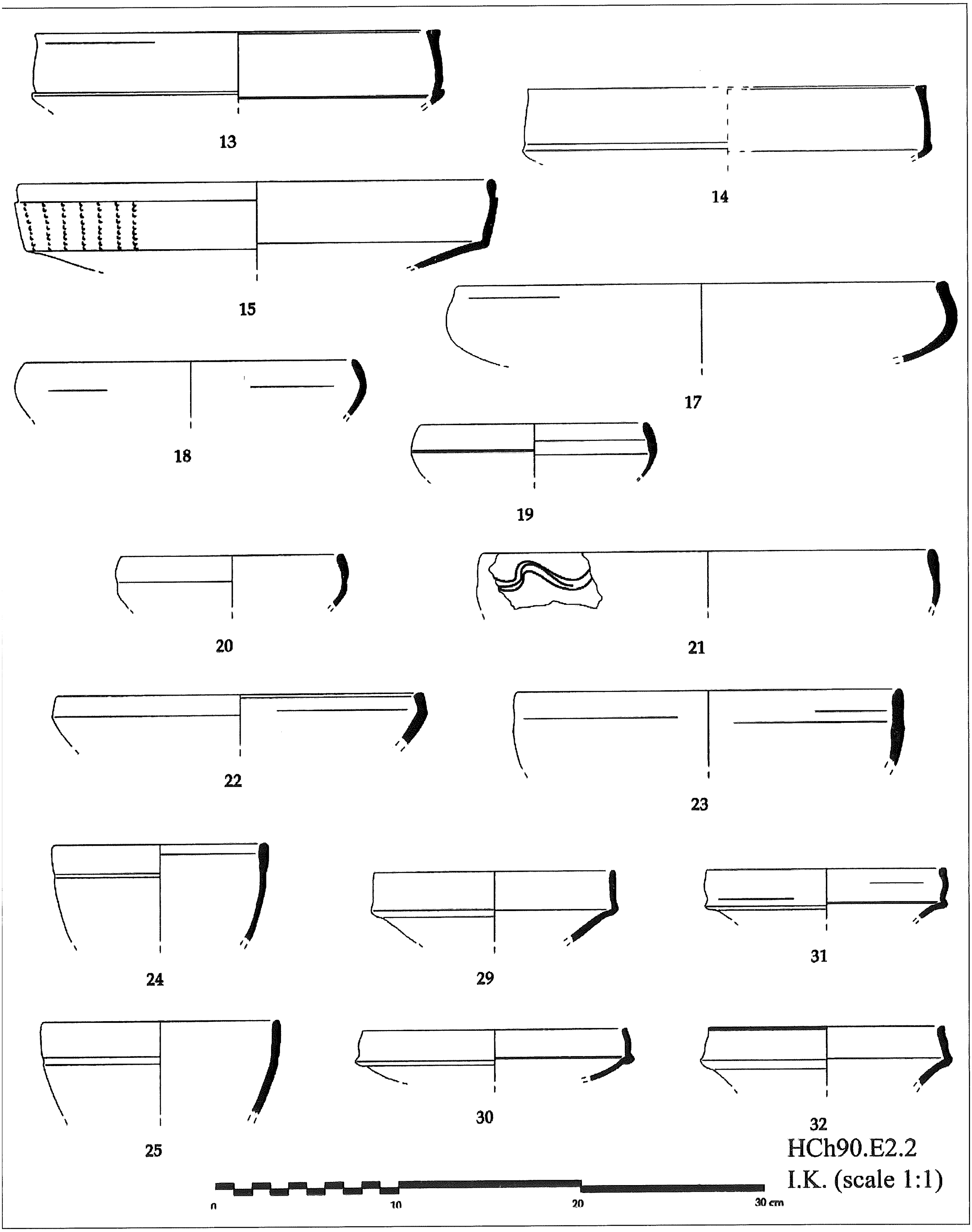
Late Roman forms made at Gerasa fitted the pottery repertoire of the romanised world at large, which explains a tendency towards generic yet rigid typologies but popularity curves of types current in Gerasa can be read more accurately as summarised in the following examples, remembering that they come from primary sources of production. If one takes the carinated cups (FIGS. 2:1-6; 3:13-15, 29-32; 4:48-52; 6:87-90; 7:33-35), their numerical position in the two assemblages differs significantly: their ratio to other forms is high at the North Temenos dump and low at the Hippodrome dump. The cups belong to a range of second century types originally inspired by imported *sigillata* and since then mass-produced at Gerasa with no pretence at exact copying of contemporary imports. Their use is known until the third century, after which the cups only occur in mixed deposits of later foundation fills and residual contexts at Jarash.

A larger carinated bowl, frequently with banded incised décor and a conical foot, accompanies the smaller cups (FIGS. 5:10; 6:91-95) in both contexts but their ratio is reversed: it is high to other forms at the Hippodrome and low to those at the North Temenos. In other words, whilst the small bowl or cup petered out during the early phases of the Hippodrome workshop, the large conical footed bowl was introduced at the time when the Upper Zeus Temple workshop began closing down, its peak of production having been during the latter half of the second century (and contemporary with the building of the upper temple) when it manufactured a large quantity of the cups[7]. The same applies to other dishes accompanying the cups and bowls, like the platters and pans (FIGS. 4:46, 55-57; 5:1-5; 10:54-61), in that some types number few at the Hippodrome chamber and are plenty at the North Temenos, while others are almost equal in number and yet others forms are rare or do not occur at all in either one or the other context. The key to correct placing of a pottery type in each context corresponds thus to the type's numerical position within the repertoire of the whole assemblage. If a deposit can provide such data, one may then be able to determine whether one or the other or groups of forms are at the beginning, at their floruit or at their petering out phase of popularity or production, which commonly overlaps. It would at least provide a relative date permitting better historical interpretation of the context. In our case study the statistical seriations and quantitative analyses actually correspond at the hippodrome to relative levels *in situ*, further supported historically by the hierarchy of coins in their separate deposits. These methods and findings are not new in pre- and protohistory but are as yet little applied in typologies of classical-periods artefacts for the purpose of dating

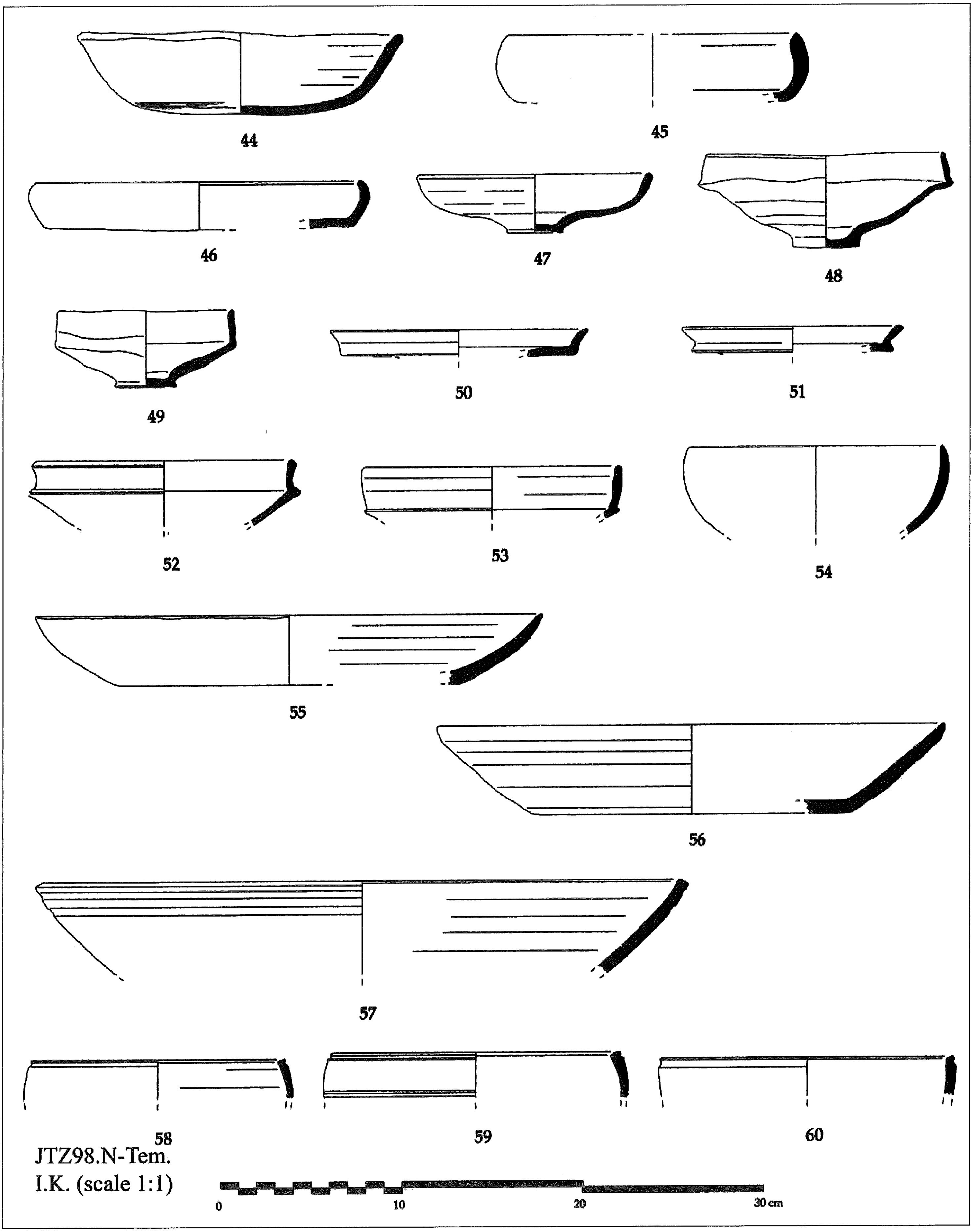
[7] Even if the North Temenos dump was not put there by potters themselves but instead a deposit brought there from a nearby kiln dump by early third century builders of the Upper Zeus Complex (see Augé 1998 and Braun 1998), the dump material itself is of such homogeneity throughout its evenly spread large quantity across the bedrock of the unfinished floor of the North Temenos, that it denotes a one-time action and protects the integrity of the original deposit. The actual spreading of the false flooring or walking surface of the temenos is dated by the 'lost purse' mentioned above and contemporary with the latest pottery types in the kiln dump.



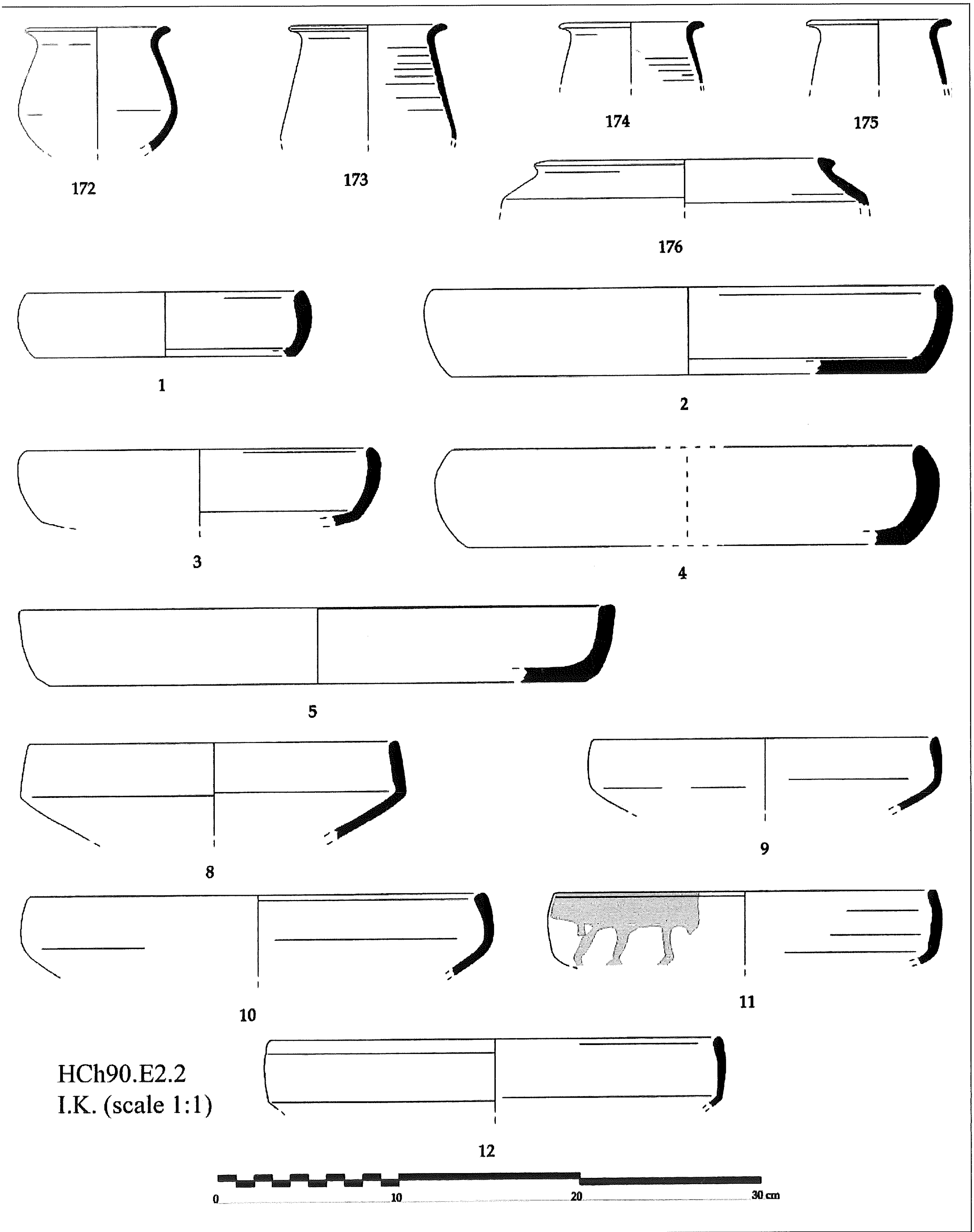
2. Jarash upper temple of zeus complex, excavations 1998, pottery workshop waste dump: table ware: cups, bowls and dishes.



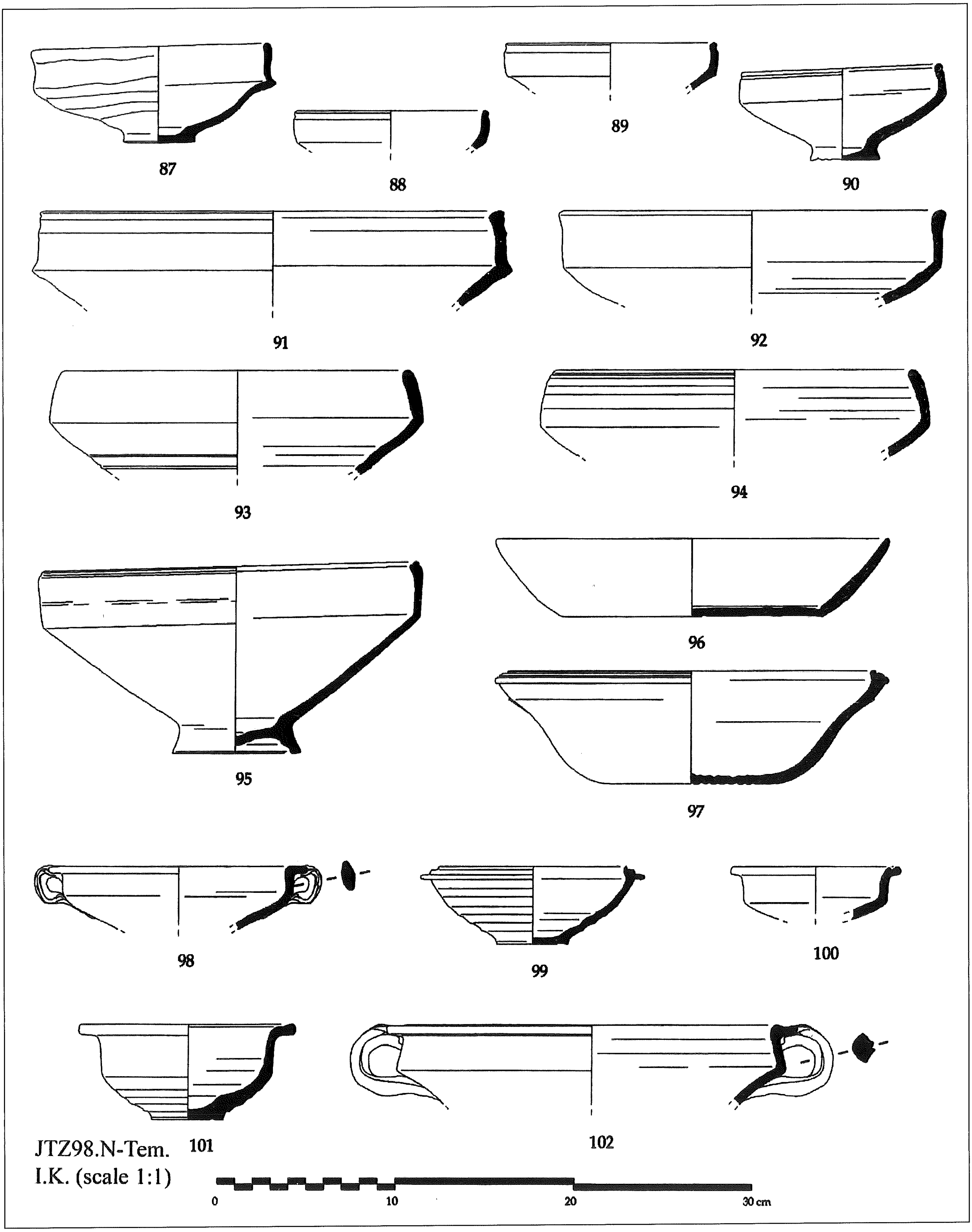
3. Jarash hippodrome 1990 excavations, cavea chamber E2 pottery workshop waste dump: table ware: bowls aand dishes.



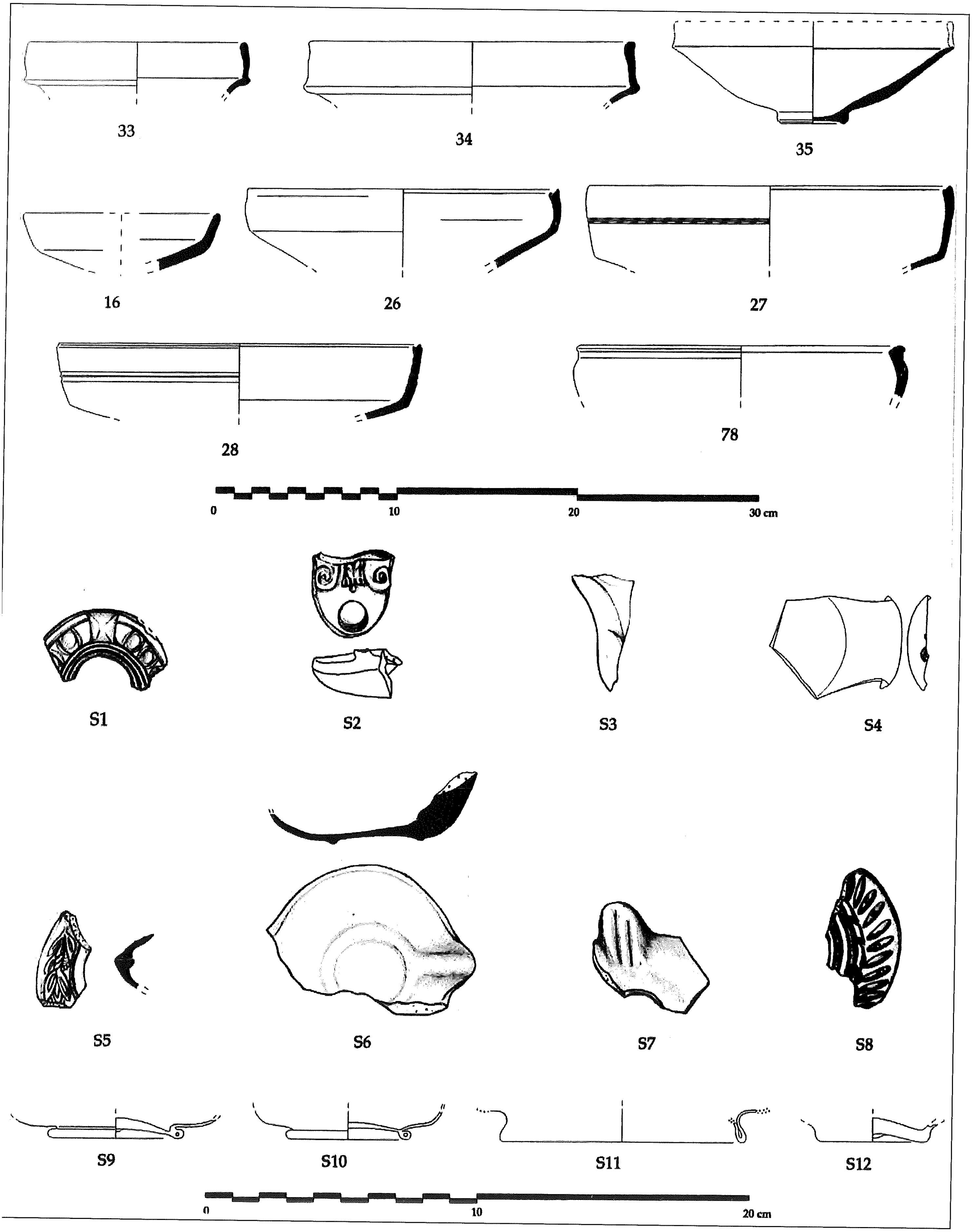
4. Jarash upper temple of zeus complex, excavations 1998, pottery workshop dump: table ware: cups and dishes.



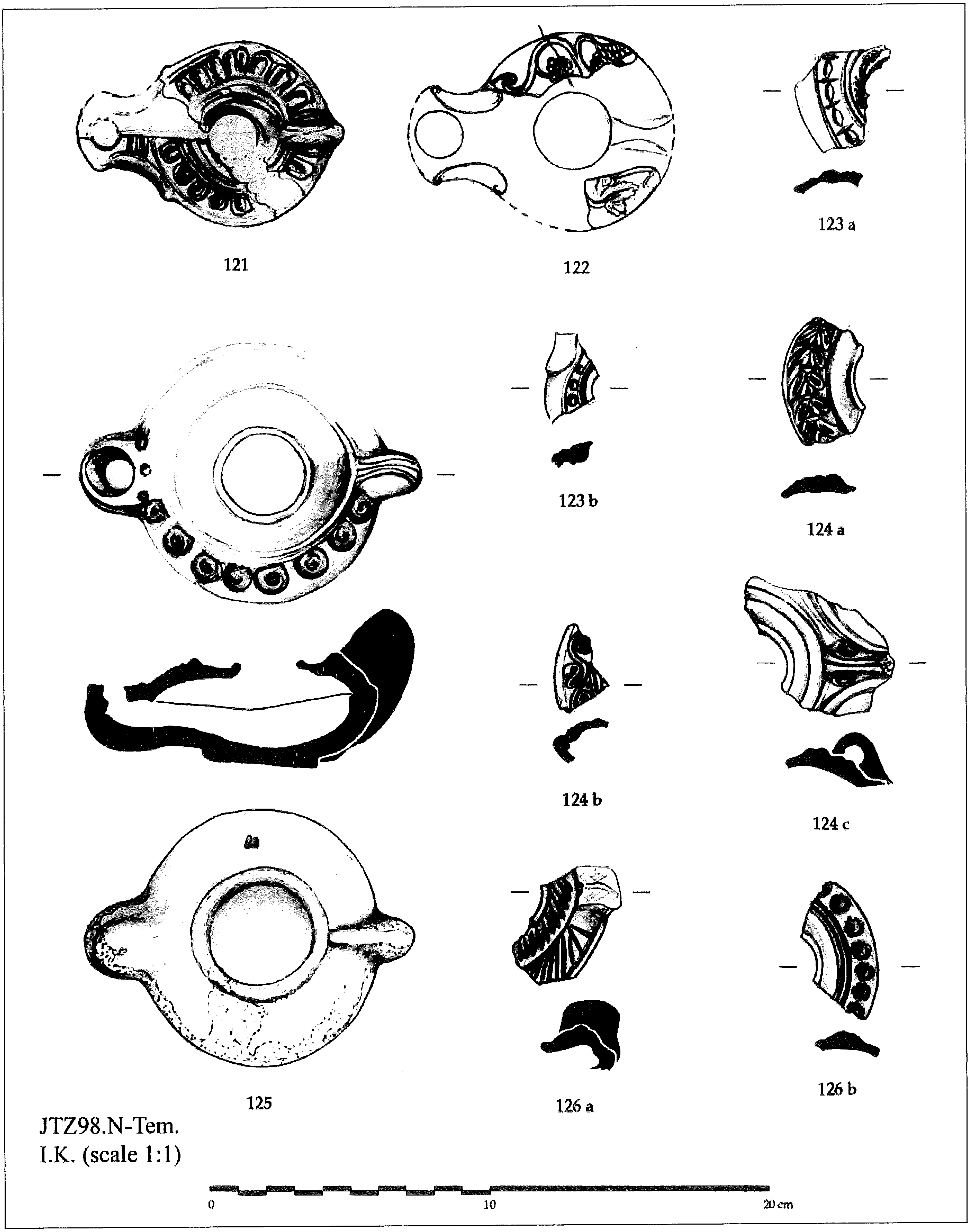
5. Jarash hippodrome 1990 excavations, cavea chamber E2 pottery workshop waste dump: table ware bowls, platters and jars.



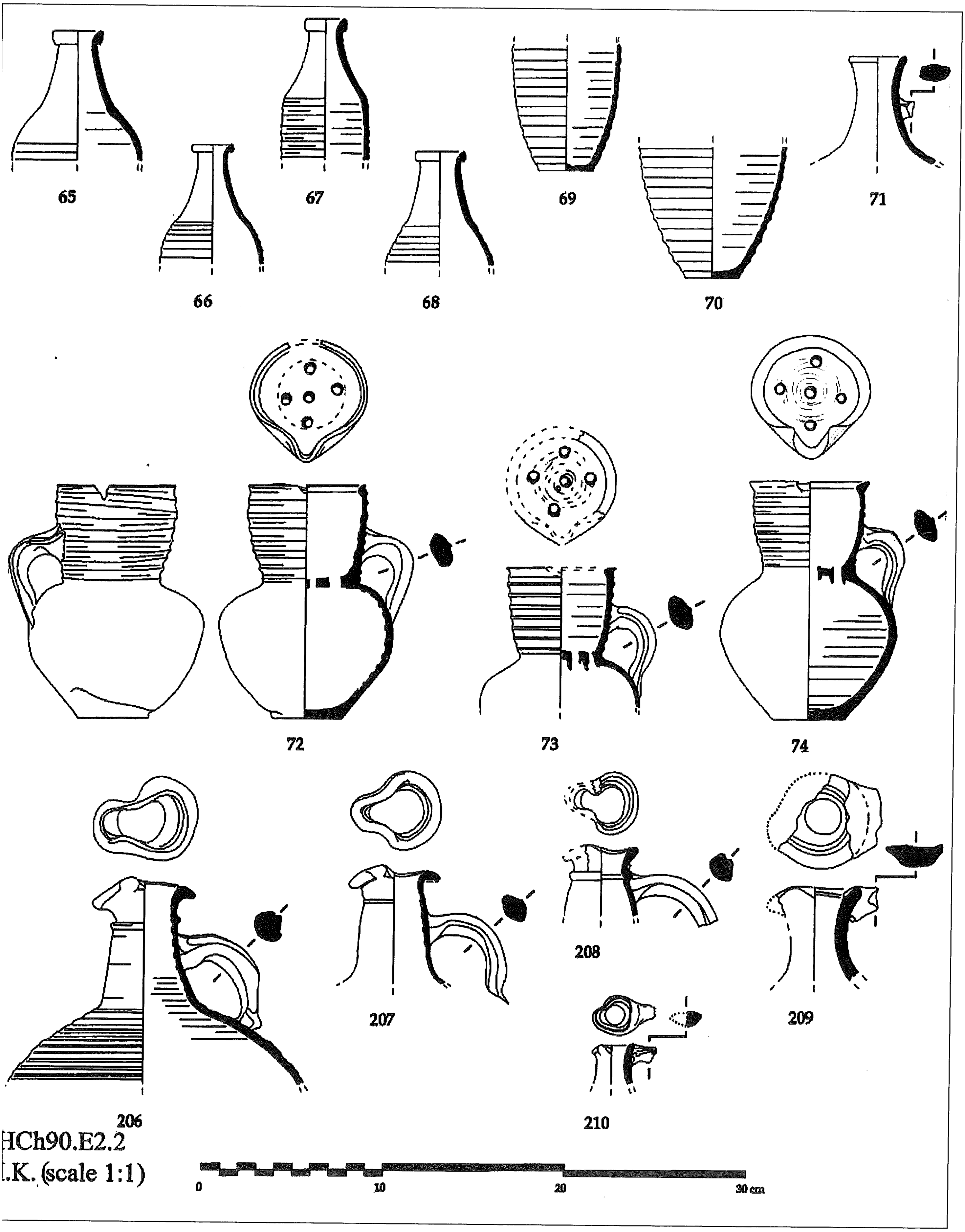
6. Jarash upper temple of zeus complex, excavations 1998, pottery workshop waste dump: taple ware: cups and dishes.



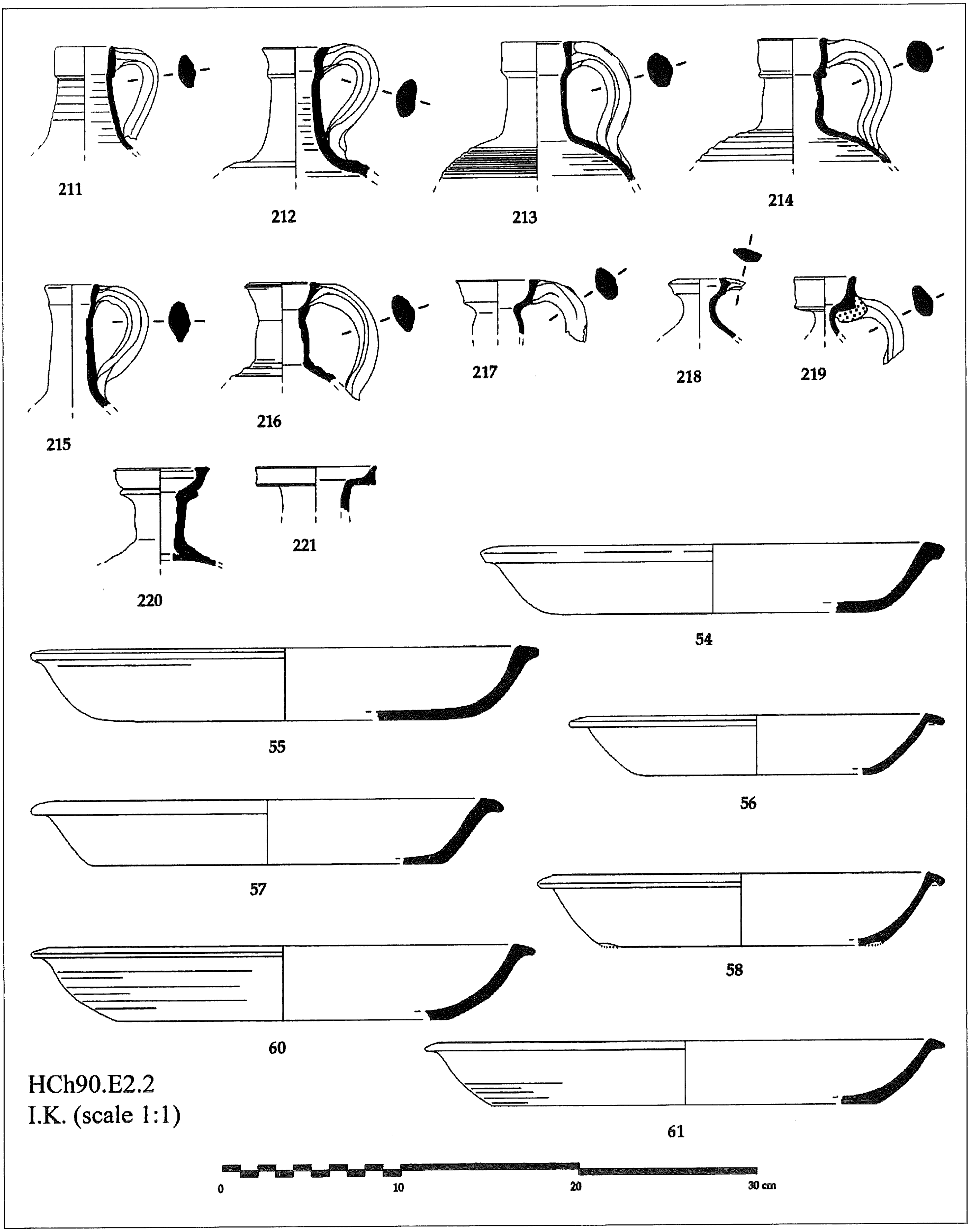
. Jarash hippodrome 1990 excavations, cavea chambeer e2 pottery workshop waste dump: table ware: cups and glass dishes; lamps.



8. Jarash upper temple of zeus complex, excavations 11998, pottery workshop waste dump: lamps.



Jarash hippodrome 1990 excavations, cavea chamber E2 pottery workshop waste dump: table ware: bottles juglets and jugs; lamp fillers.



10. Jarash hippodrome excavations 1990, cavea chambeer E2 pottery workshop dump: table ware: juglets and jugs, platters.

a context, or a form within (see n. 2).

The earlier reference to chronological 'hallmarks' denotes the small bottles (FIG. 9: 65-71), accompanied by lamp-fillers (FIG.9:72-74) and other juglets (FIG. 10:211-221): their copious occurrence at the hippodrome (including other kiln dumps of the same period) now places the peak of their manufacture at Gerasa in the second half of the Late Roman rather than in the Early Byzantine period[8]; their scarcity in the North Temenos context makes their introduction at Gerasa in the early third century a likely case. Mould-made lamps (FIGS. 7:56-58; 8:125-126b) provide a similar picture where context, not the generic type or its iconography, is the key factor for dating. Deposits from Hippodrome kilns of the and fifth centuries have demonstrated beyond doubt that moulded lamps and their stamped decoration cannot be used *ipso facto* to date contexts but rather the reverse applies (Kehrberg 2001b). Lamp types and their chronological ranking is further complicated and even compromised by ancient potters who recycled outmoded and discarded lamp moulds from earlier periods' waste dumps or workshops and — still worse for the archaeologist — manufactured new lamp moulds by using impressions (negatives) taken from older lamp types discarded by the potters as non-sellable misfired lots[9].

New Applications

One may well ask what the dating criteria of the Hippodrome pottery dumps and those of the North Temenos have to do with trade and provisions for the *limes*. This is very relevant to any enquiry focusing on a specific time-span and historical occurrence. It is important that we know, from the onset, the accurate date span and popularity curve of use or manufacture of a type, or group of types, central to the enquiry. Only then may we ask ourselves why the dishes shown here have become so popular in the third century bringing about large-scale production, not only at the hippodrome and Upper Zeus Temple but evident elsewhere in Gerasa. Was it because the Gerasaean urban population grew significantly or did people favour these dishes? This, in turn, could suggest a subtle change in style of living and food habits, i.e. type of meals, which again would lead to further questions, and a number of plausible answers[10].

The marked increase in production noticeable at our two contexts and other contexts in Gerasa (Kehrberg 1997, 1998; Kehrberg and Manley 2003) may suggest a conscious adaptation to 'modern' city life, the so-called romanisation process of the local population and a widening circle of trade in the vicinity of Gerasa. However, lacking vital evidence of and from private houses, one cannot discuss adaptation to ordinary Roman living standards by the urban community, and for the same reason cannot suggest infiltration by foreigners in the ranks of Gerasa's citizens. Pottery from kilns is not enough evidence, however plentiful, to argue that profound changes in attitude or infiltration began to take place on domestic levels or even dominated a large part of the society, making production of fashionable items profitable due to large-scale demands and thus creating trends.

But we can talk of vigorous trade in the Late Roman period because mass production, as evidenced at the hippodrome alone, reflect a very marked increase in demand, which would make little sense without markets further away. If one considers the studied or excavated output of Gerasa's potters, which is after all a small fraction of the still unknown actual amount of produced Late Roman wares, it was already more than sufficient for the

The Late Roman floruit phase of manufacture or popularity for bottles at Jarash has been confirmed at other pottery dumps dated at Jarash to the third and forth centuries and excavated at the Hippodrome, the Upper Zeus Temple complex, the Cathedral and the City Wall, see Kehrberg 1997 and 1998, 2001b; Kehrberg and Manley 2003.

A worst-case scenario was revealed at the hippodrome during excavation of chambers E8 and W4-3: we found two sold lamp matrixes of fired clay among the discarded pottery and lamps waste from two of the Late Roman and Early Byzantine pottery workshops installed at the hippodrome. These matrixes were the original models for making lamp mould of two distinct but common lamp types. Matrix HCh92.E8.2fits the Late Hellenistic first century BC period, matrix HCh95.W4-52 typifies the Early Roman or Herodian type lamp current in the first centuries BC and AD (cf. Kehrberg 2006). Found anywhere else outside their original contexts, the matrixes would not have caused undue concern. But their place among discarded pottery waste from workshops already known to have plagiarized older-period lamps for their own and much later production did raise questions, in particular since the potters had reproduced the 'replicas' en masse (cf Kehrberg 2001b).

[10] On these and other related questions to life-styles, see the excellent study on the common ware of Tall Anafa by A. Berlin 1997; see also J. Magness' paper of the Limes XVIII congress, 'Ammān, 2000, where she refers to Berlin's ground breaking work and further comments on pottery production and trade for the Roman army, reflecting influences or changes of local life-styles in ancient Israel and the Levant (Magness 2002: 198-203).

local markets of the township and surrounding areas. Other Decapolis cities also produced wares like Gerasa's and traded as well and with similar commodities, which included farm produce. I would like to suggest, or rather pose the question: is it is not conceivable that Decapolis cities like Gerasa flourished in part in the third century because in addition to their local markets they also provided goods for garrisons stationed along the Roman *limes* and other military outposts (Kennedy and Riley 1990; Parker 1986 and 2002), trading in pottery, foodstuffs and other commodities like leather. The fact that the Decapolis cities were linked to the Trajanic road network connecting north, central and southern Jordan, along or near which military road stations and forts were located, is too obvious an advantage to necessitate discussion here.

The hippodrome excavations have brought to light that beside Late Roman potters' workshops, the northern and western part of the cavea chambers also contained tanneries. The earliest lime kiln was on the same periphery and dates to the same period. The leather workers' installations date back to the later third century and are contemporary with the first potters there but unlike the potters, the tanners flourished only for about one century and ceased their production in the Byzantine period[11]. At the same time, topographical evidence of contemporary remains of rustic and rupestral installations in the surrounding hills of the fertile Jarash Basin point to increased farming around Jarash, possibly linked with olive oil production in the walled city[12]. Coupled with the steep rise of popularity of pottery forms associated with a Roman soldier's kit and the officer's mess of the first centuries AD, like the platters, pans, (compare e.g. FIGS. 4: 46, 55-6; 5:1-5; 6: 96,102 with Magness 2000: 198f., figs. 12.1:3; 12.3:5-7 and Ettlinger 1951: 109, fig. 9:3,7,8, 10-16) but also cups, bowls and jugs shown on the figures, one may be justified in directly associating the increased output of the above listed commodities at Gerasa with a demand for provisions by garrisons manning the *limes* and, for example, the late second-third century road station excavated near Gerasa in az-Zarqā' valley (Palumbo *et al.* 1993: 95-96; figs. 8-9 bottles and jugs; figs. 10:5; 12 bowls platters and pans).

A number of permanent garrisons and smaller forts in western provinces accommodated their own potters who established their workshops near the garrisons catering equally for the growing surrounding settlement(s) (Dore and Greene 1977). Large corpi of well-known and still today basic reference studies classified their wares designed to suit the requirements of the Roman camps, like the lamp 'fabrikas' and 'terra sigillata' in Gaul. This specialised class of pottery, which spread throughout the Roman Empire, together with the advance of its legions, soon became prototypes for indigenous workshops trading with the occupying forces. Examples of local productions stretch from forts in Switzerland to Spain and Britain and the East (cf. Arubas and Goldfus 1995; Breeze 1977; Ettlinger 1951; Goldfus and Arubas 2002; Greene 1977; Magness 2002; Perrin 1977; Parker 2002, etc). In the eastern provinces like in northern and central Jordan, excavations of Roman forts and smaller road stations manned by the army revealed locally made standard pottery types as shown on Figures 2-10 and associated with the military at the sites (cf. above Palumbo *et al.* 1993; Parker 1987: Chapter 18: The Pottery, esp. on Figs. 90-93, 99, 118).

It was the limes conference in 'Ammān in 2000 that first prompted the thought of Gerasa's possible role as provider for stations along the desert frontier[13] . This association was strengthened by earlier studies on local markets in Roman Britain and other sites of the western provinces, which discussed evidence for direct purchases in local markets by soldiers stationed there (papers in Dore and Greene 1977). While auxiliary units also manufactured pottery, D. Breeze has pointed out in his earlier study that possible inferences could be drawn from recorded trading of local products in Egypt, Gaul,

[11] Dye shops and tanneries in the old town quarters of Fez in Morocco date back to the third century and recall the remains of the hippodrome installations. My chapter on the tannery workshops is forthcoming in volume 1 of the Hippodrome publications (Ostrasz fc).

[12] Several surveys of the Jarash area discovered structures pertaining to farmsteads of this period and rock-cut installations, their publications are awaited.

[13] Cf. in particular Birley 2002, Carroll 2002, Pearce 2002 and Taylor 2002. Their papers are of interest for Jordan because they address and demonstrate the organisational aspects of trading between Roman frontier stations and local markets. In some cases the distance between stations and local markets were an especially important consideration. As clearly demonstrated with the Western Frontier, distance and topographical barriers or difficulties did not deter trading in the East. Whether going overland by camel caravans or overseas [lit.] on ships, both the owners and their 'vehicles of transport' were capable to handle long and difficult routes before Roman occupation.

Macedonia and Britain and which could have included pottery. He goes on to say for Roman Britain: "It is unlikely that pottery was ever supplied in connection with taxation but the procedure for the purchase of supplies such as pottery from civilian contractors certainly existed" (Breeze1977: 136-137). Several Roman non-military sites on the south-east coast of England and in Germany were shown to have been affiliated with forts along the *limes* in Holland through direct trade: pottery (as packaging) and foodstuffs from the east coast of England were shipped across the sea to the frontier in Holland or lower Germany (Taylor 2002). Native Germanic pottery produced in Cologne was again found at forts along the northern *limes*, where the pottery containers of traded food stuff were recycled in various ways by the legions (Carroll 2002).

Concluding Remarks

The findings referred to in this paper gave rise to my idea that Gerasa's explosion of pottery production in general during the main Roman periods in Jordan, and a noticeable predilection of types associated with soldiers of the Roman army, may have resulted from direct trade links with legions. Once we enter the Byzantine period, the predominance of certain associated forms ceases fairly abruptly. Although the forms shown on Figures 2-10 catered equally for the civil market, their popularity, rise and decline might have been stimulated by the increasing and decreasing demand by the military.

The title suggests a hypothesis, which needs to be explored with new research on ceramics and other materials, and with their enquiries based on historical and socio-economic grounds. It would also need laboratory analyses of the Roman pottery from the Hippodrome and other Late Roman pottery kiln contexts excavated in Gerasa, to be compared with similar test results of pottery found at forts. The study would further require collaboration between excavators and ceramicists of the various sites, it would need time and funding. Other Decapolis cities and their pottery could be considered for similar programmes. Pottery studies are vital to any scrutiny and understanding of the community that produced and used the ceramics. Fortunately, in many cases today the dates of pottery are seen as only an elementary, albeit necessary, part of research. However vital it is to provide an exact as possible date, as demonstrated in the first part of the paper, building typologies as a dating tool is no longer an end in itself. Lacking historical enquiries at the onset, fluctuating typologies cannot find satisfactory explanations impoverishing our understanding of the population we examine.

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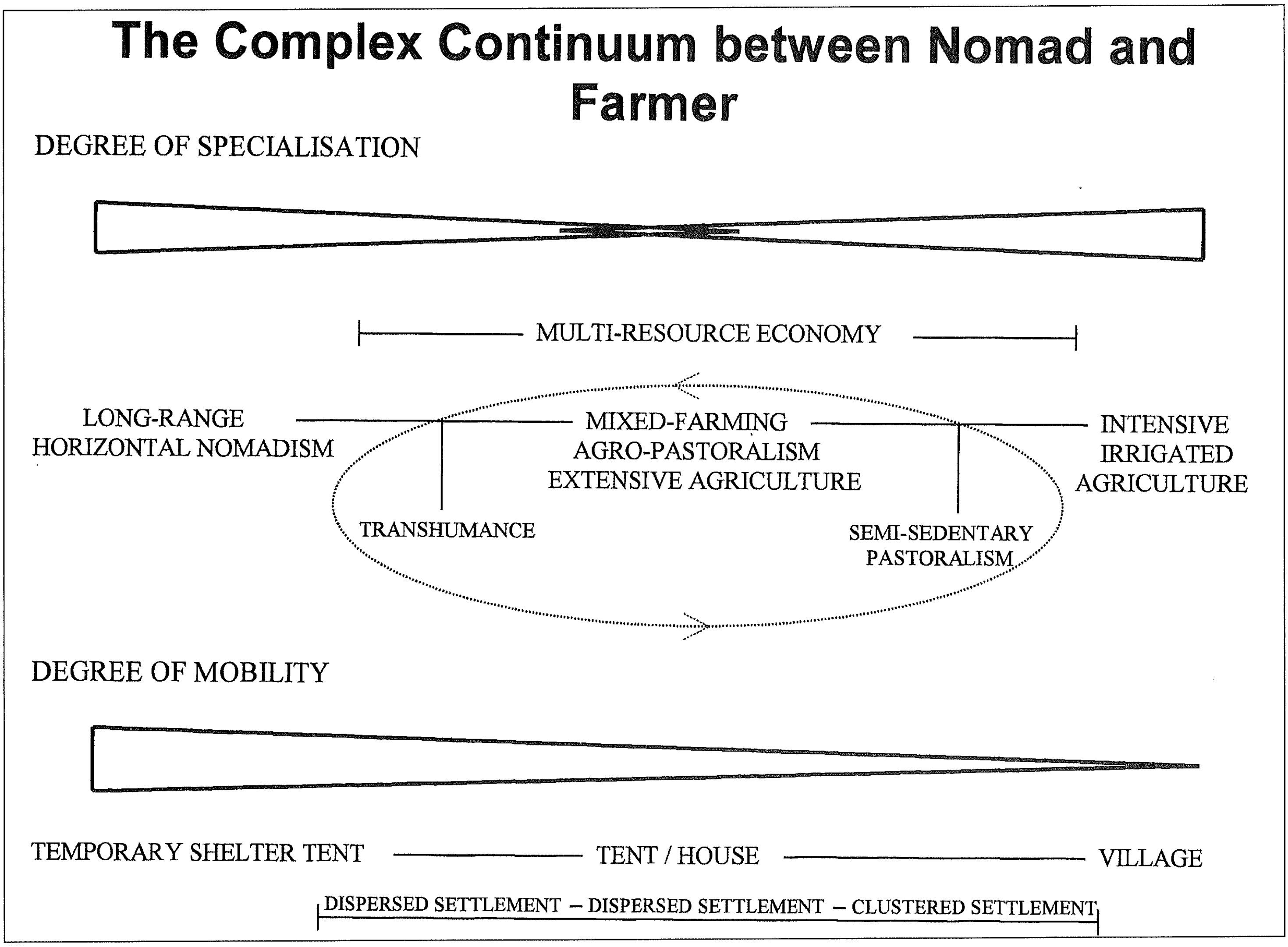
Rural Settlement on the Karak Plateau: Khirbat Fāris[1]

Khirbat Fāris is located on the Northern Karak Plateau (FIG. 1). Like much of Jordan this is an area where the strategies employed to exploit the economic potential of the land have varied both temporally and geographically. The Karak Plateau is not so much a marginal zone but a transitional zone shifting from the arid steppe environment of the east, through the more fertile rain-fed agricultural



1. Location of Khirbat Fāris.

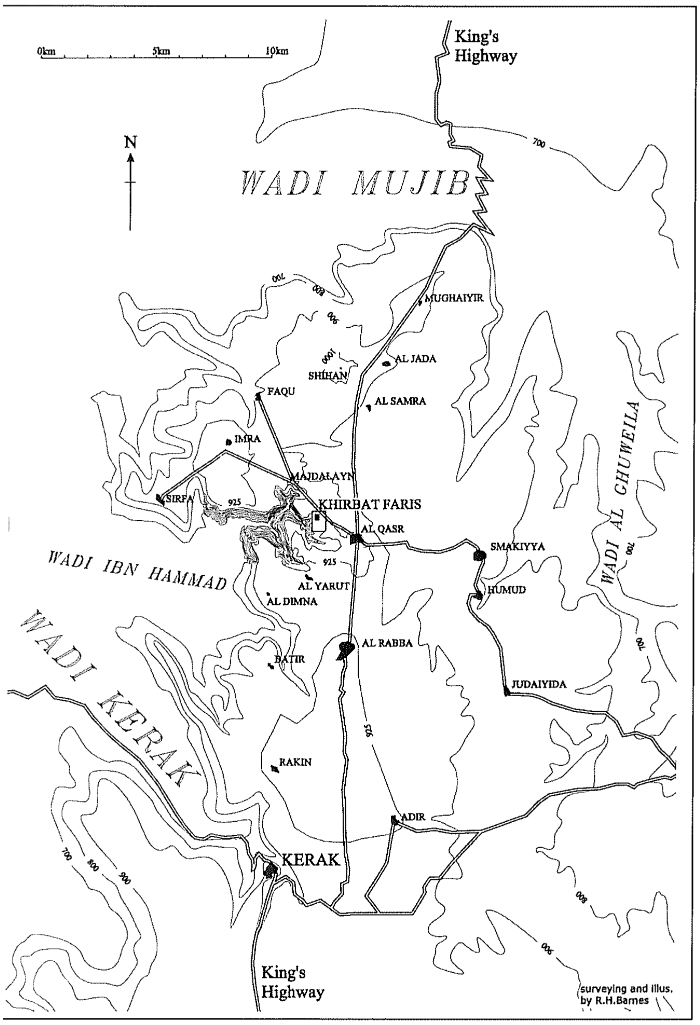
[1] The Khirbat Fāris Project is directed by the author (Research Associate, Centre for Tourism and Culture Change, Sheffield Hallam University) and Dr. J. Johns (Director, Khalili Research Centre, Oxford University) and sponsored by the Council for British Research in the Levant and the Oriental Institute, Oxford University. Figures for this article were prepared by H. Barnes (Figures 2 and 4). For interim reports see: Johns *et al.* 1989; McQuitty and Falkner 1993.

lands of the plateau itself to the wadis, often supporting irrigated agriculture, down to the oasis-like settlements of the Jordan Valley. The variation in exploitation strategies is shown graphically in Figure 2. Often the archaeological story of rural Jordan is portrayed as an opposition between the nomad and the farmer. Of course the reality is much more complex and nuanced. At one extreme stands the nomad practising specialised pastoralism. At the other end of the continuum sits intensive irrigated agriculture. In between lie the various options of a less-specialised - subsistence even - multi-resource economy. To add to the complexity, several groups practising different but complementary exploitation strategies can utilise the same geographical area. The history of the settlement at Khirbat Fāris and the life-style of its inhabitants seem to have occupied the middle zone of Figure 2.

For the archaeologist, the challenge is to identify the material traces of the community that would have occupied this middle-zone. It is much easier to identify the campsites of specialist pastoralists or the villages of truly sedentary farmers than the settlement types of communities that move seasonally or live in both houses and tents. Drawing on ethnographic as well as archaeological parallels, the interpretation of the Khirbat Fāris excavations has included detailed consideration of the types of domestic architecture represented that span a period of almost 2000 years. The interpretation endeavours to define the architectural 'signatures' of the different types of economic strategy within the pastoral/agricultural continuum.

Khirbat Fāris is a multi-period site with the earliest excavated occupation dating from the Middle Bronze Age (2000-1550BC). No historical records mention Khirbat Fāris — its background and the landscape history within which it fits are known but the details of its settlement history can only be retrieved from archaeology. Four basic types of stone structures dating from the Nabataean period to the early 20th century AD are represented. The structures survive astonishingly well, often to roof-height, and have been subject to many centuries of re-modelling.

Figure 3 shows the post-first century BC /AD '*Khān*' (a local name) that is still being used. It is a fine barrel-vaulted structure within which 2m of floor levels have accumulated. These floor-levels suggest a domestic use although some of the most compelling parallels for this type of structure suggest an original use in a funerary context, e.g. the Roman mausoleum at Khirbat 'Ayn near Jarash (Kennedy and Bewley 2004: 167 Fig. 9.9C). If the original purpose of such structures was funerary this type of architecture can not be clearly linked with an economic strategy. However, at many times, including as originally constructed, it was part of a larger complex that was not revealed in total by excavation. Hirschfeld has identified a series of towered structures along the eastern edge of the al-

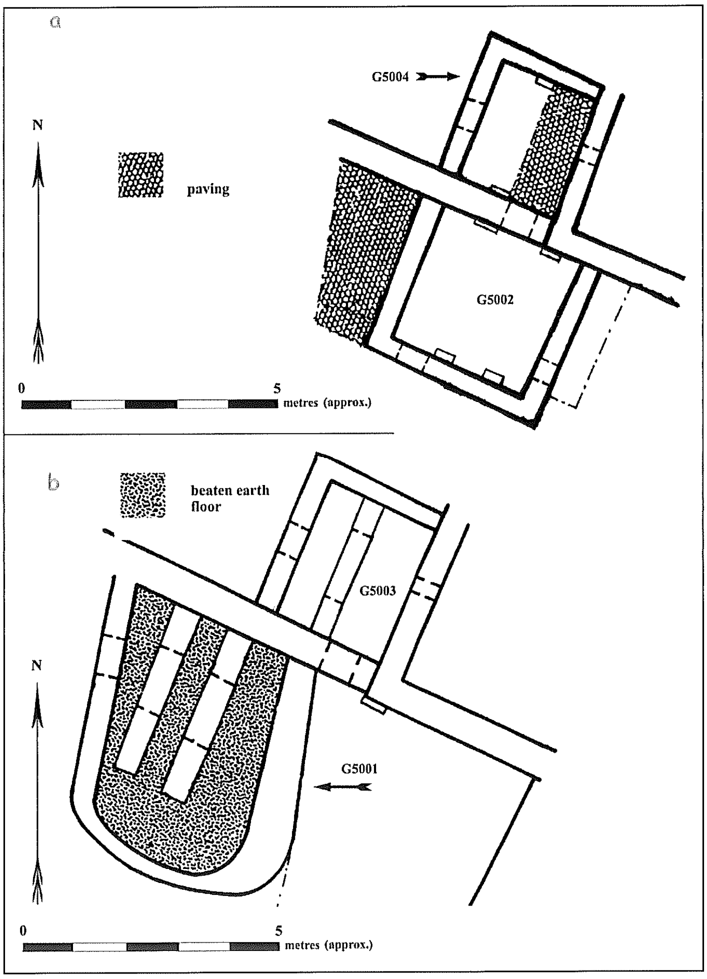


2. The complex continuum between nomad and farmer.

3. The 'Khān'.

Khalil hills as part of Byzantine farmsteads (1997: 50-59). These towers are part of more extensive complexes including annexes, sheep-folds and other agricultural features. The '*Khān*' may originally have been part of a towered farmhouse rather than a mausoleum as first thought. At the current state of research it is impossible to conclude the extent to which it is an unusual or a common architectural type on the Karak Plateau. The precise nature of economic strategy practised in tandem with this architecture is impossible to assess. However the existence of terraced fields nearby that are interpreted as being of similar date suggests that cultivation of fruit-trees and/or irrigated crops may have formed part of the agricultural cycle (Mike Charles pers. comm.). None of the other structures excavated at Khirbat Fāris are of such an early date.

Figure 4a shows the plan of an arched and flat-roofed single unit room that was originally constructed in the late Roman/early Byzantine centuries. It was used throughout the Early Islamic period. The techniques used in the construction of the house have a long history and exceptionally



4a. The 'Late Antique House'.
4b. The 'Transverse-Arch House'.

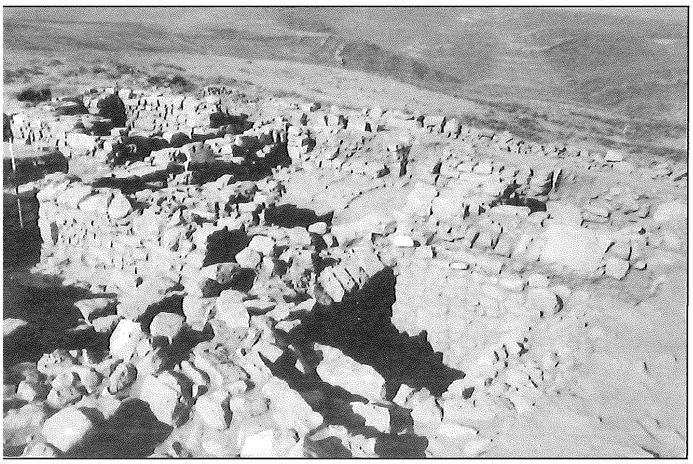
wide distribution in the Eastern Mediterranean in rural, urban, ecclesiastical and military contests. Such houses at Khirbat Fāris were identified as "the Late Antique House". The construction relies on arches springing from house walls at a high level or from arches resting on pilasters buttressed by the house wall. In either case the arches support a flat roof of stone rafters or beams. The width of the room reflects the arch-span possible: an average of 5.00 metres. The arches are spaced according to the length of the stone rafters or beams available and occur in any number. At Khirbat Fāris, the entrance to these houses was set perpendicular to, and between, the arches. From the evidence of surveys and excavations throughout Jordan, it is suggested that such architecture was associated with fairly intensive agriculture where the majority of the rural population lived in villages.

One of the two examples of 'the Late Antique house' was remodelled in the Middle Islamic period (12th century AD) to become a 'Transverse Arch house'. The example shown in Figure 4b was built *de novo* but within the walls of the earlier 'late Antique house'. In total three 'Transverse Arch houses' were excavated. The main architectural difference between the two types lies in the arrangement of the arches. The arches no longer spring from the house wall or immediately adjacent to it but rather from an arch wall projecting perpendicular to the house wall. This increases the possible roofed area: the span of the arch is added to the length of the arch walls. The space between the arches was used to construct storage bins or *rawiyat* in which the annual harvest could be stored. In addition, without exception, the door position was no longer between the arches but in the wall parallel to the arches. The examples at Khirbat Fāris date from the Middle Islamic I period but they are also the most common architectural type found in 19th/early 20th century villages throughout Jordan. These later villages are characterised by a mixed-farming economy involving both agricultural and pastoral components. When excavations at Khirbat Fāris began in the late 80s, a family came to the site every spring and autumn with their flocks. They lived in a tent or *bayt al-sha'ar* but returned every winter and summer to their 'Transverse arch house' in a nearby village. Based on ethnographic evidence, this type of architecture on the Karak Plateau is associated with an extensive type of agriculture and with semi-sedentary communities.

Although the construction technique is the same the Arch-and-Grain-Bin house' as shown in Figure 5, has been identified as a separate type at Khirbat Fāris. The scale is dramatically different with a roofed area of 135-225m^2 contrasting with the 54-100m^2 of the 'Transverse Arch house'. Two 19th century examples are still standing at the site and were used by the semi-nomadic owners of the land as barns for storing their annual harvest and agricultural equipment. The "Arch-and-Grain-Bin" houses were used as a complement to the tents, pitched nearby, in which the household's dwelling and socialising took place. The distribution of such houses' is largely confined to areas historically producing grain on a large scale. Such architecture is to be linked with the transhumance/nomadic end of the continuum on the Figure 2 diagram.

The houses of Figure 6 date from the later Middle Islamic-Late Islamic period (14th-late 16th centuries AD) and appear to be a totally new type of architecture. They are small barrel-vaulted structures with average internal dimensions of 3.00 x 4.00m, a height of ca. 2.00m and massively thick side walls that supported the vault. These houses are clustered around alleyways and courtyards and a similar pattern is seen at Ḥisbān dating to the Mamluk period (LaBianca 1990: 220-221). Such houses were a common sight in the courtyards of 20th century villages where they were used as animal stables or oven houses (Khammash 1986: 43). However, at Khirbat Fāris they are interpreted as dwelling-houses in their own right — there are separate oven-houses built within the courtyards. The barrel-vaulted houses give the impression of being part of a nucleated sedentary framing community, a village, rather than a semi-nomadic community.

. The 'Arch-and-Grain-Bin' House.



. The 'Barrel-vaulted' House.

This interpretation is based on the assumption that the variation in the types of economic strategy practised is reflected in the type of architecture used. It offers a chance to move beyond statements regarding presence/absence of particular occupation periods to more sophisticated conclusions of 'how' the landscape was used. Settlement patterns derived from survey data alone that do not take into account the variation of architecture used in individual settlements will never provide a nuanced picture of landscape use. More excavation of rural settlements along with more detailed planning of sites and their structures found during survey is needed before we have a clearer impression of rural settlement in Jordan during the Islamic periods.

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Camel Petroglyphs in the Wadi Nasib and their Implications for the Use of Camels in the Late Bronze Age

Introduction

In July 1998, a small party of colleagues from Andrews University[1] undertook a Jeep trip to the Wadi Nasib ("the valley of the stone altar") in Sinai (FIG. 1) to visit the well-known Proto-Sinaitic Inscriptions reported and photographed by Dr. Georg Gerster in 1961 (Gerster 1961: 62; Albright 1966: 3)[2]. The inscriptions (designated at Gerster No.1 and Gerster No. 2), are located on the vertical face of a large rock on the north side of the pass that runs through the north-south running ridge that serves at the eastern boundary of the Wadi Nasib. The pass, itself, is at the head of tributary wadi of the Wadi Nasib that is located immediately east of the bedouin cemetery of Bir Nasib. The settlement of Bir Nasib proper is located just to the south of the cemetery. Just east of the cemetery there is a trail (actually several meandering trails) which climbs eastward along the edge of this tributary up to the cut or pass. The Proto-Sinaitic inscriptions were easy to locate and were found to be pretty much in the same state of preservation as when Gerster first found them nearly forty years earlier.

The site was already known from explorations by Sir Flinders Petrie (FIG. 2) who recorded an inscription of **Ammenemēs III** of the 12th Dynasty (FIG. 3) – Petrie documented the location of this inscription at the top of the pass by a mark in a photo which appeared in his *Researches in Sinai* in 1906 (FIG. 4). The Ammenemēs III inscription is located two meters to the right of Gerster No. 1. The Egyptian inscription was carved into the face of the rock in the form of a "stele" and dates from the 20th year of Ammenemēs III (Gardiner and Peet 1952: Pl. XIV, no. 46; 1955: 76)[3]. This inscription is quite weathered and the surviving portion measures only 20 X 23cm. It is clear that the inscription was originally written in three horizontal lines of hieroglyphs at the top, while the lower part was divided into six vertical columns. It is these six vertical columns that have pretty much eroded away. The translation of Gardiner and Peet of the surviving top portion of the inscription reads: "Year 20 under the majesty of the king of Upper and Lower Egypt Nema'rē', son of Rē' Ammenemēs, living like Rē' eternally" (Gardiner and Peet 1955: 76). Gardner and Peet were unsure if Petrie had seen the Proto-Sinaitic inscriptions near the Ammenemēs stele and considered the former as insignificant or simply missed them altogether.

Visiting the Proto-Sinaitic Inscriptions

Whether or not Petrie was the first to see these Proto-Sinaitic inscriptions, they definitely were made known to the world by the famous Swiss photographer Dr. Georg Gerster (FIG. 5) in 1961 (Gerster 1961: 62; Albright 1966: 3). The first of the two Proto-Siniatic inscriptions, known as Gerster No. 1, is found two meters to the left of the Ammenemēs III inscription (Gardiner and Peet 1952: Pl.

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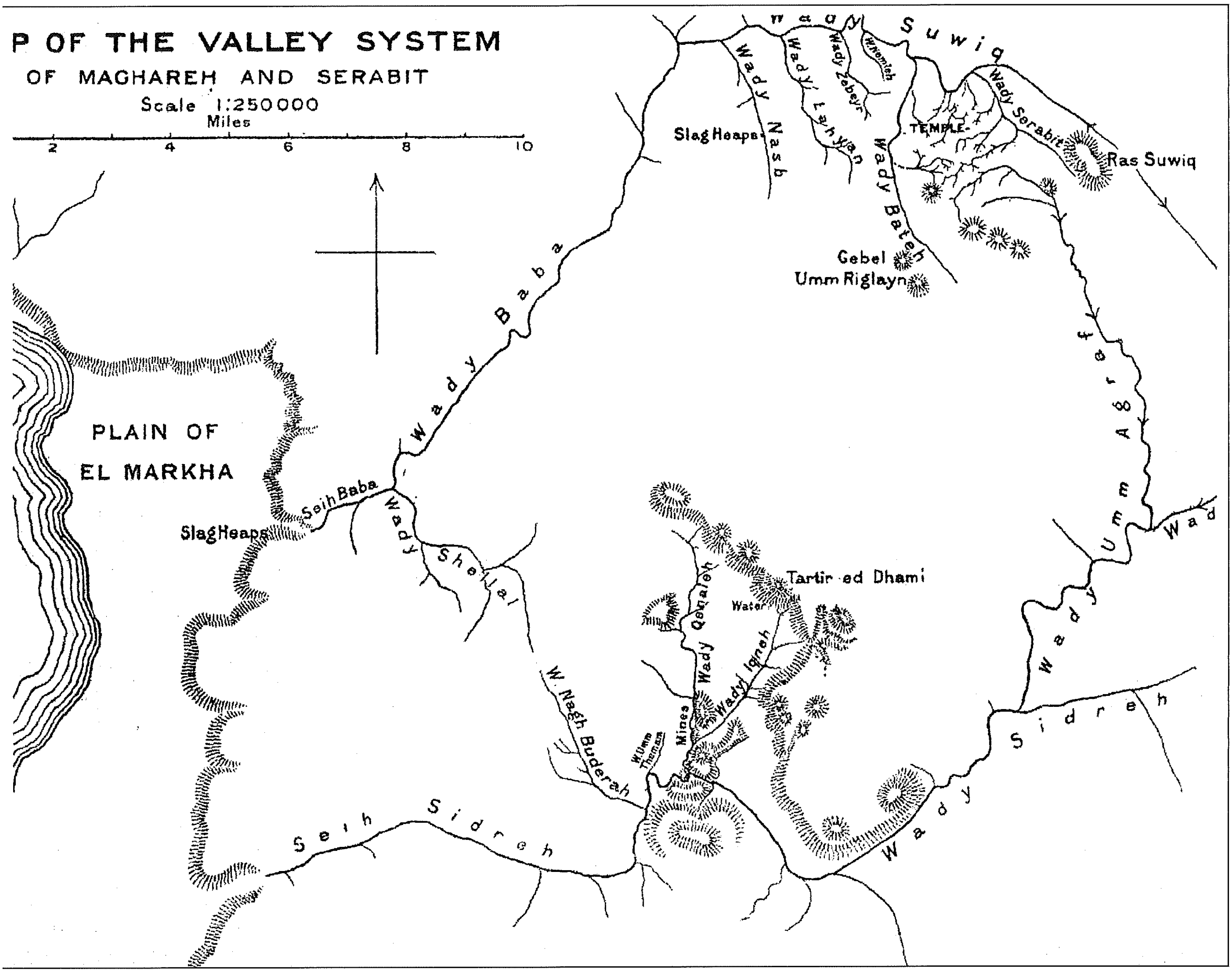
[1] The party included the author, Dr. William Shea, Dr. Richard Davidson, Dr. JoAnn Davidson, Dr. David Merling, Devin Zinke, Rahel Davidson, John Davidson, Rebecca Younker, and Michael Younker.

[2] Gerster notified William Albright about the Wadi Nasib inscriptions on March 7, 1960. The inscriptions were initially published by J. Leibovitch in Le Muséon 74 (1961). They were also commented on by Sir Alan Gardiner in the *Journal of Egyptian Archaeology* 48 (1961: 461ff) and by Albright, himself, in his small volume entitled *The Proto-Sinaitic Inscriptions and Their Decipherment* (Harvard University Press, 1966: 28-29).

[3] Immediately to the right of the Gerster text, No. 1 Albright thought there was the outline of a rectangular panel with a rounded corner and a cartouche which appears to enclose the name of Sekhem-re'-khu-tawi, the 15th pharaoh of the Thirteenth Dynasty who ruled over three years (ca. 1760BC). However, Rainey doubts this reading (Rainey 1975: 108).



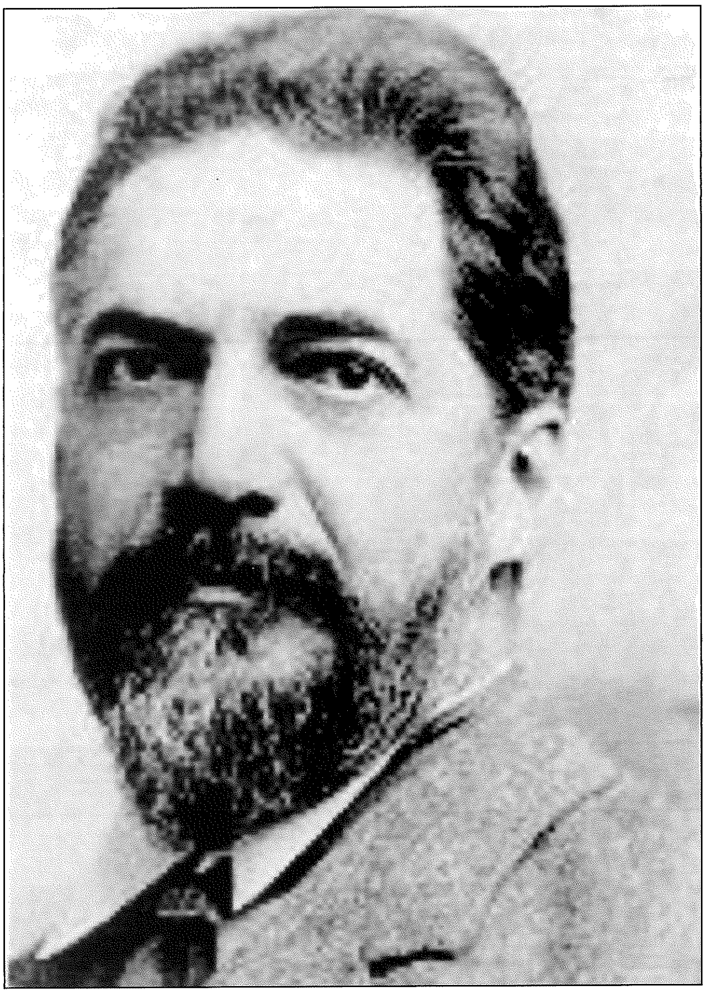
. Map of Wadi Nasib (Sinai).

ꞩIV, no. 46; 1955: 76 see FIG. 6). Gerster notified Villiam Albright about the Wadi Nasib inscriptions on March 7, 1960. The inscriptions were initially published by J. Leibovitch in *Le Museon* 74 1961). They were also commented on by Sir Alan Gardiner in the *Journal of Egyptian Archaeology* 8 (1961: 461ff) and by Albright himself, in his mall volume entitled *The Proto-Sinaitic Inscriptions and Their Decipherment* (Harvard University Press 1966: 28-29).

The actual reading of the inscriptions has been matter of some discussion. Albright (1966) failed ɔ recognize the 4th column as belonging to the incription and tried to make sense of only the remaing three. Albright's transcription was: D {L} T{N} L HB{R} {N} `LW. He translated the inscription as "O father E[l], gra[nt] to Heber re[st] beside him!" Rainey (1975), who was able to personally examine the inscription, subsequently noted that there is a 4th column that Albright ignored or overlooked. Also, he modified the readings of a few of the characters. Rainey's reading of the whole text is: BRKT 'D' RB HWT WL`H[ . . .] or "Blessing(s) (on/of) 'Ad(d)a', chief of the stockades(s), and (on/of) `h[. . .]." Other scholars have proposed still other variant readings (e.g. Shea 1987).

About 20cm to the right of the Ammenemēs III stele is the second, brief Proto-Sinaitic inscription (Gerster no. 2)[4]. Only two characters and part of a third have survived the ravages of time. The two dis-

There was originally some confusion on the precise spatial relationship of Gerster 2 and the Ammenemēs III stele. The original artist depiction, from whom Gardiner worked, showed the bull's head as directly under the Ammenemēs III stele. In actuality it is about 20cm to the right (Gardiner 1962: 45-6).



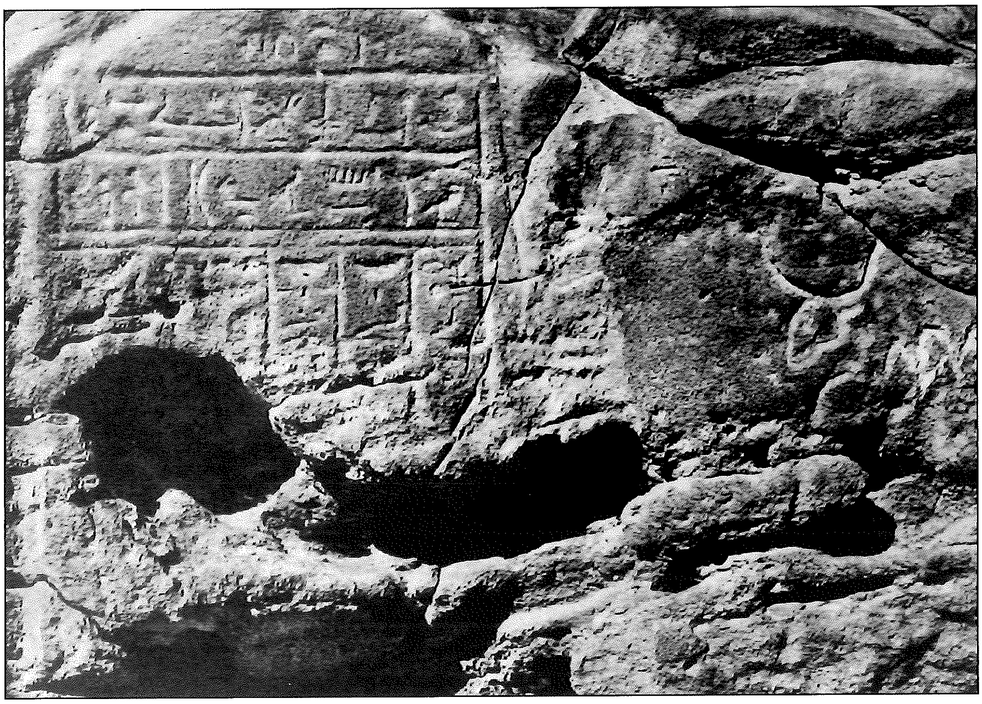
2. Sir Flinders Peetrie.

cernable characters include the bull's head (*aliph*) and the zigzag (*mīm*). Obviously, there is too little of this inscription to make out a coherent translation. Like Gerster no. 1, this second Proto-Sinaitic inscription is later than the Ammenemēs III stele. It is better preserved and the patina is lighter than the Ammenemēs III inscription, indicating that Proto-Sinaitic was carved more recently. Most scholars agree that based on the style of the characters and the color of the patina, both Gerster nos. 1 and 2 are contemporary.

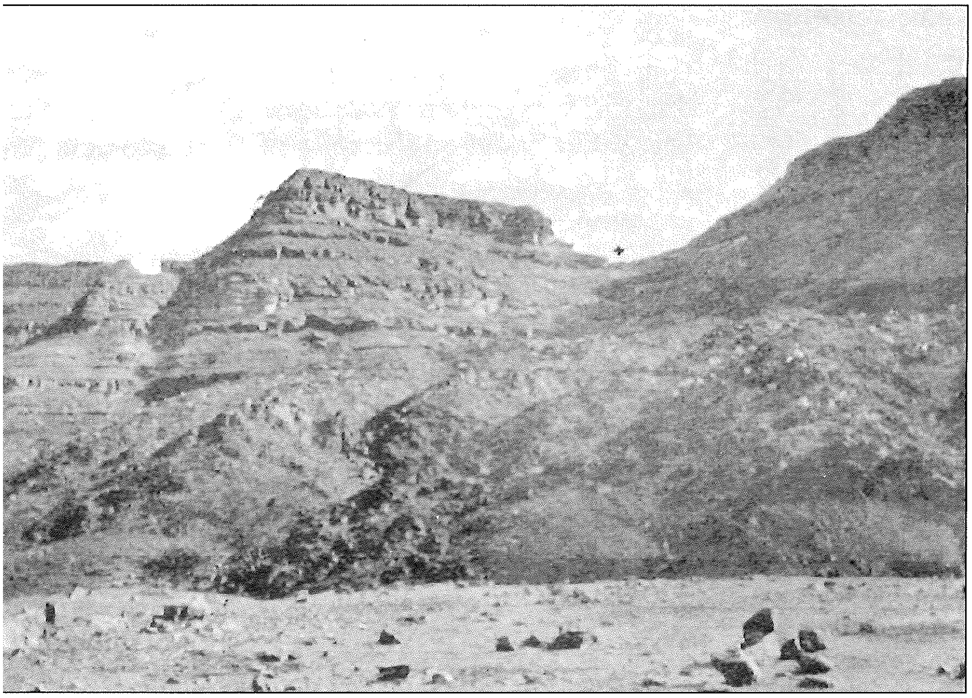
The date of the Proto-Sinaitic inscriptions has also been a matter of some discussion. Originally, it was thought that they should be dated to the Middle Kingdom. This date seemed to make sense in view of the presence of the Ammenemēs III stele (Gardiner 1962). Currently, however, most scholars seem to agree that these should be dated later to the New Kingdom's 18th Dynasty, the Late Bronze Age in archaeological terminology. This is because additional examples of this script, which were subsequently found in Israel at Shechem, Gezer and Lachish, appear to be older because they are associated with an archaeological context dating to the 17th-16th centuries BC and they are drawn more realistically (i.e. "primitively"). The characters of the Bir Nasib inscriptions, on the other hand, are drawn in a more schematized form suggesting some "streamlining" of the pictographs through time. Most scholars thus accept a date in the 15th century BC for the Proto-Sinaitic inscriptions (Naveh 1987: 26).

Discovery of Camel Petroglyphs

After examining and photographing the Proto-Sinaitic inscriptions and the Ammenemēs III stele,



3. Ammenemēs III Inscription.



4. Petrie's Picture Showing Location of Ammenemēs III Inscription in Wadi Nasib.

. Dr. Georg Gester.

6. Proto-Sinaitic Inscription at Wadi Nasib.

we stepped back to look at the rest of the rock. Generally not mentioned in the reports of the inscriptions is the presence of a number of petroglyphs found on the same rock face near the inscriptions. From the color of the patina and the close association with the inscriptions, it appeared that the petroglyphs generally span the same time period as the Ammenemēs III and Proto-Siniatic inscriptions.

As we examined the petroglyphs, we followed the rock face to the right (east) two or three meters until we could look down the other side of the pass. As we continued to scan the petroglyphs, we suddenly noticed a couple of distinctive animal petroglyphs, camels, that were represented as walking caravan-style across the rock to the right (in an easterly direction) (FIG. 7). The camels are about

7. Wadi Nasib Camel Petroglyph.

10-12cm high and 16-20cm in length. The camel figures were quite distinctive, although the first camel (to the right) had been somewhat defaced by later engravings. The trailing camel, however, was not defaced or eroded so it is quite distinct. The long neck, large head and single hump of the dromedary can easily be discerned. What made the camel petroglyphs even more interesting was the presence of human figures in association with them. The lead camel appears to be followed by a walking man. A second walking man is clearly leading the trailing camel. The petroglyphs certainly are depicting domesticated camels.

Dating the Camel Petroglyphs

Petroglyphs are, of course, notoriously difficult to date. One way is to note the archaeological evidence for human activity in this region. In this case we have a record of activity from the Middle Kingdom down to the New Kingdom of Egypt. Archaeologically, the peak of activity in this region was during the 12th and 18th dynasties of Egypt. There is evidence for later activity during the 19th and 20th dynasties over at Sarābīṭ al-Khādim, although this was at a reduced scale when compared with the earlier periods of activity. At Wadi Nasib proper, there is presently no evidence for activity later than ca. 1500BC, during the Late Bronze Age. This wadi is somewhat isolated and was probably not the main route between Sarābīṭ al-Khādim and Egypt. This route likely had a more restricted use, perhaps connecting the mines with the smelting area (Gardiner and Peet 1955: 5, 30). Camels may have been used to bring ore to the smelting area.

A second way of dating is to attempt to reconstruct the sequence of rock engravings (e.g. Anati 1968). As noted, the amount of erosion and the color of the patina of the camel petroglyphs are close to that of the Proto-Sinaitic inscriptions, providing yet another small piece of evidence that the two are roughly contemporaneous. That the camels are not the latest rock engravings is indicated by attempts to draw new characters over the outlined of the lead camel.

A third, and perhaps better, way to date a petroglyph is via its accompanying inscriptional evidence. In the case of Wadi Nasib Camel Petroglyph, we have already noted at least two datable inscriptions that appear on the same rock face. The first is the rock stele of Ammenemēs III of the 12th Dynasty. The second inscription is the Proto-Sinaitic inscription known as Gerster Inscription I. As noted, there is virtually universal agreement that these inscriptions date to the 15th century BC (i.e. the transition from LB I to LB IIA). The date of the inscriptional evidence at Wadi Nasib correlates precisely with the archaeological data that show that the peak of activity was during the 12th and 18th dynasties of Egypt. There is evidence for later activity during the 19th and 20th dynasties over at Sarābīṭ al-Khādim, although this was at a reduced scale when compared with the earlier expeditions. Again, at Wadi Nasib proper, there is presently no evidence for activity later than ca. 1500BC.

Taking all three lines of evidence together, it seems quite reasonable to date the camel petroglyphs to about the middle of the period of peak activity in this region at nearby Sarābīṭ al-Khādim. That is, around 1500BC.

Implications of the Wadi Nasib Camel Petroglyphs

The possibility that these camel petroglyphs are contemporary with the mining activity at Sarābīṭ al-Khādim provides new insights into the copper and turquoise industry with regards to transport of the mined materials. Previously, it had been assumed that donkeys were the primary mode of transporting copper and turquoise from the mining centers back to Egypt. Certainly donkeys were used. However, this petroglyph suggests that camels were in use, too. Indeed, these two camels could represent a small caravan. (interestingly, full-size representations of a camel caravan have been recently found at Petra — however, these are carved in relief). Camels would be ideally suited for transporting loads of copper and turquoise, especially as part of the trail crosses over sandy stretches. Camels cannot only travel across sand more easily, they carry twice the load of a donkey, move faster and need less food and water (Davis 1987: 166). There does not appear to be a load on the back of the camels depicted in the petroglyph, although this may not be surprising since the camels are shown as headed in the direction toward Sarābīṭ al-Khādim and may not have picked up their loads [of ore?] as yet. Another possibility is that these camels were employed locally and may have just dropped off loads of ore near the smelting center in Wadi Nasib and were returning to Sarābīṭ al-Khādim a few miles to the east to pick up more ore.

These camel petroglyphs also have implications for the broader history of camel domestication in the Levant. Unfortunately, the question of the date of camel domestication has become entangled with the question of the historicity of the Biblical references to camels, introducing an emotional element into the discussion that has influenced objective attempts to understand the nature, timing, and process of camel domestication on its own terms. This issue can largely be traced to William F. Albright's skepticism (1942, 1945, 1949: 207) that references to camels in the patriarchal narratives (generally dated as pre-Iron Age) are "anachronistic". According to Albright camels were not domesticated (and hence used in by humans for travel and transport) until sometime into the Iron Age, i.e. after 1200BC. As far as we are aware Albright had nothing against camels *per se*. However, his awareness of the use of donkey caravans in Mesopotamia during the Middle Bronze Age and his development of the donkey caravan hypothesis (Amorite hypothesis), in which he superimposed the patriarchal narrative of Abraham's migration from Ur to Palestine upon the phenomenon of these donkey caravans, seems to have encouraged him, and others, to dismiss isolated bits of data that suggested camels could have been in use in earlier times.

Ironically, while Albright's donkey caravan, or Amorite hypothesis, has been rejected by most scholars today, there continue to be some scholars who follow Albright's skepticism that references to camels in the patriarchal narratives are "anachronistic" (e.g. Köhler-Rollefson 1993: 183). However, there is now a growing body of scholars who believe that camel domestication must have occurred earlier than previously thought (prior to the 12th century BC). This is especially evident among archaeologists working in pre-historic periods. These conclusions are increasingly being integrated into the understandings of archaeologists working in the historic periods of the Bronze and Iron Ages and has forced them to reassess the patriarchal narratives in view of this new information (e.g. Ripinsky 1984; Coote and Whitelam 1987: 102; Zarins 1992: 826; Borowski 1998: 112-18)[5]. This is not to say that domesticated camels were abundant and widely used in the ancient Near East in the early second millennium BC. However, the patriarchal narratives do not necessarily require large numbers of camels. As Borowski (1998: 118) notes, the biblical evidence indicates that the camel was used primarily as a pack and riding animal during patriarchal times. These data do not require large herds associated with later camel-breeding nomads. In this regard Gottwald (1974, 1978) is correct in not characterizing the patriarchs as "pastoral nomads" camel or otherwise. Indeed, the Hebrews had a prohibition against eating camel meat (cf. Lev. 11:4; Deut. 14:7) that probably extended to the drinking of camel milk (Davis 1986: 147). Thus, the patriarchs were not likely keeping large herds of camels for subsistence in the tradition of later camel nomads. Rather, camels were used in smaller numbers, primarily as pack and riding animals. The smaller amount of evidence for domestic camels in the late 3rd and early 2nd millennium, especially in Palestine, is in concordance with this more restricted use.

Moving beyond the question of the references to camels in the patriarchal narratives, the camel petroglyph from the Wadi Nasib, adds to the growing body of evidence for the use of domesticated camels (albeit on a modest scale) in the ancient Near East prior to the 12th century BC. Beyond the fairly frequent appearance of camel bones in pre-Iron Age archaeological contexts (which do not necessarily support domestication), there are numerous artistic depictions of camels being utilized by humans. Examples include: (1) the Abusir el-Melek camel figurine of the 1st Dynasty which

[5] This discovery evokes a parallel found at Aswan, Egypt that also depicts a man leading a camel by a rope. This petroglyph was originally described by Georg Schweinfurth in 1912 (a picture of this petroglyph appears in Ripinsky 1983: 27, and 1985:139). Again, the petroglyph can be possibly be dated by an accompanying inscription. The inscription is hieratic and was dated by Müller to 2423-2263BC. (6th dynasty), making it considerably older than The Wadi Nasib Camel Petroglyph.

shows a recumbent camel carrying a load (Keimer 1929; Monten 1959: notes 6 and 7); (2) the Rifeh Cemetery camel statuette (near Memphis) dated to between1550-1200BC, which depicts a camel carrying two jars (Petrie 1907: 23, pl. 27); (3) the Benha figurine of a camel carrying jars (1300BC); (4) Hama (Syria) a camel figurine (ca. 2300BC) which seems to harnessed with ropes (Ingholt 1940: 38 and Pl. XIII:1); (5) the Syrian Cylnder Seals (18th century BC) which depict riders (dieities)? on two-humped camels (Prodoa 1977).

This growing body of evidence which geographically spans Egypt, Cis- and Transjordan and Syria (not to mention Mesopotamia), and now includes the Wadi Nasib Camel petroglyph, would seem to require us to reassess the role of the camel in trade and transport throughout the eastern Levant, including Transjordan, during the Bronze Ages.

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Trade and the Acquisition of Wealth in Rural Late Antique North Jordan

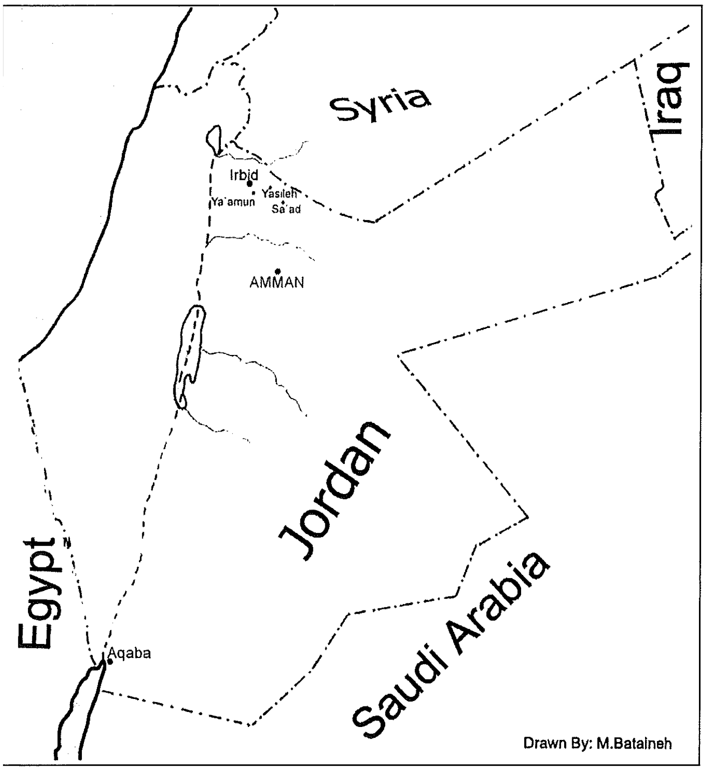
Abstract
Research at small rural Roman/Byzantine sites in north Jordan refutes the traditional view of rural life in Late Antiquity that includes high taxation, lack of socio-economic mobility, low agricultural productivity, and the inability to accumulate wealth. To be sure, this traditional view has been challenged by historians and archaeologists who are showing that Palestinian wines were produced in great quantities and shipped throughout the Mediterranean area (Kingsley 2003; Kingsley and Decker 2001). It is our contention that this wine industry extended into the highlands of present-day north Jordan and that the prosperity it brought extended beyond the cities into the small villages. In support of this contention: 1) Churches in these small communities have professionally laid mosaic floors, requiring wealth to obtain. 2) Jewelry from individual horizontal shaft tombs (that have been defined as tombs of the poor) is of good quality silver or gold, suggesting aspiration to greater wealth. 3) According to stable carbon and nitrogen isotope analysis, the diet of the inhabitants of the small and large tombs does not differ, and has not declined in quality since the Late Bronze Age. 4) And finally, the size and complexity of winepresses testify that these villagers of north Jordan took part in the lucrative wine trade in the Mediterranean. All of these indicators combine to show that not all the wealth was drawn off in taxes and in profits to the few. In sum, the north Jordan rural sites were populated by a comfortable class of inhabitants who lived rather well, contradicting the traditionally held role of impoverished peasants.

Introduction
The Late Roman/Byzantine period saw the peak of population and settlement intensity in north Jordan, owing to several factors. There was a sense of general security that allowed settlement and food production to exist in safety. Trade and economic networks encouraged an overall prosperity. An expanding religious community was given the highest political support and attracted pilgrims as part of the Holy Land itinerary (Watson 2001; Piccirillo 1985; MacAdam 1994). Dating from the foundation of Constantinople in 324AD to the Muslim Conquest in 636/640, north Jordan enjoyed the fruits of a peaceful and productive agricultural economy.

It has been argued (e.g. Jones 1964) that the Jordan population in the Late Roman/ Byzantine period suffered from severe economic stagnation. Our work in north Jordan suggests otherwise. In excavating the sites of Ṣa‘ad (1995-97), al-Yaṣīla (1998), and Ya‘amūn (1999-2004 and ongoing), we found significant evidence of an opposing view in Byzantine villages of comparable size and scope and sharing many features, such as well-constructed churches with mosaic floors, group and individual tombs ranging in quality but exhibiting fine craftsmanship, and large wine presses capable of supporting export.

This paper describes each site, arranged in order of size from al-Yaṣīla, the largest, to Ṣa‘ad, the smallest, in terms of water systems, churches, wine presses, tombs, and health and disease. The resulting picture is that of a much less stressed population than had been portrayed.

Al-Yaṣīla
Al-Yaṣīla is located 9km east of Irbid City along the western edge of the ar-Ramthā district (FIG. 1). Major excavations of the settlement, churches and tombs were undertaken between 1988 and 1991 by the Institute of Archaeology and Anthropology of Yarmouk University under the direction of Prof. Zeidoun Al-Muheisen in cooperation with the De-



1. Map of Jordan, showing al-Yaṣīla, Ṣa'ad and Ya'amūn.

partment of Antiquities. Additional tombs were identified and a portion of them excavated by the joint University of Arkansas and Yarmouk University bioarchaeological field school in 1998 under the direction of Profs. Jerome Rose and Mahmoud El-Najjar.

Al-Yaṣīla is in an important geographic location at the crossroads between southern Syria, Jordan and Palestine. It is a large town situated just to the east of the city of Arbela (modern Irbid) and the Decapolis cities of Capitolias, Abila, and Gadara ranging off in that order toward the Jordan Valley. The land in the surrounding area is fertile and well suited for agriculture. The portion of Wādī ash-Shallāla that includes the site of al-Yaṣīla is a large depression that collects rain water from the surrounding area and with an annual rainfall estimated to range between 400-500mm there would have been sufficient water for both habitation and agriculture (Al-Muheisen 1989a, 1989b). Availability of water was also ensured by 24 cisterns, a spring located 1km to the north of the site, and a complex water distribution system (Al-Muheisen and El-Najjar 1994). The people of al-Yaṣīla cultivated grains, vegetables, and, in particular, grapes for wine as evidenced by the wine presses discovered at the site. Brief descriptions of those features of the site pertinent to our arguments for rural prosperity are presented below.

Water System

Ash-Shuqayrāt (2000) examined the Roman/Byzantine water systems and storage facilities of al-Yaṣīla, which consisted of 20 reservoirs (some of which were roofed), 24 cisterns (some plastered on the inside), one dam, distribution canals and numerous natural springs. The dam was built across Wādī al-Warrān and it is estimated that the reservoir might have stored as much as 5,211 cubic meters of water. Ash-Shuqayrāt (2000) contends that the extensive water storage and distribution system contributed to agricultural prosperity as indicated by the large wine presses and basalt cereal grinding facilities. The administrative, ecclesiastical and habitation areas extend about 1.5km along the wadi, where the water channel of Wādī al-Warrān joins the Wādī ash-Shallāla in the middle of the site.

Churches

Finely constructed mosaic floors are one of the most common decorative elements of the ancient churches of northern Jordan. The mosaics of the first church discovered at al-Yaṣīla were compared to others in north Jordan such as Jarash, Riḥāb, and Khirbat as-Samrā and were shown to have similar designs that could have been executed by the same artists (Khoury 1990). Various characteristics of the church suggest that it dates to the middle of the fifth or the beginning of the sixth century AD. The second church found during the last season has a dedication in the mosaic pavement that dates it to the year 528AD (Al-Muheisen 1992). The quality of the workmanship argues convincingly for the expenditure of considerable wealth for constructing these two churches.

Wine Presses

A large wine press was found built into the eastern bank in area B across from the church and civic buildings (Melhem 1992; Al-Kousheh 2000). This two-story complex includes several rooms with treading floors and a carved socket for a screw press, as well as huge settling vats for the juice, water cisterns and storage caves. The complex is associated with a large civic building located just below it. Melhem (1992) argues convincingly that this huge wine press was intended for commercial production in contrast to the small presses found at other nearby contemporary sites. The wine press dates from at least the fifth century AD and shows evidence for all methods of grape juice extraction including the first juice derived from just the weight of the grapes alone, to treading with feet and ultimately using water and a screw press to acquire the last residues of grape (Melhem 1992). All indications are that wine production was a major enterprise at al-Yaṣīla.

Tombs

During the excavations of Prof. Al-Muheisen 30 tombs were identified, 20 of which were excavated (Khrais 1997). These were large horizontal chamber tombs of three types: first those with arcasolia and loculi; second with just loculi; and third with loculi and stone-cut graves in the floor. The bioarchaeology field school completed the excavation of the remaining tombs in 1998 (Anderson 2000). These included horizontal chamber tombs without any cut features and seven horizontal shaft tombs ending in a loculus. All of these tombs date to the Late Roman and Byzantine periods (Al-Muheisen and El-Najjar 1994). These tombs are arranged in rows along the almost vertical wadi wall and face the churches and civic buildings located on gently sloping ground directly across the wadi. All of these tombs are finely carved, exhibiting textured walls and symmetrical arcasolia, loculi, and stone-cut graves. The workmanship is clearly professional.

Six horizontal chamber tombs were excavated by the bioarchaeology field school in the north cemetery at the far northern extent of the site; however, the total number of possible tombs in this area was not determined before the end of the final season. The west cemetery is located on the gently sloping surface just back from and at the top of the steep wadi margin. Here 225 horizontal shaft tombs ending in loculi were recorded. All had been robbed in modern times and only 20 yielded any objects or human bones (Anderson 2000). The tombs in the north and west cemeteries are not constructed with the same quality of workmanship and clearly indicate differences in expenditures on tomb construction and hence social class. There is evidence of variation in burial customs due to differing social status and religious beliefs once Christianity became the normative religion. Both single and group tombs constructed during the Roman period were reused in the Byzantine. The presence of animal bones alongside the human remains indicates the practice of funerary feasts and, possibly, subsequent anniversary meals (Al-Muheisen and El-Najjar 1994).

Health and Disease

Examination of the skeletal remains from al-Yaṣīla produced very few cases of pathological lesions (Al-Muheisen and El-Najjar 1994; Khalil 2003). These included osteoarthritic lipping on the cervical (neck) vertebrae, possibly due to carrying heavy loads on the head along the very rough terrain adjacent to the site. Osteoarthritic lipping found on other joints such as the elbows and knees is most likely due to advanced age and none of the cases was extensive. Since the skeletal remains were free of infectious lesions, there was no evidence of the major diseases or conditions common at the time that include tuberculosis, leprosy, the anemias (iron deficiencies), treponematosis (syphilis), and rickets (Al-Muheisen and El-Najjar 1994). Even severe bone fractures were lacking. The incidence of dental enamel hypoplasia indicates moderate childhood stress. These grooves on the teeth formed during childhood are the result of low protein intake and infectious disease (Khwaileh 1999). However, the death rate among infants and young children, when compared to other contemporary skeletal samples, was found to be at the low end of the range, indicating that many children recovered from the stress of childhood as indicated by the hypoplasias (Al-Muheisen and El-Najjar 1994). We suggest that some sort of disease, epidemic or general childhood diseases such as small pox, chicken pox, measles, diarrhea, gastrointestinal infections, seasonal variations in nutrition, and probably deficiencies of iron and protein, may have led to childhood stress seen in the hypoplasias and to death for some of the children.

Antimortem tooth loss was common among both the young and old and can be ascribed to periodontal disease due to caries. Tooth wear was also extensive and is attributed to the extensive use of basalt grinders in preparing the grains for bread making (Khwaileh 1999). The incidence of dental caries was not only higher than those reported for Neolithic sites, but also higher than small Byzantine village sites like Ṣa'ad (Khwaileh 1999). This strongly suggests that, in addition to the carbohydrates from various grains typical of an agricultural diet, these people were sufficiently wealthy to acquire sugars and other sweets.

Ya'amūn

The site of Ya'amūn is located 25km southeast of Irbid among the most northern set of hills bordering the Ḥawrān, which is the fertile agricultural plain that extends northward into Syria (FIG. 1). Like al-Yaṣīla, the site is located just to the east of the ancient city of Arbela and the Decapolis cities, but it was smaller in population and civic importance than al-Yaṣīla. Excavation of the site began in the summer of 1999 and is still ongoing as a bioarchaeological field school operated jointly by the Anthropology Department of the University of Arkansas directed by Prof. Jerome Rose and the Department of Anthropology of Yarmouk University directed by Prof. Mahmoud El-Najjar. The site has produced evidence of continuous occupation from the Early Bronze Age through the Islamic periods, but the discussion here focuses only upon the Late Roman through Byzantine occupations. To date the site has produced a church, four wine presses, 189 tombs, and 54 cisterns for water storage. The features most relevant to our discussion are briefly described below.

Church

The Ya'amūn church is a basilical style church that measures 15 by 25 meters. The floor consists of colored mosaics with representations of people, animals, plants, various religious symbols, and geometric designs. Two of the imported marble pillars of the altar railing were discovered hidden away and two circular baptismal facilities are still extant. The mosaic pavement is also found in the four rooms excavated to date adjacent to the church and presumably forming part of the religious complex. The quality of the mosaic workmanship is high and comparable to al-Yaṣīla and churches within the adjacent Decapolis cities. The date in the Greek dedication inscription has not yet been completely deciphered but is clearly mid-sixth century and credits local people with funding the mosaic floor. The church was ultimately abandoned and then modified for secular use during Islamic times.

Wine Presses

Four wine presses have been located and excavated to date. The wine presses range in size from a single treading room to as many as seven. The single room press is located on a hill to the north of the tall and is nicely carved into the bedrock with a carved socket for a screw press. The next largest press has four rooms and is located on a hill slope to the west of the tall. Again the press floors are carved into bedrock and each has a collecting filter for the juice. The next largest is carved into the bedrock on the slope of the tall. There are six small floors arranged around a very large floor carved into the rock at a lower level. One pressing floor has a carved socket for a screw press. Each room has collecting filters for the juice and the storage cistern for the large central pressing floor is at least 5,000 litres. The most recently discovered press also has seven pressing floors carved into the bedrock. Each of the pressing floors has a filter for the grape juice, and there is one carved socket for a screw press. The major storage cistern has not been completely cleared, but it is much larger than the storage cistern of the previously described press. Most interesting about this press is that we found the lowest room to have preserved a portion of its original mosaic floor. Based on their size, complexity, and structural sophistication, we think that these presses indicate the commercial production of wine. Overall suitability for habitation and agriculture is indicated by a good water system of 54 carved water cisterns identified to date (El-Najjar and Rose 2003).

Tombs

The vast majority of the 189 excavated tombs are of Late Roman and Byzantine date; only 9 are Bronze Age. The large tombs range in style from horizontal chamber tombs with arcasolia, loculi, and carved sarcophagi to horizontal chamber tombs with either stone-cut graves or sarcophagi. There are also vertical shaft tombs with arcasolia and stone-cut graves. As at all other sites in north Jordan that we have visited, more than two-thirds are horizontal shaft tombs ending in a loculus. As seen also at al-Yaṣīla, the tombs vary in the quality of workmanship from beautifully crafted tombs cut into the hardest of rock to elaborate, but more crudely carved tombs using softer rock layers. These tombs show the entire range of skill levels in tomb carving from professionals hired at some expense to local/amateur carvers completing the tombs only as needed for more dead. This variation suggests differences in access to financial resources within the community. The number of finely carved tombs is smaller than that at al-Yaṣīla and the large number of crudely carved tombs are far below the lowest quality seen at al-Yaṣīla. Grave goods also vary in quality from very fine glassware to only ceramics and lamps. Items of jewelry are made of silver, copper alloys, and iron.

Health and Disease

Studies of the human skeletal remains recovered to date have found no evidence of extensive chronic infectious diseases (e.g. Obeidat 2001). This indicates that diet was sufficient to maintain competent immune systems. The frequency of enamel hypoplasia is similar to al-Yaṣīla, indicating low to moderate childhood stress and thus good childhood nutrition. There is evidence of osteoarthritis on the joints of limbs and spines, but not more than would be expected with advancing age. There is no evidence of abnormally heavy work loads. The teeth exhibit typical wear of the period, but carious (decayed) teeth are less frequent than at al-Yaṣīla, indicating less access to refined carbohydrates and sugar.

Ṣa‘ad

The first archaeological exploration of Ṣa‘ad began in 1994 by the Institute of Archaeology and Anthropology at Yarmouk University in cooperation with the Department of Antiquities of Jordan and was directed by Prof. Salih Sari. The next three seasons were conducted jointly by the Institute of Archaeology and Anthropology at Yarmouk University and the Department of Anthropology of the University of Arkansas USA and were codirected by Jerome Rose and Salih Sari (first year) and Mahmoud El-Najjar for 1996 and 1997 (Rose and Burke 2004). Ṣa‘ad was occupied from the Early Roman through the Ottoman periods and is located 27km west of the city of al-Mafraq at an altitude of 850 to 950m above sea level (FIG. 1). The site is located directly on a Roman road forming part of a trade system linking Syria, Jordan, and Palestine. More importantly, Ṣa‘ad is only 17km from the ancient Decapolis city of Gerasa (Jarash), where it could have marketed its agricultural products. The soil at the site is a reddish brown color, rich in minerals and highly amenable to agriculture. Today the land produces various crops, such as wheat, grapes, olives and figs, as well as grazing for a large number of sheep and goats. The average annual rainfall varies between 200 to 300ml (200ml is considered the minimum level for reliable agricultural), and the temperature ranges from 40C in July to 7C in November, with humidity of 30% to 90%. Rainfall for agriculture is supplemented by a major spring located in the broad wadi just below the site. The excavations have documented many features including a wine press, cisterns, 81 tombs, and a church that are pertinent to our discussions here (Rose and Burke 2004). Ṣa‘ad is the smallest of the three sites discussed here and is clearly a small village when compared to the other two.

Wine Press

The wine press is both large and sophisticated and its excellent state of preservation makes it one of the finest presses in northern Jordan (Sari 2004). The wine press consists of seven rock-cut chambers surrounding a large basin with a socket for a screw press, along with small juice collecting vats, that fulfilled the functions of receiving and processing the grapes. A cistern and main reservoir are linked with the wine press. Six of the rooms would have been for gravity pressing or treading before the grapes were thrown into the central chamber for additional treading and adding water and final extraction with a screw press. One side chamber had a socket for either a central post for the treaders to hold on to or for fixing an additional screw press. The dimension of the installation at 13 x 11.5m exceeds that of the elaborate wine press at the "View Point Park" near Aijalon which measures about 9.1 x 7.4m. (Hirschfeld 1983). Another comparison may be made to Khirbat Yājūz (Khalil and Al-Nammari 2000) where the two large wine presses have a combined measurement of 12.5 x 10.5 meters. A survey of 899 fourth to seventh century wine presses in Israel provides an average size of 3.4 x 3.6 meters (Kingsley 2001). The Ṣa‘ad wine press is far larger than this average. The average collecting vat capacity for these presses is 2,400 liters, with 42% of the presses having a storage capacity greater than 4,000 liters (Kingsley 2001). The combined capacity of 4,204 liters places Ṣa‘ad comfortably into this upper group (Rose and Burke 2004). These figures make it clear that this small village was engaged in commercial wine production.

Church

The church of Saint Thomas is located east of the wine press and opposite the major area of tombs (Sari 2004). The church consists of a nave, presbytery, two aisles, and a narthex. The interior measures 24x11m. The floor of the church was paved with a colored mosaic and traces of restoration were observed that indicated continued use or modification of the church during the early Islamic period. The decoration inside the vine scrolls in the main area of the nave consists of palm trees, dates, grapes, leaves, and geometric designs in addition to a high footed amphora and a partially damaged basket. The colors used to decorate the scrolls and their contents are red, brown, pink, blue, black, and cream. There were image motifs in the floor that had been removed and replaced by tesserae of a different size and color. It is probable that some of the medallions originally contained birds and animals that were later replaced by plants. The main panel is inscribed with white tessera on a reddish brown background and most of the inscription is preserved except at the northeastern edge. The English translation is provided here:

> "By the grace of God and of the Lord Jesus Christ this church of Saint Thomas was founded (and paved with mosaics) and furnished for the life of Gerontions [ ] and of his son Elia and the salvation of Porfuria the former wife of his son and of the people who have paid the money. O Lord Jesus accept the offering. It was paved (by care of ?) on the fifth indiction of the year 467. Remember O God the vows of [ ] the illustrious master of weights of the people of Bostra and of John" (Sari 2004).

Here once again the church is well paved by professionals and the inscription indicates the payment of funds by either local people or those with interests in the local community.

Tombs

The total of 81 tombs consists of 71 individual tombs and 10 group tombs. The individual tombs are 69 horizontal shaft tombs ending in loculi and two vertical shaft tombs ending in graves. These tombs are arranged in rows along the side of a wadi situated across from the hill with its church and wine press. The tomb loculi were closed with large rocks. Tombs for multiple individuals consist of 5 horizontal chamber tombs, 4 vertical shaft tombs with stone-cut graves, and one cyst tomb with one cut grave and two graves built of massive blocks of stone for multiple individuals (Rose and Burke 2004). Some of the tombs were carved in Late Roman times, but were subsequently emptied and reused during the Christian Byzantine, while others contained their original inhabitants. Other tombs were newly built during the Early Byzantine. The quality of tomb construction was, with one exception, far lower than that seen at al-Yaṣīla and Ya'amūn; this one exception was the cyst tomb located adjacent to the church main entrance. In fact, even the best tombs are only the same quality of workmanship as the poorer tombs at Ya'amūn, and thus the quality of construction ranges from moderate to low.

Grave Goods and Jewelry

The majority of grave goods were jewelry items, while frequent ceramic lamps provided evidence for dates of use. Using the contents of unrobbed tombs, we know that the better dressed women wore earrings, a necklace, one or more bracelets and one or more finger rings (Rose and Burke 2004). The least wealthy women wore at least one bracelet and one other item of jewelry. Some bracelets are silver and indicate access to wealth. The earrings were made of gold foil molded over a carved stone core that made them look and swing like gold earrings. Most of the bracelets are copper alloy, and chemical analysis shows that the copper alloys were composed to make the bracelets look like either silver or gold (Cooper and Al-Sa'ad 2001). These results in conjunction with the foil earrings indicate that we have costume jewelry, of which the purposeful manufacture and use reflects both the desire and possibility of acquiring wealth and the real jewelry that it could buy.

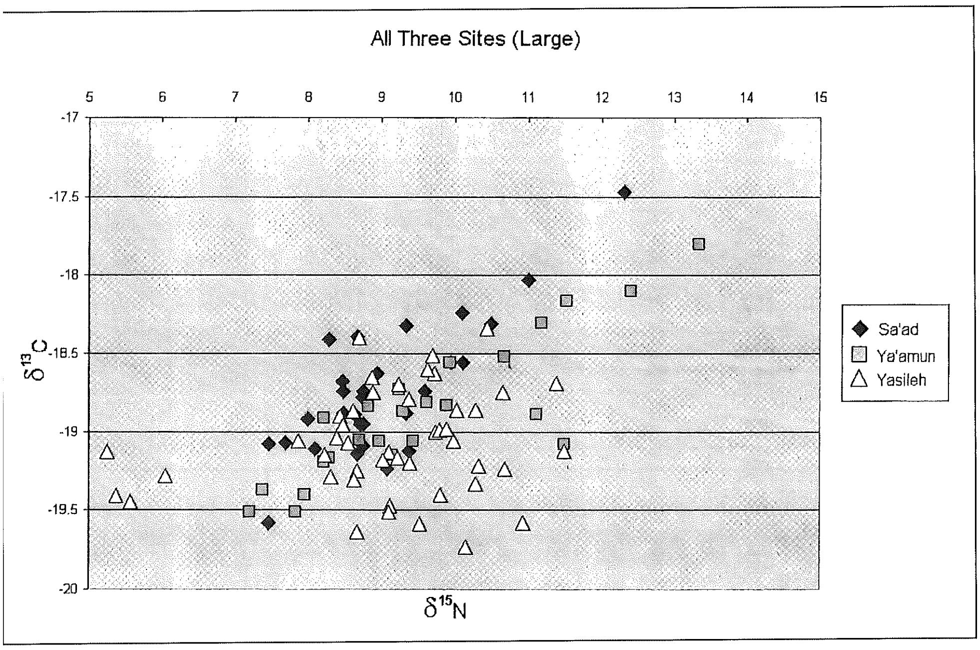
Skeletal Remains

Osteological analysis shows that the people who lived at Ṣa'ad were not very different from any other studied Roman or Byzantine skeletons from the Levant (Rose and Burke 2004). The high frequency of arthritis among the cervical vertebrae suggests that heavy loads were carried on the head. Arthritis rates for the major joints such as the elbow and knee are higher than some studied skeletal collections and lower than others, in particular the prisoners who worked in the copper mines of Faynān. These data suggest that the people of Ṣa'ad worked moderately hard and this conclusion is corroborated by the rugged development of the muscle attachments (Rose and Burke 2004). Comparison to data from al-Yaṣīla indicates a more rugged life style at Ṣa'ad, including a higher frequency of healed broken bones at Ṣa'ad. As with the other sites, evidence of infectious disease was minimal, indicating robust immune systems.

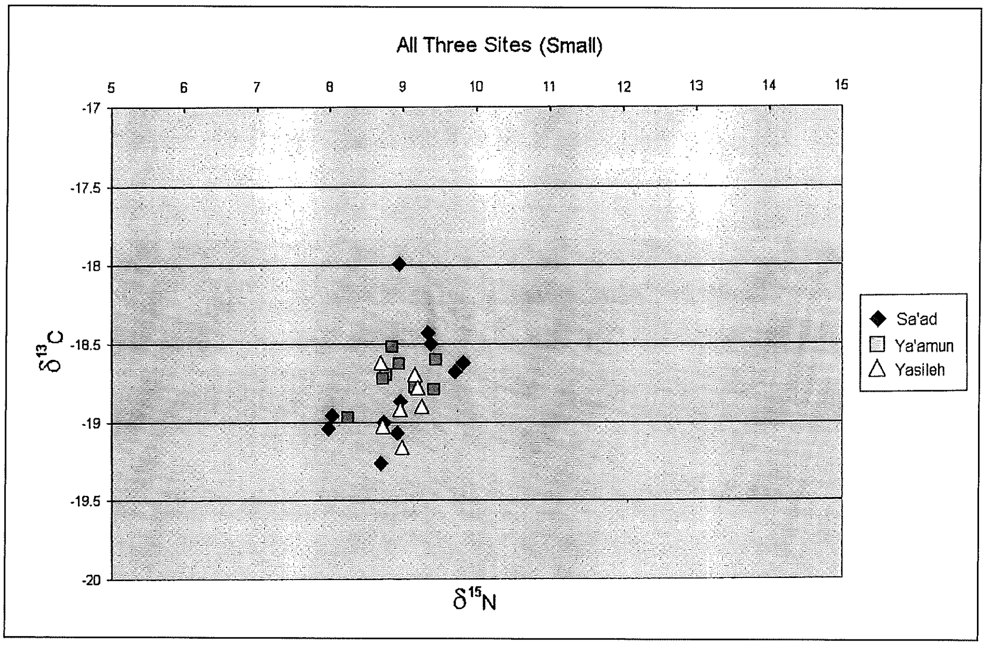
The enamel hypoplasia rates for the canine range between 50 and 61 percent (Al-Awad 1998). When the rates from Ṣa'ad were compared to other Roman and Byzantine sites in the Levant it was found that childhood stress was at the high end of the range and was probably related to lower protein consumption (Rose and Burke 2004). The overall dental decay rate is 12.5%, but the people buried in two of the best constructed tombs had lower decay rates than the average, suggesting a relationship between status and carbohydrate consumption (Al-Awad 1998; Rose and Burke 2004).

King (2001) analyzed the stable carbon and nitrogen ratios of teeth from the three sites of Ṣa‘ad, Ya‘amūn, and al-Yaṣīla to test for differences in diet. She first compared the combined samples from these three sites to the isotope ratios of the Late Bronze Age people from Ya‘amūn and found no differences. These results indicate that the diet had not changed significantly between the Late Bronze Age and the Late Roman/Byzantine in north Jordan (Rose and Burke 2004). If the condition of the rural Byzantine peasants was as poor as the traditional economic reconstruction suggests, then we would have expected to find a significant difference from the Bronze Age. The people were eating mostly plant foods, primarily wheat (as bread), and very little meat. This conclusion is further supported by a recent study by Al-Shorman (2003) who showed that the stable carbon isotope ratios in the enamel of the teeth from the Ṣa‘ad and al-Yaṣīla samples indicate the same contribution of C^3 and C^4 plants to their diet. These studies both conclude that the people of all three sites used the same food resources and based on the values of the stable carbon isotopes, the probable food staple in their diet was wheat (Al-Shorman, 2003).

Figures 2 and 3 show the distribution of the ^{13}C and ^{15}N values for the large group tombs and single person horizontal shaft tombs from all sites. The average values of the stable carbon and nitrogen isotopes from all three sites are not significantly different; what is different are the ranges of the values (Rose and Burke 2004). The distributions of the plots for the large and small tombs is both interesting and informative. The large tombs have the greatest spread of values, with the distribution of Ṣa‘ad and Ya‘amūn being identical. The al-Yaṣīla values have a slightly different distribution with many of the carbon values being more negative and many of the nitrogen values being lower than the other two sites, suggesting some differences in diet at this site, probably with greater access to animal protein. The spread of values in the large tombs at all three sites indicates that there was variation in the diets of the people who were buried in the large multi-person tombs. This might have resulted from the long time span over which these tombs were used (Late Roman to Late Byzantine) and a change in diet over time or most likely differential access to animal foods based upon wealth. These large tombs where all who died were buried together would reflect the full dietary range found in the community. The data for the small tombs, though meager in number, are most informative. All the values from the three sites fit tightly into the middle of the large tomb distributions. The diets are clearly average in comparison to the large tombs. Further, the diets



2. Scatter plot of all samples from the large elaborate tombs at all three sites.



3. Scatter plot of all samples from the small individual tombs from all three sites.

are identical between the small tombs at the three sites, and this tight pattern contributes to the importance of these data. This small range of the data from the small tombs from all three sites indicates a great dietary uniformity between the people of these tombs, both within and between sites. If we continue to attribute these tombs to the Late Roman period (see Rose and Burke 2004) then in the subsequent period represented by the people in the large tombs, some of the diets improved in animal product consumption while others declined. Thus we have differential access to resources.

Conclusion

The traditional view of the Late Antique Levant as presented by Jones (1964), and widely accepted until recently, is one of economic stagnation, with the rural population restrained by excessive taxation and bureaucratic restrictions. From this we must assume that the life of the rural person was at best grim and the potential for economic improvement limited. Flaws in these economic and social interpretations have been identified and published over the past two decades by historians and archaeologists such as Kingsley and Decker (2001), Mango (1980), Parker (1999), Ward-Perkins (2000a, 2000b), and Watson (2001). In particular Kingsley (2001) makes a case for the Palestinian wine trade to be a source of wealth and that the rural peasants had access to some of its benefits. During this time the vast majority of the population was rural, and the historical sources are silent as to how they lived, how hard they worked, and how they were tied to the greater socio-economic structure. Kingsley (2001) among others has made a case for access to wealth by the rural peoples west of the Jordan River, while Parker (1999) has dealt with those in the south of Jordan. In this paper we have marshaled our evidence to demonstrate that this potential for prosperity brought on by the wine trade also existed in Late Antique rural north Jordan. This prosperity is supported by quality of rural church construction, the quality of tomb construction, the jewelry showing some access to wealth and aspiration to more, the skeletons which show evidence of healthy populations, and fine large wine presses that were a source of wealth among the local inhabitants.

Each rural Late Antique town and village had one or more churches similar to the three sites described here. The mosaic workmanship on these floors is first rate and reflects the considerable expense of importing highly skilled craftsmen. Dedication inscriptions tell us who paid for the mosaic floors and indicate that there are individuals with significant wealth willing to expend that wealth within the rural villages. These wealthy people may have lived in the local community, but even if they lived elsewhere they spent resources locally. Our three sites range in size from big town to small village, but the quality of the churches did not vary.

The high quality of some of the tombs supports the proposition that the ability to acquire wealth extended to at least some members of the social hierarchy at each of the three sites because some had the wealth to hire highly skilled craftsmen. The number of high quality tombs decreased as we move from the largest to the smallest, with Ṣa'ad having only one fine group tomb located just outside the church door. Using the quality of workmanship, and not just size, demonstrates that access to wealth varied greatly within these rural communities. Differential access to wealth within each community clearly shows that there was indeed wealth to be acquired in the rural communities. The rural communities were not uniformly poor. The presence of gold foil earrings and bracelets made to look like gold or silver strengthen the case made by variation in tomb quality. This costume jewelry, and its purposeful manufacture and use, reflects both the desire and the possibility of acquiring wealth and the real jewelry that it could purchase.

We have shown access to the necessities of life and similar variation in wealth using analysis of the skeletons themselves. The absence of chronic infections indicates a robust immune system associated with good diets and living conditions. Childhood stress is moderate to high, but these small villages do not differ from their contemporaries that have been studied in modern day Israel and Palestine. The frequencies of arthritis and broken bones are higher than some of the comparative sites and show that these people worked hard and, in fact, harder at the smallest site. However, the work loads were not excessive and well below that of workers in the copper mines. The stable carbon and nitrogen isotope values speak directly to the kind of diet and differential access to protein. The lack of difference from the Bronze Age diet indicates no major change in protein access, that would have resulted if the traditional economic model of the rural Byzantine countryside was valid. The stable isotope data from the individual tombs show that the Late Roman villagers had a good diet with little variation between sites. The data from the group tombs show a great increase in variation among the Late Byzantine inhabitants of the same three rural sites. If increased access to animal proteins from meat, milk and cheese indicates increased prosperity, then we can see that many people improved their condition from Late Roman times, while only a few declined, and most remained unchanged in their diets. Further, the values from al-Yaṣīla, the largest site, indicate they were better off than those living at the two small sites. These results are the best single indicator that there was differential access to resources and wealth in these rural villages.

Finally, we have identified wine production as at least one source of wealth. Each site had one or more large elaborate wine presses that were in the upper range of size in the Late Antique Levant. The large number of rooms indicates that large quantities of grapes could be processed at the same time. Further, the construction of the wine presses indicated efficiency in extracting all quality of juices at the same time: finest quality from gravity and weight extraction; second quality from treading; and third and fourth quality from large treading floor and screw presses. We conclude that the small rural Late Antique sites in north Jordan shared in the access to wealth already established for the wine and agricultural industries west of the Jordan River.

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Suzanne Richard and Jesse C. Long, Jr.

Khirbat Iskandar: an Argument for Elites in the Early Bronze IV Period

Introduction

Much has been written and speculated about the apparent uniqueness of the Early Bronze IV (hereafter EB IV) settlement at Khirbat Iskandar (Rast 2001; Prag 2001; Dever 1989; 1995, Haiman 1996; Gophna 1992: 138; Palumbo 1990; 2001: 236). Is it a city, a town, a large village? Is it urban? Is occupation at the site an anomaly for a non-urban period generally characterized as agro-rural/pastoral-nomadic? Or, should it not be considered an anomaly at all, but rather an "example of an urban EB II-III site one could have expected to survive the collapse" (Dever 1992: 88). The expedition has consistently argued that Khirbat Iskandar's EB IV remains veer from the norm; that the archaeological record (settlement, architecture, and material culture) compares more favorably with small urban sites, e.g., EB III Numayra, than with most of the sites in EB IV. Indeed, comparisons with house type and features at EB II 'Arad have also been suggested in the past.

Renewed excavation (Richard 2002; Richard and Long 1995a, 1995b, 1998; Richard, Long, and Libby 2001, 2005) has revealed a wealth of new data that both illuminate more clearly the occupational history of the site, and support more strongly the previous hypotheses proffered by the expedition; namely, that 1) the level of sociopolitical and economic complexity at Khirbat Iskandar is somewhat unique for the period, and 2) that continuity with Early Bronze Age traditions is discernible in the EB IV settlement. The remarkable state of preservation of the stratified remains offers perhaps the best view of a site that apparently weathered the still enigmatic forces that caused the disintegration of the EB II-III urban system and abandonment of many sites ca. 2350 BC throughout the southern Levant. With a view toward understanding the uniqueness of the site, we offer an interpretive framework (below) that contextualizes and helps to explain the remarkable EB IV remains at Khirbat Iskandar.

In support of that framework, this article will summarily highlight the relevant data both from past work and from the most recent excavations. In the process, we hope to clarify earlier published accounts of the stratigraphy of the site, and to set forth our present understanding of Khirbat Iskandar's occupational history. On the strength of recent discoveries, newly refined working hypotheses now guide the project; namely, 1) there are vestiges of urban sociopolitical and economic organizational institutions at the site; and 2) there is continuity of Early Bronze Age occupation at Khirbat Iskandar in the EB IV period, destruction phase in-between notwithstanding. These hypotheses presuppose continuity in the community's traditions and lifeways, including vestiges of power inequality representative of a ruling elite. That said, one should expect to find evidences for unequal access to resources, as well as other status markings that imply vertical social distinctions, such as differentiated architecture, neighborhoods, or material culture, etc. We believe that such data sets, indicative of social complexity and differentiated social identities, exist at Khirbat Iskandar, and that a case can be made for elites in residence in EB IV. These data are not inconsistent with recent research demonstrating considerable complexity in the period, e.g., in reciprocal trade networks, possible colonization (Goren 1996: 67; Haiman 1966) metal production (Adams 2000) and in burial customs, including probable warrior burials (Palumbo 1987; Philip 1995: Baxevani 1995).

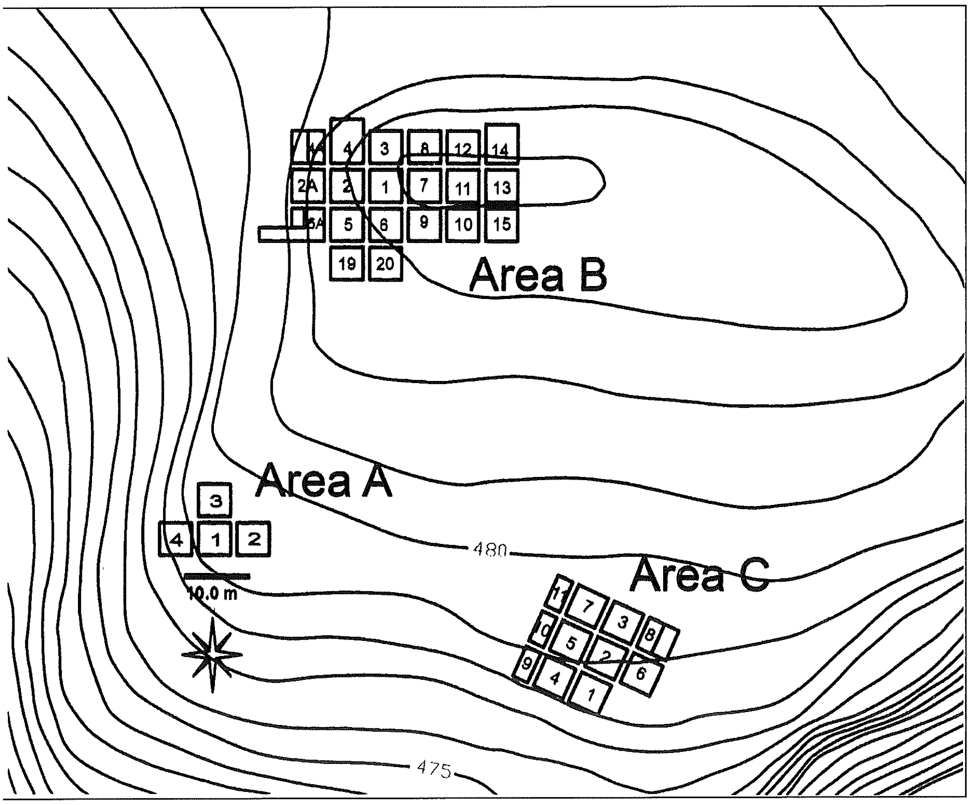
Recent Work at the Site

At the close of Phase 1 operations in 1987, the Ex-edition had completed work in Area C at the south-ast (FIG. 1), where three EB IV phases revealed n evolution to a quite remarkable type of "gate" or ntryway (Richard and Boraas 1984, 1988; Richrd 1990). In Area B, at the northwest, the stratiraphic record had revealed what were clearly nultiple strata, including two major settlements in B IV, two major stages in the construction of the ortifications, and what appeared to be two phases f buildings running under the corner tower. Some f the pottery in deeper probes, though weathered, parse, and generally non-diagnostic, appeared to e early, perhaps EB I or EB II. Given the discovry of an EB I tomb by the expedition (Richard 990), as well as the findings of Peter Parr (1960), he presence of earlier remains on the mound was ot surprising.

Phase 2 operations at the site began with a study eason in 1994, followed by major field seasons in 997, 2000, and, most recently, 2004. Work conentrated in Area B, particularly on the interior ccupational levels within the fortifications. As a esult, the work from earlier seasons has been coniderably clarified.

In broad strokes, from the top, in Area B there re two major EB IV settlements, Phases A and B, oth with sub phasing. There is a Phase B reuse nd rebuild of the fortifications. Below, a major lestruction layer covers an EB III occupational layer, whose architectural elements are a rebuild of an earlier phase, presumed to be EB III, although this is not yet certain. Temporarily, we have labeled those levels C1, C2 and C3. We now are certain that the founding and the expansion of the fortifications date to Phase C. Finally, below the western perimeter defenses, there is a destruction layer covering a stone and mudbrick construction, plus battered pier. We have tentatively labeled those remains, Phases D1 and D2. The date of Phase D is not yet clear, since no interior occupational remains with diagnostic pottery have been excavated. Whether these remains are from the same phase as the structures found below the tower on the north is not yet known. Because of the obvious architectural superposition of each of these phases, and clear separation markers, previously excavated materials and phases termed Phases C and D can now be aligned or realigned with the stratigraphic profile of the site, as currently understood. Whether there are still earlier strata remains to be seen.

It is worth noting that Parr's excavations on the northeast slopes are not incompatible with the above-mentioned phasing. From the top, Period 3ii comprised 3-4 phases of EB IV buildings, plus reuse of Period 3i fortification wall. In Period 3i, there was a large foundation trench (2m deep and 3m wide), probably for a defensive structure, a segment of which was found; several rebuilds of the

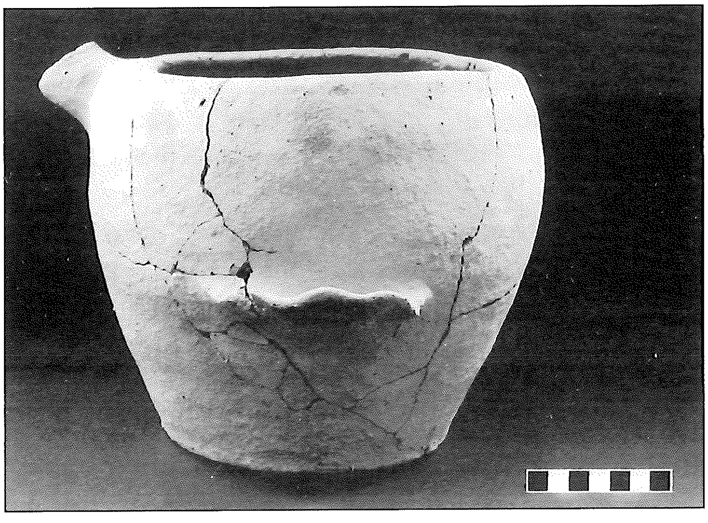


1. Topographic Plan of Khirbat Iskandar, showing Areas A-B-C.

structure were indicated. In Period 2, occupational remains, including mud brick debris from a destroyed building were found. Finally, on bedrock, a large defensive wall, probably EB I, was discovered in Period 1 (Parr 1960).

Previously, we have termed the newly recovered Phase C occupational remains EB II-III; however, in 2004, continued excavation of the same destruction level in two squares uncovered a wealth of pottery, including wavy, ledge-handled teapots and wavy, ledge-handled pithoi (FIG. 2). These classic diagnostics date Phase C at Khirbat Iskandar to the EB III period. Once the considerable number of C14 samples taken from the destruction level has been analyzed, we will have a firmer grasp on the date when the EB III settlement at Khirbat Iskandar was destroyed.

This newly recovered EB III stratum is quite remarkable in a number of ways, not the least being the need to dismiss the near iconic identification of Khirbat Iskandar with EB IV only. Three projects at the site (Glueck 1939; Parr 1960, and the current expedition), and countless sherdings of the site through the years, found at most a handful of diagnostic EB III sherds (Parr 1960: 32), but more evidence for a probable EB I occupation. Clearly, these new discoveries will require a re-evaluation of work and materials from earlier seasons in the light of what appears to be a major settlement of urban occupation at the site in EB III, not to say, possibly a considerable settlement in Phase D, whose date is uncertain as yet. A case in point is the teapot discovered in a probe from the pilot season (Richard 1982: Fig. 4:1). That teapot has been variously dated, based on comparisons with EB IV trickle-



2. EB III wavy, ledge-handled "teapot" found in Phase C at Khirbat Iskandar.

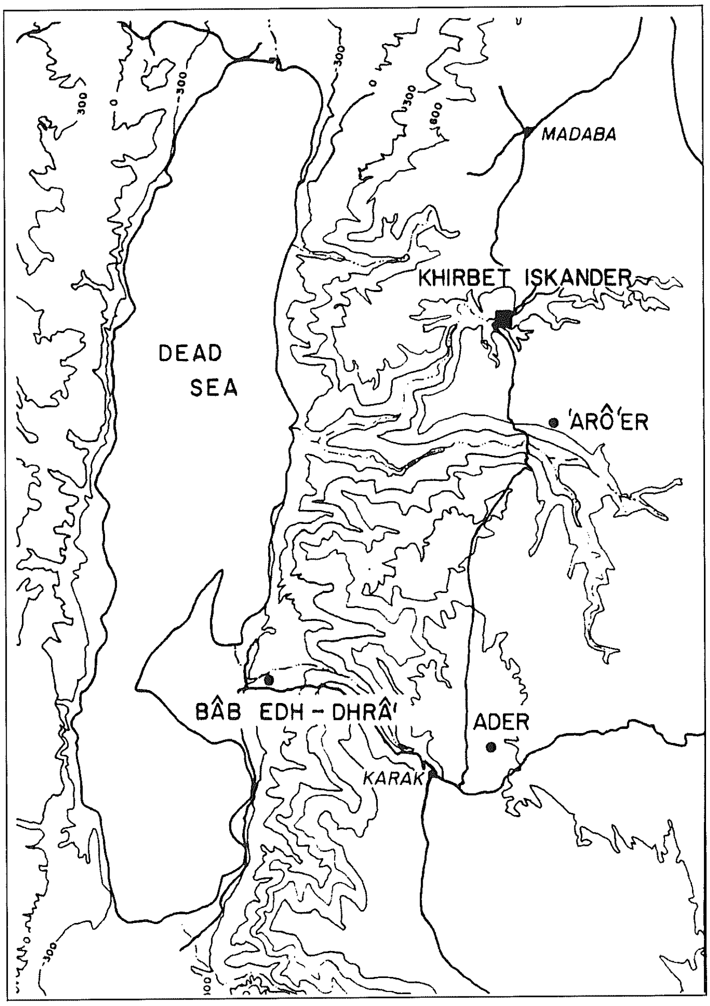
painted ware and with EB III Tomb A at Jericho. Its context and comparisons with FIG. 2 now unquestionably date the vessel to Phase C and, thus, EB III.

The newly recovered EB III level is also remarkable because it makes the wonderfully preserved and, to date, somewhat unique, EB IV settlement at Khirbat Iskandar, much more comprehensible. It renders moot earlier questions about the project's stress on EBA continuity through the EB IV period at the site (although continuity with EBA tradition generally was the thrust of the argument). Clearly, the well-fortified EB III urban site at Khirbat Iskandar and its subsequent fortified EB IV settlement combine to strengthen the argument that, in the face of collapse at the end of the third millennium BC, some urbanites opted for a continuation of their traditional city lifeways. It suffices to note here that EB IV rebuilding and reuse of EB III structures does occur (Richard and Long, forthcoming b).

Finally, the EB III occupation is remarkable because Khirbat Iskandar becomes the only site known thus far to show a complete reoccupation of an EB III tall site, following the destruction that brought urban life to an end throughout the southern Levant. EB IV reoccupation of EB III tall sites is known, e.g., Jericho, Ader, Lajjūn, Khirbat az-Zayraqūn, Hazor, Lachish, Bethel, Tall Bayt Mirsim, Bāb adh-Dhrā‘, Megiddo. Although only the cultic area is on the tall at Bāb adh-Dhrā‘, still there is good evidence for continuity between EB III and EB IV at that site (Rast and Schaub 2003: 399). However, with the exception of Megiddo, whose continuity of the cultic area is probably but a shadow of what may have been a significant reoccupation by EB IV occupants, the original nature of EB IV tall remains is, unfortunately, not recoverable. Yet, surveys indicate that EB III/IV occupation of tall sites was not inconsiderable. Palumbo has shown that thirty percent of EB II/III sites and fifty percent of EB III sites in Palestine were reoccupied in EB IV (1990: 45). Interestingly, some thirty of EB II/III/IV sites continued into the MBA, where a "smooth" transition is noted (Palumbo 2001: 240-241). In many cases, MBA building efforts clearly have obliterated the evidence for EB IV settlement. Note, for example, the quantities of EB IV material culture but the lack of architectural remains at Tall al-Hayyāt, due no doubt to the construction of the temple precinct in the succeeding period (Falconer and Magness Gardiner 1989: 341). It is interesting that as recently as 1989, it was observed that "not a *single* site thus far excavated in Western or Eastern Palestine shows a full continuity of domestic occupation from EB II, through EB III, into EB IV, then on into MB I." (Dever 1995: 236). As the discussion above indicates, it is now possible to emend this long-held view.

Theoretical Considerations

How may we understand the continued success of tall/urban-like lifeways at Khirbat Iskandar in a post-urban period of collapse? For one thing, the site is strategically located on the Central Transjordanian Plateau at a major crossing point of the Wādī al-Wāla, along the main north-south trade route, the ancient "King's Highway" (FIG. 3). Presumably, the site's accessibility to trade and tribute, as well as the continued dominance of agriculture and horticulture (primarily olive), were major factors in its continued occupation throughout most,



3. Map showing some key EB IV sites and the position of Khribat Iskandar along the ancient "King's Highway".

if not all of, the Early Bronze Age, ca. 3500-2000 BCE. However, similar extenuating factors such as these could be suggested for other tall sites in the EB IV. Perhaps Khirbat Iskandar played an important role in the EB IV reintegration of trade routes, the continued production of copper ore in the mines of Faynān, manufacturing, and the expansion of sites between the Faynān, an-Naqab (Negev), Sinai and Egypt, as has been postulated (Haiman 1996; Goren 1966).

Recently, we have developed a theoretical framework that offers some alternative perspectives on why Khirbat Iskandar appears to veer from the norm in the EB IV period (Richard, Forthcoming b; Richard and Long: Forthcoming a). By utilizing insights from Chaos Theory and venturing into the realm of the "archaeology of people" one can posit a model or paradigm that has great explanatory value for understanding a remarkable, continued tall-site occupation in EB IV, following the "chaos of collapse". The interpretive framework is predicated on the view that, regardless of a destruction layer in between, the two prosperous EB III and EB IV settlements at Khirbat Iskandar represent continuity of tall settlement. Intrinsic to this paradigm is the concept of a "mental template" specific to the settlers of this reoccupied tall-site. Arguably, for the community at Khirbat Iskandar (and probably other tall-sites), such a view is totally at odds with a pastoral-nomadic "mental template". The latter has recently been posited for the EB IV population generally (Dever 2003). As developed elsewhere (Richard, Forthcoming b; Richard and Long, Forthcoming a), it is self-evident that the "pastoral-nomadic mental template does not resonate with the evidence recovered from this site. While the aforementioned "pastoral-nomadic mental template" may be applicable to the majority of EB IV society, there's no denying that considerable variability is extant in the period. Only when the hundreds of sites in the marginal and peripheral deserts of the Negev/Sinai are added to the mix, does the resulting picture favor an overwhelming pastoral-nomadic "look" to the archaeological landscape in EB IV. We should not underestimate the strong evidence for a considerable, permanently settled agricultural and sedentary core to the population, with which the inhabitants of those seasonal/temporary sites in the Negev/Sinai were clearly connected (Goren 1966; Haiman 1996). Nevertheless, for the sake of argument, we consider the normative pastoral-nomadic "mental template" to be a useful benchmark against which to compare and contrast the distinctive Khirbat Iskandar site and community.

If one can speculate on the "mental template" driving the community's reoccupation of the tall site of Khirbat Iskandar, one would assume that: 1) the community seemed firmly intent on salvaging and maintaining, to various degrees possible, antecedent urban traditions of the land; and 2) the community likewise seemed determined to reorganize their sociopolitical and economic system, and to reintegrate their community within the interregional system. Based on the archaeological record at the site, these suppositions seem valid. Research on burial customs in the period likewise suggests that a "period of qualitative re-organization of southern Levantine communities" ensued following the collapse of cities (Baxevani 1995: 95). The pastoral-nomadic agro/rural "mental template," on the other hand, drives people to occupy or reoccupy a "peripheral site or a cave or a newly dispersed site or a deserted mound with ephemeral remains" (Dever 2003: 43). Again, the occupiers of this particular urban tall-site appear to reflect motives in contrast to the pastoral nomads, at least from the viewpoint of the "archaeology of people".

So, why did the apparent option for continued occupation at a former urban site seem plausible at Khirbat Iskandar? We know that tumultuous events and conditions, still poorly known to date, transformed the southern Levantine landscape from a uniform and integrated EB II-III urban cultural complex to a landscape of despecialized (in the macro sense) and regional polities in EB IV (Long 2003). We also know that factionalism is a fairly typical phenomenon following a breakdown of any inter-regional system of communication and trade (see, generally, Yoffee and Cowgill 1988; for the Chaco Valley culture, Vivian 1990; the Hopewell culture, Braun and Plog 1982). This seems to be the case in the southern Levant following the collapse of cities at the end of EB III.

Borrowing insights from Chaos Theory, it is possible to assume that, in the face of collapse, individuals or groups can play a role in the outcome. Not generally considered in paradigms of culture change, the perception of and reaction to instability in a system by the individual or the community are cognitive factors not to be underestimated (Stone 1999). Obviously, systemic instability and perception of communities to it varies from site to site, region to region, across the entire inter-regional system. Some communities either suffered greater instability or perceived more instability in the system, which resulted in the subsequent abandonment of their cities for alternative subsistence styles. Others, apparently, perceived less instability in the system; they remained to rebuild and to attempt some maintenance of previous traditions. In such a process, typically, communities gradually tend to experiment with and reorganize the system, economically, politically, socially and ritually. Studies have shown that the transformation after systemic collapse usually includes both of the above elements: traditional (antecedent) organizational principles of the former system, and experimental reorganization, often recharged or energized by outside influences (Renfrew 1979, 1991; Stone 1999; Tainter 1988).

The still enigmatic collapse, destruction, abandonment of sites in EB II-III in the southern Levant is a considerably complex issue, one that requires analysis at the level of individual regions and sites in order to understand the peculiar factors that played a role in their demise. This discussion of the site and population of Khirbat Iskandar is intended as a case study, highly particularized to the site, to its unique archaeological record, eco-environment, and place on the broader landscape.

Generally, one could argue that, given the separate trajectories in reorganization in EB IV in Transjordan and Cisjordan, the dynamics of collapse had to vary considerably throughout the region. This inference derives from the evidence that permanent, multiphase agricultural/sedentary settlements appear to be a cultural phenomenon primarily of Transjordan in EB IV (see also Gophna 1992: 138; Palumbo 2001: 240-41, 243). It is suggested here, that some of these insights from Chaos Theory do explain the variability and uneven evidence for collapse in the southern Levant; they also inform us on the regionalism or factionalism in the subsequent EB IV period. Although paradigms describing the EB III/IV shift — continuity / discontinuity; urban / deurbanization; specialization / despecialization; urban / rural; urban / pastoral-nomadic — have played an important role in the re-evaluation of the EB IV, Chaos theory offers more explanatory value.

The newly recovered EB III stratum at Khirbat Iskandar serves to bolster the interpretation of the site's fortified EB IV settlement as representing the last vestiges of Early Bronze Age urban traditions. We surmise that, among other factors undoubtedly, reoccupation at Khirbat Iskandar following the collapse reflects the perception that instability in the system was not insurmountable, and that some semblance of the earlier "urban" system could be maintained in a general reorganization.

Thus, we suggest that the EB IV population at Khirbat Iskandar chose to perpetuate a semblance of "city-life" at a well-established former urban site in a strategic and successful eco-environmental niche on the Central Transjordanian Plateau. By focusing our lens on a variant, perhaps idiosyncratic, population in the period — the settlers of the urban sites — we hope to provide a glimpse into the perceptions and behaviors of individuals who, apparently, made choices distinctly at odds with the "majority" of people in the face of collapse. More specifically, the theoretical structure sketched above contextualizes and helps to explain the higher levels of complexity apparent at the site, including the evidence for elites.

The Archaeological Evidence

As much of the evidence concerning the relevant materials at the site has been elaborated recently in several sources (Richard 2000, 2003, Forthcoming a and b; Richard and Long, Forthcoming a), the following is a summary discussion highlighting the relevant evidence bearing on the issues, paradigm, and hypotheses detailed above. Relevant to the discussion is the site and its catchment area (FIG. 4). Given the results of excavation and survey, the political and territorial, as well as economic, boundaries of Khirbat Iskandar extend far beyond the tall itself (see also Prag 2001). Recent GPS survey of the tall delineates a mound of 2.5 hectares, although the east and southern sides have eroded. The project excavated a "circle of stone" feature in 1987 to the east beyond the small wadi, which bounds the tall, as well as a "high place" in 2004 on the summit of the hill behind and overlooking the site on the north. Excavations took place in Cemetery D in the hillside, across the wadi to the south, Cemetery E to the east, and Cemetery J to the west. Menhir have been found throughout the vicinity of the site. Although some of the features could very well be EB III, the vast EB IV cemeteries in the vicinity indicate that Khirbat Iskandar, just like Bāb adh-Dhrā', was a central site or regional center, to which kindred peoples returned to practice the rituals associated with burial of the dead.

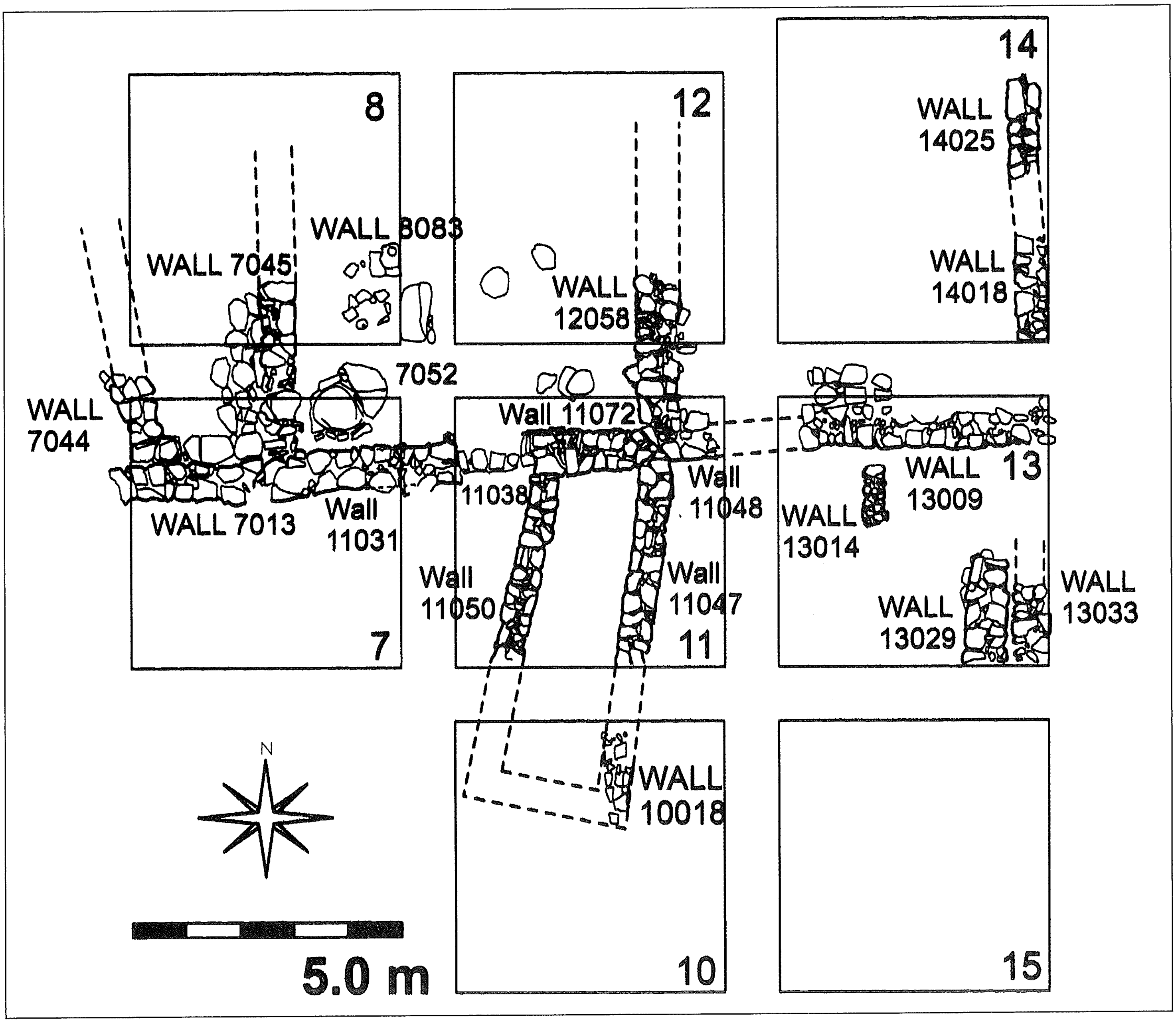
Although much of the surrounding area is under cultivation, when Glueck explored the site, he noted circles-of-stone features, menhir, EB IV ceramics and occupational remains beyond the site in all directions, including the area to the north (1939). It is also worth emphasizing that the fortifications and towers were visible at the time, thus strongly suggesting that they were still in use through the EB IV period, the latest layers on the mound. In particular, Glueck noted that the uppermost (EB IV) structures at the north were built against the outer fortifications (1939: 127). The evidence of

4. Khirbat Iskandar and its environment in a view from the east.

paleobotanical remains (Neef 1990), faunal remains, geomorphological evidence for irrigation agriculture (flood terraces to the west of the site, per Carlos Cordova), along with the requisite material cultural remains attesting to production facilities for olive oil, all combine to illuminate a stable economic regime underpinning what appears to be occupation at the site of Khirbat Iskandar throughout most, if not all, of the Early Bronze Age.

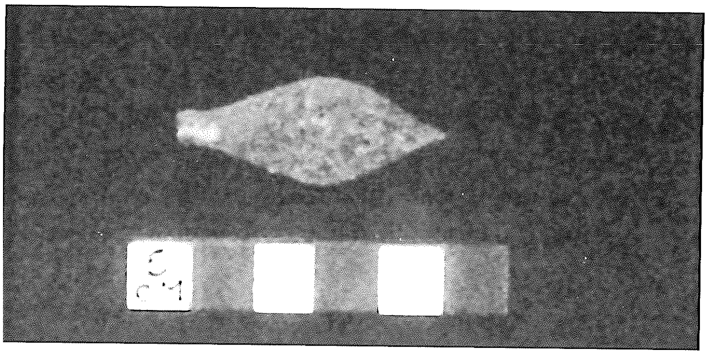
With the above as a backdrop, then, a brief discussion of the relevant EB IV materials follows. In Phase B, what we have termed the "public complex" succeeds the destroyed EB III settlement at the northwest (FIG. 5). The complex is unique at the site. The tripartite building, its furnishings, its unusual range of materials (see below), and its location suggest continuity with what we have termed "the citadel area" from Phase C. The highest elevation on the mound, the "citadel area", includes a reinforced tower, steps leading up to a platform, a well-preserved inner and outer defensive line, all bounded by a substantial north-south transverse wall at the east. The EB IV "public complex" includes a bench-lined room, a large central room, and a third room, the eastern boundary wall of which runs to the outer fortifications. Within the Phase B destruction, a wealth of whole and restorable vessels and objects came to light.

As detailed elsewhere (Richard 2000), the complex included a wide range of vessels and an unusu-



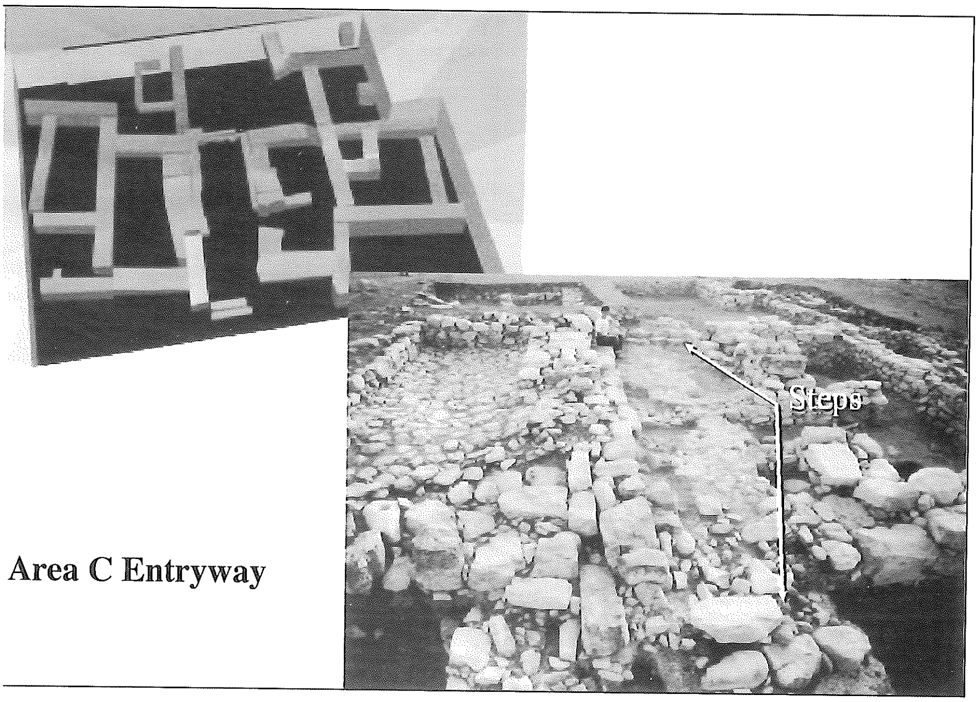
5. Khirbat Iskandar, Area B, Phase B, the "public complex".

al number of well-made and highly decorated jugs and juglets. In comparison with the usual domestic assemblages found elsewhere on the mound, the evidence for concentrated storage facility is unique. Volumetric study of thirty-five restored storejars alone points to at least 834 liters of product, adding the widths of 100 of the 103 restored vessels suggests nearly 26 meters of shelving space would be necessary to store them, or that there was a second floor. The restored vessels (Richard 2000) represent only a portion of the assemblage of pottery discovered in the building. The stereotypical olive oil production materiel is seen by the large vats, various sizes of spouted vessels and by pithoi. Whether these stores were intended for trade, for redistribution, for use in public rituals, or other, all things considered, it is difficult to label this complex as domestic. The discovery of miniatures and several status items (below) serves to reinforce observations made long ago (Richard 1990) that the Phase B northwest sector probably was a public area, possibly connected with the cult, as suggested by pits with whole vessels and food offerings *(favissae)*. At the very least, the combined evidence implies the control of production and a level of political/economic control made explicable only by assuming that elites were in residence at the site. We believe it is possible to discern such social identities; that is, those having, apparently, unequal access to wealth in the EB IV at Khirbat Iskandar. The recent discovery in Phase B of a ceramic bull's head and a unique bronze spearhead (Richard Forthcoming a), both of which are indicative of differential wealth and perhaps gifting, strengthens the view that elites were in residence at the site of Khirbat Iskandar.



6. Bronze socketed spearhead from Phase B at Khirbat Iskandar.

The spearhead is significant because it illuminates further the transition to tin/bronze alloying processes in the southern Levant at the end of the third millennium, BC (FIG. 6). It provides us with valuable data with which to further the discussion concerning the role of metalworking and its socioeconomic implications in reconstructions of the EB IV period; it offers insight into the level of institutional complexity and specialization that is a remnant of the previous urban era. This particular artifact can be added to a growing corpus of bronze weapons (mostly daggers), virtually demanding the conclusion that the EB IV people were more innovative and the period more pivotal as a transition to the MBA than most of us believed. For a full discussion of the spearhead, see Richard (Forthcoming a).



7. The Area C "gateway" at Khirbat Iskandar, photo and isometric view.

Thus, it is really the uniqueness of the Area B, Phase B building complex that allows us to explore the "alternate EB IV mental template". All the evidence points to the continuation of public occupation in an area that gives every indication of being a high status citadel at the highest point on the mound. Although it is not possible to discuss the overlying Phase A settlement, the contrast between its domestic nature and the Phase B public area could not be clearer, pointing to discernible functional distinctions in site settlement. We have hypothesized previously that, following the destruction of Phase B, the public area shifted to Area C at the southeast, where the monumental (for EB IV) "gateway" or entryway is found (FIG. 7). A brief look is in order, since the three-phase occupation in Area C serves as the archaeological correlates to the theoretical framework posited earlier.

Briefly, Phase 1 witnesses the reestablishment of stability at the site and return to some modicum of equilibrium. It is a transitional EB III/EB IV occupational phase witnessed especially by the intrinsically local Early Bronze Age red-slipped and burnished pottery and virtual absence of the fossil-type of the EB IV — the inverted, rilled-rim platter bowl. In Phase 2, however, the distinctive inverted, rilled-rim platter bowls (the caliciform assemblage) appears and merges with the local red-slipped wares and forms; new forms also appear, e.g., the necked cooking pot. The sum of the evidence suggests the community experimented with, modified, and added to remnant traditions, a type of reorganization spurred on by new, outside influences. Finally, in Phase 3, where there is reuse of Phase 2 walls, the former domestic area was transformed into an entryway or gateway of some sort. The caliciform ware dominates the repertoire and new types appear, e.g., the beveled rim platter bowl, carinated bowl, and straight-sided cooking pot. Yet, the last vestiges of the millennium-long EBA traditions, though greatly diminished, are still evident to the very end.

Conclusion

In this essay, we have shown that the excavations and material culture recovered at Khirbat Iskandar indicate that there was a higher level of complexity at the site than found in the EB IV generally. The sum of the evidence suggests that elites were in residence at the site. Framed with Chaos theory and an alternate EB IV "mental template", there is a plausible rationale for the continued occupation at Khirbat Iskandar in the face of collapse. We interpret the remains to indicate that the community was intent on maintaining remnant organizational principles with which they were familiar, including the control of production by elites. The Area C phasing likewise illuminates a community changing and experimenting, as evidenced by new external influences in Phases 2-3.

The evidence is considerable, but the Phase B "public complex" is especially telling. As we have summarized, the bull's head, the bronze spearhead, the unusual amount of storage, the evidence for olive oil production, the high quality vessels, the evidence of offerings, possible *favissae*, and miniature vessels, all combine to demonstrate a high level of social complexity extant at the site. We, therefore, infer that the social identities of those in control of production at the site were elites.

In particular, the discovery of the tin-bronze socketed spearhead adds additional support to the view espoused for some time that elites were living at the site of Khirbat Iskandar. We might surmise that the very costly and prestigious item was: 1) an offering in the cult, perhaps as a miniature; or 2) an object derived through gifting, or 3) simply a high-status item indicating status/wealth/power. Whatever the answer, the proposed paradigm utilizing both insights from Chaos Theory and an alternate EB IV "mental template", not only makes the EB III/IV occupation at Khirbat Iskandar more comprehensible, but also provides a window on the eclipse of urban lifeways in the southern Levant following the chaos of collapse.

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A List of the Ammonite Kings According to Cultural and Political Interactions

Introduction

The Ammonites were known in antiquity as a Semitic people who established their kingdom in the last decades of the Second Millennium BC, and flourished for most of the First Millennium BC. The first historical mention of them as a 'kingdom' is in the Old Testament (Deuteronomy 2:20, 3:23; Nehemia 4:7, 13:1; I Kings 11:1-2; Landes 1962: 108). The Ammonite kingdom lay east of the Jordan River and north of Moab (Hitti 1951: 179; Landes 1962: 110).

Assyrian annals and documents refer to the Ammonites in the more usual form "Beit Ammon" (Pritchard 1950: 287-298) and distinguish them and from all other states to the north west of Mesopotamia. By the term Beit "they meant the form of a state on a specific land where the throne of rule used to be succeeded by the ancestors of the same family" (Mallowan 1966: 239; Bowman 1962: 191).

An Ammonite inscription on a bronze bottle, dating to the seventh century BC, confirms that the Ammonites themselves used the term (Krahmalkov 1976: 55-57; Zayadine and Thompson 1974: 117,129-30). The Semitic origin and name of the Ammonites was related to their presumed ancestor Ben 'Ammi. The term, in Arabic and Semetic means "my cousin" (Albright 1954: 132-36; Landes 1956: 1-68). They were considered as ancestors of Ben 'Ammi, son of Saint Agios Lot, citizen of the biblical city of Sodom.

The Ammonite king Nahash, was the first king mentioned in the Old Testament as being contemporary with Saul, the first king of the Hebrews (Albright 1957: 12, 1954: 132-133; I Samuel 11:1-2, 11). After that the mention of the Ammonite successor kings and their Ammonite capital Rabbath Ammon were repeated, the first as contemporary with David, who reigned from ca. 1010 to 972BC, and the other as contemporary with king Solomon after him, and others contemporary with other successor Hebrew kings and leaders (Albright 1954: 133, 1946: 130-133; II Samuel 10:1-2).

Ammonite independence was threatened by the Neo-Babylonians and the Persians in the Greek (Hellenistic) period (Abu Dayyeh 1979: 39-44). However, the successors of Alexander the Great (in the second and first centuries BC) did recognize the control of Tobiad Herkanos (of Ammonite ancestry and supported by Ptolemy) over the East of Jordan. A monument, constructed with massive stone blocks, at 'Irāq al-Amīr is attributed to him and testifies to his power and wealth (Abu Dayyeh 1979: 43-44; Zayadine 1975: 8; Nehemia 2:10,19, 4:3,7).

Although the Biblical sources indicate the existence of an Ammonite kingdom at the time of the Exodus? in the last decades of the first millennium BC (Deuteronomy 2:20, 3:23; Nehemia 4:7, 13:1; I Kings 11:1-2; Landes 1962: 108) no other sources can confirm an Ammonite monarch before the story of Shaul, king of Judah, who reigned around 1020BC.

List of the Evidenced Ammonite Kings

Nahash I
Before 10th century)
(Contemporary with Shaul, King of Judah 1020BC).

This king of the Ammonites had a hostile relationship with King Shaul of Judah and fought battles with him around Yabish Gilead (I Samuel: 11; Landes 1956: 152-53; Albright 1946: 222; Abu Dayyeh 1979: 45).

King Nahash II Son of Nahash I
(Contemporary with King David 10th century BC).

According to King David of Judah, this Nahash

II, son of Nahash I, was in good terms with him and showed kindness into him "as his [Hanun] father, Nahash, showed unto me" (II Samuel 10: 2).

Hanun Son of Nahash II
(Beginning of 10th century BC, contemporary with King David).

The Bible tells that when King Nahash of Ammon, the old friend of King David, died his son Hanun inherited his throne. On the death of Nahash II, King David sent delegates to pay condolences to the new king "Then David said, I will show kindness unto Hanun, the son of Nahash as his father showed kindness unto me. And David sent to comfort him by the hand of his servants came into the land of the children of Ammon". However, King Hanun insulted those delegates: he "shaved off the one half of their beards and cut off their garments in the middle, even to their buttocks, and sent them away". He did this because "the princes of the children of Ammon" suspected the delegates to have been spies who had come "to spy out and to overview" the Rabbah (city or capital) of the Ammonites. As a result hostile relations commenced with King David (II Samuel: 10-12; Albright 1954: 136; Cross 1973: 13-14).

Shobi
Son of Nahash II and brother of King Hanun
(Second half of 10th century BC, Contemporary with the last days of King David).

He assumed the throne after his brother Hanun (Landes 1956: 145-152; Zayadine 1974: 135; Thompson 1073: 11; Abu Dayyeh 1979: 46). This king was, like his father Nahash II, on good terms with King David. He had offered food and refuge to King David when he was fleeing from his son Abshalum, to the east of the river Jordan, the land of the Ammonite's (II Samuel: 17; Landes 1956: 152-153).

Ruhubi father of Ba'sa
(Before 853 BC, Contemporary with Shalmaneser III 858-824BC).

Campaigning in the sixth year of his reign against Karkara, North Syria, Shalmaneser III mentioned a coalition of twelve kings who supported Irhulini, king of Hamath, and Hadadezer, king of Damascus, in the battle of Karkara (ca. 853BC). King Ruhubi is mentioned as being the father of King Ba'sa, who joined that coalition and sent a number of soldiers to Karkara (Pritchard 1969: 278-9; Abu Dayyeh 1979: 47; Dornaman 1970: 71).

Ba'sa, son of Ruhubi
(Contemporary with Shalmaneser III 858-824BC).

King Shalmaneser III "the legitimate king, the king of the world, the king without rival, the Great Dragon, the only power within the four rims (of the earth), overlord of all the princes, who has smashed all his enemies as if (they be) earthenware, the strong man, unsparing, who shows no mercy in battle king of Assyria, son of Tukul-Ninurta, likewise king of the world, etc..." (Pritchard 1969: 276) marched on many campaigns and fought many battles against different countries. One of those campaigns took place in the sixth year of his reign (853BC) (Pritchard 1969: 278-79). He marched against Karkara, one of the towns of Irhulini from Hamath in north Syria. Irhulini was supported with troops, chariots and battle equipment from a coalition composed of 12 different surrounding states in an attempt to stand against the Assyrian campaign. Ba'sa, king of Ammon and son of King Ruhubi of Ammon, supported Irhulini with a number of thousands of soldiers with their weapons. The battle was fought between Karkara and Gilzau, in the region of Hamath in 853BC. According to Shalmeneser the troops of that coalition were defeated by him (Pritchard 1969: 279; Abu Dayyeh 1979: 47).

Sanipu
(Contemporary with Tiglath-Pileser III 744-727BC).

On a clay inscription, preserved in various copies, Tiglath-Pileser III (744-727) mentions that he received tribute from kings of different vassal states, including King Sanipu of Bit-Ammon and other kings who paid loyalty to the Assyrian empire (Pritchard 1969: 282).

Zakir son of Sanipu
(After 733 and before 701BC).

The name of this king was not referred to in the Bible, nor in the Assyrian texts. However, he does appear in an inscription discovered on a base of an Ammonite stone statue as the son of Sanipu, whom the annals of Tiglath-Pileser (745-727BC) mention as one of the kings who showed respect, paid tribute to the Assyrian Great King and put his kingdom under the sovereignty of Assyria around 733BC when he was campaigning against the region of Syria (Zayadine 1974: 257; Albright 1954: 136; Abu Dayyeh 1979: 48). According to the inscription, the statue belonged to King Yerah Azar, son of Zakir, son of Sanipu (Zayadine 1974: 135; Abu Dayyeh 1979: 49).

Yerah Azar Son of Zakir son of Sanipu
(Before 701 and after 733BC).

The name of this king was inscribed on the base of his small limestone statue. He appears bearded and wearing a garment decorated with beautiful trimmings. That inscription introduces the name of another king, Zakir, whose name was not known before. Moreover, the inscription mentions notes that Yerah Azar is the son of King Sanipu.

Pado'el I
(around 701BC, contemporary with Sennacherib (704-681BC).

Sennacherib's annals record that during his third campaign he marched against different kingdoms and cities in the northwest of Assyria. Amongst those kingdoms were Hatti, Luli, and the Kingdom of Sidon. The coalition-cities of the Kingdom of Sidon are mentioned by name as Great Sidon, Little Sidon, Bit-Zitti, Zaribu, Mahaliba, Ushu (the mainland of Tyre), Akzib, Akko, and all the fortress cities. Ethba'al (Tuba'lu) "was installed (sustained) upon the throne to be their king" due to the pragmatic behavior of that king towards Assyria, and "tribute was imposed upon him (due) to him as overlord to be paid annually without interruption". From the annals we understand that any kingdom, who did not resist the rise of Assyria in their region remained as semi independent states and their kings were admitted (installed according to the text) by the Assyrian king as long as they paid annual tribute to Assyria[1]. Of those states was the Kingdom of Ammon, whose king, Podo'el (Buduiili from Beth-Ammon). He or two other Bod'els (II and III?), retained his/their independence and his/their throne for a long period. He is mentioned again as the King of Beth Ammon in the annals of Asserhaddon (681-669), and again in the texts of Ashurbanipal (668-636BC) (Landes 1956: 261-62; Pritchard 1969: 287, 291; Abu Dayyeh 1979: 49).

Bod'el II Buduili, (Possibly contemporary to Esarhaddon 681-669BC).

King Bod'el is mentioned by three Assyrian kings: Sennhacherib (704-681BC), Esarhaddon (681-669BC) and Ashurbarnipal (668-636BC), who together reigned for a period of 68 years. It therefore seems unlikely that these three references are all to the same Bod'el. It would seem likely that there was more than one king who bore that name, perhaps even three of them. In this case Bod'el II could be placed contemporary with Esarhaddon (Landes 1956: 261-62; Pritchard 1969: 287, 291; Abu Dayyeh 1979: 49).

Amminadab I, first mentioned in 667BC, Contemporary with Ashurbanipal 668-633BC).

On the Rassam Cylinder found in 1878 in the ruins of Kuyunjik, Asshubanipal mentioned that in his first campaign (in 667BC) he marched directly (in the shortest route) against Egypt (Magan) and Ethiopia (Meluhha) because Tirhakka, whom his father, Essarhaddon, had appointed to Egypt, had turned against appointees to other districts of Egypt, because "he (Tirhakka) put his trust on his own power". During his march in that campaign, twenty two kings of vassal states to Assyria, including Amminadab of Beth Ammon, brought him gifts and paid loyalty to him. Moreover, said it is noted that Assurbarnipal made them accompany him in his campaign 'over the land as well as over the sea-route', with their armed forces and their ships (Landes 1956: 294).

A list of these kings, which included the name of Amminadab of Beth Ammon, was preserved on Cylinder C, and composed of various fragments (Pritchard 1968: 294). Differentiation between the two Amminadabs was only possible after the 1972 discovery of a small bronze bottle in 'Amman, which bears an Ammonite inscription which reads "Amminadab son of Hissal El son of Amminadab" (Thompson and Zayadine 1973: 127, 133, 135).

Archaeological discoveries shed more light on the existence of King Amminadab. His name is written on two stamp seals of highly ranked officials, the first one belonging to Adoni Balit, servant of Amminadab, while the other belonged to Adoninur, servant of Amminadab (Torrey 1923: 103-4, no.1; Avigad 1970: 284-5; Harding 1953: 51; Abu Dayyeh 1979: 50-51).

Bod'el III, Buduili (Contemporary with Ashrbanipal But after 688BC and before Hissal El).

Bod'el (Buduili), is mentioned as a king of Beth Ammon in the time of Ashurbanipal, and therefore should be contemporaneous with Ashubanipal (at least after the year 668BC and before the reign of Hissal El, since Hissal El, and Amminadab II reigned between 667-600BC) (Landes 1956: 261-62; Pritchard 1969: 287, 291; Abu Dayyeh 1979: 49).

Hissal El (Between 667-600BC, Contemporary with Ashurbanipal).
Discoveries at Tall Sīrān (inside the University of Jordan campus) revealed the name of this monarch was introduced. A small bronze bottle was found at the mound during a field training course in 1972. Eight lines of Ammonite inscription covered part of the body of that bottle. The inscription mentioned the works of establishing of a garden and it mentioned names of three Ammonite kings, two of them with the title of Amminadab Part of it read "Amminadab son of Hissal El son of Amminadab". That means that there have been two Amminadabs, the first Amminadab was the contemporary of Assurbarnipal, while the other (the owner of the bottle) would have reigned after the time of Assurbarnipal. This has meant that Hissal El was a son of a king, and he himself succeeded to the throne and then his throne was inherited by his son Amminadab II. It seems that this family was in accord with Assyria, as is known from the annals of Ashubanipal, who mentioned the gifts of Amminadab I in 667BC when he marched in a campaign against Egypt. This may be why this royal family ruled for such a long period.

Amminadab II (Around 600BC).
The inscription from Tall Sīrān revealed the existence of the later Amminadab: "Amminadab son of Hissal El son of Amminadab". The style of the alphabets written on the bottle indicate that which the inscription dates to around 600BC, which provides additional evidence for the date of Amminadab II (Thompson and Zayadine 1973: 127, 133-5).

Hanan El (Sixth century, after 600 and before 582BC).
This Female name was known via the discovery of a stamp seal bearing the inscription which reads "Belonging to Alia the maidservant ('mt) of Hanan-El" in a form parallel to that found on stamps of male servants of kings (Landes 1956: 299, 301, 382, note 160; Harding 1953: 51; Torrey 1923: 103-4, no.1), strong evidence that the lady Hanan El was a monarch.

As with the Arabs, females could rise to high office (even to the throne). Tiglath-Pileser III (744-727BC) mentioned an Arabian queen who "had acted against the oath (sworn) like 'Samsi, the queen of Arabia", and again he mentioned "in the country of Sa[ba'..] in her camp...she became afraid..." (Pritchard 1969: 283). That state stands as a strong evidence that the lady Hanan El was a monarch.

On the other hand, Albright relies on the consonant alphabets of the name Hanan which have strong similarity to the alphabets of the Ammonite king Hanun, son of Nahash II, from the 10th century (Albright 1954: 135; Landes 1956: 382).

The period of this female monarch was after the date of the reign of Amminadab II in 600BC and before the reign of Ba'lis in 582BC according to the Bible (Landes 1956: 317; Jerimiah 40:14).

Ba'alis, Ba'alyasa or *Ba'alyisa* (According to Jeremiah he reigned about 582BC, Contemporary with Nebuchedhneser).

Ba'alis was recognized in the Bible (Jeremiah 40:13-16; Herr: 169) in relation to Nebuchedhneser who campaigned against southern Palestine (Judah) and Jerusalem.

Ba'lis the king of Beni-Ammon urged Samuel, son of Nethaniah, a citizen from Jerusalem, to kill Gedeliah. He was appointed as governor of Jerusalem by Nebuchedhneser after he destroyed that town and is mentioned in the Bible as being the king who had Gedaliah assassinated "Moreover Johanan, the son of Kareah, and all the captains of the forces that were in the fields, came to Gedaliah at Mizpah, and said to him "Do you certainly know that Baalis the king of the Ammonites has sent Ishmael the son of Nethaniah to murder you?". But Gedaliah the son of Ahikam did not believe them" (Jerimiah 40:13-16). The date of that campaign (582BC) provides a clue to the date of Ba'lis's reign (Albright 1956: 136).

The discovery of a royal seal impression in 1985 by Andrews University at Tall al-'Umayrī provided the first extra-biblical reference to Ba'lis The object that included the impression was probably a juglet-stopper, made of fired ceramic ware, shaped by the fingers into a blunt cone. The seal had been impressed into the flat end of the cone (21mm high, 19mm in diameter) (Herr 1985: 169). The name was mentioned on the seal impression in the form of 'Ba'alyasa or Ba'alyisa' and recognized as a king from the royal symbols that accompanied the

Table of the Ammonite Kings.

SERIAL	KING'S NAME	DATE OF REIGN	CONTEMPORANEOUS
Gap	Unknown	From time of Exodus	
1	Nahash I	Before 10th Century	Shaul king of Judah (1020BC)
2	King Nahash II Son of Nahash I	10th Century BC	King David 10th Century BC
3	Hanun, Son of Nahash II	Beginning of 10th century BC	Contemporary with King David
4	Shobi	Second half of 10th century	Contemporary with the last days of King David
GAP			
5	Ruhubi, father of Ba'sa	Before 853BC	Contemporary with Shalmaneser III (858-824BC)
6	Ba'sa, son of Ruhubi	After 853BC	858-824BC
GAP			
7	Sanipu	744-727BC	Tiglath-Pileser III (744-727BC)
8	Zakir, son of Sanipu	After 733 and before 701BC	Tiglath-Pileser III (744-727BC)
9	Yerah Azar	Before 701 and after 733BC	Tiglath-Pileser III (744-727BC)
GAP			
10	Pado'el I	Circa 701BC	Sennacherib (704-681BC)
11	Bod'el II (Buduili)	Possibly 681-669BC	Possibly contemporary with Esarhaddon (681-669BC)
12	Amminadab I	667BC	Contemporary with Assurbanipal (668-633BC)
13	Bod'el III (Buduili)	After 688 and before Hissal El	Ashurbanipal (668-633BC)
14	Hissal El	Between 667-600BC	Contemporary with Ashurbanipal (668-633BC)
15	Amminadab II	Around 600BC	After Ashubanipal
16	Queen Hanan El	After 600 and before 582BC	After Asurbanipal and before Nebuchedhneser
17	Ba'alis	582BC	Contemporary with Nebuchedhneser The Neo Babylonian
GAP			
18-	Herkanos of the Tobiad Family	Appeared in the second century BC	Ptolemy II of Egypt

name on the middle zone of the impression (170). In a long argument the name of the king mentioned on this impression was recognized as the same king Ba'alis (Herr 1985: 170-172) who reigned, according to Jeremiah, during an event dated to 582BC. The seal impression thus reads as "Belonging to Milkomor the servant of Ba'alyasa' or Ba'alyis'a".

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The Jordanian Countryside as a Corridor for Population Movements and Trade

Jordan, in its present boundaries, carried the name Transjordan, for many years, until the 25th May 1946. The modern movement towards independence began in March 1921 when Prince Abdullah Ibn Al-Hussein arrived by train to 'Ammān from Ma'ān and was proclaimed prince of the land. Later, in 1925, the King of Ḥijāz ceded to him the districts of Ma'ān and 'Aqaba and the country acquired its present borders. Although the area has been a corridor all through known history it is now certain that the last century witnessed the most significant changes in population. The changes brought about by these movements have not settled yet and our generation, and that of our children, may be exposed to unexpected and serious events, during the coming decade or two.

Under the circumstances, it will be useful to define, in chronological order, the different events and factors that have affected population. The list I have chosen for this purpose is the TABLE 1 that has been compiled by the "Institute voor Aardewerktechnologie in Leiden" (Homés-Fredericq and Franken 1986: 30).

The three first periods namely the Paleolithic until 17000BC, the Epipaleolithic 17000-8500BC and the Pre-Pottery Neolithic 8500-5500BC are too early to have any important bearing on the subject and have therefore not been included in the study. The following periods were reviewed and population movements that took place during their time were mentioned in the detail that time allows for a work of this nature.

TABLE 1. The Chronology.

Pottery Neolithic	5500-4500
Chalcolithic	4500-3200
Early Bronze (EB)	3200-2250
Intermediate Period (EB/MB)	2250-1900
Middle Bronze (MB)	1900-1550
Late Bronze (LB)	1500-1200
Iron Age (I and II A-C)	1200-539
Persian Period	539-331
Hellenistic Period	331-63
Nabatean Period	312BC-106AD
Roman Period	63BC /106AD-324AD
Byzantine Period	324-636
Islamic Period	636-1516
Ottoman Period	1516-1918
British Mandate	1918-1946
Royal Hashemite Kingdom	1946-

The Pottery Neolithic 5500-4500BC

Witnessed settlement in the 'Ayn Ghazāl area north of 'Ammān and confirmed the close relations that seem to have developed between human groups in the 'Ammān Plateau and the Jordan Valley depression near Jericho. Archaeological remains at 'Ayn Ghazāl represent adaptation through joining agriculturalists and pastoralists in one large Jordanian Neolithic town, that continued as a living unit for over 2000 years (Simmons 1995: 119).

The Chalcolithic 4500-3200BC

This period witnessed the development of Jāwā in the al-Ḥarra region in the north of Transjordan. Its archaeological rise to prominence in the Nineteen seventies seemed unique in terms of its elaborate hydraulic system, and massive fortifications in a most inhospitable area. Writing in 1980 Helms was confident that "The establishment of the town and its essential life-support systems, took place during a time of well-attested population movements throughout the greater region and might be seen as a part of this pattern. Thus arises the hypothesis that the technocrats of late fourth-millennium Jāwā may easily have emigrated yet another time and entered the "Land of Milk and Honey" along with other migrants and been the source of the new urban idea in the land that became known as Canaan" (Helms 1981: 9, 11).

The Bronze Age 3200BC-1550BC

Was the period when the Semites made their appearance in Syria starting with the Sumerians, followed by the Akkadians and the Amorites. In the Hyksos period the area started to see the development of city states and it was towards the end of this period around 1500BC that the Egyptian waves of influence started to make themselves felt. A wave of Hittite influence (Lehmann 1977: 303-306) followed in around 1350BC which also extended over few hundred years. The importance of the early Transjordanian states of Edom, Moab and Ammon started to appear immediately afterwards and it is most probable that settlers who founded these states were originally from among the indigenous local nomads who had previously entered the region and settled in it (Chang 2002: 353). The coming and going of all these groups and different armies was in fact another extended period of time when the Jordanian Corridor was being traversed by many groups in different directions.

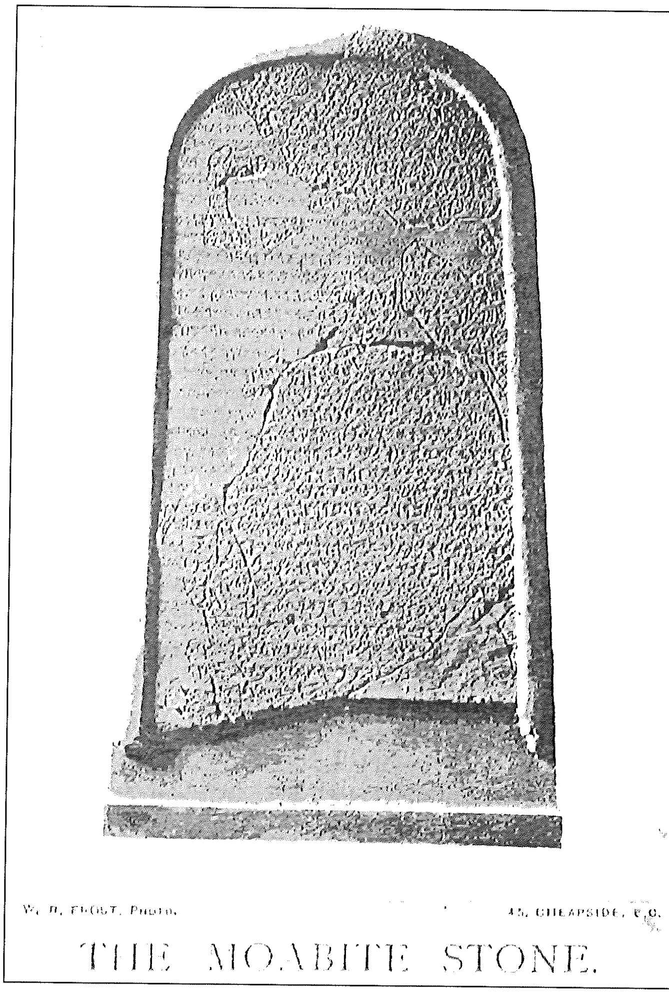
The Iron Age 1200-539BC

This age was so important in the history of our area since it has left its mark on the states as well as the people who dwelled in it, until our present times. It saw the coming of the Israelite tribal movement, which continues to affect the whole area some 3200 years afterwards. The wars that developed between the newcomers and the indigenous population, in the states of Edom, Moab, Ammon and Cann'an (in Palestine), are recorded by the Israelites in the Old Testament. Another source of a different nature, which greatly aids to reconstruct the history of the area, is the Moabite stone (also referred to as the Mesha' stele). Discovered in Dhībān in 1868, this important relic puts on record the endless fight for land and thereby the continuous movement of people. Figure 1 is a photo of the stone and Figure 2 is a translation of its text in English, as received through the courtesy of the Palestine Exploration Fund in London, will give the reader a good idea not only about the local wars, but also about that dire need for water even these early days[1].

The period also witnessed the many movements of the armies of the Assyrians and the Neo-Babylonians, every time a campaign occurred there was a forced or voluntary movement of population, including the exile of the Israelites from Palestine to Babylon. People saw the end of the Neo-Babylonian supremacy when Cyrus of Persia succeeded in invading the Babylonian Empire and conquering it, while its King Nabonidus (555-539BC) was living with his whole court in the oasis of Tayma in northern Ḥijāz, a thousand kilometres from his capital.

The Persian Period 539-331BC

This was the first invasion of the Persians in the area and the period was marked with continuous strife and wars in the north between them and the Mace-



1. Mesha' stele.

[1] The Moabite Stone Rev. W. Pakenham Walsh George Herbert Dublin 1873 P 44

The Translation of the Inscription is as follows :—

"I, Mesha, am the son of Chemosh-Gad, king of Moab, the Dibonite. My father reigned over Moab thirty years, and I reigned after my father. And I erected this stone to Chemosh at Kirkha, a (stone of) salvation, for he saved me from all despoilers, and made me see my desire upon all my enemies, even upon Omri, king of Israel. Now they afflicted Moab many days, for Chemosh was angry with his land. His son succeeded him; and he also said, I will afflict Moab. In my days (Chemosh) said, (Let us go) and I will see my desire on him and his house, and I will destroy Israel with an everlasting destruction. Now Omri took the land of Medeba, and (the enemy) occupied it in (his days and in) the days of his son, forty years. And Chemosh (had mercy) on it in my days; and I fortified Baal-Meon, and made therein the tank, and I fortified Kiriathaim. For the men of Gad dwelt in the land of (Atar)oth from of old, and the king (of) Israel fortified for himself Ataroth, and I assaulted the wall and captured it, and killed all the warriors of the wall for the well-pleasing of Chemosh and Moab; and I removed from it all the spoil, and (offered) it before Chemosh in Kirjath; and I placed therein the men of Siran and the men of Mochrath. And Chemosh said to me, Go take Nebo against Israel. (And I) went in the night, and I fought against it from the break of dawn till noon, and I took it and slew in all seven thousand (men, but I did not kill) the women (and) maidens, for (I) devoted them to Ashtar-Chemosh; and I took from it the vessels of Yahveh, and offered them before Chemosh. And the king of Israel fortified Jahaz and occupied it, when he made war against me; and Chemosh drove him out before (me, and) I took from Moab two hundred men, all its poor, and placed them in Jahaz, and took it to annex it to Dibon. I built Kirkha, the wall of the forest, and the wall of the city, and I built the gates thereof, and I built the towers thereof, and I built the palace, and I made the prisons for the criminals within the walls. And there was no cistern in the wall at Kirkha, and I said to all the people, Make for yourselves, every man, a cistern in his house. And I dug the ditch for Kirkha by means of the (captive) men of Israel. I built Aroer, and I made the road across the Arnon. I built Beth-Bamoth, for it was destroyed; I built Bezer, for it was cut (down) by the armed men of Dibon, for all Dibon was now loyal; and I reigned from Bikran, which I added to my land, and I built (Beth-Gamul) and Beth-Diblathaim and Beth-Baal-Meon, and I placed there the poor (people) of the land. And as to Horonaim, (the men of Edom) dwelt therein (from of old). And Chemosh said to me, Go down, make war against Horonaim and take (it. And I assaulted it, and I took it, and) Chemosh (restored it) in my days. Wherefore I made . . . . year . . . . and I . . ."

2. Translation of Mesha' stele text in English.

donians and Greeks. Their advance westward was checked after the naval defeat at Salamis (480BC) and battle at Plataea (479BC). Nevertheless they remained as overlords until they were defeated by Alexander the great in 331BC when the period of large population movements was to follow for one thousand long years.

The Hellenistic Period 312BC-106AD

The area in this period witnessed, in the northern part of the country, a most important population movement from the north. Large numbers of Macedonians, Greeks and Europeans from the Balkans and central Europe, came to the East in systematic waves of organised settlement. They started with veterans of Alexander's victorious armies in places like Jarash, which name may have been derived from the Greek word Yeresi meaning "The retired". On the other hand, it is certain that Jarash is an older word, having been used for a site in Yemen, evidently a few hundred years older Together with Jarash other settlement centres were occupied e.g. Philadelphia, Pella, Gadara, Capitolias, Abila and Dion. Within a few decades most of the Decapolis cities were established along with the settlers around them (Miller 1993: 410). It is unfortunate that there were no registers of people living in these settlements, but a conservative study leads one to assume that the figure for those of European descent in both the cities and the countryside exceeded half a million people. The indigenous population could have been a similar number.

The drive for settlement by the Greeks, Romans and other Europeans was outstanding in terms of space and time. It spread eastwards to the boundaries of Armenia and southwards to the boundaries of the Ḥijāz. It lasted for nearly one thousand long years. Its influence was only removed by the arrival of the Arab Armies from Medina. The signing of the Covenant of Omar in Jerusalem in 636AD marked the start of the mass evacuation by settlers of European origin and sealed their fate. Naturally many chose to remain on the land that they had known as their own for generations, and it was not long before they became completely accepted as an integral part of the population of the prosperous Umayyad Empire.

The Nabatean Period 312BC-106AD

Simultaneous with the Greek settlement waves in the northern part of Tranjordan, another wave of similar dimension was being mounted by the Arab Tribes of Ḥijāz known as Al-Anbāṭ or the Nabateans. Their numbers were also large since Petra, their capital city, could have had more than fifty thousand inhabitants in its glorious days. Gradually the Nabateans managed to spread their domain to the borders of Medina in the south and Damascus in the north. Their important cities other than Petra, such as Madā'in Ṣāliḥ, Al-'Ullā, Tayma, Umm al-Jimāl and Bostra also prospered. They inter-mingled with the Edomities, who were already settled on the land, together with the Moabites, and Ammonites. These new groups formed the bulk of the indigenous Arab Transjordanians at the time of the Arab conquest in 636AD It is thought by historians that the large tribal federation of Judham was really the fruit of this inter-mixture and that the word Judham is the Arabic rendering of the older Semitic "Edom".

During this relatively short period of five hundred years Transjordan had its great opportunity to become the centre of the Middle Eastern trade with all that such a position gave in influence and wealth. Petra was the centre that received all caravans coming from the Hadramaut via Yemen and Ḥijāz, as well as those that came from Bahrain via Najd, or from Kuwait via Dawmat al-Jandal (Al-Jauf). The goods received from these caravans were dispatched on the Nabatean caravans the seaports of 'Aqaba and Gaza for reshipment and to Damascus for distribution in Syria. The whole episode must have been one of great challenge at a time when it was most difficult to have the peace that is no necessary for trade. However their accomplishments in this field were best described by Ian Browning (1982: 20) when he wrote "By the time the Nabateans were in control of Edom about the beginning of the fourth century BC trade was well established. It was these tough Arab people who lifted it, and no doubt the revenue from it to unprecedented heights. The Hellenistic world would have been able to absorb most of the available supply and China, in its turn, is recorded as importing 'henna, storax, frankincense, asbestos, cloth, silk gauze, damask, glass, orpiment, gold and silver".

The Islamic Period 636-1516AD

In the 650s another wave of Arab tribal settlers was forming continuously, as if to compensate for the loss of the outgoing groups in the Byzantine period. Tribes of the Ḥijāz, Yemen and Oman who were not in the land prior to the conquest in 636AD were now moving into Transjordan in large numbers. Tribes such as Qays, Rabia, Azd, Billy, Kināna, Kalb, Aws and al-Khazraj were making their settlement felt side by side with the tribes that were, for centuries, already in the area, such as Judham, 'Udhra, Ghassan, Balgain and 'Aamelah. Annuals do not give any reports about disputes for agricultural estates or pastureland. It is reasonable to believe that, in adherence to the calls of Caliphs, all able-bodied men joined the expeditions to the north against the Byzantines, and to the East against the Persians, and that there was no reason for conflicts over land ownership. Probably this was also caused by a severe shortage of labour that was met with a number of slaves being brought in to work the farms, especially those in the Jordan Valley. The descendants of those brought in, at these times, are now a living witness of the large communities involved in these operations, mainly in the Ghawr districts.

The century that saw the advance and success of the crusades in Palestine and Transjordan was naturally full of population movements. Many Europeans came to the east and many had to leave when the campaign of Salah ad-Din accomplished its final aims and the Crusader Kingdoms and principalities in the east were defeated. During this period movements from Palestine into Transjordan, and vice versa, were common. Those who decided not to leave seem to have been absorbed by the local communities and all that remains now are the European names of some clans and families that have been maintained over a thousand years.

The Transjordanian countryside during the Ayyubid and Mamluk periods must have witnessed population growth as a result of the political importance the area acquired after the end of Crusader times. Tribes were brought in to support the Governors of Al-Karak every now and then. The tribes of Bani 'Uqbah comprising seven thousand souls and Bani Mahdi, whose number is not recorded, were brought in by Sultan Barquq when he was fighting to regain the throne in 1389 (Al-Ghawanmih 1979: 23). Needless to say that they all played a very important part in Transjordan's life during the following centuries.

The Ottoman Period 1516-1918

The Ottoman conquest of Bilād ash-Shām, including Transjordan, was completed in a short while without much bloodshed or destruction of cities. The Mamluk regime in Syria was already suffering decline and even disintegration when Sultan Salim defected the Mamluk army lead by Sultan Qansaw al-Ghuri at Marj Dabiq (near Allepo) in 1516. The different provinces of Syria fell to the conquerors without fighting and the people may have felt very little of the new regime that was to continue for 400 years (Abujaber 1989: 24).

The first century after the occupation saw some administrative improvements. Many military outposts were built, especially on the Óajj routes, and garrisons were stationed in them to watch over security and the collection of taxes. These taxes were computed as per the Daftari Mufassal (Tax Detailed) Register in 1525AD Seventy years later new registers were evidently needed and the Daftari Mufassal Jadid (New detailed Tax Register) was compiled in 1595/7AD Settled people were already feeling the strains of the new tax collection system and were further concerned about the enlistment of their sons in the army to fight the Empire's wars on the Eastern Front in Iraq and the North-Western Front in the Balkans. At the same time security in the seventeenth century was already weak due to the lack of sufficient numbers of police and Gendarme. As a result, farmers in different parts of Transjordan, started moving to the Ḥawran northwards and Palestine westwards. People from the areas of Wādī Mūsā and ash-Shawbak settled in ar-Ramala and al-Bira north of Jerusalem while residents of aṭ-Ṭafīla and al-Karak started migrating to Hebron, the Balqā' and Ḥawrān. On the other hand, people came to the area from Hebron, like the Majalis themselves, and Jerusalem district and Nablus in smaller numbers (Burckhardt 1822: 381, 420). The net result however was negative and the total number of the population of Transjordan in 1812, during Burckhardt's visit, could not have been more than one hundred thousand.

The sixteenth century saw at least one important Bedouin incursion into the area. This was the Banī Ṣakhr Tribe whose original abode was around the Oasis of al-'Ulla in Northern Ḥijāz (Peake1934: 214). They now number over forty thousand people and were considered, even in 1800, a large tribe of around 1500 tents. Their influence and role in Transjordan's life has been of the greatest importance and the continuous conflict between them and the 'Adwan has been a cause of instability for over three hundred years. The 'Adwan, leaders of the Balqā' Tribal Federation, comprising all the settled tribes in the Balqā' Province, have been continuously attempting to ward off the encroachment of the Banī Ṣakhr on their agricultural lands. Their efforts have been partially successful, as the Banī Ṣakhr was forced to agree to occupation of the land on the two sides of the Ḥijāz Railway. The areas to the west remained in the ownership of the settled tribes such as al-'Ajarma, al-Balqā' and ad-Da'ja as well as the 'Adwan, leaders of the Federation.

Towards the middle of the nineteenth century a new development occurred when the large Ruwala tribe of the 'Aneze Federation attempted to regularly use the pasturelands of al-Balqā'. Feeling together the danger of this new development, the Banī Ṣakhr and the Balqā' Federation joined hands to stop it at an early stage. Many skirmishes and raids took place before the Ruwala saw fit to withdraw northwards nearer to Damascus. Peace was finally concluded between the Banī Ṣakhr and the Ruwala at the guesthouse of al-Yādūda in 1908.

During these times, a certain inflow of people into the different parts of Transjordan seems to have been a continuous process, probably due to better opportunities for agricultural activity. Many of the settled clans were descendents of people who came from Najd, al-Ḥijāz, Ḥawrān and Palestine. There was also a continuous inflow of Egyptians. Large numbers came with Ibrahim Pasha during his occupation of Syria between 1831 and 1841 and many stayed behind. They also came to avoid the *Sukhra* (forced labour) in the construction work to open the Suez Canal in 1867-1868. Their last movement was when numbers of them joined the British Forces that came with General Allenby in 1917.

Three waves of a special character occured in the Eighteen eighties when the Circassians and the Chechen started coming from the Ottoman Empire in 1879, the three clans of Karaki Christians moved to Mādabā in 1880, and the people of Nablus started coming to as-Salṭ around 1880. The first was imposed on the Ottoman Authorities by their defeat in the Caucasus and the Romilly when the need for the settlement of these refugees became great. They were settled on the lands of villages that had a running water supply and although they had restless days at the start, their presence in the country has become a positive feature of the pluralism that Jordan is proud off. The second movement was made by free choice and the contribution of the Mādabā clans to agriculture and animal husbandry. The third was composed of nearly one hundred extended families that came to as-Salṭ from Nablus to practice trade in a more or less virgin market. They were craftsmen, moneylenders, landowners and government officials. Their services were greatly valued, and when 'Ammān became the capital, many of them moved to it, thereby the modern city became a mixture of Bedouin, Circassian, Damascene and Nabulsi groups.

The British Mandate 1918-1946

This period was, as far as, population movements were concerned, a continuation of the latter fifty years of Ottoman rule. Many Merchant families continued to come to 'Ammān, which by 1946 had nearly fifty thousand people. Zarqā' was also growing with the camps of the Arab Legion, the Transjordan Frontier Force, and their few thousand military personnel. Irbid, on the other hand, was growing with people moving from the villages to the city and Palestinian and Damascene families making it their permanent residence. During these twenty eight years one cannot ignore the importance of the efficient administration which encouraged people to seek employment or attempt to procure for themselves new opportunities of trade. Transjordan's markets also became a tempting proposition when in 1940 the Middle East supply center in Cairo started allocating generous quotas of imported goods for the Jordanians. The goods were imported by those who could obtain the licenses and many were from neighboring countries. When the commodities arrived they were sold at high profits and later re-exported to Palestine and Syria where shortages of supply created a strong demand.

Another factor that contributed to the economic development of the Transjordanian countryside was the installation in 1934 of the Iraq petroleum Company pipeline with its main station in al-Mafraq. A few years later another line of a military nature, was also built in the north. That was the Eden line organized to repulse any attack on the British Forces from Syria and Lebanon. Such activities brought in people from different countries and generated internal movements of people that are still apparent in az-Zarqā', al-Mafraq and Irbid. Trade activities in this period were given first priority including the export of local products such as cereals and livestock, the prices of which increased tremendously in comparison with the low prices of the thirties.

The Royal Hashemite Kingdom 1946-

The Legislative Council, during its meeting on the 25th May 1946, declared Jordan as an independent state, and King Abdullah Ibn Al-Hussein as a Constitutional Monarch. A new constitution was announced the 1st February 1947 and on the 17th March of that year Prince Talal was awarded the title of Crown Prince. The population was still small and the census of 1938 gave the total number of Jordanians to be three hundred thousand people. The country was on its way to a new way of life and a better future.

On the 20th July 1951 King Abdullah was assassinated in Jerusalem and King Talal was proclaimed King. Within a short time he declared the need for a new constitution, which was promulgated on the 8th December, 1952. Due to the ill-health of King Talal, his son Hussein was announced King on the 2nd May 1953. A new period for Jordan began on that day and continued for nearly half a century (Al-Mahdi and Musa 1959: 409, 411, 565 and 578).

Within two years however, the whole situation took on a new dimensions with the start of hostilities in Palestine on the 15th May 1948. The first Arab-Israeli war resulted in a large population movement. In August 1952 the Census held by the General Statistics Department registered a population of 587 303 souls. The largest increase happened in 'Ammān where the inhabitants were 108,412 rising from 65,754 in 1946 and an estimated 38000 in 1938 (Al-Mahdi and Musa 1959: 448). The Palestinian refugees were accommodated in the Jordanian Countryside and temporary camps in the West Bank. Few of them were able to move to Syria, Lebanon and Iraq at a time when conditions in the Gulf countries and Saudi Arabia did not offer many work possibilities.

Under these circumstances Jordan's Government was confronted with a difficult new situation that necessitated its cooperation with the United Nations Relief and Welfare Agency (UNRWA). With hard work and continuous sacrifices, matters were gradually brought under control. However in 1967 the second Arab-Israeli War erupted and resulted in a good part of the population of the West Bank (as well as the refugees who were residing in the camps) moving into the East Bank. By June 1968, the number of new refugees rose up to 354 248 (records of the Ministry of Construction and Welfare). To differentiate between the two groups, those of 1948 were called refugees whereas those of 1967-68 were called *Naziheen* (Musa 1996: 227).

In addition to the movements of Palestinians between the West and East Banks there were also movements for purely economic reasons such as that of the Egyptian Labourers who, since the 1970s, have become the main Labour force engaged in agricultural activity. Their numbers vary, but estimates in certain years have put the figure at nearly two hundred and fifty thousands. There were also unknown numbers of Syrians whose specialty was animal husbandry, and Iraqis who worked in the building and construction projects. Here again the real numbers are not known but the total could reach two hundred thousands. Some fifty thousand more are engaged in domestic services and they come from countries like Sri Lanca, the Philippines, Bangladesh, India, Pakistan and countries of the African Horn. Their presence may seem unnecessary, considering the living standards of the ordinary Jordanians, amongst whom many are unemployed and need work. However local traditions are still very strong and people do not like to be domestic servants. This "Shame tradition" causes the country to do away with a few hundred million dollars per annum as salaries and wages for imported labour.

The last wave of incoming refugees was comprised of a large group of Palestinians and Jordanians, who as a result of the Gulf war in 1990, flocked back to Jordan from Saudi Arabia, the Gulf States (especially Kuwait) and Iraq. Some of them had been living there as expatriates for over thirty years, but conditions after Saddam's occupation of Kuwait forced them to return. There are no exact figures but conservative estimates put those at four hundred thousand. They have been an important element, in recent years, in Jordan's economic and commercial development. Their savings and the indemnifications, paid by the United Nations as compensation for their losses in the Gulf War, were substantial. Once again Jordan (especially its populous capital 'Ammān) had to absorb this large number pf people and it is outstanding that the country cope with all the effects of a 10% sudden population increase in an already crowded countryside.

Over the millennia Jordan has had its good share of population movements and has been indeed a corridor. Its 96,000 square kilometres has remained constant but its population has grown to the point where its water resources are already insufficient for the needs of its people. Presently the population exceeds 5.5 million people and is expected to continue increasing at the rate of 2.8%. This means that we may have, due to natural growth only, double the present population in 2020. To complicate matters further our annual per capita income is only USD 1250 or JOR 887.50, our imports are approaching JOR 4.5 million; our exports do not exceed much over JOR 3 million. Some think that our survival during the last fifty years, accompanied by development and improvement of the standard of living for all Jordanians, is indeed a miracle for which we should thank our lucky stars. Others maintain that Jordanians, having been given a progressive and open-minded leadership, have been able to apply their persevering spirit in the service of their country's development and growth. Probably it has been a mixture of these two elements. The generous nature of the hospitable Jordanian combined with the sturdy spirit of the settler-pioneers in the semi-arid fringe of the al-Bādiya, made it possible for Jordan of the twentieth century to withstand all political storms and population waves and relatively prosper in spite of the adverse odds every now and then.

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Notes on the old water system and the integrated of Jordan future

Jordan is considered one of the most water-poor countries in the world. Jordan therefore faces water crises. The average of rainfall is very law (Jordan is considered an arid region), and surface water is rare too, 90% of rainfall evaporates. The ground water table is also low because of the artesian wells are being drained for use by the agricultural and industrial sectors (Rjoub 1994: 12-15).

According to the geographical studies the eastern part of Jordan consists of three main sections:

(1) A broad plain rising from the center of the desert, i.e. the east and southeast areas;
(2) A hinter land of mountain ranges, i.e. the western areas;
(3) Steep slopes to the main valleys, i.e. the Jordan rift, and the al-Azraq, Wādī as-Sirḥān Basins and al-Jafr basins (FIG. 1).

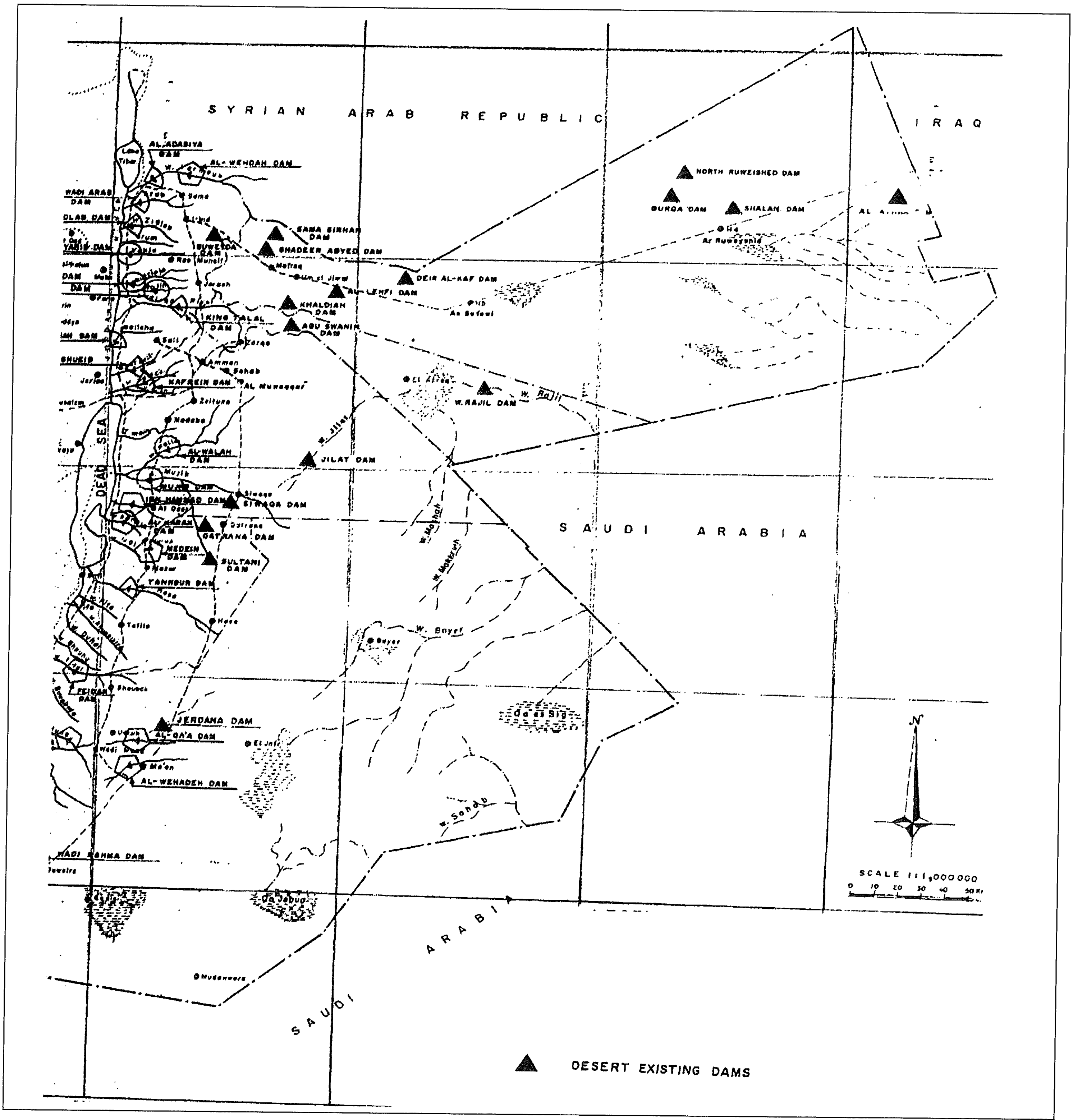
Currently, Jordan has a Mediterranean climate although temperatures in Trans-Jordan are more extreme. Temperatures in winter rarely fall below freezing and most rain falls in the winter months, although actual rainfall varies according to the region:

(a) Annual rainfall in the Mediterranean zone is 200-600mm, temperature 20°C in the north western part of the country, declining to the low levels in the barren eastern and southern areas.
(b) Annual rainfall in the semi arid zone 100-200mm, temperature 30°C.
(c) Annual rainfall in the arid zone is 50-100mm and may be less than that, temperature 37°C. According to the study (Abed 1994: 9-20), 90% percent of Jordan land receives less than 150mm of precipitation per year depending on rainfall statistics.

The number of sunny days approximates 320 during a year so the totally of rainfall (water) evaporates. There is limited evidence for the Paleolithic climate in this region. This region has a few sand dunes stretching along the eastern and southern shores, and the topography of the desert consists also of a series domes in certain sections. These eroded domes form part of the various parallel ancient folds showing dipping chert beds. There are a number of sites which document the developed stages of the lower Paleolithic, e.g. in the mountainous region in al-Azraq basin. The Middle Paleolithic began 80,000-40,000BP. Certain sediments in association with the typical lithic tools indicate a gentle sustained rainfall, which would indicate that the weather may be wetter than today. (Blake 1947: 1-7; MacDonald 1965: 81-82).

During the Holocene Geological age (ca. 20,000-10,000BP), climate was more humidity. There are indications of a small quantity of water, often saline and springs. It appears that more erosion occurred wide caves. This means that climate has some changes through Geological ages. (MacDonald 1988: 26-36). Cenomanian Geological strata have highly developed main springs, water table and wells.

6000 years ago, our ancestors were able to collect water and that made al-Bayḍa a place to live in and witnessed the development of the greatest and one of the oldest civilizations in the East. Those ancestors have, since the Neolithic age, worked hard to build settlements close to a river or a spring bearing in mind their ability to protect and defend this water source, which represents life to them; later on it became like a sanctuary. They repaired any damage or erosion to their settlement resulting from the elements. The relationship between water and life and the system of distributing water among all creatures on the earth has therefore been long recognized. As has the fact that water keeps body and mind healthy by means of scientific, agricul-



1. A Rainfall Map of Jordan showing al-Azaq and Jilāt Drainage Catchments.

tural and economical practices which used trial and practice as a source of knowledge and invention, this is common in any rate of creatures.

70% of Jordan is classed as semi desert (NRA 1977, brochure issued from Natural Resources Authority of Jordan) therefore, the inhabitants of this country, pioneers in settlement, were obliged develop different methods of living such as systems of collecting water, such efforts were accompanied by creating an authority to control these sources and to use them in dry seasons.

The remnants of archaeological sites in Jordan have revealed the existence of unfamiliar water systems

- A water reservoir was discovered inside al-Bayḍa area, in Petra, dating back to the Neolithic period

(Kirkbride 1985). This reservoir has been reused again in the second phase of this period.

- At Jāwā, located on the borders between Jordan and Syria, a comprehensive irrigation system has been discovered, it dates back to the end of the 4th Millennium thousand BC. It is one of the oldest systems, which incorporated natural pools (Helms 1981: 145-187).

Helms shows that rain water was gathered and collected by mathematical and scientific systems depending on natural storages (i.e. the low area to the east of Wādī Rājil was used as a natural water trap), (1983) which resulted in a significant volume of water (see TABLE 1).

- By the end of the second millennium BC a new method to strengthen reservoirs appears this allowed water to be kept for a longer period and involved more elaborate canal systems, irrigation wheels and more widespread use of surface run-of (TABLE 1).
- The Arab Nabataens were distinguished in rain water collection. Their methods included:

a) Digging rock-cut cisterns in rocks because rocks do not absorb water e.g. Umm al-Biyāra (Mother of Cistern), Wādī 'Araba, Wādī ath-Thamad and an-Naqab (Glueck 1965: 315-319) see TABLE 1.

b) Terracing along the banks of valleys so that water could cover a larger areas before it is lost down the valleys (Evenari and Koller 1956; Hammond 1967).

c) Making rectangular and square sealed reservoirs to reduce evaporation in many areas such as Wādī 'Araba (Glueck 1959: 201). Umm al-Jimāl (Mother of camels) and others (Devries 1993) see TABLE 1.

d) Making canals and bridges (aqueducts) to carry water by making use of its pressure. This method was well known in the Hellenistic-Roman period the Eastern Deserts (Bianchi and Faggella 1993; Oleson 1996).

e) Using networks of water and a system of secret or hidden pools e.g. Nabateans (Ball 2000: 46; Watson 2001) see TABLE 1.

Throughout history religious sources and other inscriptions describe water as an essential element of life.

- Water systems were described during the kingdom of Moab ca. 840BC. The King Mesha' Stela note that the king ordered the reconstruction of pools and the reclamation of the high lands for run-of systems for irrigation and erosion prevention.[1]
- In the Ammonite inscription on the Seiran bottle – King Amen-dab (ca. 700BC) ordered the planting of fruit trees and the construction of pools (Thompson 1973).
- A Latin inscription from Mādabā dedicated wholly to Neptune, god of water. (Unpublished inscription; altar erected now in Mādabā museum. The inscription reveal something of the town's culture during the period of the Roman administration).
- In the historical documents of the Byzantine churches (Onomasticon) the importance of water cisterns are mentioned frequently for instance, an inscription noting Christ as the source of life was discovered inside a carved cistern in Madaba (Piccirillo and Donton 1997: 25-26) see TABLE 1.
- In a water cistern at al-Yādūda, (Brochure written by Judith Cochran and Stein LaBianca 1994 'Ancient water management') discovered a relevant saying was written on a stone: "We sent down water from heaven abundantly and lodged it in the earth ....". A verse from the Holy Quran, the Believers 23:18.

We could say that our ancestors have provided us with lots of technical methods for the preservation of water, which form an important part of. Our heritage as they document a large part of the relationship between our ancestors and their living practices. We still have these examples of these in Jordan because they have been preserved despite the weather conditions, their particular situation, development plans, the economic and information systems. Archaeological discoveries show us that in order to achieve an environmental balance water systems of all kinds were critical. We can use this information to inform modern planning:

1- Sustainable development requires a permanent source of water (TABLE 2).

2- Dams and pools, can play an important role if their construction and ability to store water is properly thought out. Jilāt dam was used for irrigation and for drinking. 'Urayniba Dams provided for more than that also Dayr al-Kahf. These examples date back to the early Islamic ages (see TABLE 1).

3- The water canals in Petra have been used to make a pioneer tourism project that exemplifies

[1] A spring or a pool was considered sacred or gracious (Bedal 2001).

TABLE 1. Archaeological remains of ancient rain water collection (including proposed capacity). Including the map of Jordan.

District	**Geographical Region**	**Kinds of water tanks**	**Capacity by M³**	**Periods**
Jāwā (FIG. 3)	North east Jordan desert	Dams Natural catchments	70,000	4th Millennium BC.
Ḥisbān	Al-Balqā' area Hinter land	Reservoir rock cut cistern	8500	1st Millennium BC
Umm al-Biyāra	Petra mountains south Jordan	Rock cut cisterns channels	Each one 500	1st millennium BC-750BC
Mukawir al-mashnaqa	Dead sea mountains	Reservoirs aqueduct	Each one 1000	1st century BC
Petra and Wādī 'Araba, Umm al-Jimāl	South and west part of Jordan North part of desert	Reservoirs, cisterns (30) aqueducts, canals dams, natural dams and natural terrace	Average 1000 5000 40,000	1st century BC to 2nd century AD Nabataen and Roman
Mādabā, Zizyā	Central plains of Jordan, beside desert road	Pools, cisterns pools	60,000 80,000 10,000	3rd century AD to 7th century AD Roman/ Byzantine period
Early Islamic archaeological examples				
'Ammān, 'Urayniba (FIG. 5) Al-Qasṭal (FIG. 7)	Central part of Jordan Central plain of Jordan Central plain of Jordan	Cisterns Dams Pools	15000 200,000 10000	The end of 7th century AD until 10th century AD Umayyad-Abbasid
Jilāt Basin (FIG. 4)	Central part of Jordan, deseret	Dams	300,000	7th century AD to 10th century AD
Al-Azraq Basin	Central part of Northern desert	Pool	10,000	7th century AD to 10th century AD
Al-Muwaqqar palace (FIG. 6)	Central part of Jordan, desert	Pool	25,000 5000	7th century AD to 10th century AD
Dayr al-Kahf (FIG.2)	Northern part of Jordan	Dam	200,000	7th century AD

water systems and supports a service to tourism facilities.

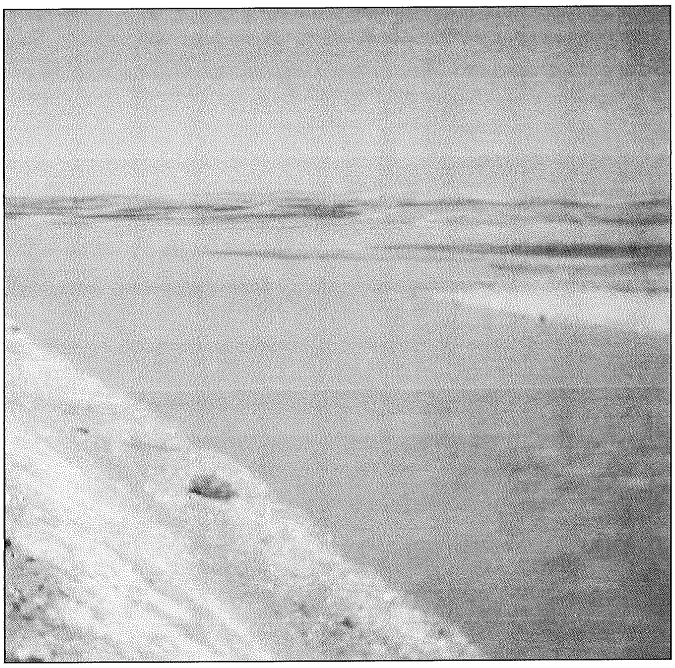
4- Ancient water cisterns existing in villages are often still used again by villagers in 'Ajlūn and Irbid to irrigate olive trees.

5- When preparing any development study, the following sectors have to cooperate: The Natural Resources Authority, the Water Authority, the local universities and the Royal scientific society. They must cooperate in order to choose attractive places with local water source to attract tourists.

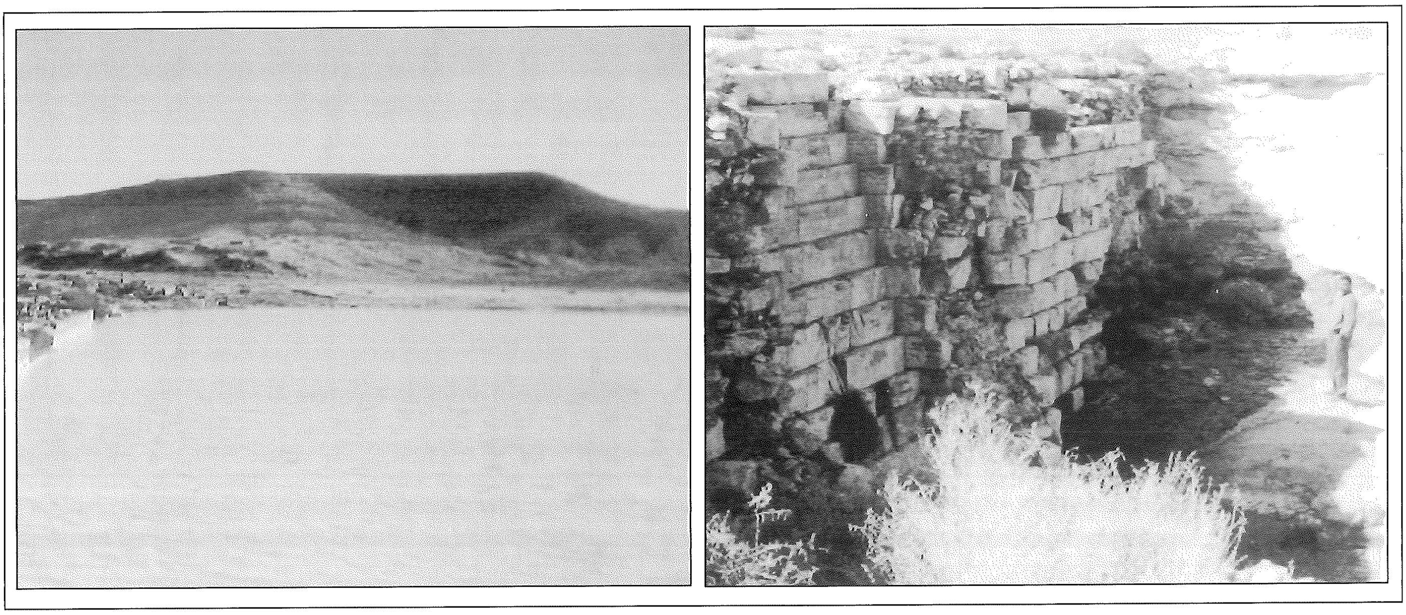
TABLE 2. Water use for Agricultural products area, this is as example if we assume the same range rainfall through ages. Quantities per each 1000m^3 (Taken from: A study of water use of agricultural products. Ministry of Agriculture, Wa'il el-Sharif).

Product	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Wheat	50	90	125	170	175	---	---	---	---	---	---	45	655
Barsim (clover)	---	---	75	70	160	200	215	105	155	154	131	---	1430
Corn	---	---	---	---	---	---	150	95	122	148	120	---	635
Tomato	---	---	---	---	20	70	125	225	270	30	---	---	750
Vegetables	---	---	---	---	---	---	225	140	105	140	135	120	870
Fruits	69	74	95	116	144	160	162	160	135	114	90	70	4310
The total per cubic meter													8650

2. Dayr al-Kahf.



3. Wādī Rājil (Jāwā Water 2003).



4. Jilāt Dam.


5. 'Urayniba Dam.


6. Al-Muwwaqar Pool.


7. Al-Qasṭal Pool.

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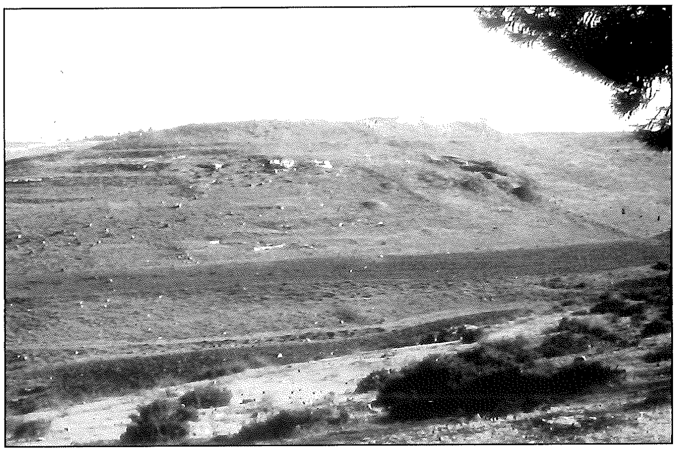
Cultural Interaction through the Windows of the Four-Room House at Tall al-'Umayrī

This paper will examine in preliminary fashion evidences for regional cultural interaction by opening an investigation into everything associated with the early Iron Age "four-room" or "pillared" house at Tall al-'Umayrī (FIG. 1), part of the Mādabā Plains Project, and begin the process of exploring any connections beyond them. In doing so, we will explore intellectual constructs, as well as architectural and artifactual finds (and the expertise it required to produce and construct/transport them), related to three phases in the use of this house: 1) construction, 2) occupation and 3) destruction. Each phase has left us material clues from which we hope to determine provenance and means of procurement. These will provide information about cultural interaction not only within the area immediately around the tall, but in the Mādabā Plains region of Jordan in general and beyond. By using as our starting point a domestic dwelling, the best preserved "four-room" house anywhere in the Levant, we enjoy the benefit of analyzing one locus of cultural activity serving as the collection point for evidence of interaction with other locations and activities.

While the early Iron Age does not lend itself especially well to the study of cross-cultural interaction, given the primarily subsistence economy dominating the region during this period, there are evidences of cultural interaction apparent in the material record of this house. Construction remains indicate the use of materials brought in, some from a distance. Occupation has left us approximately 170 artifacts used in everyday chores like food preparation, consumption, storage and disposal; textiles and other household activities; and cultic tasks. These come in the form of ceramic, stone, floral and faunal remains, which demonstrate some level of interaction far beyond the regional borders with which the inhabitants were familiar. Finally, the house's destruction occurred due to outside forces, leaving limited remains, which we wish could be more helpful in identifying from where the perpetrators came. Our investigation is preliminary and primarily descriptive, as opposed to synthetically analytical, and will only begin to open windows for further research. Much comparative analysis awaits our attention if we hope to complete this investigation in the future.



1. Profile of Tall al-'Umayrī, Jordan from the southwest.

Dimensions of Four-Room Houses

This study of cultural influences visible through four-room houses must consider the wider dimensions of these structures, even if not all will receive equal treatment here. They are:

- Chronological Dimensions — The entire Iron Age (ca. 1200-550BC), although our attention will be directed to the earliest part of Iron 1 (ca. 1200), even the latest years of the Late Bronze Age. This represents the temporal setting of the four-room house at Tall al-'Umayrī.
- Environmental Dimensions — The world of the Iron Age (especially the economic world) in which four-room houses were utilized, consisting

primarily of subsistence strategies of survival in an agri-pastoral setting. Given the localized nature of this mixed survival strategy, we should not expect significant levels of interaction much beyond regional homelands utilized for agricultural purposes (FIG. 2) and normal patterns of travel to pasturage for sheep and goats (FIG. 3).

- Architectural Dimensions — The construction of the house itself, including design and materials and their procurement.
- Basic Human Dimensions — What it demanded of people to construct, occupy and destroy domestic houses.
- Social Dimensions — The nature of life and existence in these houses, including roles for men, women and children.
- Ethnic Dimensions — The capacity of remains to assist us in identifying the ethnic makeup of those who occupied four-room houses, wherever they are found.
- Ideological Dimensions — Theories on the mental templates lying behind four-room house design, construction and use.

2. Agricultural harvest taking place to the west of Tall al-'Umayrī.

3. Sheep being stabled in the traditional village of Ḍanā in southern Jordan.

- Dimensions of Destruction — What we can know about the demise of these houses and its causes as well as perpetrators.

It is in particular the environmental, architectural, basic human and destructive dimensions, which will play a role in this investigation, interwoven within the discussion, which follows.

Stone Houses in Iron Age Palestine and Transjordan

Although we do not have any direct textual descriptions or visual representations of the building activities or construction design of Levantine houses from the Iron 1 period, archaeological research has focused a good deal of attention on what have come to be called "four-room" or "pillared" houses and small agrarian villages from this period. Their connections with early tribal entities, which ultimately became ancient Ammon, Moab, Israel, etc., have occupied archaeologists and biblical scholars with intensity of late and will likely continue to do so for some time. A growing consensus today suggests that these tribal entities initially settled in small agricultural villages in the hill country of Palestine and Transjordan, often building four-room houses and constructing terraces, cisterns and wine and olive presses.

The Iron 1 four-room houses discovered by archaeologists in this region typically measured 10-12m long and 8-10m wide (FIG. 4). The broad room, extending across the back end of the building, may have been 2m wide and opened into an area containing three long rooms, each separated from the others by a wall or a row of pillars or posts

4. Al-'Umayrī four-room house immediately following excavation picturing, clockwise from left top, Larry Geraty, Douglas Clark, Larry Herr, co-directors.

which also supported the ceiling or roof. The two side rooms normally housed animals, leaving the central long room for domestic activities surrounding food preparation and consumption.

This pattern is clear in the best preserved and likely one of the earliest examples of this type of house, excavated in Field B at Tall al-'Umayrī, south of 'Ammān, Jordan. The Late Bronze/Iron 1 town was extremely well defended with a moat, rampart and perimeter wall construction. Interestingly, the builders utilized the broad rooms of the two adjacent buildings exposed to this point in excavation (Buildings A and B) as an integrated part of what appears to be double-wall defenses (FIG. 5). An external animal pen extended the length of House B.

Both early Iron 1 buildings have been completely excavated and suggest two stories over their full extent, thereby illustrating the size of these structures for domestic use as well as the height of the city wall into which they had been constructed.

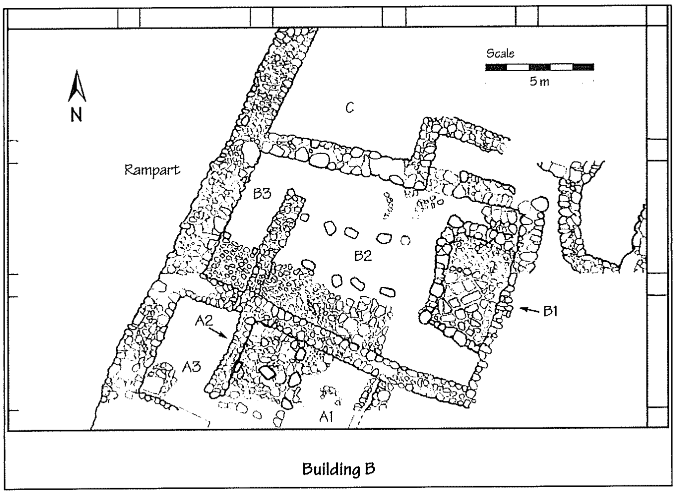
Is there anything in the process of construction, which might illustrate cultural interaction beyond the immediate vicinity of the village or town?

Construction

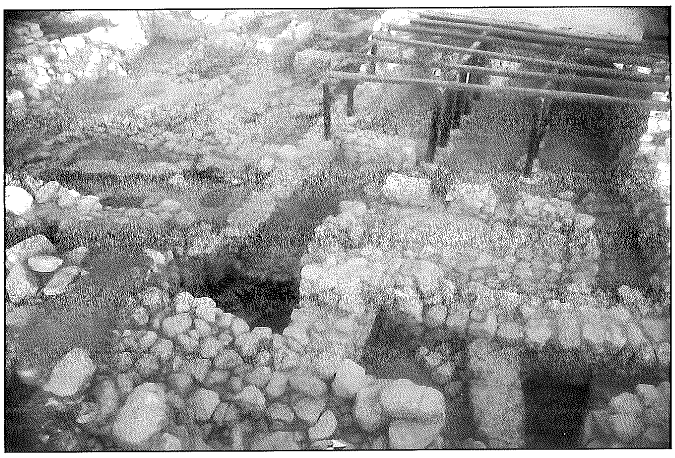
Given the subsistence economy characterizing early Iron Age Palestine and Transjordan, we should not expect significant cultural interchange. However, questions arise surrounding issues of the four-room house design and the transport of building materials. Unfortunately, in the case of design, debate continues about whether the "four-room" house plan derived from earlier "three-room" models in Syria or those from Late Bronze Age Canaan at Tall Harasim and Tall Batash. The design lends itself extremely well to the mixed agricultural/pastoral survival strategies with its space for animals as well as agricultural produce and production, but provenance is to this point arguably unclear to us. The house at Tall al-'Umayrī, even if one of the earliest four-room houses in existence, nevertheless had precedents, which reflect cultural influence.

Building demands from the ground up (FIG. 6) included 1) beaten earth and flagstone flooring; 2) exterior stone walls on the ground level; 3) interior stone walls and wooden posts, beams and rafters; 4) first-story ceiling/second-story floor consisting of branches, mud, clay and plaster; and 5) the upper story with mudbrick walls, wooden posts, beams and rafters and another wood, mud and plaster ceiling/roof. Stone and mudbrick walls were also likely plastered over inside and out to prevent external erosion from the annual rainfall, which can be heavy and intense during the winter and early spring months and the internal invasion of insects and vermin. These required significant amounts of lime plaster and assumes all the labor involved in the manufacture of lime along with its application and maintenance.

Building materials included mostly locally available types: limestone field stones for flooring and walls on the first floor as well as for lime used in plaster and mortar; wood from area forests for use as beams, rafters, ceiling/floor support; clay for the mudbricks of the second story and flooring/roofing material. The only building material brought in from a distance were the reeds for ceiling construction on both stories (FIG. 7); these came from the Jordan Valley or one of the wadis heading down into the valley. While this says little about cultural interaction between al-'Umayrī and other sites



5. Top plan of al-'Umayrī four-room house on western edge of the tall.



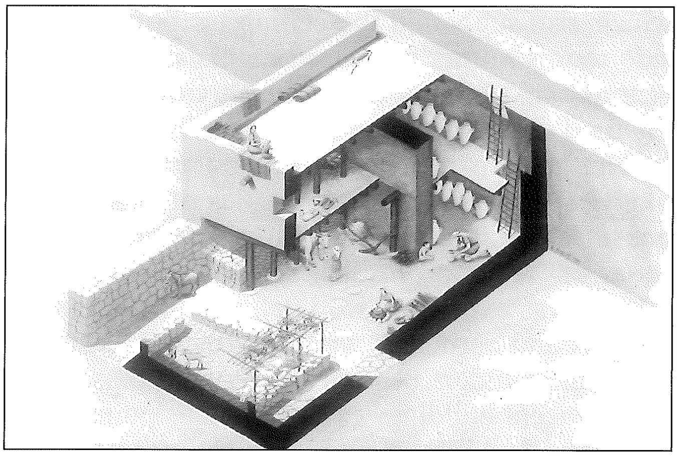
6. Partially reconstructed al-'Umayrī house from the east.

7. Reeds transported from the Jordan Valley being installed on the partially reconstructed al-'Umayrī house.

or tribal entities, it makes clear that at least some commercial transactions occurred. So too, likely, exchange of construction technologies and techniques, however challenging to trace.

Occupation

From the second phase in the life of four-room houses, and of the one at al-'Umayrī in particular, we examine artifacts associated with the house in order to explore possible cultural interaction with other peoples and places (FIG. 8). This could prove promising at al-'Umayrī due to the complete preservation of everything remaining in the house following a sudden military assault. The rapidity of the conquest, evidenced by large stores of grain, complete assemblages in food-preparation areas and remnants of articulated animal shank bones in the debris which fell from the second story, plus virtually complete preservation beneath 2 meters of mudbrick destruction debris from the second story



8. Artist's conception of al-'Umayrī four-room house as it may have appeared during the time of its use ca. 1200BC (Rhonda Root).

collapse, guarantee that we have virtually everything left behind by the house's Iron 1 occupants who apparently fled in a hurry. We thus find ourselves in an enviable position with regard to artifactual remains at least from this four-room house.

Two lists of all the approximately 170 artifacts from al-'Umayrī house follow, the first by material and type, the second by function:

Artifacts List by Material and Type

Stone
- Hand Grinders – 8
- Ballistica/Pounders – 4
- Weights – 4
- Whetstones – 3
- Bowls – 2
- Querns – 2 (one huge)
- Sockets – 2
- Alabaster Jar – 1
- Cosmetic Palette – 1
- Flint Blade – 1
- Hematite Ball – 1
- Loom Weight – 1
- Pestle – 1
- Roof Roller – 1
- Spindle Whorl – 1

Ceramics
- Pithoi – 60-70
- Jugs – 18
- Cooking Pots – 10
- Stoppers – 10
- Bowls – 7
- Jar/Jug – 7

Kraters – 7
Jars – 6
Spindle Whorls – 4
Lamps – 2
Seal impression – 1
Flask – 1
Pyxis – 1

Metal
Bronze Weapon Points – 5
Bronze Figurine Legs and Feet – 1

Bone
Ca. 150 bone fragments, remains of at least four individuals (two adults, one likely male; one juvenile, ca. 15; and one child), the bones burned, disarticulated, scattered in the Broad Room.
Astragalus

Unknown
Gaming Piece – 1
Large Spacer Bead – 1

Artifacts List by Function
Food Preparation
Ceramic Cooking Pots – 10
Stone Hand Grinders – 8
Stone Weights – 4
Stone Whetstones – 3
Stone Querns – 2 (one huge)
Stone Flint Blade – 1
Stone Pestles – 1

Food Consumption
Ceramic Jugs – 18
Ceramic Bowls – 7
Ceramic Kraters – 7
Ceramic Flask – 1
Ceramic Pyxis – 1
Stone Bowls – 2
Stone Alabaster Jug – 1

Food Storage
Ceramic Pithoi – 60-70
Ceramic Stoppers – 10
Ceramic Jar/Jug – 7
Ceramic Jars – 6

Food Disposal
Massive Midden 60-70 Artifacts, 5,000-7,000 sherds, 25,000 bone fragments.

Textiles
Ceramic Spindle Whorls – 4
Stone Loom Weight – 1
Stone Spindle Whorl – 1

Household
Ceramic Lamps – 2
Ceramic Seal impression – 1
Stone Sockets – 2
Stone Cosmetic Palette – 1
Stone Roof Roller – 1
Gaming Piece – 1
Large Spacer Bead – 1
Astragalus
Stone Hematite Ball – 1

Cultic
Bronze Figurine Legs and Feet – 1
Military
Stone Ballistica/Pounders – 4
Bronze Weapon Points – 5

Human Bones
Ca. 150 human bone fragments, remains of at least four individuals (two adults, one likely male; one juvenile, ca. 15; and one child), the bones burned, disarticulated, scattered in the Broad Room.

The artifactual data contain several items that demonstrate cultural interaction. Most of these derive from secure stratigraphic levels of the house and, where noted, additional finds were produced by a massive midden to the east of the house which contained fragments of 60-70 objects, 5,000-6,000 ceramic sherds and some 25,000 bones. While we will not utilize these finds extensively in this paper, there are several items of significance to our goals here, as we shall see below.

First we turn to stone objects. Most if not all of the limestone artifacts were likely local in origin and utilitarian in function. Nothing here points to foreign provenance, although further study might change this assessment. This was not so with the sandstone and basalt implements (FIG. 9). Sandstone is not local; the three whetstones, while simplistic and utilitarian, derive from elsewhere, perhaps the Jordan Valley. Basalt was available only at some distance, from the deserts to the north and east or south toward Karak or the southwest near Mukāwir.

According to Cynthia Temoin in her Thesis at the University of Lethbridge, a study of grindstones at

9. Assemblage of typical basalt grinding stones from al-'Umayrī.

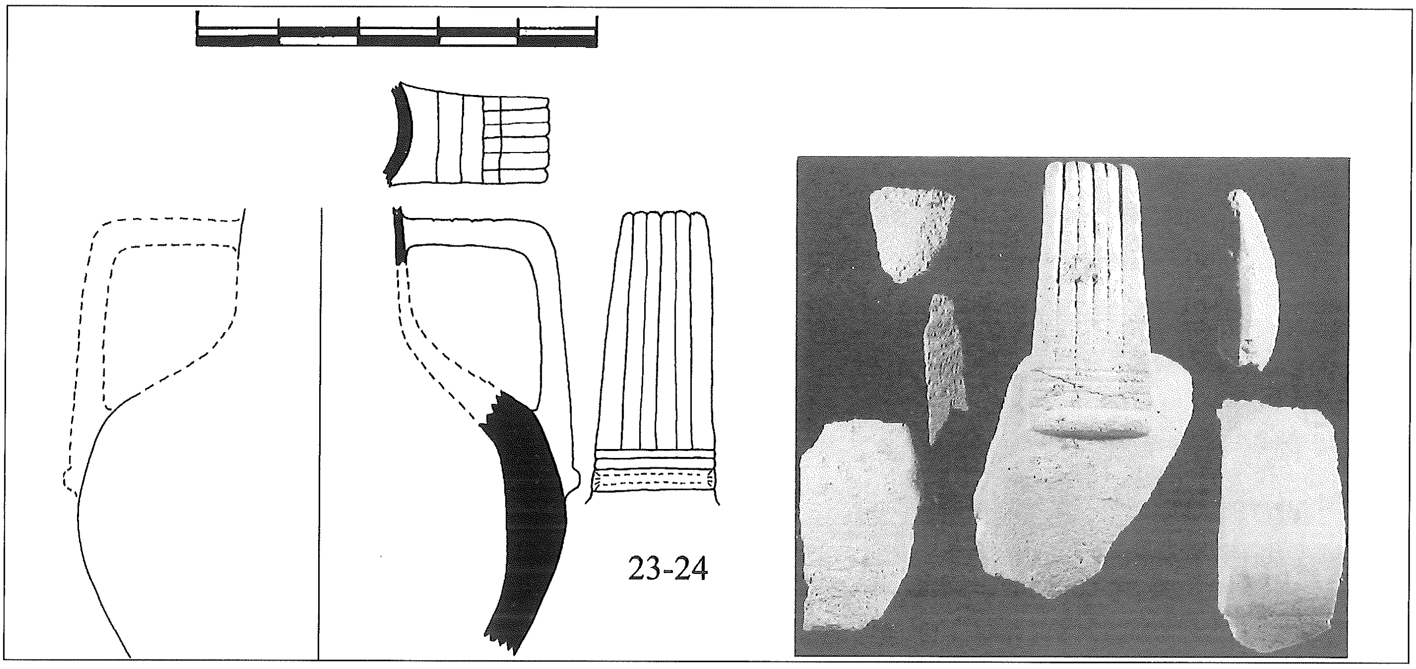
Tall al-'Umayrī, there are three patterns of design distinguishable among basalt ground stone tools:

1. Strategically designed — those which are typically large, well crafted, intended for single use, non-local, made by specialists. These are normally manufactured near the source of the stone since the weight of unfinished stone would make transport extremely difficult.
2. Sequentially designed — those which are typically small, conical and cylindrical in shape, intended for multiple uses, locally (re) made by non-specialists.
3. Expediently designed — those which are typically small, ovoid in shape, intended for multiple uses, (re) made locally by non-specialists.

At al-'Umayrī, the Iron 1 basalt grinding stones fall into two of the three categories. Forty percent are strategically designed, and thus reflect artisanship from nearer the sources of stone. The rest (60 percent) were designed expediently by locals whose utilitarian needs and limited economic capacity necessitated the reuse of imported basalt implements. Thus, nearly half of the basalt grinding stones at Iron 1 al-'Umayrī were acquired directly from elsewhere, demonstrating commercial exchange of some kind.

More easily traceable evidence of foreign interchange among the stone finds in al-'Umayrī house were fragments, some large, of an alabaster jug (FIG. 10). As the form was typical of Egyptian types from the Late Bronze Age (Platt and Herr 2002: 157, 159), there is no doubt of its place of origin, design and manufacture. Despite the fact that al-'Umayrī four-room house contained only limited evidence of exchange and economic standards above the level of subsistence, this find appears to be an exception. The same may also be the case with other stone artifacts, for example, the hematite ball and cosmetic palette, but solving that question will take further research.

Of the ceramic objects discovered in al-'Umayrī house, most are clearly utilitarian forms with similarities to those from local sites in the area. The largest representation is found in collared pithoi, which make up 60-70 separate vessels (FIG. 11),



10. Fragments of an elegant alabaster jug.

which time its small chapel was paved with a mosaic floor. In the eighth century, a tomb was inserted under the floor at the western end of the nave. This task necessitated the repaving of this area and the addition of a new dedicatory inscription that provides a date of 762AD (Piccirillo 1995). This inscription demonstrates not only that Christian communities were continuing to thrive, but that a local monastic presence was also sustained well into the eighth century.

The Church of the Virgin Mary, located along the cardo northeast of Mādabā's acropolis, contains a lengthy inscription in front of the apse that documents the dedication of the building in 767AD. The remains of the border of an earlier pavement indicate that this must have constituted a rededication in conjunction with the installation of a new geometric mosaic floor (Di Segni 1992; Piccirillo 1982).

This inscriptional evidence demonstrates that churches in the Mādabā region were being repaved and renovated well into the mid-eighth century. It also provides the names of three bishops from the Early Islamic period: Sergius (718AD), Job (756-762AD), and Theophane (767AD). Thus, not only was there enough wealth in the area to permit the re-founding and renovation of several churches, but the diocese of Mādabā was still fully functional, complete with a bishop. Although these ecclesiastical remains are important when discussing the impact of the transition to Islamic rule on the life of the Christian community in the region they must be contextualized by examining the broader social and cultural developments that also occurred during this period. In keeping with this objective, the results of the recent excavations of the Tall Mādabā Archaeological Project help illustrate these developments within a secular context, and constitute an important addition to the growing corpus of material from the Mādabā region.

Mādabā's West Acropolis Mansion

The remains of a large complex have been uncovered on the western slope of Mādabā's acropolis (Foran *et al.* 2004; Harrison *et al.* 2003). The building was constructed against the western face of the city's pre-classical fortification wall, and extends across a series of bedrock ledges that descend to the west. There are several features of this structure that indicate it underwent two distinct construction phases, followed by a lengthy period of abandonment. The initial construction phase dates to the Late Byzantine period (sixth century AD), while the subsequent renovations and abandonment date to the Early Islamic period (mid-seventh to mid-eighth centuries AD).

The building consists of a series of rooms arranged around a large flagstone-paved courtyard (FIG. 1). Most rooms were paved with mosaics, some of which portray elaborate geometric and Figural designs executed in a variety of colours. The complex exhibits a number of different construction techniques. The exposed bedrock on the site was effectively employed as the foundation for several walls. These walls were constructed of large and small stones supplemented with mud mortar, and were then faced with numerous layers of plaster. The arches supporting the second storey of this building were constructed of dry-laid ashlar boulders. An elaborate water collection system composed of pipes, basins, and channels, link the different areas of the complex.

Room 1, the southern-most room of the building, was paved with a mosaic depicting a field of rosebuds, with a geometric panel framed by a meander border to the west. The southern wall of this room was equipped with a window. Room 2, immediately to the north, was connected to Room 1 via a doorway.

Room 2 could also be entered through a doorway in its western wall fitted with a stone threshold. The floor of this room was unfinished, consisting of a simple beaten earth surface. The area in front of Room 2 was paved with a plain white mosaic floor, its perimeter delineated by carved bedrock complemented by stone and mortar construction. The bench located against the north and west walls acted as a step in front of the western doorway to the room. An entrance in the northern wall linked this area with a third room to the north (Room 3).

Room 3 had four east-west arches that spanned the width of the room, supporting a second storey. These arches were anchored to an east wall built directly against the exterior of the fortification wall. The floor of the room was paved with a plain white mosaic. A basin carved from the bedrock was located in the southeast corner of the room. The second storey mosaic was preserved in a small strip along the top of the east wall of Room 3, and a small portion of its polychrome decoration was preserved. A second stone basin was located in the northeast corner.

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A Large Urban Residence from Late Byzantine and Early Islamic Mādabā

Introduction

By the mid-seventh century AD the character of the Near East had changed forever. The Byzantine Empire, the dominant force in the region for the previous three centuries, had been defeated by the Muslim armies invading from the east, and the flourishing Christian communities of central Transjordan came under the control of the Umayyad caliphs based in Damascus. Their fate had once been thought to be quite dismal, until interest in the transition from Byzantine to Islamic rule gained increasing scholarly attention (Bisheh 2001; Shboul and Walmsley 1998; Shahid 1995, 2001). Previously this period had been characterized as a time of decline accompanied by an abatement in settlement, a degeneration of public institutions, and a reduction in population. However, the evidence produced by numerous archaeological projects, working in the region over the past 20 years, dispels this idea, presenting instead a period of continued prosperity.

The large amount of excavated material from the Mādabā region provides compelling evidence for this new view (e.g. Bisheh 1994, 2000; Piccirillo 1985, 1986a, 1989, 1993, 1997, 2001, 2002; Piccirillo and Alliata 1994, 1998; Saller 1941; Saller and Bagatti 1949). The Byzantine period was one of extensive prosperity in the area, during which the town of Mādabā reached its greatest extent. The city was the see of a bishop, who controlled a diocese that extended to the northwest as far as Mount Nebo, to the southwest to include the sites of Mā'īn, 'Ayn al-Qaṭṭār, and Mukāwir, and to the southeast to incorporate the settlements of Nitl, Dhibān, and Umm al-Raṣāṣ.

The Byzantine – Islamic Transition and the Churches of the Mādabā Region

The mosaic pavements that adorn the churches of the Mādabā region provide an invaluable resource for dating the building activity of the sixth through the eighth centuries AD. Many of these floors contain inscriptions that give a precise date for the foundation of the building and for any renovations that were carried out subsequently. It is from these sources that we learn of the continued prosperity of the Christian communities of Mādabā. The inscriptions of the eighth century depict a period of sustained building activity where older buildings were renovated and new mosaic floors were installed, complete with updated dedicatory inscriptions.

The Church of St. Stephen at Umm al-Raṣāṣ presents one such example. The building was most likely constructed in the late sixth century, but an inscription in the nave confirms that it was rededicated in 718AD. A second inscription, located in the apse, provides a date of 756AD for the repaving of this area. Architectural and ceramic evidence indicate that the courtyard west of St. Stephen's was transformed into a church, known as the Church of the Courtyard, in the early eighth century, probably in conjunction with the rededication of the basilica. A chapel was also constructed to the south of this church in the mid-eighth century (Piccirillo 1991; Piccirillo and Alliata 1994).

The Acropolis Church at the site of Mā'īn contains an inscription with a date of 719/720AD. It is unclear whether this refers to the dedication of a new pavement, or a rededication associated with alterations executed in order to conform to iconoclastic law (de Vaux 1938; Piccirilo 1985; Schick 1995: 398-399). In any case, it testifies to some form of ecclesiastical building activity at Mā'īn in the eighth century.

The Monastery of the Theotokos at 'Ayn al-Kanīsa was constructed in the mid-sixth century, at

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and the bones themselves do not yield much meat, making it unusual that they were transported only for food. Thus, we have support for trade in the region with Egypt.

Destruction

Unfortunately, artifactual remains from the destruction of al-'Umayrī house are extremely limited and tell us very little about who mounted the assault on the site. The five bronze points deserve further study, but at this point can tell us nothing definitive about those who used them, whether local or foreign. This task is especially difficult as we continue our efforts to understand who occupied al-'Umayrī, l*et al*one who attacked the place.

It may be that further analysis of the human remains discovered in the house could prove helpful. However, it appears that the four individuals — two adults, one likely male, a juvenile and a child — may well have been unlucky inhabitants of the house who were killed before the building was torched and collapsed. Future DNA research will at least be able to determine relationships among them.

Conclusion

Thus, there are preliminary indications that, by viewing cultural interaction through the windows of the four-room house at Tall al-'Umayrī, we can see limited evidence of exchange. The subsistence economy of the Late Bronze Age / Early Iron Age transition placed severe restrictions on the possibility or practicality of significant trade with tribal or state entities at any distance away from the site.

However, signs of interaction do exist. We can argue for regional sources for the fabric and patterns on some of the collared pithoi, particularly the Ḥisbān area. From further away we can posit exchange of ground stone tools, perhaps the Karak, Mukāwir or northeastern desert regions. The Jordan River was probably the source for construction reeds and maybe even one of the types of fish whose bones were uncovered in the large midden. Syria or Canaan might provide the origin of the house design itself. Finally, Egypt appears to have provided not only the other fish bones, but also the alabaster jug as well as the stamped jar-handle impression and possibly the bronze statue fragment, although Canaanite parallels might explain the statue. Further research will contribute more to our understanding of cultural exchange and how we should interpret its significance for economic and political realities.

Acknowledgments

The author acknowledges the support of many people and organizations for the work leading to this article, but especially wants to single out: The Walla Walla College Faculty Research Grants Program for nearly two decades of financial assistance with the Mādabā Plains Project excavations at Tall al-'Umayrī; the Council of American Overseas Research Centers for a senior fellowship (2002) to study early Iron 1 architecture in Jordan; my fellow directors of MPP-al-'Umayrī; and Pierre and Patricia Bikai and the staff of the American Center of Oriental Research in Amman.

[Except where indicated otherwise, all figures are used courtesy of Douglas R. Clark or the Mādabā Plains Project-al-'Umayrī].

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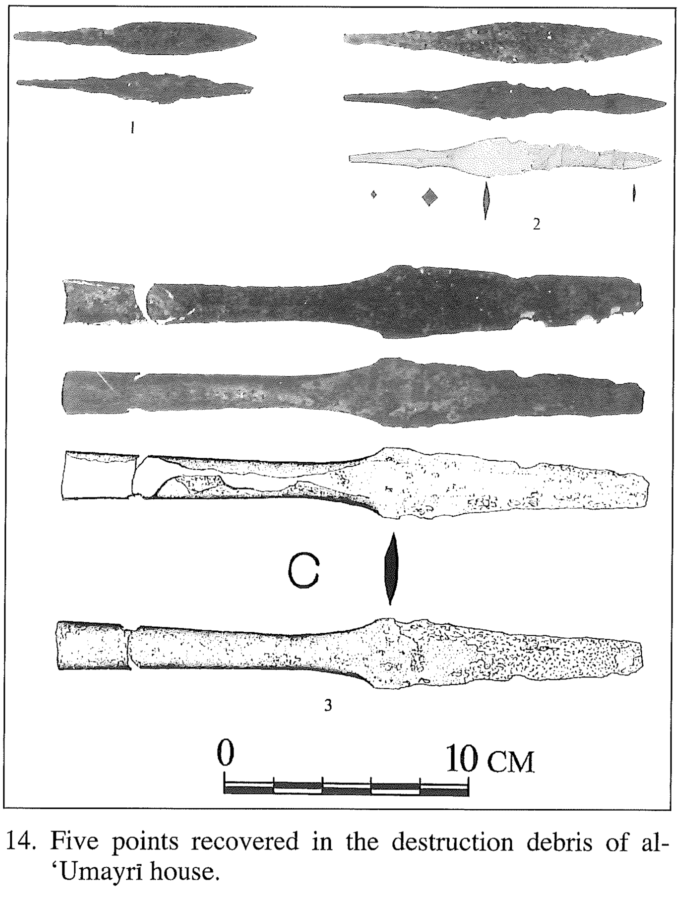
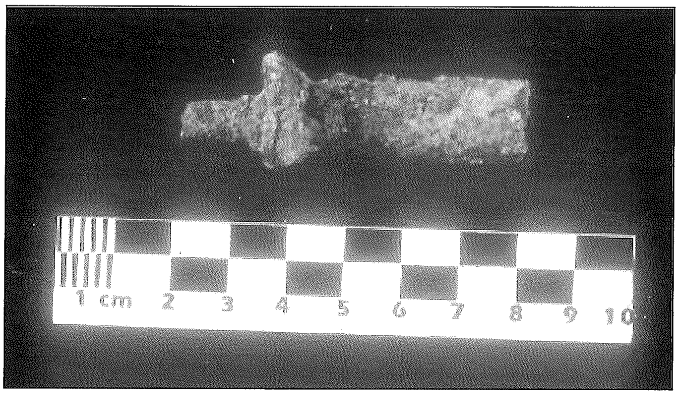
nean seas. Thus, we are able to establish that some type of exchange occurred to bring Egyptian and likely northeastern Mediterranean artifacts to the four-room house at al-ʻUmayrī. This assessment, however, is incomplete and awaits study of the remaining seals/impressions from the midden. These remains without *in situ* security can only help us in marginal ways to draw conclusions about wider cultural connections.

Metals are not highly represented at al-ʻUmayrī house. Besides unidentifiable fragments, two categories of metal objects might carry potential: five bronze weapon points and the bronze legs and feet of a male deity statue. The bronze points — three spear, one lance and one arrow (FIG. 14) — belong to the destructive phase of our treatment of the house and deserve further study before we can say much at all about original provenance.

The 6cm high legs and feet should carry more potential (FIG. 15). While bronze male deities surface occasionally and typically represent gods like Reshef or Baal, or some variation thereof, further research may well provide additional connections among al-ʻUmayrī's household items of worship and those belonging to surrounding groups at the time. Potential ties with Egyptian as well as Canaanite sources are likely (Keel and Uehlinger 1998: 116).



14. Five points recovered in the destruction debris of al-ʻUmayrī house.

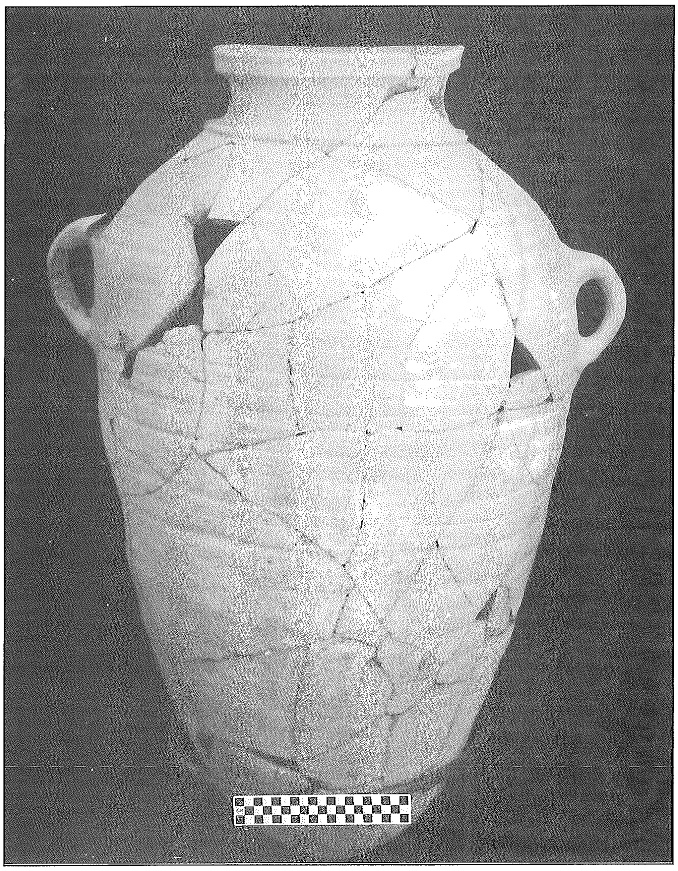


15. Bronze feet and legs of statue of a male deity.

Remains of flora and fauna, particularly those providing food, might suggest something about interchange. However, carbonized seeds found in the storeroom of the contemporary "Building A", adjacent to the four-room house, revealed evidence of the following foods: wheat, barley, broad bean, grape (pits and skins), poppy, corn cockel, sweet *ʻilba*, lentil, vetch, green bean and flax (Clark 1997: 64). Nothing indicates non-local sources for these food groups.

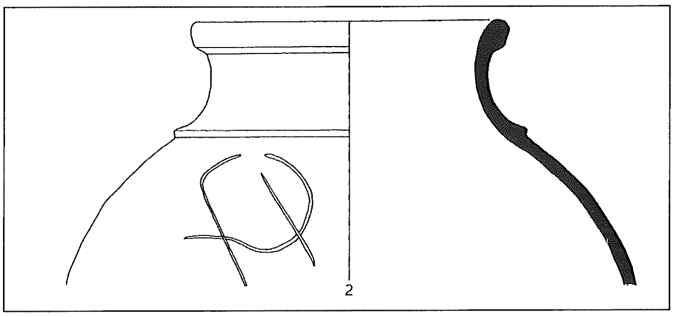
Animal remains contribute to a wider representation of influences from beyond the region of the tall. The massive midden, located east of the house, produced 25,000 bones, many of which have not yet been studied. Of the thousands thus far analyzed (Peters *et al.* 1997), 98.6 percent were domestic mammals. Wild mammals accounted for 1.3 percent — wild cat, lion, wild boar, Mesopotamian fallow deer, aurochs, goitred gazelle and gazelle. How many of these might be found locally is an intriguing question. The same can be said for the small number of bones from wild birds (15) — ostrich, garganey, buzzard, chukar partridge, rock dove and pigeon.

But it is very clear that the four fish bones recovered from the midden derive from elsewhere. Two bones represent a cyprinid 70cm long, likely from the Jordan River (Peters *et al.* 1997: 313-314) and the other two come from a centropomid 1.4m long, a Nile perch (Peters *et al.* 1997: 314). There is no evidence in the pre-LB/Iron Age remains from the Near East of this type of fish and there is no indication that these bones derived from anywhere other than the Nile River. This is especially interesting, according to Peters *et al.*, since there were other fish available from sources closer than the Nile



11. Iron 1 collared pithos, restored at the Walla Walla College Archaeology Lab.

all currently being reconstructed in the Archaeology Lab at Walla Walla College in Washington State. Neutron Activation Analysis on several of these demonstrates that most derive from local sources of clay, although some come from the area around Ḥisbān, several kilometers away (Gloria A. London: personal communication). We are also able, at least preliminarily, to assign limited inscribed patterns on a few of the pithoi to the Ḥisbān region (FIG. 12). Iron 1 collared pithoi have been found throughout ancient Palestine and Transjordan at mostly hill-country sites and are thus popular forms

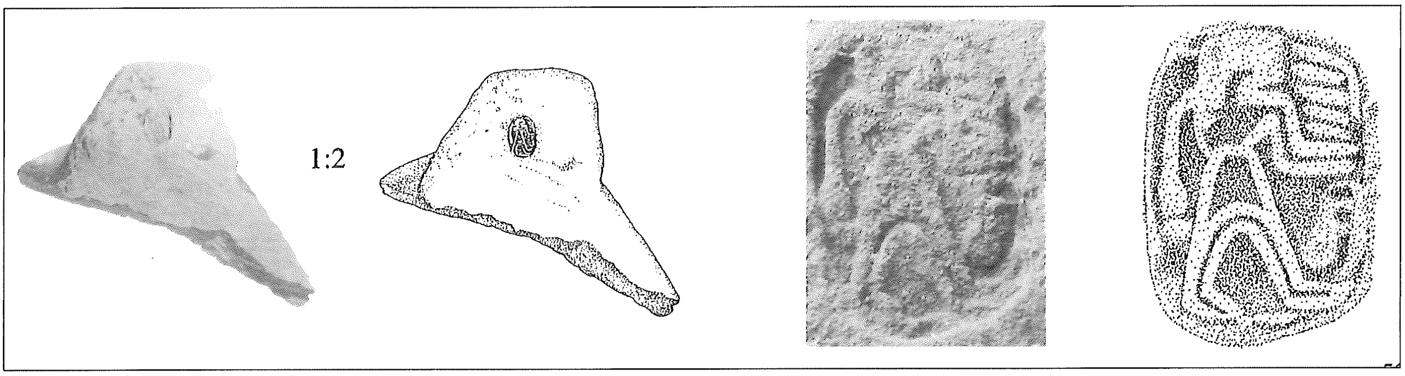


12. Inscribed pattern on one of the 60-70 collared pithoi.

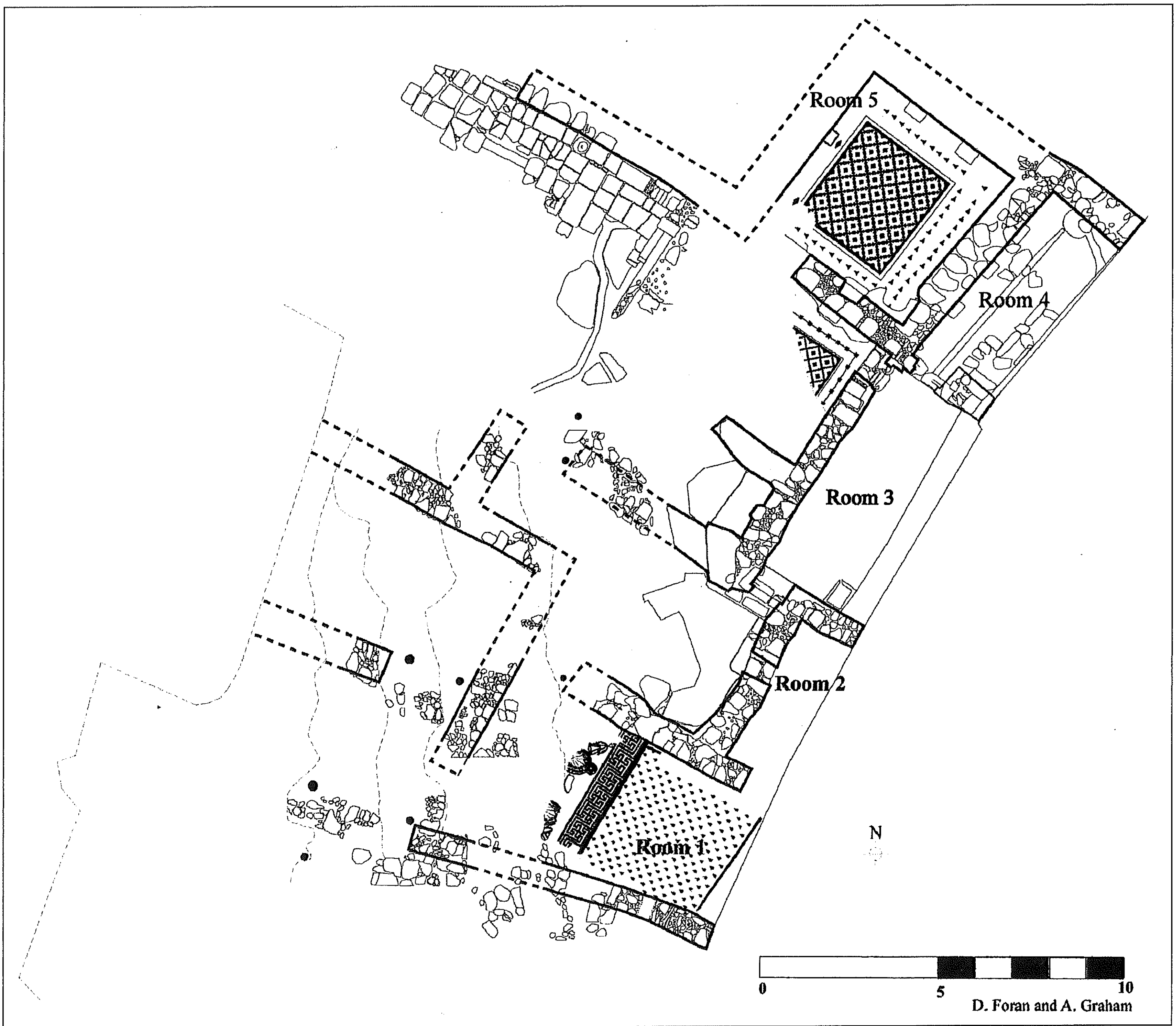
of storage in many places. Tracing cultural influence and exchange in the invention and manufacture of collared pithoi is challenging in many ways and space will not allow us to do so here.

Ceramic (as well as tuff) seals and seal impressions (Eggler *et al.* 2002) account for a small number of artifacts connected with al-'Umayrī four-room house, although only one can boast stratigraphic integrity; many (seven) of the others surfaced in mixed contexts at the location of the house (five of these in a huge foundation pit dug during the Roman period into the debris of the Iron 1 house), yet others nearby and still others elsewhere on the tall, some in stratified remains, some not. Impression 5133, a stamped jar handle discovered near the center of the house in second-story destruction debris, pictures a striding human figure (FIG. 13), possibly of Egyptian origin (Eggler *et al.* 2002: 274-275).

In addition, while not directly attached to the house, a massive midden located nearby to the east and most likely used by inhabitants of the house and others, boasted several seals and impressions, only one of which has been published to this point (Eggler *et al.* 2002: 284-285). A horned quadruped was carved into the sole of a small, human-foot-shaped piece of yellow tuff, with parallels throughout the Aegean and northeastern Mediterra-



13. Stamped jar handle seal impression.



1. The West Acropolis Mansion of Mādabā.

The area to the west of Room 3 was accessed through a door in the north-west corner of the room. A wall with a bedrock foundation divided this space in two, the southern portion of which was paved with a plain white mosaic floor. The northern section had a polychrome pavement that was partially removed in the 1980s, leaving only the northeast corner intact. The extension of the northern wall of Room 3 preserved a plaster facing that concealed a clay water pipe embedded in the stonework behind it.

The second storey over Room 4 was paved with a practically intact white mosaic. The eastern edge of the floor sealed directly against the pre-classical fortification wall, and was bordered by free-standing walls on its north and west sides. This upper pavement sat on a series of large roofing slabs, which were supported by three arches anchored to the walls of the room below. The first storey floor was hewn directly out of the bedrock, and the entrance to the room was located in its southern wall. Three large stone bins were installed to the east of this doorway. A channel cut down the center of the floor led to a shallow basin located directly below a window in the northern wall. A large ceramic pipe protruded from the deep ledge beneath this window. This pipe led into a plaster-lined basin that was connected to a narrower east-west pipe in the northern wall. This smaller pipe directed the water west, inside the northern wall, then south, beneath the facing of the western wall, and would eventually have connected with the clay pipe in the northern wall of Room 3. The basin presumably served as a catchment area in which the flow of water could be controlled.

Room 5 was paved with a polychrome mosaic portraying a grid-pattern of flowers enclosing squares. Traces of arch supports were uncovered along the northern and southern walls of this room, each of which was outlined by a border of two rows of tesserae. These springers had obviously once supported two large arches that had in turn supported a ceiling, and possibly a second storey.

A large flagstone floor was built to the west of the rooms previously described. Two drains carved directly into the bedrock, and fed by a large channel equipped with a series of check dams, ran beneath the floor, which clearly formed the central courtyard of the complex.

The exposed bedrock to the south of the flagstone floor is marked by a number of stone retaining walls and platforms. These installations would have served to complement the bedrock in this area, which descends in step-like terraces to the west. Flat surfaces would have then been created for the floors in this part of the complex. Though fragmentary, the walls in this area help to delineate the parameters of the rooms that once formed this southern wing of the building. The bedrock was also dotted with a number of deep holes, which were probably used as door sockets, designating different entryways and thus facilitating the identification of traffic patterns within the complex.

In the Early Islamic period, in the mid to late seventh century, this building underwent a series of renovations and repairs. A vault built of stone blocks was inserted between the existing walls of Room 1 to help support a second storey paved with a white plaster floor. The base stones of the vault were laid directly on top of the first floor mosaic, and the upper portion of the structure blocked the window in the southern wall and the doorway in the northern wall that once led to Room 2.

Portions of the western wall and doorway to Room 2 were repaired and refinished with finely cut stone ashlars. A retaining wall was added to the north side of the southern wall of Room 3, presumably in order to support the original construction. This addition blocked both the southern doorway into Room 3 and the basin in its southeastern corner.

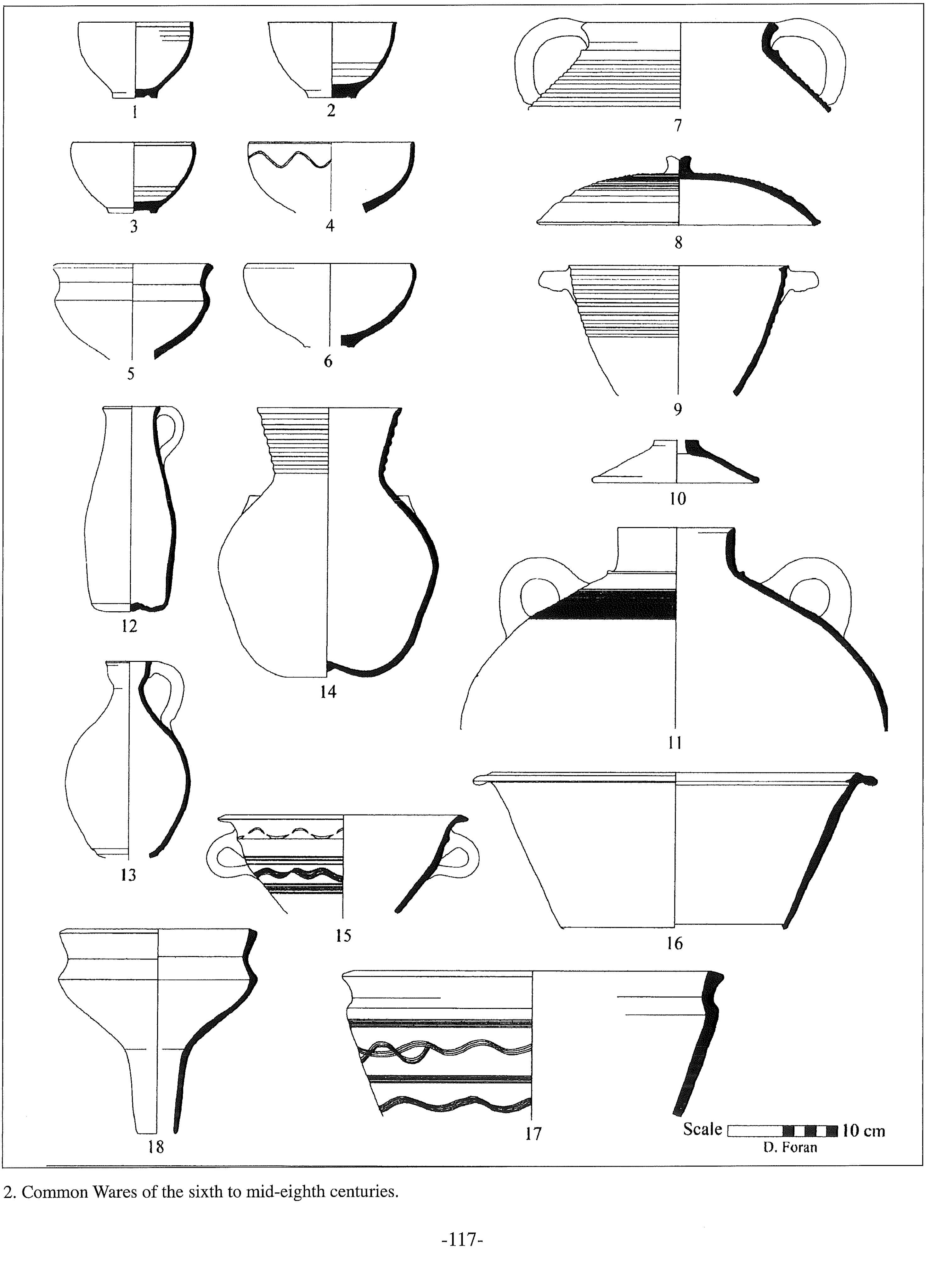
The mosaic floor of Room 5 was subjected to a number of repairs, appearing as mortar patches, during this second phase of occupation. A stone basin was also embedded into the mosaic floor midway along the western side of the room. The tesserae surrounding this installation are significantly larger than those of the polychrome pavement, indicating that it was a later addition. A small plastered niche was incorporated into the southeast corner of the room. The upper portions of the niche were destroyed in antiquity. However, traces of plaster were found still adhered to the walls behind it, providing evidence that the niche had once stood at least 2 m in height, and possibly had even reached the ceiling directly above it. This installation was decorated with painted designs executed in yellow, red, and black, traces of which are still preserved on its inner surface.

The building on the western slope of Mādabā's acropolis has been identified as a residential complex. Its familiar layout, comprised of rooms of varying sizes concentrated around a large courtyard, coupled with the lack of any evidence related to public activity confirm this identification. The size of the building, the care employed in its construction and the lavishness with which it was decorated denote its affluence. This structure can therefore be referred to as Mādabā's West Acropolis Mansion.

Ceramics

The pottery recovered from the West Acropolis complex consists predominantly of material that dates to the sixth through mid-eighth centuries AD. A variety of common ware forms have been found in the building (FIG. 2). These common wares appear to remain relatively unchanged throughout the Late Byzantine and Early Islamic periods, further supporting the idea of a smooth transition between the two periods. Included in the assemblage were several cups with ring bases, cooking pots, casseroles with lids, storage jars and their accompanying lids complete with ventilation holes, jugs, large and small basins, and one large funnel.

Certain wares characterize the building's final phase of use, during the mid-seventh to early eighth centuries AD. Painted examples are distinguished by an orange or buff coloured fabric decorated with dark red or brown paint. The most popular patterns chosen for these vessels include rectilinear or curvilinear motifs and alternating bands of geometric



2. Common Wares of the sixth to mid-eighth centuries.

lesigns. Commonly painted forms include small ımphora (FIG. 3: 1-3), bowls (FIG. 3: 4, 8-9), and :ups (FIG. 3: 5-7). A small collection of candle-ıtick-style lamps (FIG. 3: 10-11), which typify this ɔeriod, were also recovered.

The ceramics distinctive of the post-abandon-nent phase of the complex date to the mid-eighth o ninth centuries AD. Painted wares are charac-erized by a pale-coloured fabric decorated with ı dark reddish brown paint. The designs in these ater styles are far more intricate than their prede-:essors, consisting of complicated arrangements of ;eometric patterns. It is also curious to note that n this later phase, painted decoration is limited to ı single vessel type: the straight-walled cup (FIG. ¦: 12-15). Many fragments of mould-made lamps vere also recovered from this period (FIG. 3: 16-7). The motifs on these examples include grape-ines and pomegranates.

Several glazed ware bowls were also recovered FIG. 3: 18-20). The glaze is usually found on the nside of the vessel, and appears in a variety of col-ırs, including green, white, black, and blue. The nost common designs on these vessels consist of ırge dots, as well as rectilinear and curvilinear ines. These vessels belong to an Early Islamic ;lazed ware tradition typical of the eighth and ninth enturies AD.

ꞩmall Finds

ʌ large corpus of objects has been recovered from ıe West Acropolis Mansion. In addition to a vari-ty of ground-stone tools (FIG. 4: 1-2), several high tatus artifacts have also been uncovered. A large ronze ewer (FIG. 4: 3) was found resting on the arthen floor of Room 2. The vessel was supplied ⁄ith a heavy, ornate handle that was attached to :s lid via a small chain. A carved, stone Eucharis-.c bread stamp was discovered while clearing the .agstone floor. The cone-shaped piece measures pproximately 5cm in height and 3cm in diameter. 'he bottom of the stamp was decorated with cross ɜt inside a circle (FIG. 4: 4)

A small human figurine (FIG. 4: 5) carved of one was found in the channel running underneath ıe flagstone paving of the courtyard. Originally, it ⁄as most likely equipped with moveable arms and ȝgs. The figurine also has pierced ears and a hole ıat enters through the top of its head and exits at ıe back. The top of its head is unfinished, perhaps ıdicating the addition of a headdress. Figurines such as this are usually identified as dolls and are well known from the Byzantine world (e.g. Petrie 1927: 62, pl.55).

A second bone-carved item, a small plaque (FIG. 4: 6) depicting a standing male figure holding a spear and a shield, was uncovered at the southern end of the bedrock ledge. The military-style clothing portrayed suggests that the figure represented was a soldier or government official, or possibly a military saint. Ivory-carved plaques depicting military figures, such as this one, have been uncovered a number of sites in Jordan, including al-Ḥumayma (Foote 1999) and the port city of Ayla (Whitcomb 1994: 28-31).

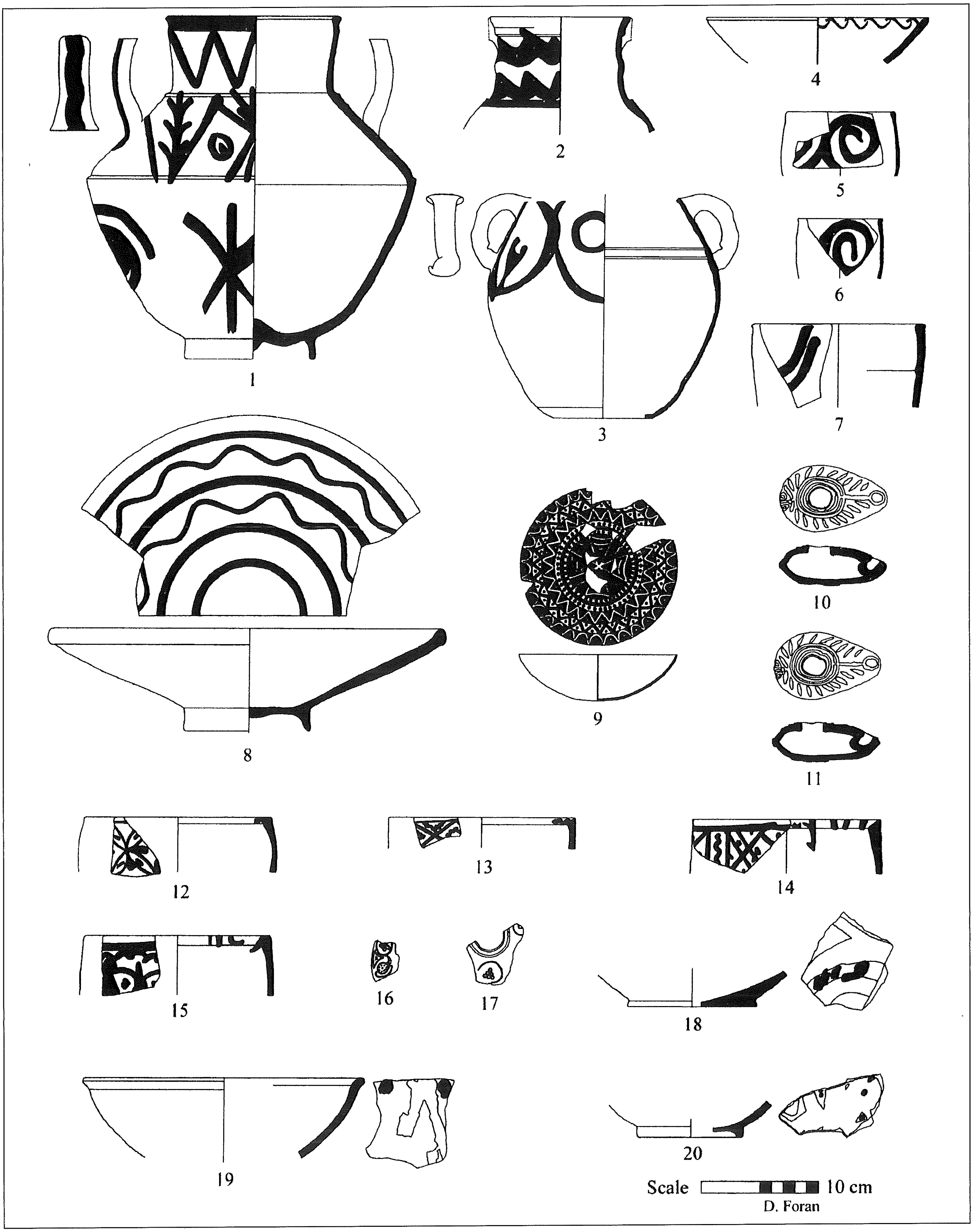
A large corpus of painted plaster fragments (FIG. 4: 7-9) has been assembled from the West Acropolis building. Through the efforts of Dr. Nola Johnson, several letters in a Late Greek script have been identified. Dr. Johnson has also isolated a number of fragments of a Greek cross, as well as the border that framed the inscription. To date, several syllables have been identified, however, the exact nature of this inscription however has yet to be determined.

The Urban Domestic-Building Tradition

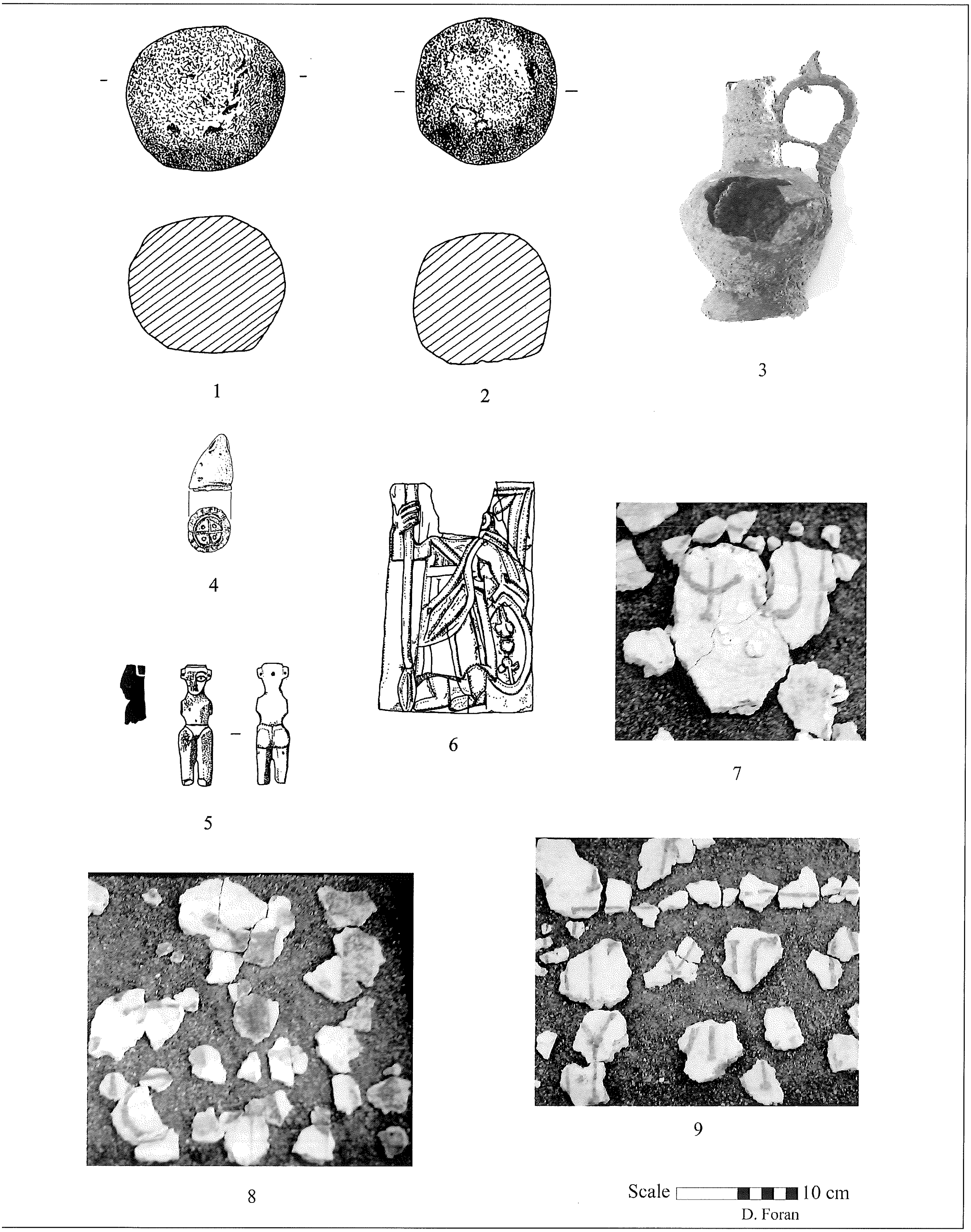
The Mansion on Mādabā's West Acropolis is an example of a widespread tradition characteristic of the Byzantine and Early Islamic periods, in which large domestic structures were built in urban settings (Hirschfeld 1995, 1999). The Burnt Palace of Mādabā (Bisheh 1994; Piccirillo 1986b) provides an important parallel with which to compare the West Acropolis complex. Both complexes were composed of various-sized rooms paved with mosaics built around a central courtyard equipped with an extensive drainage system.

The presence of large residential complexes within an urban context is not limited to the Mādabā region. Similar structures have been identified elsewhere in Jordan, including sites such as Tall Jāwā (Daviau 1994), Umm al-Jimāl (de Vries 1993), Pella (McNicoll *et al.* 1982: 123-139, 1992: 163-170; Walmsley *et al.* 1993; Watson 2002; Watson and Tidmarsh 1996), and Jarash (Gawlikowski 1986). The same phenomenon also appears at a number of sites in the southern Levant, including Qasrin (Killebrew *et al.* 2003), Bayt-Shān (Sion and Said 2002), Chorazin, Giv'at Orha and Horvat Kanaf (Galor 2003).

The presence of these large residential complex-



3. Painted/Glazed Wares and Lamps of the sixth to mid-eighth centuries.



. Small Finds from Mādabā's West Acropolis Mansion.

es within urban contexts argues for the existence of a powerful aristocracy that thrived between the fifth and eighth centuries AD. This group played an important role in the religious life of the community in which it lived. They were largely responsible for funding the construction and renovation of the many churches that lined the streets of these Byzantine cities, and their names are prominently displayed in the numerous inscriptions that cover the floors of these monuments (Dauphin 1980; Saradi-Mendelovici 1988).

Conclusions

The flourishing building activity that the Mādabā area experienced in the sixth and early seventh centuries attests to a thriving Christian population. The securely dated mosaic pavements of the region provide concrete evidence of the smooth transition from Byzantine to Islamic rule, and the continued prosperity of the Christian community. To complement this abundance of material, attention must now be concentrated on the secular and domestic environment. The complex uncovered on Mādabā's west acropolis, though it was clearly renovated in the mid to late seventh century, is a testament to this continued prosperity. A substantial investment was made in order to refurbish this building. Repairs were made to the walls and mosaic floors of the building, and plaster installations were added to certain rooms within the complex. The incorporation of the vault over Room 1 and the retaining wall between Rooms 2 and 3 also altered the traffic patterns within the structure.

The changes witnessed in the West Acropolis Mansion are symptomatic of what was occurring on a larger scale throughout the region. The alterations made to the complex certainly indicate a re-structuring of the building, perhaps to accommodate the needs of a growing family, a shift in the functional use of the building, or a change in ownership. In the mid-seventh century, the introduction of a new ruling power from the East brought about gradual changes that manifested themselves in the architectural and artistic traditions of the region. Despite the fact that the Christian communities of Mādabā now paid their taxes to Damascus, they continued to renovate their homes, tend to their fields and flocks, and practice their Christian faith. Thus, Mādabā's West Acropolis Mansion, like the numerous mosaic-paved churches of the region, bears witness to a community that experienced change in the late seventh century, but which did not experience decline until the late eighth century.

Acknowledgements

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Craft Production and Landscape at the Early Bronze Age Settlement at al-Lajjūn, Jordan

Introduction

In 2003 the University of Minnesota Duluth — Early Urbanism Project (UMD–EUP) began a long-term research project to examine craft and agricultural production in the urban Early Bronze Age from a landscape perspective. The inaugural season focused on the Early Bronze Age settlement of al-Lajjūn located on the Karak Plateau in south-central Jordan. The 2003 crew counted pottery, chipped stone, and ground stone artifacts along transects in four surface areas to test whether evidence of craft production could be located and whether the final stages of production were nucleated or dispersed within the settlement. The distribution of chipped stone manufacturing debris provided the best evidence for the location of production, because little ceramic or ground stone production debris was present in the survey areas. Debitage was present in low numbers in all four areas sampled with a spike in one area suggesting that low intensity chipped stone tool production occurred across the site and higher intensity production occurred in at least one nucleated context. The paucity of ground stone or ceramic production debris indicated that off-site survey or excavation will be required to understand the organization of production for these items.

A Landscape Approach to Urbanism at al-Lajjūn

The population aggregation that led to the first urban society during the Early Bronze Age in the southern Levant was followed by a period of disaggregation and urban abandonment (Palumbo 2001; Philip 2001). Excavations (Amiran 1978; de Miroschedji 1999; Rast and Schaub 2003), synthetic analyses (Chesson 1999; Esse 1991; Joffe 1993), studies of craft production and exchange (Falconer 1987; Jones 1999; Schaub 1987; Watts *et al.* 2004), and survey data (Betts 1998; Broshi and Gophna 1984, 1986; Falconer and Savage 1995; Gophna 1995; Greenberg 2001; Harrison 1997; Ibrahim *et al.* 1976, 1988; Mabry and Palumbo 1988; Mattingly 1996; Miller 1991; Palumbo *et al.* 1990) have incrementally added to our understanding of the economic, political, and social organization of the urban period.

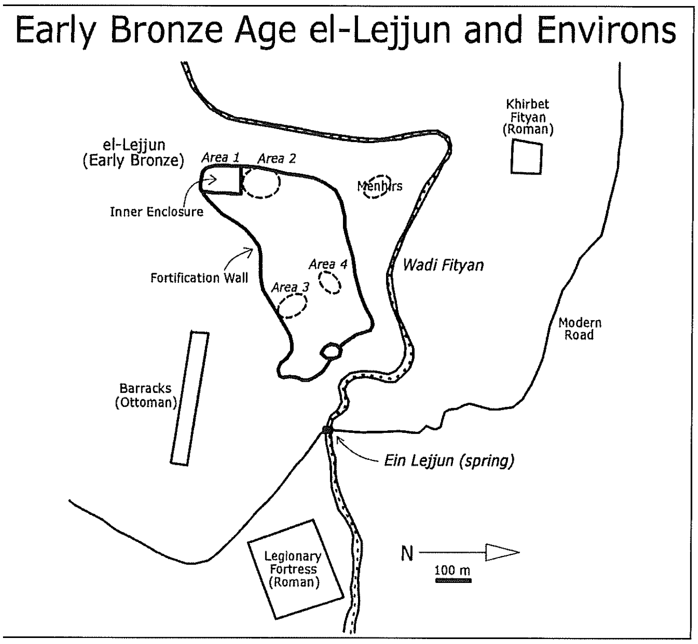
The broad goal of the University of Minnesota Duluth Early Urbanism Project (UMD – EUP) is to integrate economic and ideational approaches to archaeological data to underscore the complex interplay of meanings embedded in landscapes (Wilkinson 2003: 219). While making a living, people imbued their surroundings with cognitive dimensions of religiosity and ideology. In the Early Bronze Age, population aggregation and the construction of fortification walls around many larger settlements likely necessitated changes in the organization of labor and the scheduling of tasks. At the same time, people moved across the landscape to tend annual and orchard crops, to herd animals, to acquire raw materials for craft production, to exchange goods, and to visit other settlements. This pattern of intensive human investment in a localized area and land use at varying distances and intensities requires a landscape-based approach that integrates material and ideological factors.

The inaugural season of the UMD-EUP tested, whether craft production occurred in dispersed or nucleated contexts within al-Lajjūn based on the premise that the concentration of production, the degree to which production was dispersed or nucleated, might differ among various crafts or for individual stages in the production of a craft item (Costin 1991). The sparse vegetation covering the site, single period of occupation, and high visibility of surface artifacts presented an opportunity to test whether production loci could be identified from surface artifacts. The field methodology in 2003 included two components: a non-random inspection of the surface architecture across the site and counting pottery, chipped stone, and ground stone within the settlement to determine the density of artifacts and production debris. Although the larger goal of the project is to reconstruct where craft and agricultural production occurred across the landscape, we concentrated the bulk of our efforts during this first season inside the settlement.

Early Bronze Age al-Lajjūn

The Early Bronze Age site of al-Lajjūn (JADIS #2307-001) is located in south-central Jordan between the modern towns of al-Karak and al-Qaṭrāna (UTM East: 772300, UTM North: 3459600). The site sits along a ridge top with a precipitous drop on the northern and western sides to the Wādī al-Fityān and a perennial spring and small creek to the east (FIG. 1). The area has attracted settlement intermittently over the millennia: Paleolithic flints, a Roman/Byzantine legionary fortress, Ottoman period barracks, and modern era burials occur in the near vicinity. Site size estimates for Early Bronze Age al-Lajjūn vary from 10-11 hectares based on a GPS generated site map (Chesson 2001: 4) to 14 hectares based on previous survey estimates (JADIS).

Architectural elements visible on the surface included a fortification system, an inner enclosure wall in the southwestern corner of the settlement, discontinuous wall segments across the site, and a line of 17 menhirs of unknown date. The fortification system incorporated a one meter thick encircling wall with a series of projecting rectangular towers. Spaced at irregular distances along the wall, the towers varied in width, with two along the southern side of the wall measuring 7.70m and 10.40m wide. No gates were identifiable from the surface remains, although erosion gullies and soil deposition obscure the fortification wall near the spring. Visible on an aerial photo (Parker 1987: Fig 20, p. 189) and noted by successive archaeological teams (Albright 1934; Glueck 1934; Miller 1991; Musil 1907), the inner enclosure segregated a 0.5 hectare area within the southwestern corner of the fortification wall (FIG. 1). Although the inner enclosure wall has been cited as the boundary of an "acropolis" (Albright 1934: 14; Glueck 1934: 44; Miller 1991: 102), determining the function of this area will require further information on the sequence of construction. A number of discontinuous wall segments and rock alignments were visible along the ridgeline north of the inner enclosure wall. Construction details, namely the smaller stones used and the single stone width differentiates these segments from the fortification system and inner enclosure and suggests that they may be the remnants of domestic structures. The menhir line at al-Lajjūn consists of seventeen stones, 11 upright, arranged in a north-south line outside the fortification wall that has not been altered for at least eighty years (Glueck 1934: Fig. 19, p. 45).



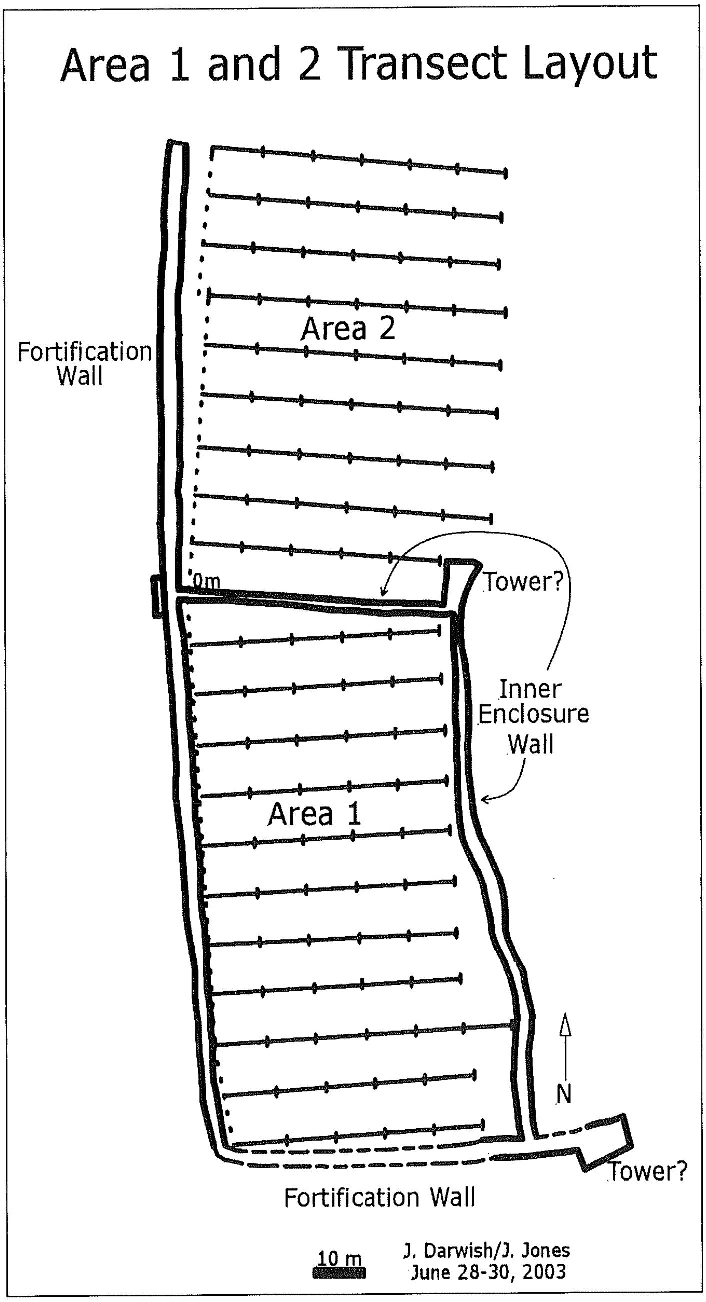
. Map showing the area around Early Bronze Age al-Lajjūn and the location of transect survey Areas 1-4 inside the fortification wall.

Published records of Early Bronze Age al-Lajjūn date back at least to 1896 and 1897 when Simeone Vailhe and Germer-Durand noted the menhir line and the similarity of the stones to nearby geological strata (cited in Brunnow and Domaszewski 1905: 38). Musil visited the menhirs in August 1896 and collected folklore from local residents that explained the origin of the stones as either the children of a mother who would not feed them bread or as the companions of a bride (1907: 36). Subsequent archaeological survey teams dated the site to the Early Bronze Age based on surface pottery, and noted the size of the settlement, the presence of the fortification wall and towers, and the inner enclosure wall (Albright 1934; Glueck 1934; Miller 1991). The first excavation at al-Lajjūn occurred in 2000 and in three test units suggested the archaeological deposits at al-Lajjūn were relatively shallow at approximately 0.40-0.60 meters deep (Chesson 2001).

Survey Methods

Determining whether craft production was dispersed or nucleated at Early Bronze Age al-Lajjūn required us to calculate the density of production debris across the settlement. The low quantity of surface material allowed us to count artifacts to calculate these densities. Arguably on a site with higher artifact densities this procedure would have been impractical. The 2003 survey team identified and counted pottery sherds, ground stone, and chipped stone artifacts in four transect areas, numbered 1-4, inside the fortification wall of al-Lajjūn (FIG. 1). The two person planning team of myself and Department of Antiquities Representative Jihad Darwish, counted artifacts along each side of transects spaced 10m apart, restarting our tallies at 10m intervals along the transect line (FIGS. 2-3). Approximately 2.5m of ground was visible on either side of a transect line, yielding $50m^2$ of coverage per each 10m interval. Artifact counts on each side of a transect line were combined per each ten meter segment of a transect line for the data analysis portion of this study.

The square meters covered in each area, the number and length of each transect, and an assessment of transect visibility are listed in TABLE 1. A total of $9{,}050m^2$ of surface area was examined during the survey which represents 6.5% - 9.1% of the surface area of a 10-14 hectare site. The transect areas were selected judgmentally to sample different portions of the site: Area 1 within the inner enclosure, Area 2 extending northeast from the inner enclosure, and Areas 3 and 4 in the eastern portion of the site where little surface architecture was visible (FIG. 1). The size of each area was determined by the time allotted to the survey work. Transects were laid out over the entire area inside the inner enclosure and a similar sized area was surveyed in Area 2. Surveying additional transects in Areas 3 and 4 would have been desirable but the time allotted for the fieldwork had expired.



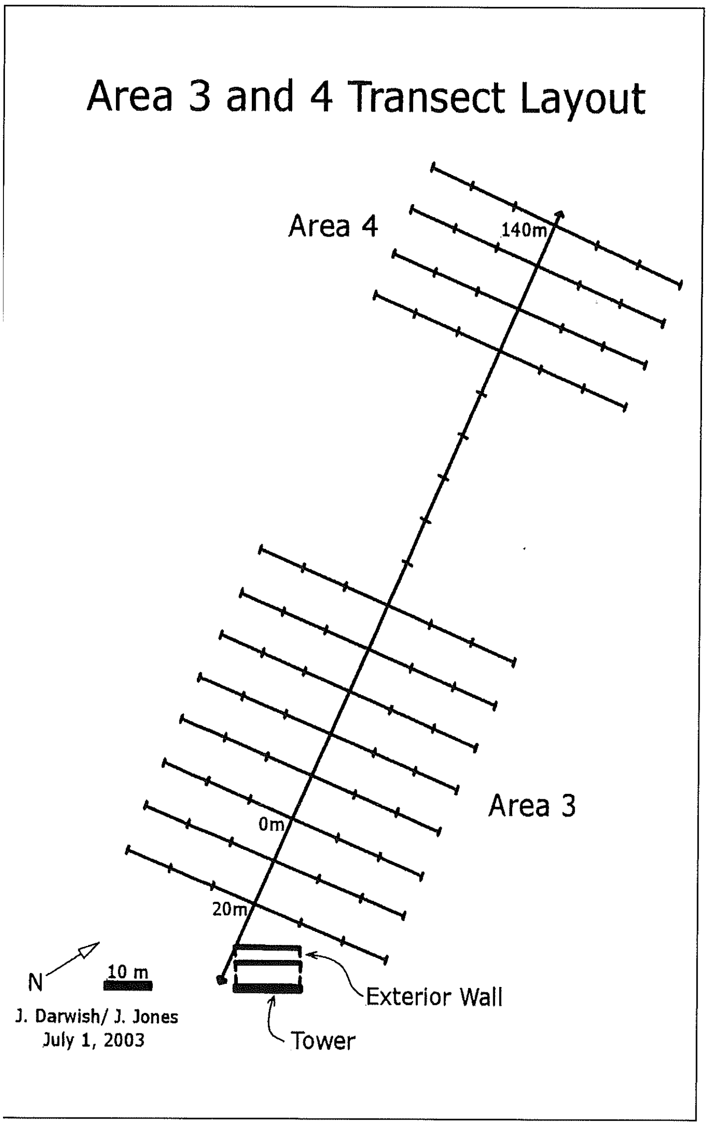
2. Location and layout of survey Areas 1 and 2.

Survey Data and Artifact Descriptions

The presence of ceramic, ground stone and chipped stone artifacts at al-Lajjūn allude to the expected suite of Early Bronze Age activities including the harvesting of crops, and food preparation and consumption. Chipped stone debitage provided the best evidence for the location of craft production at al-Lajjūn because no evidence for ceramic or ground stone production was identified in the surveyed transects. Ceramic counts and densities were used to evaluate whether artifact distributions in the four surveyed areas resulted from where crafts were produced or where garbage was disposed, a topic that is discussed in greater detail in a subsequent section.

Pottery

Nearly all of the ceramics enumerated at al-Lajjūn in 2003 were Early Bronze Age in date. No Early Bronze IV sherds were identified contrary to previous claims (Miller 1991) although we examined only part of the site and Early Bronze IV material may be present elsewhere. The sherds in the transect areas were heavily eroded and consisted



3. Location and layout of survey Areas 3 and 4.

mainly of undiagnostic body pieces. Ceramic collection by previous survey teams undoubtedly has impacted the presence of diagnostic pieces in the surface assemblage. The survey team counted all sherds larger than 1cm in size. The density of ceramics in the survey areas varied from a low of 0.22 sherds per m^2 in Area 2 to a high of 0.30 per m^2 in Area 3 (TABLE 2). Areas 1 and 4 contained similar densities of ceramics at 0.28 per m^2 and 0.27 per m^2 respectively.

Ground Stone

Ground stone tools at al-Lajjūn were produced from black vesicular and non-vesicular basalt. Known local sources of basalt include an area near Jad'a on the King's Highway approximately 19 kilometers northwest of al-Lajjūn (Koucky 1987: 38) and basalt flows 3.5-12 kilometers west of al-Lajjūn (Shawabkeh 1991: see map insert). The size of al-Lajjūn and location near a spring would suggest an agricultural subsistence economy, yet the surface ground stone assemblage was sparse and fragmentary. The only complete tools among the 120 ground stone artifacts were a hand stone and one small quern. The ground stone counts from each survey area are shown in TABLE 3 with the densities transformed by multiplying by 400 to yield more comprehensible quantities. The transformed densities range from lows of 1 and 1.32 fragments per $400m^2$ in Areas 4 and 3, to highs of 4 and 12 fragments per $400m^2$ in Areas 2 and 1, respectively (TABLE 3).

TABLE 1. Transect Areas, Square Meters Covered, and Transect Visibility.

Area	Square meters covered	Visibility
Area 1	$2,750m^2$ (11 transects of 50 meters each * 5m of visible area)	Moderate. Ground heavily covered with stones 0.10-0.20m in size. Possible domestic architecture visible.
Area 2	$2,700m^2$ (9 transects of 60 meters each * 5m of visible area)	Good. Some coverage of stones 0.10m in size but less densely than Area 1. Possible domestic architecture visible.
Area 3	$2,400m^2$ (8 transects of 60 meters each * 5m of visible area)	Good. Some coverage of stones 0.10m in size, especially in southern half of transects. Little domestic architecture visible.
Area 4	$1,200m^2$ (4 transects of 60 meters each * 5m of visible area)	Very good. Light coverage of naturally occurring chert gravel but few larger stones. Little domestic architecture visible.

TABLE 2. Count and Density of Ceramics by Area.

Area	Ceramic Count	Ceramic Density	Ceramic Density per $100m^2$
Area 1	770	$0.28/m^2$	28
Area 2	581	$0.22/m^2$	22
Area 3	711	$0.30/m^2$	30
Area 4	326	$0.27/m^2$	27
Total	2388		

TABLE 3. Count and Density of Ground Stone Artifacts by Area.

Area	Ground Stone Count	Ground Stone Density	Ground Stone Density per $400m^2$
Area 1	81	$0.29/m^2$	12
Area 2	28	$0.10/m^2$	4
Area 3	8	$0.033/m^2$	1.32
Area 4	3	$0.025/m^2$	1
Total	120		

Chipped Stone

The chipped stone artifacts at al-Lajjūn included flake and blade tools and debitage. Flakes, utilized flakes, flake tools, blades, and debitage larger than 1cm were counted during the survey. Utilized flakes were counted separately from flake tools because a large number of flakes observed in the initial field walkover had few or no retouch scars. For this analysis, utilized flakes exhibited three or fewer retouch scars while a tool had more than three scars. Utilized flakes and flake tools were likely used for similar suites of activities that included cutting and scraping and the greater number of retouch scars may have resulted from either longer use, the need for a sharper tool, or from cutting harder substances. Triangular in cross section, 150 out of 381 utilized lithics were blades, representing 39% of the items in this category. Debitage included a range of pieces from flakes missing a bulb of percussion to shatter.

The following analysis focuses on the density and distribution of debitage as a key indicator of the location of production. Debitage accounted for the vast majority of chipped stone artifacts and comprised between 76% - 85% of the assemblage in Areas 1-4 (TABLE 4). The density of debitage was lowest in Area 1 with a transformed equivalent of 8 pieces per $100m^2$ and highest in Areas 3 and 4 with 31 and 21 pieces per $100m^2$ respectively (TABLE 4). Isopleth maps of the density of debitage in each survey area show the higher artifact densities in Areas 3 and 4 (FIG. 4). The density of utilized flakes, blades and tools was low in all transect areas, equivalent to 3-7 pieces per $100m^2$ (T 4).

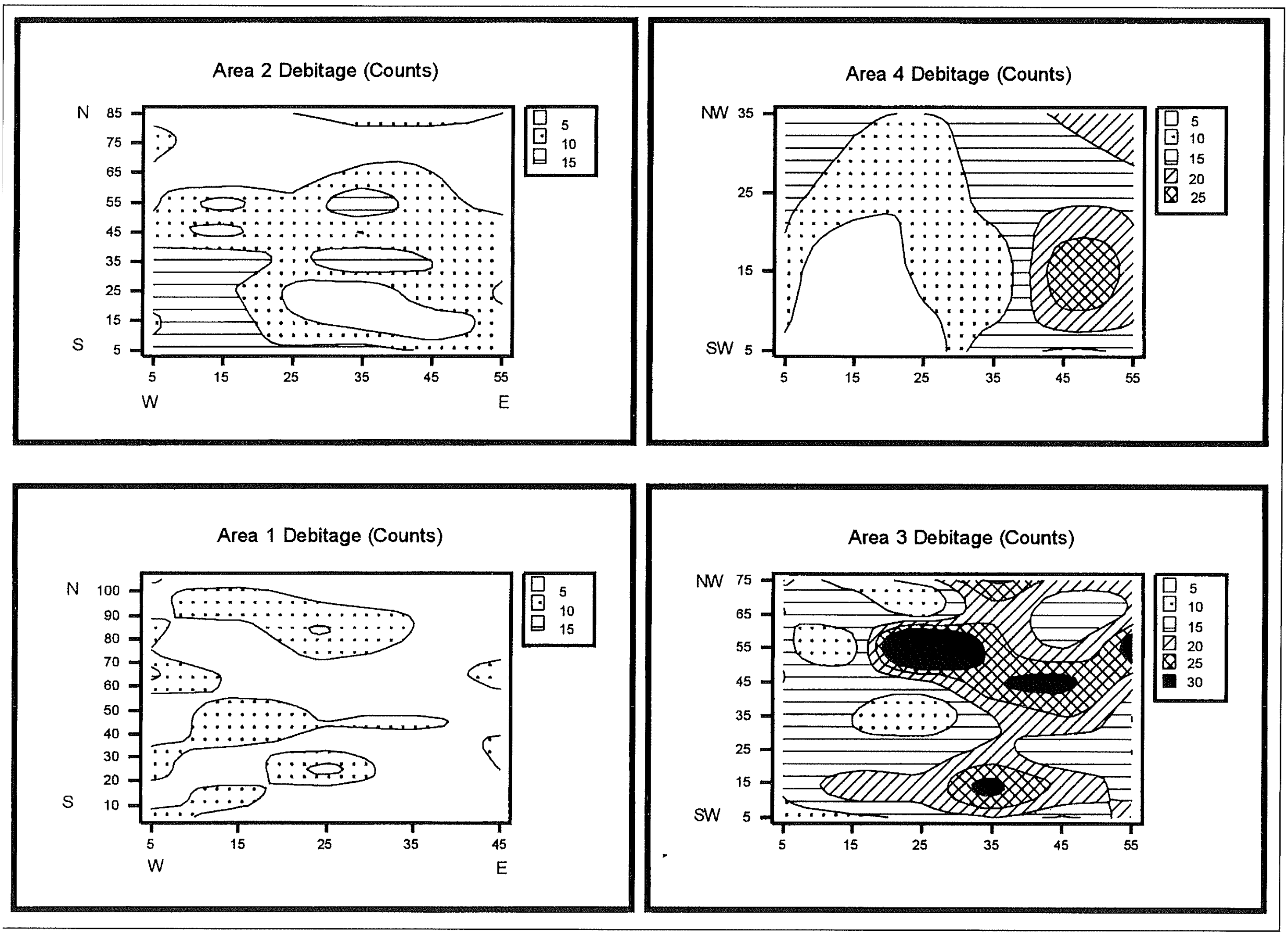
The Concentration of Craft Production

The deposition of ceramic, chipped stone, and ground stone artifacts at al-Lajjūn likely resulted

TABLE 4. Count and Density of Chipped Stone Artifacts by Area.

Area	Count of Utilized Flakes, Blades and Flake Tools(1)	Debitage(2) Count	Total Lithic Count	Density of Utilized Flakes, Blades and Tools per 100 m^2	Density of Debitage per $100m^2$	Density of Total Lithics per $100m^2$
Area 1	73	226	299	3	8	11
Area 2	87	369	456	3	14	17
Area 3	176	749	925	7	31	38
Area 4	45	255	300	4	21	25
Total	381	1599	1980			

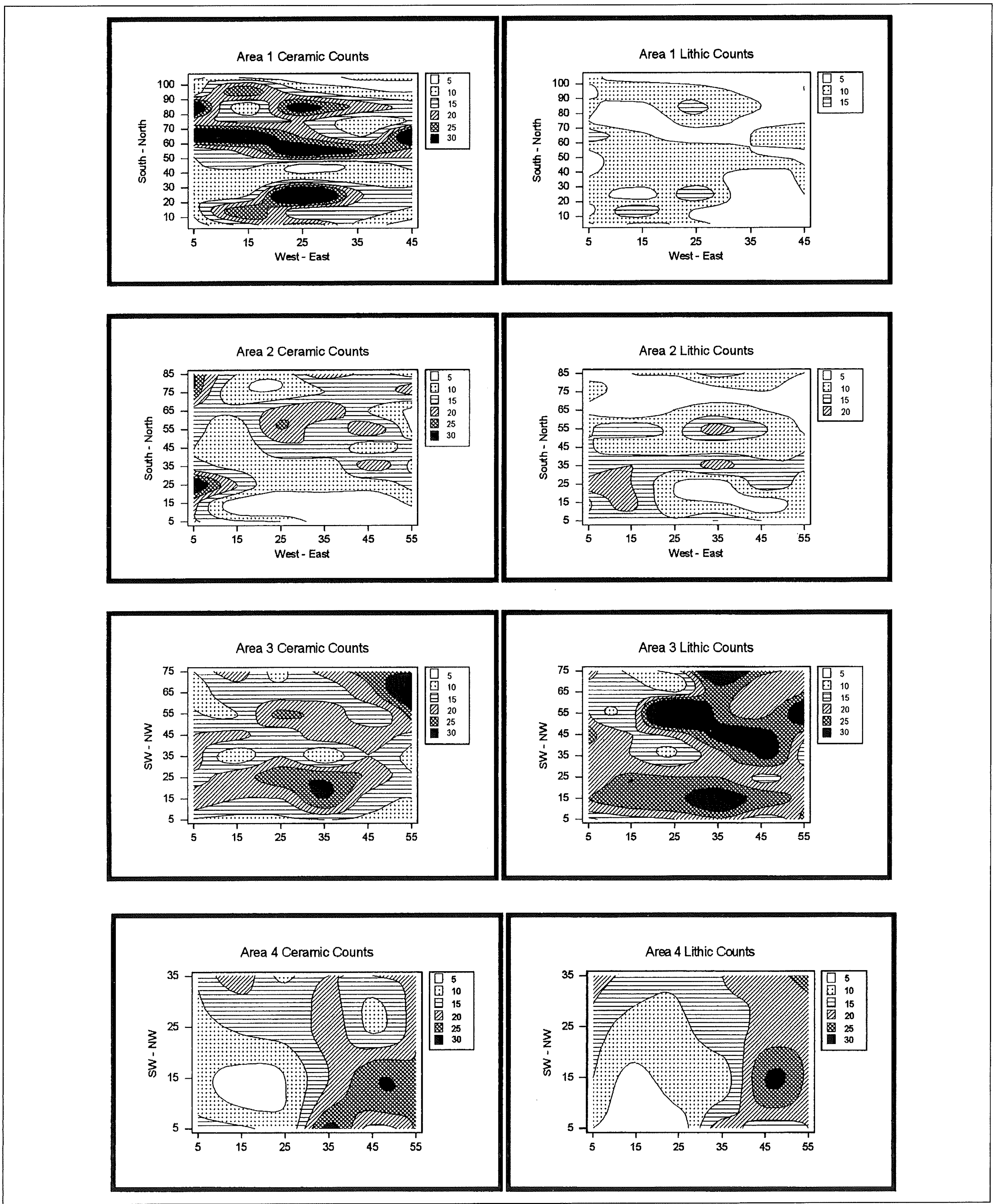
(1) Blades, flake tools and utilized flakes were combined into a single category for this analysis since their distribution represents use and disposal contexts rather than production contexts.
(2) Unutilized flakes and all other debitage combined.



ꜰ. Distribution of Debitage in Transect Areas. The transect are laid out in their geographic relative to one another.

ꜰrom a combination of use, disposal, and produc- ion contexts. Disentangling these contexts is chal- enging based on surface collected material but he artifact counts indicate that certain parameters an be narrowed. For example, the lack of ceramic production debris and ground stone shaping flakes uggests that these items were not produced in the ransect areas and that the distribution of ceram- cs and ground stone fragments reflects a combi- ation of use and/or disposal activities rather than production. In contrast, the location of chipped tone debitage likely represents a mix of disposal nd production contexts rather than use contexts. The mix of depositional contexts represented in the urface artifacts at al-Lajjūn is inferred here based n a judgmental assessment of the degree to which he peak counts of ceramic and lithic artifacts over- ap in each of the four survey areas. If ceramic and ithic distributions were primarily the result of dis- posal patterns and the inhabitants disposed of gar- page from a variety of activities in a given midden, then we would expect the peak counts of ceramics and lithic debitage to overlap in the same locations within transect areas.

Isopleth plots illustrate the ceramic and lithic counts within each transect area (FIG. 5: a-h). Total lithic counts are plotted rather than debitage alone. Comparing the ceramic and lithic plots for each area shows that the peak counts for the two artifact types do not consistently overlap in a given survey area. High ceramic counts in the bottom center of Area 1 overlap with peak counts of lithics, but three other locations with high ceramic counts do not overlap with correspondingly high lithic counts (FIG. 5:a-b). Peak counts of ceramics in the lower left portion of Area 2 occur in the same location as high lithic counts, but one area of high ceramic counts in the upper left portion of Area 2 and high lithic counts in the center of Area 2 do not correspondingly overlap (FIG. 5:c-d). In Area 3, high ceramic and lithic counts in the lower center and upper right portions of the plots overlap, while a



5. Distribution of artifacts within transect areas showing the location of peak counts for ceramics and chipped stone lithics: a) Area 11 Ceramic Counts; b) Area 1 Lithic Counts; c) Area 2 Ceramic Counts; d) Area 2 Lithic Counts; e) Area 3 Ceramic Counts; f) Area 3 Lithic Counts; g) Area 4 Ceramic Counts; h) Area 4 Lithic Counts.

arge area with high lithic counts in the center of the ırea does not correspond with high ceramic counts FIG. 5:e-f). In Area 4, peak ceramic counts in the ower right portion of the plot overlap with peak ithic counts (FIG. 5:g-h). The contrast in the loca-ion of peak counts for ceramics and lithics in Ar-:as 1-3 hints that the distribution of these artifacts nay not be solely related to disposal patterns.

Based on the current data, the location of pro-luction for chipped stone tools is inferred at al-Lajjūn where peak counts of debitage occurred in he survey areas. Debitage was found in all four ransect areas with notable concentrations in Areas } and 4. Debitage counts for Areas 1 and 2 range rom 0-14 pieces with the bulk of these two areas naving 10 or fewer pieces of debitage per 10 meter ransect section (FIG. 4). Areas 3 and 4 present a stark contrast with three peak counts above 24 and ›ne count above 40 in Area 3 and one peak concen-ration of 25 pieces in Area 4 (FIG. 4).

The distribution of lithic debitage at al-Lajjūn suggests a largely dispersed pattern of lithic pro-luction across the settlement with greater intensity ›r duration of production in portions of Areas 3 ınd 4. This pattern supports a model in which both lispersed and nucleated production occurred at the ite. Alternative possibilities include functional lifferences in the activities carried out within the urveyed portions of the site or chronological dif-erences in the occupation of these areas but testing hese alternatives will require broad-scale excava-ions. The possibility that chipped stone tool pro-luction occurred in both nucleated and dispersed ocations at al-Lajjūn caution against a linear as-ociation between the development of urban soci-:ties and specialized craft production. The timing ınd pace of the adoption of specialized production n the urban Early Bronze Age and the variability n the degree of specialized production across a va-iety of crafts will require excavation at al-Lajjūn ınd material resource surveys around the site.

Conclusions

Early Bronze Age al-Lajjūn holds great promise or illuminating issues related to craft production n early urban societies. A landscape approach is equired to understand work and craft production ›ecause tasks occurred across the landscape based ›n the location of raw materials and the location ›f different stages of production. Different strate-;ies will be required to elucidate the location of the stages of production for different crafts. For exam-ple, excavation at al-Lajjūn may provide informa-tion on the location(s) of production based on lithic micro-debitage and ceramic production debris. Off-site survey and compositional sourcing of temper and clay will likely be required to address the issue of dispersed or nucleated production of ceramics. Compositional testing and survey of basalt flows on the plateau will be required to determine how precisely the source materials can be located and the location of initial ground stone shaping.

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Irrigation Systems at Dayr ʻAllā

Introduction

The excavations at Dayr ʻAllā in the central East Jordan Valley, were started by Leiden University in 1960 and resumed in 1976 – in cooperation with the Department of Antiquities of Jordan, with Yarmouk University as a third partner since 1980. The [in total] fifteen large and small scale field seasons dealt with the MB, LB, Iron Age and Islamic Period use of the site and its surroundings. They provided a wealth of information about the Iron Age – the period of concern of this contribution.

Iron Age I strata were excavated in the 1960s and Franken produced his first major and seminal archaeological publication about the results in 1969, dealing with the stratigraphic and ceramic aspects of these strata (Franken 1969). The Iron Age II and III strata (ninth till forth century BC) were excavated mainly during five seasons in the 1970s and 1980s, but also earlier and later seasons (up to and including the latest one in 2004) provided important information. Their data are now under study for final publication, but preliminary reports are presented in Van der Kooij and Ibrahim (1989) with additions in Ibrahim and Van der Kooij (1997), and Van der Kooij and Kafafi (in preparation).

One of the striking features of the use of the site during this period is the alternating variety of intensity, from being densely inhabited until hardly used, or not at all used, as well as the different ways the peaks of use started and ended (see Van der Kooij 2001). The periods of intensive use (particularly the phases IX, ca. 800BC, and VII, ca. 700BC) provided large amounts and a great variety of plant remains, showing that not only animal husbandry, but also varied agriculture made up a great deal of the economy of the populations of these periods.

The current physical geographic condition of the landscape surrounding Dayr ʻAllā provides a good view of the agricultural possibilities, which is taken also as valid for the past of the Iron Age II period, since no climatic changes are recorded since that time (cf. e.g. Van Zeist 1985).

The surrounding land of the site is part of the alluvial floor of the Jordan Valley, with saline and alkaline lacustrine sediments (cf. recently Hourani 2002: 49-57). At the eastern edge of the East side of the Valley the soil has a lower salinity than near az-Zūr, to the west, but is still not optimal for agriculture (JVP 1969 Annex C: 43f). The climatic situation gives the region of the site a steppe character, with a rainfall average of 263mm, varying between 118 and 432 at Dayr ʻAllā itself in the 1950s and 60s (JVP 1969 Annex B: 8) and a very high mean annual Potential Evapo-transpiration of ca.1900 (JVP 1969 Annex G: 26).

With these circumstances some rain-fed agriculture is possible now, as it was in the Iron Age. However some archaeological plant remains from that period, as well as from the LB Age, indicate the use of irrigated fields (Van Zeist and Heeres 1973: 27, dealing with flax).

This prompts questions regarding the organization of agricultural activities and furthermore, the fluctuations of intensity of use of the site (and surrounding land) also prompt questions regarding how and why the technology of irrigation was introduced and again abandoned.

In an attempt to answer these questions we have to know address three specific subjects, namely:

1) how irrigation agriculture generally looked — technically, economically and socially — and how it may have changed;
2) how this general image might be applied to the the Dayr ʻAllā landscape; and
3) how this 'localised' image could be applied to

the specific Iron Age II periods.

This means that four steps have to be taken to answer the questions. The first and second step are ethnographical/ ethno-historical descriptions and analysis, namely about general systems of irrigation agriculture (and their changes), and about local landscape specific systems. The third is the construction of a hypothesis for the archaeological situation, and the fourth is a discussion of the application of this hypothesis to the specific archaeological situation.

In this contribution the focus will be on the first two steps, in particular in relation to the technical and economic aspects.

Systems of Irrigation Agriculture: A General View (Step1)

Irrigation agriculture is studied by several disciplines, such as physical and social geography, agriculture sciences, economy and anthropology. It appears that the interaction between these disciplines is not always optimal, especially when dealing with technical and social aspects, but in modern development studies bridging interdisciplinary approaches are often used.

In archaeological studies a fully interdisciplinary approach is necessary, in order to take account of all possible factors that may have played a role in establishing, using and abandoning such a system, during the process of interpretation of the — by definition — scanty archaeological data.

In the following paragraphs the two, chronologically distinguished, main parts of this general view will be considered:

A. How does an irrigation system work — providing a synchronic view;

B. How does such a system develop, how is it maintained or changed and how is it abandoned — providing a diachronic view.

A. How Does an Irrigation System Work; its Technical and Social Aspects

Scanning of some relevant accessible dictionaries provides elements of a definition of irrigation (Goodall 1987, s.v.): "The artificial distribution and application of water to arable land to initiate and maintain plant growth". The author adds that this "is essential to farming if annual rainfall is less than 30cm, desirable where rainfall is less than 50cm", and is meant to spread water (time-wise) more adequately than rain does. His additions in fact correct his definition, because irrigation does not necessarily initiate plant growth except in completely dry regions or in a dry season. In most of the Middle East this dry season is the summer period, with the production of summer crops. In fact in most regions of the Levant irrigation-agriculture goes together with, or functions in addition to, rainfed agriculture in the same field-system, for example in the 200-400 isohyète zones, and even in the dryer *ghouta*s in Syria: see Wirth 1971: 200f.

A German definition (Meyers' 1986: 51), using the term *Bewässerung*, takes irrigation as the total of measures taken to humidify the soil in order to take care of plants by providing water beyond the natural precipitation. It is interesting to note that this dictionary defines irrigation-economy (*Bewässerungswirtschaft*) "as the total of measures and arrangements (*Einrichtungen*) in order to rationally provide for the water-needs of cultivated plants". It basically includes availability of water and distribution of water, together making up an irrigation system.

These definitions adequately describe the use of irrigation. In this first step we have to find out how a system with such aims works, but for this study the search is limited to pre-modern examples, especially while dealing with technological aspects. In an archaeological study, an irrigation system has to be taken as an "artefact", that is produced and used as part of a small scale or a large scale social system, living and working in a given environment. It may be preliminarily assumed for the archaeological application at Dayr 'Allā that we are partly dealing with a *peasant* economy, with as its "key dynamic" the household structure, and with the "production and consumption ... oriented to the household", but with also "some economic and political obligations to outside power-holders" (Spencer 1996). We may also be dealing with a kind of market economy, where a large surplus is to be produced, with a different economic, social and political organization behind both the production and the means of production.

Technically (artefactually) different systems of irrigation can be distinguished. Irrelevant for this study is the so-called flood irrigation as brought about by a swelling river that inundates the fields during a limited period of time a year. We know this method from Egypt and Mesopotamia.

With the other methods of irrigation five elements form the physical make-up the system, each with its own techniques, organizations and activities of man power, as well as animal power:

1. The water source (a river, a lake, a well, a source; all with a device to separate and extract the water needed).
2. The way of bringing this water towards the fields (canal, *qanat* / *falaj*-tunnel).
3. The way to move water from the canal onto the fields (lifting, or gravity/flowing method); with some very small systems the canal may be the same as the water source.
4. The way to spread water over the fields (ditches — of different lay-out, or flooding).
5. The way to drain off or flow off the water from the land.

Each of these elements demands quite an investment to be prepared, as well as maintainance of a significant labour force, and an additional care to prevent salinity.

With these elements one could classify irrigation systems in a variety of ways, but an oft-used classification is the one based upon element 3 (the way water is brought onto the fields) and is divided into lift irrigation and flow irrigation:

- Lift irrigation means that water is available at a lower level, generally in a canal (this is also the case in Egypt and Mesopotamia) and has to be lifted up, with a special device (and power), on to the fields.
- Flow irrigation, or gravity system, has the water supply at a higher level already, and can be brought on the fields via an opening in a dike, whether a gate or otherwise.

The first system generally deals with horizontal flat landscapes, the second with a more or less sloping field-floor. This is, for our purpose, an adequate distinction because according to a study in Egypt (Mehanna, Huntington and Antonius 1984: 5,134) "the two technologies determine the style of social institutions responsible for the allocation of water, labour time and maintenance", as far as they could deduce this from Egyptian practice. These "styles" are described thus:

- A lifting system (in the Delta) produces a *saqia* ring (group), and cooperation is among a relatively small and stable group of people.
- A gravity flow system (in the Faiyum) produces a large group, organized according to principles of power, patron-client relations, based on a single source of water.
- A mixed system with gravity (multiple source) and lifting (in Minia; at the Ibrahimyeh canal - higher up along the Nile) produces combinations (teams) of farmers of relatively equal status, shifting, forming and reforming according to precise needs and opportunities.

Furthermore it appears that here the water source is also an important variable.

This point brings us to the **economic and social aspects** of irrigation systems, because the kind and amount of work needed for these systems have a strong economic impact.

The main infra-structural elements mentioned above, namely the devices to take water from a source and to bring water up to the fields, demand a lot of work to be set up, but they may exist for a long time — needing only occasional repair or adaptation. The other three elements, especially the delivery of water to a field (by lifting or by opening dykes) and the spreading of it across a field, requires much work with each new crop:

- Often ploughing at least twice;
- Watering frequently (summer crop for example each 10-14 days, cf. Wirth 1971: 232); and
- Frequent weeding in the dry season since unwanted plants grow well too.

This requires a labour investment 10 times larger than with mechanized winter crop (Wirth 1971). Indeed, figures have been produced for the relationship between extra production and extra labour with irrigated farming (see below).

All this work is organized since it has to be repeated regularly to ensure a reliable production. Particularly important issues within this **(economic) organization** are the time at which the water is made available and the amount of water. These may differ around the year, especially if the source varies in amount available, by water shortage, which may cause more fallow land and another choice of crop. In many cases the distance to the source also requires a difference of amount of water (or another frequency of watering) available for a field.

In any case it has been concluded (with figures) that the extra production needs a lot of extra work (Boserup 1965: 39f, based upon data from China and India). The total labour input per irrigated crop/hectare may be twice as high as with dry-cultivation, even when watering is by gravitation and requires little labour. Much more labour is required for lift-irrigation.

Altogether, on average, there is a lower production per labour hour compared to dry farming. This is even more marked when animal workforce is required and taken into account, because fodder is produced in the fields.

In irrigation systems the main **social issue** is water rights (the assignment of water), but also assignment of land (depending on the organization of land ownership), and the obligation of maintenance. These are very sensitive issues and have to be organized adequately (Diemer and Slabbers 1991). Some examples may clarify this issue.

Wirth (1971) mentions that very old customary laws control the division of water for day and year. They are often disputed, not well fixed and often conflicting. On the other hand studies often refer to the smoothness and effectiveness of the organization. Fernea (1970), for example, mentions for a village in S-Iraq, that a tribal system (shaykh as leader) provides a perfect realization of the irrigation, based upon firm rules of solidarity. The right of water may be established by labour investment in the system/ infra-structure (Coward 1985 — as quoted in Diemen and Slabbers 1991: 112). Often the producers, the peasants/households, form commonly the organization. This could mean one village, but also several villages – if they are connected by one system, or one set of systems (cf. Wirth 1970: 384).

It should be added here that studies hardly deal with the issue of co-existence of cattle, sheep and goats with this agricultural system. These animals have to be kept separate from the vulnerable physical parts of the system, at least during some seasons, which means the implementation of additional special arrangements.

We come now to the second question:

3. How and why does an Irrigation System Come up, is it Changed and Abandoned?

Basic to answering this question is still the study of the Danish economist Ester Boserup about the conditions for agricultural growth (Boserup1965). She opposed the functionalistic view, which was common at that time, that improved techniques are necessarily introduced from outside into static primitive communities. She makes it clear that rather the opposite is true, namely that profound changes are occurring within primitive agricultural communities by internal forces.

The process of introducing these innovations has also been studied by other scholars and technicians working in the Third World, where they are always dealing with the problem of introducing new technologies effectively. For example Dutch scholars from the Agricultural University at Wageningen are attempting to understand 'failure' when new technologies are introduced, in order to improve the introduction. Thus Diemer and Slabbers (1991: 111f; cf. also Diemer 1990) conclude that it does not work when a new technology is simply imposed (which is often done), but that it should be integrated in the existing system — including its social aspects. They understand technique as a social process, following Pfaffenberger (1988). To this may be added the experience of Boserup (1965). The introduction of a new technology will work only if the receiving society is ready for it, or up to it (or to its results), which indeed is a normal observation in acculturative situations. In her opinion the society should be in need of more agricultural food production — a need provoked by population pressure.

Boserup's **model of intensity** of land use is based upon the number of crops and consequently also upon the length of lying fallow. This model is suitable for our purpose. Her five stages, or levels, of intensity are (Boserup 1965: 15f; cf. discussions in Downing and Gibson 1974):

- Forest-fallow cultivation: plots of land are cleared, used some years, then left for many years to become forested again;
- Bush-fallow: the same, but left during a shorter period, giving only bush vegetation the opportunity to grow;
- Short-fallow cultivation (or "grass-fallow") with one or a few years fallow, giving only "grass" the opportunity to grow;
- Annual cropping: land is left uncultivated for several months only, but with fallow rotation;
- Multi-cropping, with two or more successive crops every year.

"Annual cropping" is done with rain-fed farming in semi-arid regions, and in the same regions multi-cropping is only possible by irrigating the fields during the rainless but warm seasons. Such an intensity of use and high production can only be maintained for some time if fertilization or long-fallow, is used as well.

This innovation requires new techniques and organizations, as well as new working habits, with many more hours of work, during all seasons. In Boserup's opinion the internal reason to make this change (if the technology is within reach) is an increase of the local population. Her work is based on a basic subsistence economy. However, for ethnographic as well as historic reasons we also have to take into account a kind of specialization of producing agricultural surplus when dealing with the Jordan Valley, connected with, for example, tax and special products — such as sugar cane during the Ayyubid and Mamluk periods.

It should be added, that innovations may also concern new crops.

Ethnographically/-historically, in the Levant the general winter crops are/were wheat and barley, and some vegetables. Summer crops are/were often vegetables, with sorghum and sesame, and fodder such as clover and lucerne (cf. among others Wirth 1971: in Syria also cotton), as well as tree fruits, often grown without irrigation.

Regional Specification: Dayr 'Allā Region (Step 2)

The regional example is specified in this paper for the physical aspects only. The specification of social aspects of the irrigation system has to be necessarily dealt with at another occasion, in order to develop a reference of interpretation when dealing with the material remains from the Iron Age.

The immediate surroundings of Dayr 'Allā provide a large piece of land suitable for agriculture, extending about 3kms to north, west and south and 2kms to the east (totaling up to 2 000ha), except for a salt plain of more than 200ha to the south-west. Since the end of the 1950s the region has a new irrigation system, because of the central governmental intention to strongly increase the agricultural production of the Jordan Valley and to take part in a national and international market for agricultural products. The development of the new system in the East Jordan Valley has been studied by Sharif Elmusa (1994), with a focus on economic and social aspects, and (more journalistically) by Rami Khouri (1981).

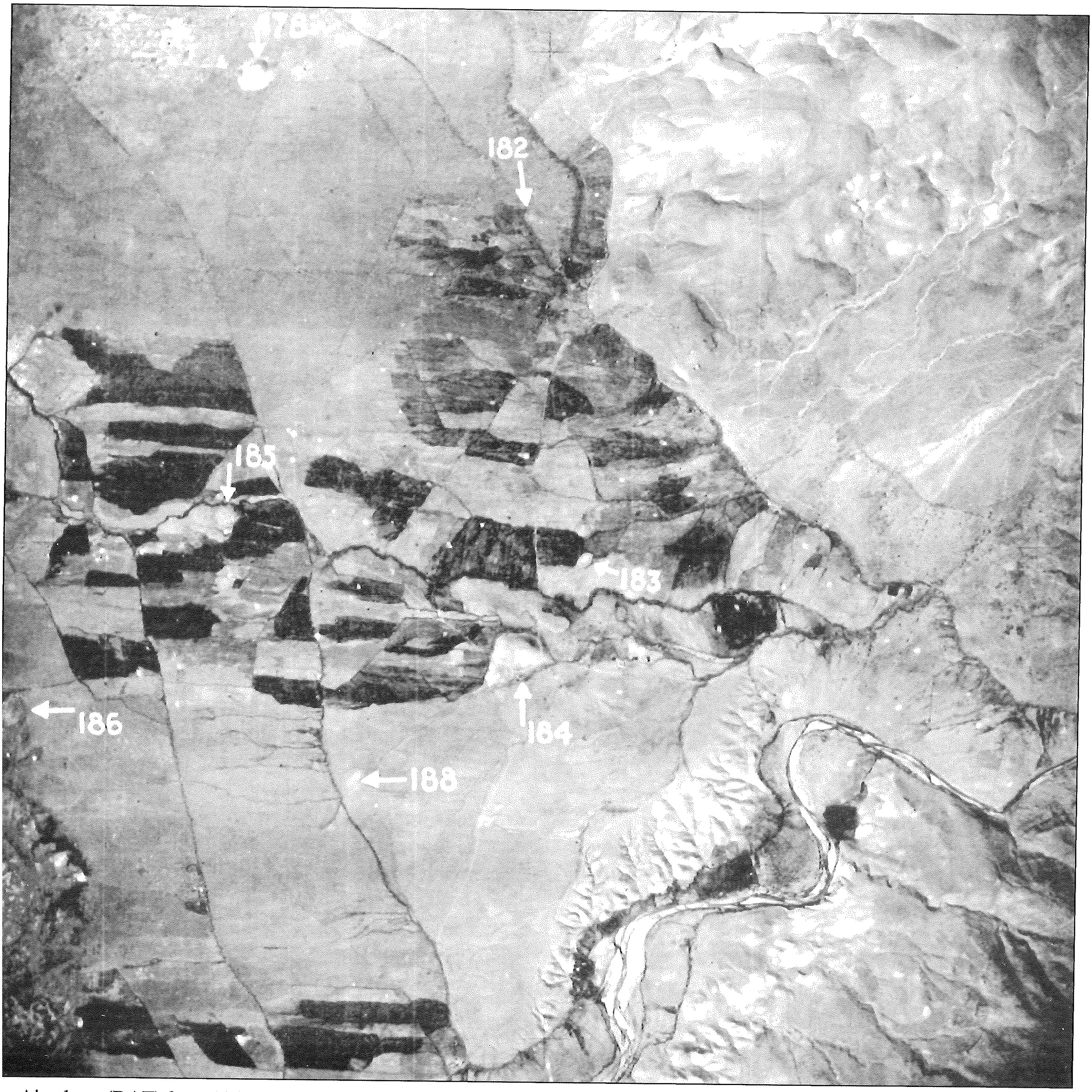
The Sub-recent Irrigation System

Before this new system was introduced another, but local system existed, organized by local authorities, namely some tribes, and used by the ploughmen (*harrath*), for basically a subsistence economy. The old system has been described to some extent by Mohammed Tarawneh (1989) in his study of the social aspects of the transition from the old to the new system. References to that system are also given in Van der Kooij and Ibrahim (1989: 12f), based on interviews by Mr. Mohammed Jamra. Presumably the population was very small, but tax demanded parts of the surplus as did nomadic raids. The British Mandate counted that one family needed 130 dunums of rain-fed fields or 40 dunums of irrigated fields, to feed itself (Tarawneh 1989: 36). This would mean for the Dayr 'Allā region, with its 20 000 dunum of land, that 150 families could be fed by dry-farming, and 500 by irrigated farming.

The structure of the system has not been studied or accessibly published, although the British topographic map of the region from the 1940s – partly reproduced in Van der Kooij and Ibrahim (1989: 11, fig. 4), as well as some other maps, give the three main canals running SE to NW. Also the names of two canals are given: the eastern one (*qanat el-mazariiya*) and the middle one (*qanat el-yahudiya*). The system is also visible on the Royal Air-Force photographs from the same time and published by Nelson Glueck, when archaeologically exploring Eastern Palestine (Glueck 1951: figs 96, 100, 101, and 102). The photo was not taken in the rainy season, because no "wild" green is shown. (FIG. 2) is a provisional map drawn from these photographs and indicating the main canals (running SE to NW) as well as the secondary canals (generally running E to W). The RAF air-photos (FIG. 1) show the watered plots of land with dark plant growth. They also shows that only a part of the system was used at that time and that parts were neglected. It should be added that some of the east-parts of that system (east of the current East-Ghawr canal, specially east of Dabbab) were still in use till a few years ago.

The system's basic elements are clear (FIG. 2):

1. The water source is az-Zarqā' River, with its year-through water, though most in winter.
2. The three canals mentioned above tap water at three locations to bring it towards the field-areas, running almost horizontally, following contour lines. Al-Mazariyya takes it from a place 1km east of al-Ḥimma (behind the hill-ridge of "Tall Mughanni", beyond the map), with a diverting dyke system. The second canal (al-Yahudiyya) takes water from az-Zarqā' River 1km west of al-Ḥimma, following the edge of az-Zarqā' flood-plain to get to the Valley floor near az-Zarqā' bridge. There the third canal may split from the second, apart from taking water directly from az-Zarqā', further to the NE.
3. Each canal has a number of outlets into secondary canals, generally running east-west, that



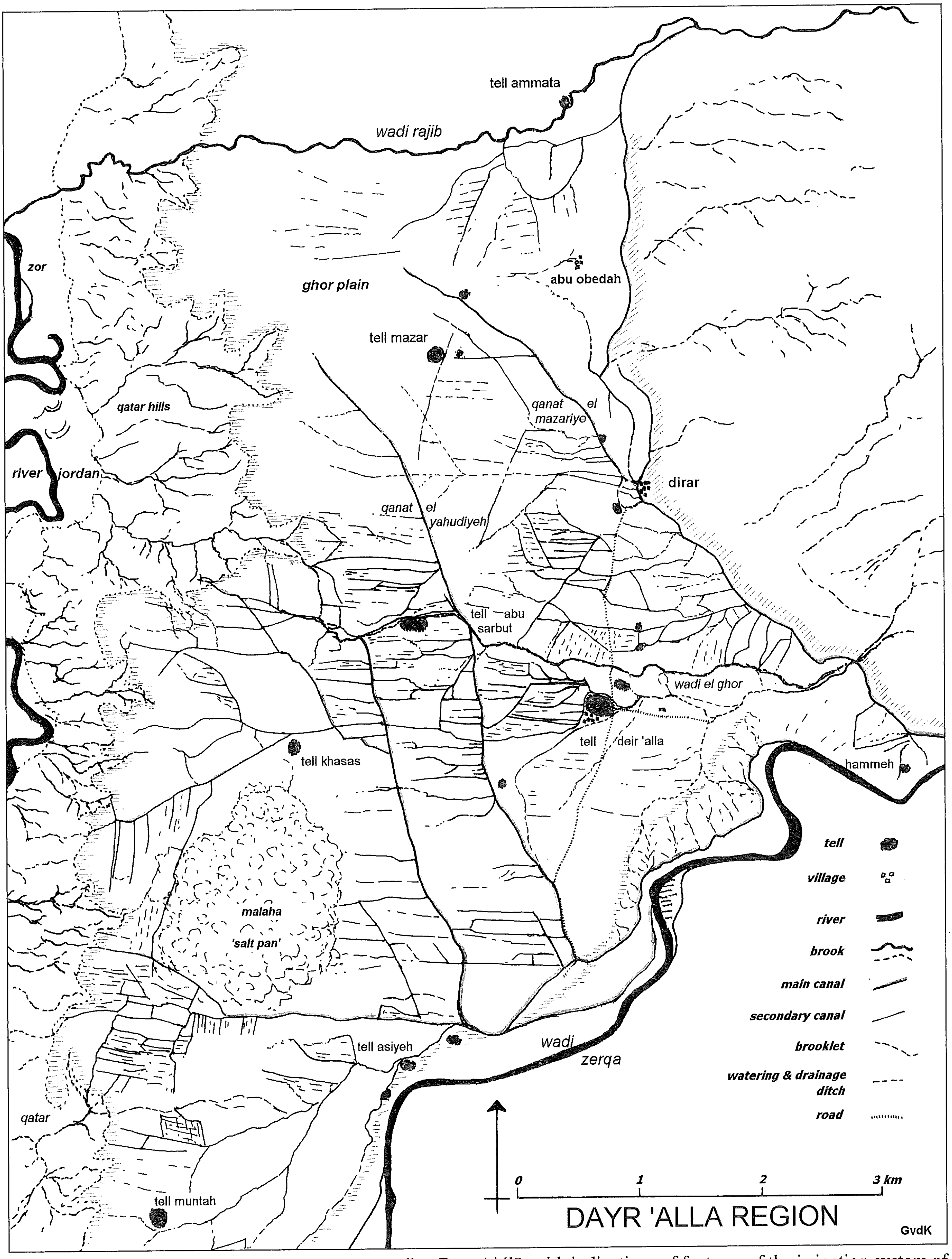
.. Air-photo (RAF) from 1940s of the Jordan Valley landscape around Tall Dayr ʻAllā, showing irrigated fields. Number indicate sides described by Glueck, such as 178 al-Mazār, 184 Dayr ʻAllā, 185 Abū Sarbūṭ and 186 Ikhaṣāṣ (from Glueck 1951).

may have branches running parallel to the main canals (thus in almost horizontal position).

|. From these secondary canals the water is tapped to flow over the fields. However in places this appears to have been done also from the main canals. The system is based on gravity, the fields having a gradually decreasing slope from east to west, from 4m to 2m height over 100m distance. The method of flow is not clear, but traditionally the system used parallel (ploughed) grooves-and-ridges for the water to run through.

5. Drainage seems to have been taken care of, in places, by small canals carrying away the flown-in water from the fields.

The organisation of the large system and the social aspects need further study. For now it is important to find out about the period of use and perhaps the origin of this sub-recent system.

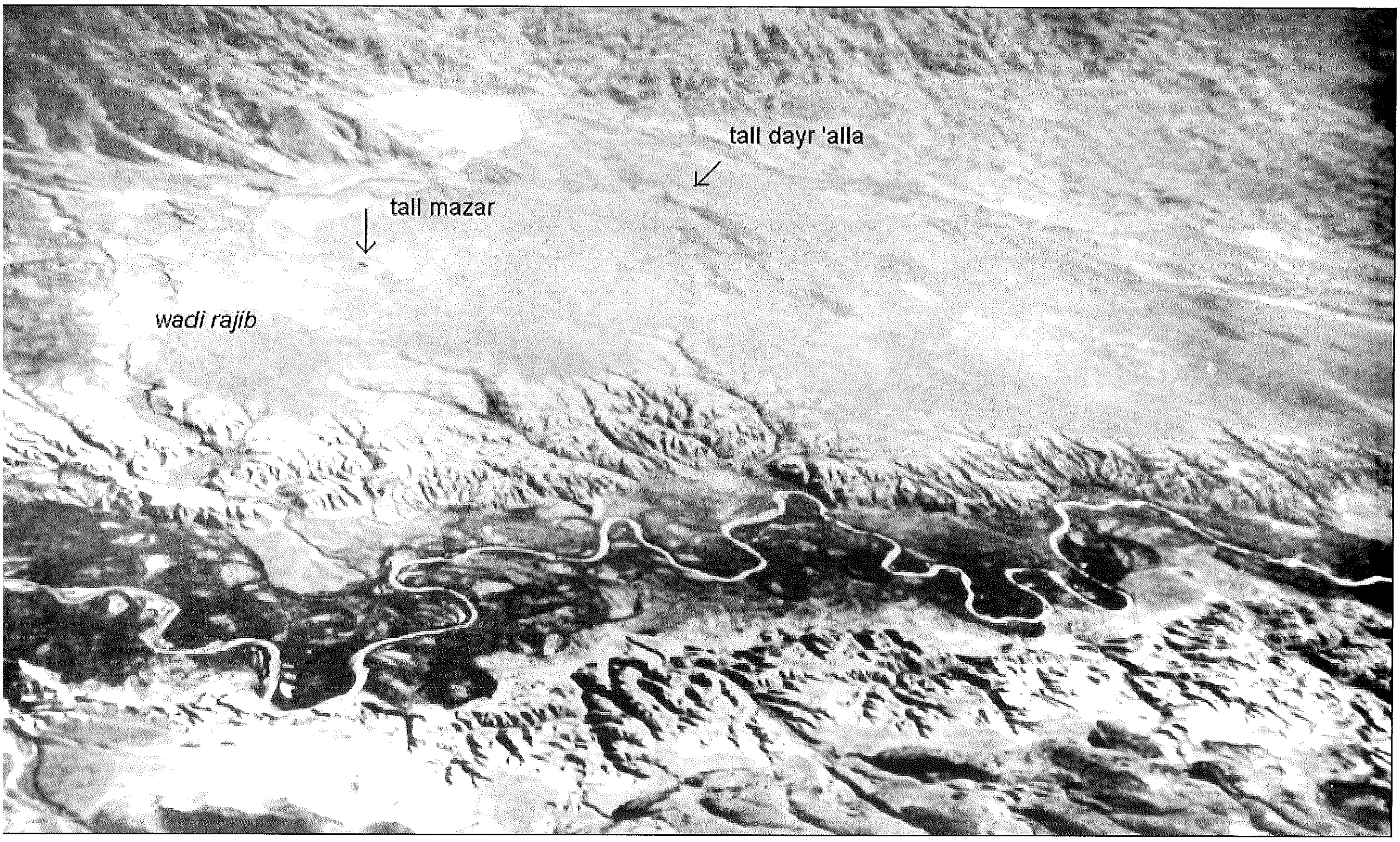


2. Drawing of the Jordan Valley landscape surrounding Dayr ʻAllā, with indications of features of the irrigation system of the 1940s (mainly after air-photos in Glueck 1951).

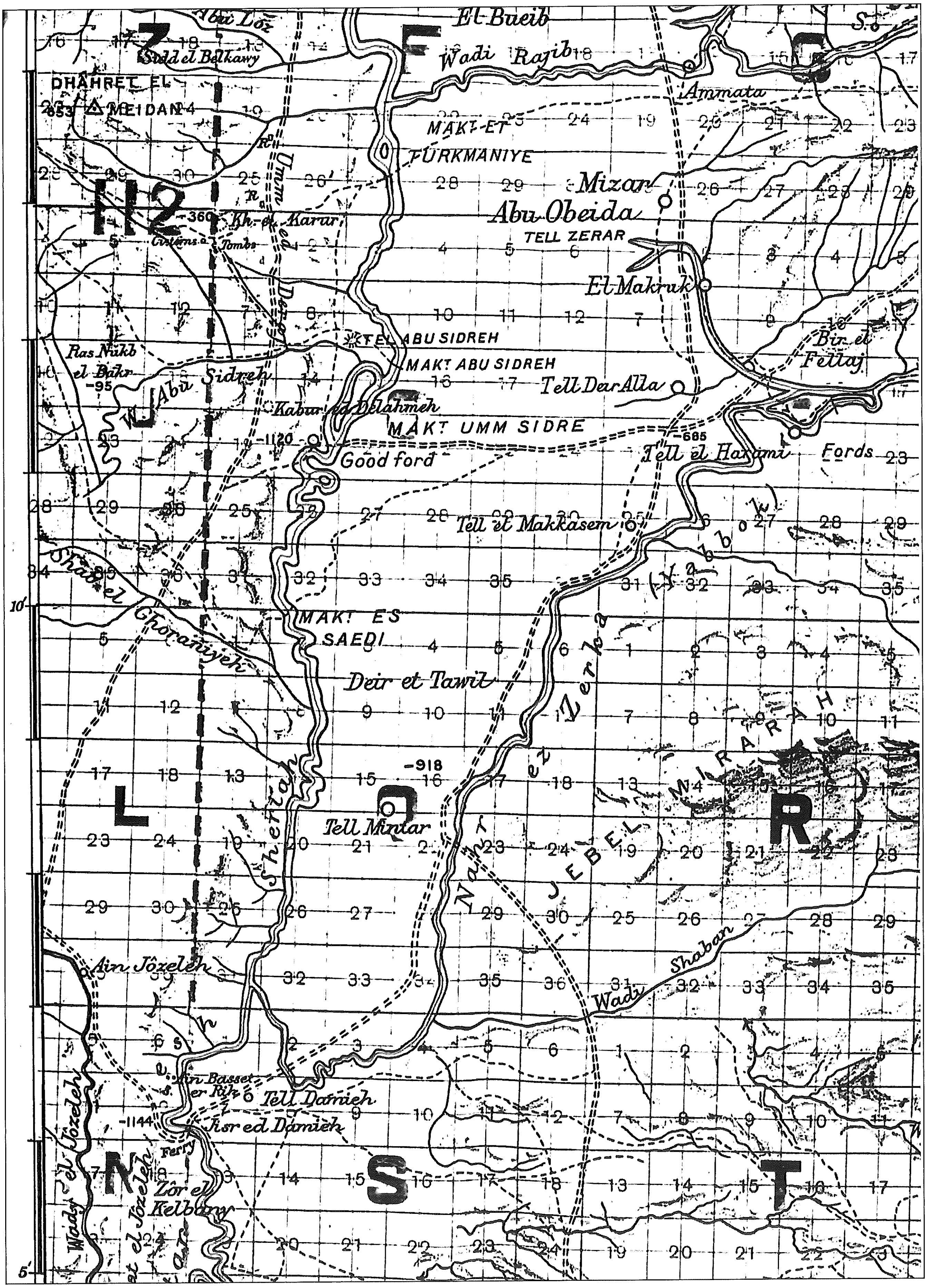
The Antiquity of this System

Going back to the 1940s, some information may be gleaned from old photographs, maps and traveller's accounts. In fact the system appears already very clearly in use on a German air-photo from ca. 1917, published by Gustav Dalman in 1925 (FIG. 3), which is surprisingly early, considering the largely pastoral and nomadic way of life of the local population. There are also indications, on some topographic maps of that same time, of the Mazariyya canal (FIG. 4). However it [probably] does not appear on the earlier Schumacher based maps and the Ordnance survey map of 1867, nor on the best preceding map by Charles van de Velde of 1858 (see FIG. 5). On the other hand, from travelers accounts, especially Selah Merrill's from 1881, it appears that canals existed at that time and were apparently not made by his local informants. We must conclude that we are dealing with the same system. On the 1917 air-photo the same large system [as shown on the RAF photo] is visible, including the three main canals and their length. It is also clear that only a small part of the system was used, and even less intensively than in the 1940s. The development of such a large system cannot be expected during the nomadic-pastoral use of this part of the valley in the 17th-19th centuries. However the 16th century witnessed strong agricultural activity in the region. This is shown by the historical-geographic study of Hütteroth and Abdulfattah (1977). They base their view on historical data from the last intensive Ottoman census registers (dafters) from 1596/97 that were made to calculate tax revenues (a quarter or third of the agricultural produce) from all of the population, geographical data from topographic maps and some archaeological records. Although their location of villages needs revision, this study is of great value to reconstruct the local economy of around 1600AD.

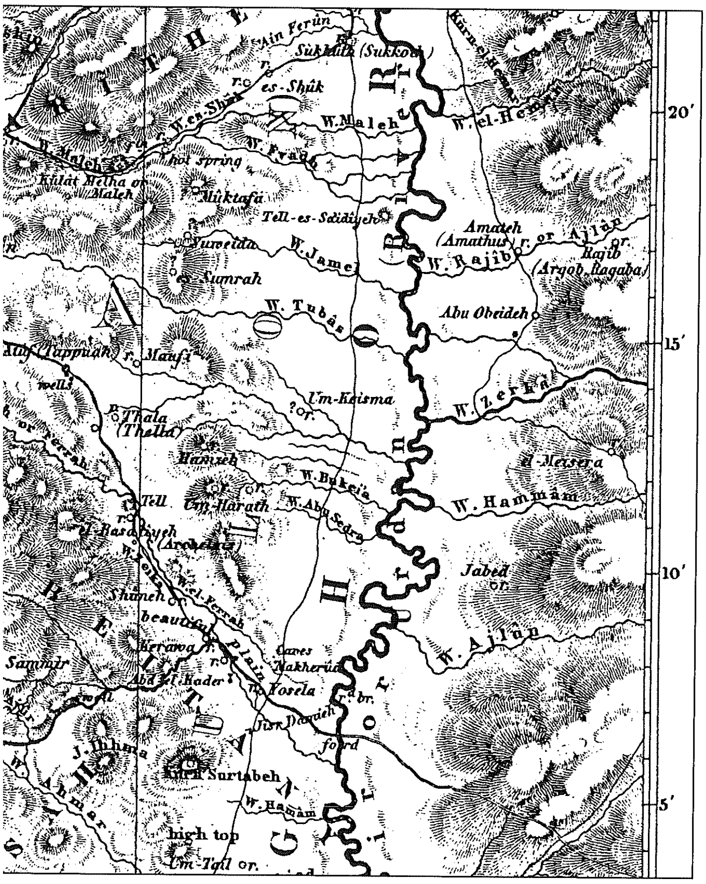
For the Dayr 'Allā region (from Kurayma, north of Wādī Rājib, to Dāmiya) 174 family heads are listed in six villages (taken as representing nearly 900 people), with a good production of wheat, barley and the summer crop sesame. Also many water buffalos were in use, for traction, as well as a water mill at Dayr 'Allā (Hütteroth and Abdulfattah 1977: 167f). The amount of products at this particular time point may be a stage in a decreasing production, following the trend elsewhere in Palestine. In any case it is known from historical sources, as well as



Air-photo (German Luftwaffe) from ca. 1917 of the Jordan Valley towards east-south-east, showing the region between Wādī Rājib and az-Zarqā' (from Dalman 1925).



4. Part of German made topographic map (1917, 1: 50 0000) of about the same part of the Jordan Valley.



i. Part of the 1858 map by Charles van de Velde, showing several streams coming from the east in az-Zarqā' region.

'rom archaeological data from sites in this part of he Valley, such as Tall Abū Sarbūṭ, that especially luring the Ayyubid (and Crusader) and Mamluk ›eriods the region was intensively cultivated, in- :luding sugar cane production, as a tax and export :rop, to outside the district. This indicates that the rrigation system used for summer crops (at least) round 1600AD was already in use some 4 cen- uries before. This indicates that an irrigation sys- ɜm close to the above technical description, based pon the data from the 1940s, was also in use in ıe 13th century — when it may have originated as /ell. During its long history, intensive and limited se (or no use at all) are indicated.

ɩpplication to the Past: Basic Hypothesis (Step)

'he ethnographic data indicate the basic elements f systems of irrigation agriculture. For the appli- ation of this reference model to **the Iron Age II ituation** at Dayr 'Allā we have to make choices ɛgarding what would be acceptable, for both the ystem (technically and socio-economically), and ıe changing processes, in particular the innova- ons.

The system may be easily *technically* described, because there is little choice, as the main water source would be az-Zarqā' River. In order to water the fields that are closest to Dayr 'Allā (including the good soil to the east, in az-Zarqā'-triangle) the tapping place has to be about the same as that of the sub-recent main canal along the foot of the hills, so this canal has to be included in the hypothetical system as well. If Tall al-Mazār was inhabited, the population would have used an extension of the same canal, because the Wādī Rājib (just a little to the north) is very modest in water flow. Because of the source and the slight slope of the valley floor it has to be a gravitation system, with all the elements of side canals and temporary out-lets for drainage.

It is difficult to project the amount of irrigated area: other sites may have been contemporary, and therefore add to the number of people. This population density would be an important determining factor for the amount of irrigated land, if a subsistence economy is considered. However the presence of nomads would make it necessary to produce a surplus for exchange with them, to avoid raids. It is also expected that a larger economic organisation would demand a surplus for tax or markets.

A local *socio-economic* part of the hypothesis can be described, but within the framework of a wider socio-economic and political situation. It would include the possibility that only a part of the fields were used for summer cropping (and therefore irrigated), unless the population density was too high to allow that, or a surplus production was necessary. Thus we envisage a small-scale subsistence economy, with a less complicated functional organization and maintenance of the system than that of a lifting system. With a demand for surplus production the system would be larger and the organisation more complicated. Matters of ownership are beyond the reach of this exercise now, and with them the element of decision making. A certain amount of stability in the region would be necessary in order to maintain the year-round working of vulnerable elements of the system. The larger the system (for a larger population or a larger surplus) the greater the stability demanded.

In order to obtain a hypothetical view of the start of the system (the innovations) and changes, the interesting features of the Dayr 'Allā societies have to be accounted for, namely the quite sudden start, at full size, of the settlements of Phases IX and VII. It has been suggested (van der Kooij

2001) that population pressure elsewhere brought the Phase IX people (ninth century BC) from the east (the mediterranean zone of the plateau) to this marginal region, although some local nomads may have joined them. The phase VII people (probably mid of late eighth century) appear to have arrived from a greater distance, considering the elements of their material culture traditions, which were largely unknown locally. It is quite possible that they were transplanted people from within the Assyrian Empire, and required irrigation agriculture right away because of the number of people involved. However, in both cases it is also possible that the settlements and use of surrounding lands played a role beyond subsistence, and had to supply an agricultural surplus for people outside the immediate region, or even a special product, such as iron (Tall al-Ḥimma) and trade services.

The end of use of the systems may have come with the sudden destructions of both phases of habitation. On the other hand, the knowledge about Tall al-Mazār is not detailed enough to exclude a continuation of use by the community of that settlement.

Application to the Past: Discussion (Step 4)
In such a discussion there are many aspects to consider in relation to the construction of the irrigation systems of the phases IX and VII, but on this occasion it is sufficient to refer to a number, just to give a few examples:

Which plants were cultivated under irrigation (cf. Arlene Rosen's phytolith studies on wheat); do the types of weed indicate a certain season of use (Charles *et al.* 2003), and so are there indications of summer crop with which the weeds were harvested? Which cultivated plants were not from irrigated fields (olive? - see Neef 1989). Is an increase of draught animals (cattle or equids) recorded in these phases? Are specific tools found, including calculation devices (not treated now from ethnography). Furthermore, field research in the surrounding landscape may provide data of activities during these phases in the fields but especially at locations where the irrigation system is expected, as deduced from the sub-recent system. Further social interpretations about the community living at Dayr 'Allā have to be worked out from independent sources (such as village organization) in order to connect them with the social implications of an irrigation system.

It should be added that currently an intensive surface exploration of the Dayr 'Allā region, from Wādī Rājib till Dāmiya, is taking place, as well as a study of Iron Age II sites in that region. This study is part of the four year project "Settling the Steppe; the archaeology of changing societies in Syro-Palestinian drylands during the Bronze and Iron Ages". Mrs. Eva Kaptijn is following up the study of use of landscape, and deals in great detail with the issue of irrigation systems (cf. Kaptijn *et al.* 2005).

Conclusion
The current conclusion is that, as is a common feature in archaeology, with this comparative ethnographic and historic knowledge, the investigations are better equipped. Indications are given about where and what to look for in both field work and data analyses, in order to detect the data relevant for the interpretation of the irrigation system, with all its physical, economic and social aspects. As to the case of Iron Age II Dayr 'Allā, quite a clear theoretical image is appearing, with a substantial amount of data from the site to support it (or negate it) and in addition a growing amount of data is being retrieved from the surrounding landscape.

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Terrace Cultivation in the Jabal Hārūn Area and its Relationship to the City of Petra in Southern Jordan

Introduction

The Finnish Jabal Hārūn Project (FJHP) comprises the excavation of a monastic complex on the top plateau of Jabal an-Nabī Hārūn and an intensive archaeological survey around the mountain. The Jabal Hārūn area is located approximately 5km southwest of Petra, at an elevation of 800-1000m asl, on the eastern edge of the Wādī 'Araba. The semi-arid environmental setting, with a mean annual rainfall of ca 150mm, means that the area offers only limited possibilities for humans to utilize the land. Most of the rainfall comes during heavy storms, which cause flash floods in the wadis. Despite these climatic restrictions, dry cultivation of cereals can be practised on the upland plateau, but not without special techniques. Due to the aridity and sparse vegetation in the area, herding is most profitable way for people to make their living.

This paper aims to discuss changes in cultivation practices in the Jabal Hārūn area since ancient times to the present day. It is assumed that conclusions about cultivation practices can be drawn from the study of hydraulic structures related to different archaeological periods. In addition to the numerous barrages around Jabal Hārūn, there are datable finds and various other structures, which may be related to agriculture or habitation in the area. We should also take into account the possible significance of the roads running through the Jabal Hārūn area between Wādī 'Araba and Petra. Travellers would have needed food and water supplies, and the agricultural activities may have been related to the active caravan routes crossing the area.

Three basic hypotheses can be postulated for explaining the correspondence between archaeological evidence and land use in the past. Firstly, environmental conditions and changes have been the crucial factor in bringing about changes in agricultural practices. Secondly, changes in cultivation practices most importantly reflect changes in societies. Finally, a complex combination of both factors may have been at work.

The general objectives, research questions, methodology and central results of the FJHP survey have been covered in many earlier articles (see Frösén *et al.* 1998, 1999, 2000; Lavento *et al.* 2004a, *forth.*). These issues are therefore not included in this discussion.

Cultivation in Dry lands

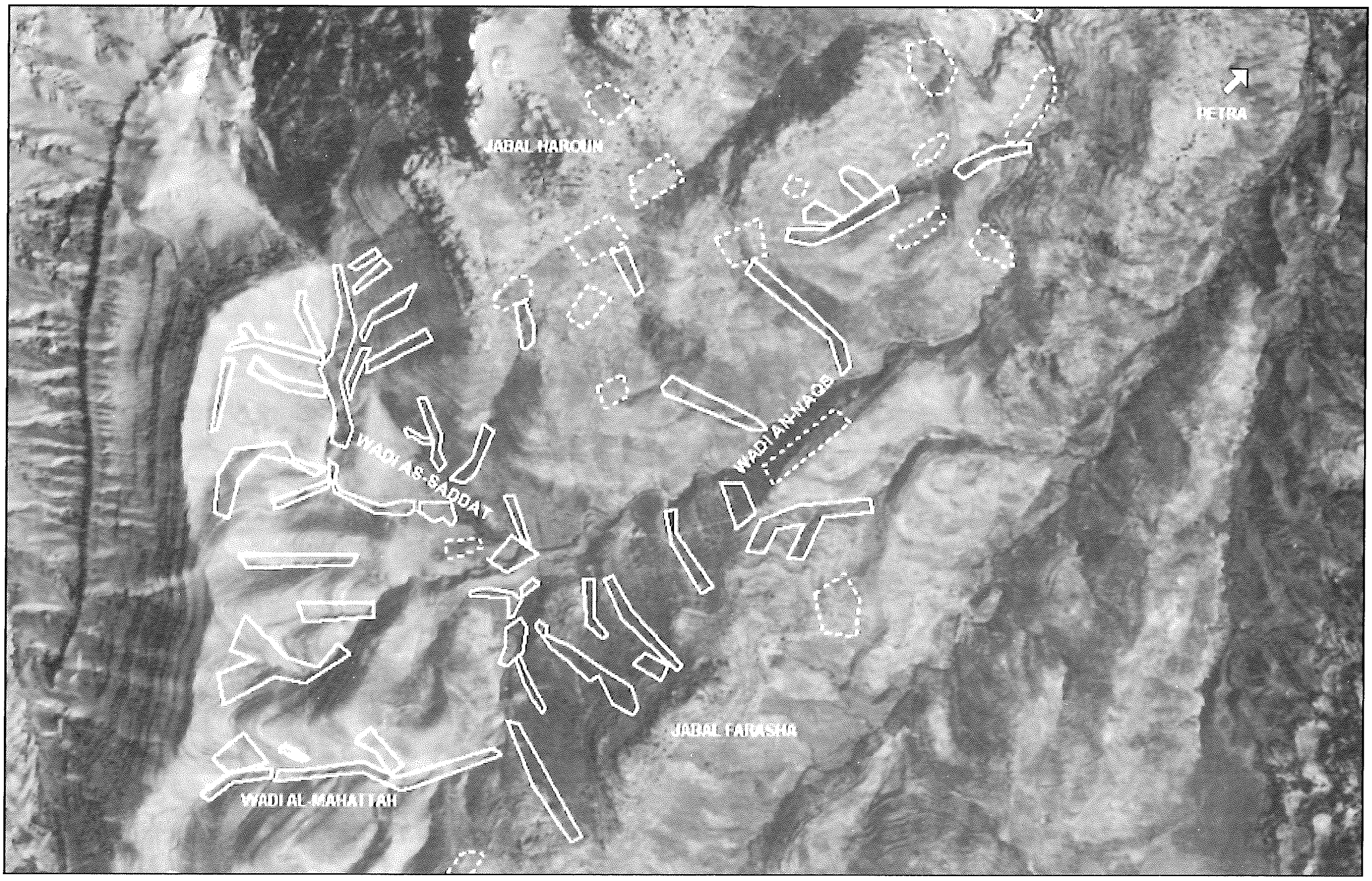
Ancient agricultural installations in the Negev desert have been studied extensively from as early as the 1950s (for example Bruins 1986; Evenari *et al.* 1961; Glueck 1968; Mayerson 1962; Morris 1961; Rubin 1988; Zohary 1954). There are indications that run-off farming began during the Chalcolithic and was practiced through the Bronze and Iron Ages in the Negev (Bruins 1986: 36-38). After a millennium, the next signs of run-off farming are from the Nabataean period, from the first century AD (Bruins 1986: 36-38). The rain-fed agriculture practiced by the Nabataeans relied on a complex system consisting of barrages in the wadis and terraced fields on the slopes. Such installations are known throughout the Nabataean kingdom and have been studied extensively especially in the Negev (e.g. Bruins 1986; Evenari 1997; Mayerson 1962). In the central Negev hills, where these systems are common, they are dated to the Nabataean-Byzantine period. In the Negev, the technology for run-off farming peaked during the Byzantine period. Cultivation as a large-scale enterprise was apparently abandoned during the latter part of the Early Islamic period (Haiman 1995: 34).

Many authors discussing Petra and other nearby Nabataean sites mention the existence of hydraulic installations in the surrounding landscape (e.g. Lindner *et al.* 1996a: 111-113; Lindner *et al.* 2000: 553; 'Amr *et al.* 1998: 504, 516, 532, 539; Tholbecq 2001: 403-404). However, a more detailed study of these systems seems to have received less attention near the Nabataean capital than in other areas of Jordan, where surveys have focused on rural areas (e.g. Mattingly *et al.* 1998; Oleson 1988).

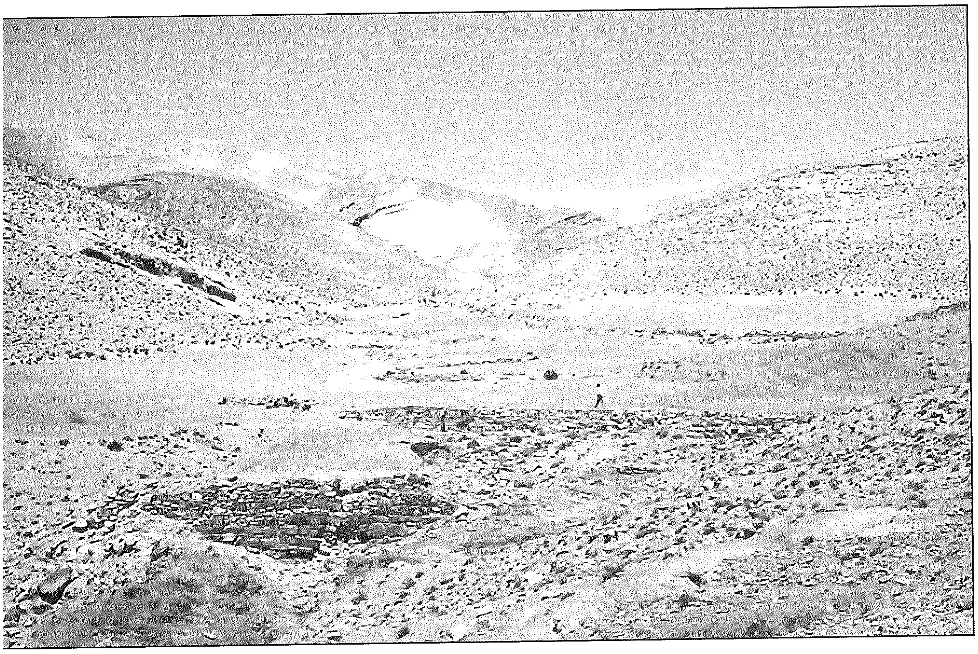
In addition to the hydraulic installations, water channels and cisterns have also been constructed at least since the Iron Age. Starting in the Nabataean period, water was conducted from springs to settlements in the modern Wādī Mūsā area and eventually down to Petra (see e.g. 'Amr and al-Momani 2001: 259, 267, 270). Although water conduits and cisterns have been used also on the top plateau of Jabal Hārūn (Frösén *et al.* 2003: 309-310), unambiguous evidence of cisterns or water channels has not been found in the area surrounding the mountain.

The part of the FJHP survey area to the west and south of Jabal Hārūn is characterized by several wadis and their numerous tributaries. Hydraulic installations, i.e. barrages (dams) and terrace walls, have been built all over the area, forming an extensive run-off farming system (FIGS. 1, 2). Remains of terraces and barrages have also been recorded in the area between Ṣabrā and Jabal Hārūn (Lindner 1986: 137-138), and similar constructions are known everywhere in the Petra region ('Amr *et al.* 1998: 504, 516, 532, 539; Tholbecq 2001: 403-404). However, the installations in the Jabal Hārūn area are exceptional because they are concentrated in a small area and display a high level of technology and functional interdependence. This suggests a large project under common administration and management (Frösén *et al.* 1998: 495-498).

Even though the valley where the city of Petra is located is not suitable for agriculture, the sandstone and limestone hills around the city are suitable for cultivation on terraced fields (Al-Muheisen 1990: 206-209). The Wādī Mūsā Water Supply and Wastewater Project Survey has documented several agricultural terraces and wadi barrages dated to Nabataean times ('Amr *et al.* 1998). Agricultural fields ("gardens") irrigated by run-off systems have



1. The main part of the run-off farming system in the Jabal Hārūn area presented on an air photograph. Lines: barrage systems, dotted lines: areas with terrace walls.



2. Well-preserved barrages and barrage-terraces at the foot of Jabal Hārūn.

been observed at Umm Rattām (Lindner *et al.* 2000: 553-554). The region of Ba'ja was an important agricultural provider in the Nabataean period. This area is also currently under cultivation using dry farming techniques, and seemingly the rainfall is sufficient for watering the cereals and olives grown there (Al-Muheisen 1990: 209-210; 1992: 215).

Somewhat farther away in Wādī Faynān, about 40km north of Petra, there is an extensive field system indicating planned agriculture and water management, dated mainly to the Roman and Byzantine periods. In Wādī Faynān, the construction and management of the field system during the Roman and Byzantine periods was an imperial enterprise, related to the industrial-scale mining of copper in the area (Barker *et al.* 1997: 27-32, 1998: 9-17, 1999: 269-281, 2000: 42-44). The structure of the Wādī Faynān farming system resembles the system in the Jabal Hārūn area. Two examples of stepped water control structures (i.e. spillways) in barrages were also observed in Wādī Faynān, similar to those at the FJHP Site 33 (FIG. 3) (Ruben *et al.* 1997: 433, 443-444).

In the FJHP survey area, two basic methods of cultivation by runoff irrigation can be separated, namely the main and tributary wadi cultivation and cultivation on the slopes (see Lavento *et al.* 2004b). Also the differences in topography and bedrock have resulted in considerable variations in the hydraulic installations (Lavento and Huotari 2002; Lavento *et al.* 2004b). Similar observations have been made in the Negev by Evenari (1997), Bruins (1986; 1990), and Mayerson (1962). Because rains come seasonally, during a short period of time, water needs to be preserved in cisterns or

3. A stepped structure in a barrage at FJHP Site 33. Similar structures have been recorded in Wādī Faynān.

pools or absorbed into the soil to prevent evaporation. The most effective way to retain water is to build barrages across wadis. Water can then be stored in small pools (or cisterns) from which it can later be directed to the areas under cultivation. As water runs into pools, it also transports the fertile fine sediments that are deposited behind barrages. Erosion can be reduced by building terrace walls across slopes. The walls retain fine sediments, which would otherwise be washed away by rainwater, and increase the infiltration of water into the soil. Sometimes it is necessary to use channels to conduct water into areas with more even topography where it may infiltrate more easily (Frösén *et al.* 1999: 398). Small fields can also be farmed on the slopes.

Dating the Run-off Farming System

The dating of terrace walls and barrages is problematic due to their long history and usually simple construction. In the Wādī Faynān, there is evidence that some of the field walls may date to the Bronze Age (Barker *et al.* 1997: 35-36). An Iron Age date has been suggested for some of the terrace walls in the Petra area (Lindner *et al.* 1996b: 150), but most of the barrages and terrace walls have been attributed to the Nabataeans (Lindner *et al.* 1996a: 114; ‘Amr *et al.* 1998; Tholbecq 2001: 403-404).

Small soundings excavated in several barrages in the Jabal Hārūn area have revealed that the structures have clearly been used, repaired and remodeled at several stages over a long period of time. However, attempts to date the structures via scientific means have not produced satisfactory results. C14 dating of macrofossiles gave recent dates and OSL dating of sediments did not yield dates accurate enough for establishing a chronology for the phases of barrage construction and abandonment.

For the dating of the hydraulic installations we should also take a look at other archaeological materials. The analysis of Nabataean fine ware pottery from the FJHP excavation and survey indicates that the first century AD was the period of the most intensive Nabataean presence in the FJHP area (Lavento *et al.* 2004a: 232). The fairly even off-site distribution of pottery could be the result of the practice of intensive manuring in the fields in Nabataean times (e.g. Alcock *et al.* 1994: 138; Bintliff 2000: 209; Wilkinson 1989: 41). However, even if manuring explains how the background scatter of sherds was formed, the problem of chronology remains. The pottery dating may be entirely contemporary with the period of cultivation, but it should also be taken into account that the sherds may have found their way onto the fields at some time later than the date attributed to them on typological grounds. However, pottery finds in the Jabal Hārūn area, seem to decline around the time of the Roman annexation in 106AD. Also the majority of building structures, including a farm or a small hamlet (Frösén *et al.* 2003: 309-310) appear to date to Nabataean period, the first and early second centuries AD, although often their chronology cannot be securely fixed (comp. ‘Amr *et al.* 2000: 233).

Environmental Impact

The minimum mean annual rainfall for dry cultivation is considered to be ca. 200mm (van der Veen *et al.* 1996: 254), which is met on the slopes of the ash-Sharā range and the western parts of the Jordanian highlands. However, the minimum amount of rainfall required by olive, vines and fruit trees is 300 mm (van der Veen *et al.*: 255), which at present day is only reached in the Ash-Shawbak area to the north of Petra (Shehadeh 1985: 30-31). This indicates that floodwater or run-off farming systems or irrigation were needed for successful cultivation in much of the Petra area. The data from Byzantine-period Negev and later reconstructions have shown that the annual rainfall of 100mm could be transformed into more than 400mm of effective rainfall by the collection of run-off, which would be sufficient not only for cereals, but also for vines, olive and fruit trees (Rosen 2000: 50-51). Results of remarkably high yields for both wheat and barley under run-off cultivation have been reported in ethnoarchaeological studies of traditional agriculture in the Petra area (Russell 1995: 696-698).

The climate of the Near East has generally resembled that of the present for the last 7000 years, although there have been fluctuations between more humid and more arid phases within the semi-arid climatic regime (Bar-Matthews *et al.* 1997: 161-166). Based on Dead Sea levels, the climate was relatively more humid during the Nabataean-Roman period from the first century BC to the third century AD, but following it between ca. 300-850AD there was a more arid phase (Bruins 1994: 307-308). There is evidence in the Petra papyri that the fields owned by one person were distributed among different geographical areas, perhaps as a response to the variability of the rainfall and to ascertain that at least some of the fields received enough rainfall for cultivation from year to year (Koenen 1996: 184). On the other hand, despite the apparently adverse climatic conditions, desert agriculture reached its widest extent in the Negev during the Byzantine period (Rosen 2000: 45-51).

On the basis of this information we can expect that changes in humidity have also taken place within the range of centuries in southern Jordan. It seems that the more humid period around the turn of the Christian era witnessed also the most intensive agricultural activity in the Jabal Hārūn area. Likewise it is possible to connect the more arid phase during the Byzantine and Early Islamic period with the apparent decrease of cultivation and human activity. The adverse climatic setting might explain why the monastic complex on Jabal Hārūn did not utilize the surrounding area as much as might have been expected.

The core of this hypothesis is that the Jabal Hārūn area is very sensitive even to small changes in climate. This hypothesis assumes that already a few dry years could have changed the sensitive environment essentially and made run-off cultivation unproductive for a long period afterwards. The problem with brief climatic changes is that they are almost impossible to observe in the archaeological data or in the sedimentary record around Jabal Hārūn. Nevertheless, they may have played an important role in the cultivation history of the area.

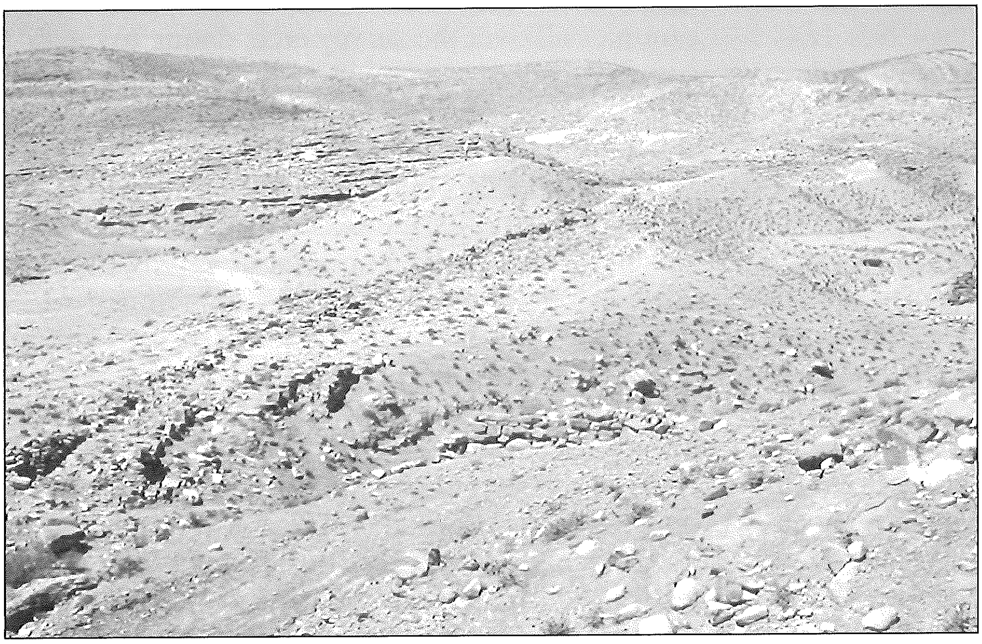
Human History and Agriculture in the Jabal Hārūn Area

The Nabataean capital of Petra was established in the first century BC at the crossroads of several caravan routes and experienced its heyday during the first-third centuries AD. In 106AD Nabataean was annexed by Rome. As the capital of the Roman province of Arabia, Petra continued to be a prominent urban centre also under Roman rule (Fiema 2002a: 1).

It has been postulated that during the Nabataean period the need for arable land grew as a result of the growth of the city of Petra (Lindner 1986: 153, 172; Lindner *et al.* 1996a: 114). It can be suggested that after the most productive areas were already taken into cultivation, the areas less suitable for agriculture were also needed. The area surrounding Jabal Hārūn represents this type of marginal environment for agriculture. Cultivation in the area is not possible without some form of artificial irrigation. The large amount of Nabataean fine ware ceramics all over the survey area, dating to the first and the early second century AD (Schmid 1996), may indicate the importance of the Jabal Hārūn area during this period.

The spread of pottery not related to settled activities is most often explained by manuring, which creates relatively even spreads of sherds over the fertilized fields (Alcock 1993: 84). Manuring is thought to be connected with intensive agricultural practices such as horticulture and relatively small field size (ibid.). In addition to water management installations, there are other structures of different types in the survey area. Some of these may have been related to agricultural activities while others are probably connected to the ancient road running through the Jabal Hārūn area from Petra to Wādī 'Araba. The overall picture of the surroundings of Jabal Hārūn during the Nabataean period is that of a largely rural area servicing Petra. The population of the area may have lived in the smallish buildings that are now in ruins, or they could have led a semi-nomadic lifestyle, living in tents while farming the fields.

The intensification of the use of the Jabal Hārūn area during the Nabataean period was probably encouraged by growing traffic on the caravan route, traces of which can be seen in the southwestern part of the FJHP survey area (FIG. 4). The road seems to split in two at the foothills of the mountain: one stretch continued east to Petra and the other one curved north to Umm Rattām via Naqb ar-Rubā'ī. The remains of the separate branches cannot be seen in the survey area. This probably results from the recent construction of a modern road, which most likely follows the pre-existing route. Although the remains of the road to Petra end by the southwestern foothills of Jabal Hārūn, structures that can be tentatively related to the continuation of the road have been found. Some stone tumbles, probably the remains of small buildings, have been located also by both stretches of the existing road. In addition, there are the remains of a watchtower (FJHP Site 54) with a view to the Wādī 'Araba as well as to the direction of Petra. A larger multi-room structure (FJHP Site 49) close to the watchtower may indicate that the caravans were staying overnight in the area (Frösén *et al.* 2000: 415-418). An open camping ground with no built structures (FJHP Site 25) has also been tentatively identified. The locals still know the place as a caravan camping site (Lindner



4. The ancient road on- the southern foothills of Jabal Hārūn.

et al. 2000: 539). However, modern land use may have altered the appearance of the structures and perhaps some of the remains are entirely modern.

Caravan camping grounds are also found elsewhere around Petra. A good example has been studied by Kloner (1996) along the road between Naqb Sulaysil and al-Bayḍā to the northwest of Petra. The site includes cisterns and camping grounds. According to Kloner (1996: 132) it was the centre of caravans proceeding mainly to the east and south, passing Petra at some distance to avoid its taxation. Zayadine and Farajat (1991: 281) highlight Bayda as an ideal place to halt due to its water reservoirs and more open terrain compared to the narrow valley in Petra, accessible only with difficulty. Structures of similar character are found also in Ṣabrā (see e.g. Lindner 1997/1998: 563).

The caravan routes through the Jabal Hārūn area share similar characteristics with those via Wādī Ṣabrā and Bīr Madhkūr, although they were not as popular and widely used. The caravans needed water and food supplies, as well as open terrain with good visibility of the surroundings for safer sleep when stopping for the night. All the sites presented here were able to meet these requirements. At the time when the Roman Empire took over the territory and concentrated the traffic to run south to north along *Via Nova Traiana,* the number of small farming communities and amount of agricultural production declined considerably (Graf 1992: 260; Lindner 1992: 266).

Long-distance caravan trade may have diminished in the third century, affecting also Petra (Fiema 2002a: 1-2). During the forth century geopolitical changes in the province of Arabia altered the status of Petra and the surrounding areas. Earlier it was believed that Petra declined seriously during the forth century and was finally wiped out by an earthquake in 551AD. However, the finding of the Petra Papyri has changed this picture. The papyrus archives span almost the whole of the sixth century and have provided evidence of a provincial town that continued its life through the supposed destruction much as before (Koenen 1996; Fiema 2002b). There are some changes, however: trade no longer seems to be very important, as evidenced also by the archaeological finds in Petra itself, which include very few imported items (Fiema 2002b: 225), and land holdings seem to have become the main source of income for the wealthy citizens of Petra. Much of this property appears to have been agricultural land (Koenen 1996: 179-180).

Changes in land ownership and estate size may have influenced the land use practices from the Nabataean and Roman to the Byzantine times. Alcock (1993) has convincingly argued with data from Classical and Late Classical Greece that larger estates and the concentration of land-ownership into fewer hands result in the nucleation of rural settlement and more extensive agricultural practices. The Petra Papyri indicate that there were a few families owning large areas of agricultural land in Byzantine Petra (Koenen 1996: 183-184, 187-188). The decreasing number of settlement sites from the Nabataean to the Byzantine times has been noticed in many surveys ('Amr *et al.* 1998; Tholbecq 2001).

Especially the abandonment of small sites which might be considered single farmsteads, around the Late Roman – Early Byzantine period, could be taken as evidence of the nucleation of settlement, although the survey data from the Petra region is not yet sufficient to prove this conclusively.

Whether the monastery on Jabal Hārūn also owned land is an open question. The monasteries in Palestine usually practised agriculture, including olive culture and viticulture (Hirschfeld 1992: 105), and the monastery of Mount Nebo on the edge of the Jordanian highlands, near the Dead Sea, apparently had extensive terraced fields and was involved in the production of wine and olive oil (Piccirillo 1985: 259). It would be tempting to connect the monastic complex with the development of the large system of hydraulic installations surrounding Jabal Hārūn, but the small amount of Byzantine finds in the survey area does not support this interpretation (Lavento *et al.* 2004b). On the other hand, the lack of ceramics cannot be used as a solid argument for the opposite interpretation either. It may simply reflect a change of the cultivation and manuring practices, perhaps to less demanding plants and a more extensive form of agriculture. Even if the monastery owned the land around Jabal Hārūn, it probably leased it to tenant farmers like the papyri prove other large landowners in Petra commonly did (Koenen 1996: 184). The area is close enough to Petra so that it could have been easily farmed by people living closer to Petra or even in Petra itself, and perhaps staying in the area only temporarily during the sowing and harvest time, which would leave few archaeologically visible traces.

On the basis of the present ceramic evidence, the occupation of the monastery on Jabal Hārūn continued at least until the seventh/eighth century (Fiema 2004: 137-138). However, pottery from these periods is absent in the surroundings of the mountain. There are only a couple of structures that could be indicative of human activity in the area during the Early Islamic period. On the al-Farāsha Ridge there is a structure (Site 136), which closely resembles the open mosques known from the Negev, dated to the seveenth-eighth centuries (Frösén *et al.* 2003: 310-312). A possible indication of Early Islamic agricultural activity is FJHP Site 118 (Frösén *et al.* 2003: 312), the remains of a structure, which today is not much more than a heap of stones on the lower southeastern slope of Jabal Hārūn. A couple of Nabataean sherds were found close by, but the structure resembles the description of the watch-posts in the Negev dated to the Early Islamic period, interpreted as having been used for watching over the fields during the harvest period (Haiman 1995: 35). This idea is supported by the fact that Site 118 offers a wide view to the alluvium of Wadī as-Sāda where the most extensive arable fields of the area are located. There are also numerous terrace walls and barrages on the slopes of both Jabal Hārūn and Jabal al-Farāsha that have no associated pottery at all. The date of their construction remains open.

A large number of thick handmade pottery sherds with coarse fabric and organic temper have been found on the ledges of the northeast summit of Jabal Hārūn and at the foot of the cliffs. The sherds are sometimes painted with black or red geometric decoration or have a reddish slip. The decoration of the pottery indicates that they date to the Ayyubid-Mamluk period, possibly to its earlier part (Hendrix *et al.* 1997: 289-306; Khadija 1992: 345-356; ‘Amr *et al.* 2000: 244; Brown 1988: 230-240). As this type of pottery has not been found in the area of the monastery, it seems that settlement on the mountain had moved to the heights of the northeast summit. Contemporary sources from the 10th -13th centuries indicate that the mountaintop was still in the possession of Christians (Fiema 2004: 129). During the same period, settlement reappeared also in the surroundings of the mountain. A farmstead or a small hamlet (FJHP Site 109) consisting of a few buildings is located on the northeastern slope of Jabal Hārūn (Frösén *et al.* 2001: 372-373). Pottery closely resembling the finds from the mountaintop and Site 109 can also be found in scatters on the northern and northeastern slopes of Jabal Hārūn.

The archaeological material does not help much when we are trying to understand what happened in the Jabal Hārūn area after the 11th century. The weli on top of the mountain was built in the 14th century, and pilgrimage to Jabal Hārūn has probably continued more or less without interruption through the ages. The traces associated with pilgrimage include rock carvings of footprints and short inscriptions but these did not require long-term stays in the area. Only some sporadic finds of hand-made pottery of uncertain date, but considered Ottoman, indicate the use of the area for habitation during the long period of time between the 13th and the 20th century. There are also some structures, like a lime kiln (FJHP Site 24), which probably dates to the Ottoman period (Frösén *et al.* 1999: 399). Three threshing floors of unknown date have been found in the survey area (Frösén *et al.* 1999: 399, 2003: 312-313). There are also some stone buildings constructed in the traditional style. Apparently these were built by the Bedouin mainly during the 20th century for storing various things, including agricultural equipment.

Ethnographic evidence confirms that the area has been sporadically settled up to the present date (Simms and Russell 1996). Even if the area was used infrequently by the Bedouin we cannot tell much about its history on the grounds of archaeological finds. It seems likely that some barrages have been repaired and used also later, although dating the periods of re-use has not been possible so far.

Towards an Understanding of the History of Terrace Cultivation

Previous discussions of barrages and terrace walls in agriculture have often concentrated either on the importance of cultural factors or on the determining role of the environment. It seems more useful to approach the problem as an interaction between both of these factors and by taking a look at issues not taken up so far. Although it might be convenient to discover the one factor that would explain the changes in cultivation over a long period of time, we should not forget that there is a multitude of factors, each influencing each other and sometimes taking the role of a catalyst in the change.

If ceramics can be used for reliably dating other phenomena, it is conspicuous that the end of the Nabataean fine ware in the Jabal Hārūn area may reflect the change in political situation. The interpretation is still not simple, because we do not know whether the scattered sherds are related to the habitation in the area, and their connection with the hydraulic installations is even more problematic. It seems that at some point the area was rapidly subsumed under cultivation via the construction of an extensive run-off farming system. This period of primary agricultural importance of the Jabal Hārūn area may have lasted for less than 200 years. After that the field system was probably at least partially abandoned or used only sporadically.

The most intensive period of use of the monastic complex dates between 400–800AD (Fiema 2004). However, on the basis of the archaeological evidence it may not have played as important a role in the history of the cultivation of its surroundings as might have been expected. It is still hard to believe that no re-use of the barrages and terraces took place. It seems likely that at least parts of the run-off farming system were used also during the Byzantine period, although no settlement activity can be observed in the area. It is evident that environmental conditions in general for cultivation became less favorable after the Nabataean period. However, we should be careful not to overestimate the importance of the environmental factors.

One possible interpretation is that past human activity and its influence is not reflected through the archaeological material in the area. The structural details of the barrages seem to indicate that the same hydraulic installations were used, abandoned, repaired, reconstructed and re-used many times over a long period of time. On the basis of the archaeological material or other available data it is very difficult to estimate when these phases of use and abandonment have taken place and how long they have been. The off-site pottery found in the area is overwhelmingly Nabataean. Although there are some sites with Roman – Byzantine pottery, and Ayyubid-Mamluk pottery is found in places, the archaeological evidence does not reliably indicate agricultural activity after the Nabataean period. Evidence of later settlement has also been found, but it is very sporadic (and limited) in comparison with the settlement during the first two centuries AD.

The area continues to be used today. Every year a few families live there for some time in their Bedouin tents. This kind of habitation does not leave traces that could remain in the soil to be observed by an archaeologist visiting the area hundreds of years later. According to local informants, some of the hydraulic installations were used less than 50 years ago. In the last few years, the Bedouin from Umm Ṣayḥūn have attempted to recultivate the fields on the alluvium at the foot of Jabal Hārūn, but rainfall has not been sufficient to grow crops.

Conclusions

It seems that run-off cultivation started during the first century AD in the area around Jabal Hārūn. The peak in the activity in the area can be connected with the heyday of the city of Petra. It is likely that there was an increased need for cultivated land related to the development of Petra as an important junction of several caravan routes. The Jabal Hārūn area may also have been used as an overnight stop for caravans before they entered the city itself. Most intensive cultivation in the area probably took place before the Roman annexation in 106AD. Although no dramatic economic change appears to take place immediately after the annexation, the new role of the Petra region as a part of a much wider empire and its markets may have decreased the need to cultivate the more peripheral and environmentally marginal areas. The importance of several of the many western caravan routes in the Petra area also seems to have diminished after the Roman annexation, possibly as a result of the new geopolitical structure emphasized by the building of the *Via Nova Traiana* in the early second century AD. Together with the more arid climatic trend that began during the second century AD, these factors may have resulted in the abandonment of at least part of the run-off cultivation system and/or significant changes in the agricultural practices, most likely including a shift to less intensive cultivation. In addition, the monastic community that developed on Jabal Hārūn probably needed the environs of the mountain for food production. Surprisingly the archaeological material from the area does not support this view. In fact the situation appears to be the opposite: The archaeological finds indicate diminishing land use and human activity after the Nabataean period. We do not have first-hand evidence of cultivation in the area, although there are traces of at least sporadic human presence during the Byzantine, Early Islamic and Ayyubid-Mamluk periods.

The many building phases documented in the barrages give evidence of a need to keep them in shape. Although we have not been able to date these repairs so far, the many structural differences observed indicate that they were not made during one period or at several phases over a short period of time. In the light of our present knowledge it seems reasonable to assume that parts of the run-off farming system have been more or less continuously in use since the Nabataean period up to the present day. The period of its most intensive use dates to the florescence of the Nabataean kingdom, which was also a period with favorable climatic conditions. The combined effect of changes in economic and socio-politic conditions, as well as the aridification of the climate, may have diminished the agricultural use of the area during the period after the Roman annexation. After the monastic complex on Jabal Hārūn fell out of use, the area fell into a peripheral position. As a result, after the Ayyubid-Mamluk period the Jabal Hārūn area was most probably only periodically inhabited and sporadically cultivated by semi-nomadic herders, and it has remained in similar use up to the present.

In 2002-2003, some of the barrages in Wādī an-Naqb were rebuilt and experimentally used by the locals. Interestingly, these dams were able to preserve pools of water over the whole summer — the warmest and driest period of the year. This provides practical evidence that run-off harvesting could still be applicable today. Perhaps the old traditions will gain a foothold again, after they have been proved to still work.

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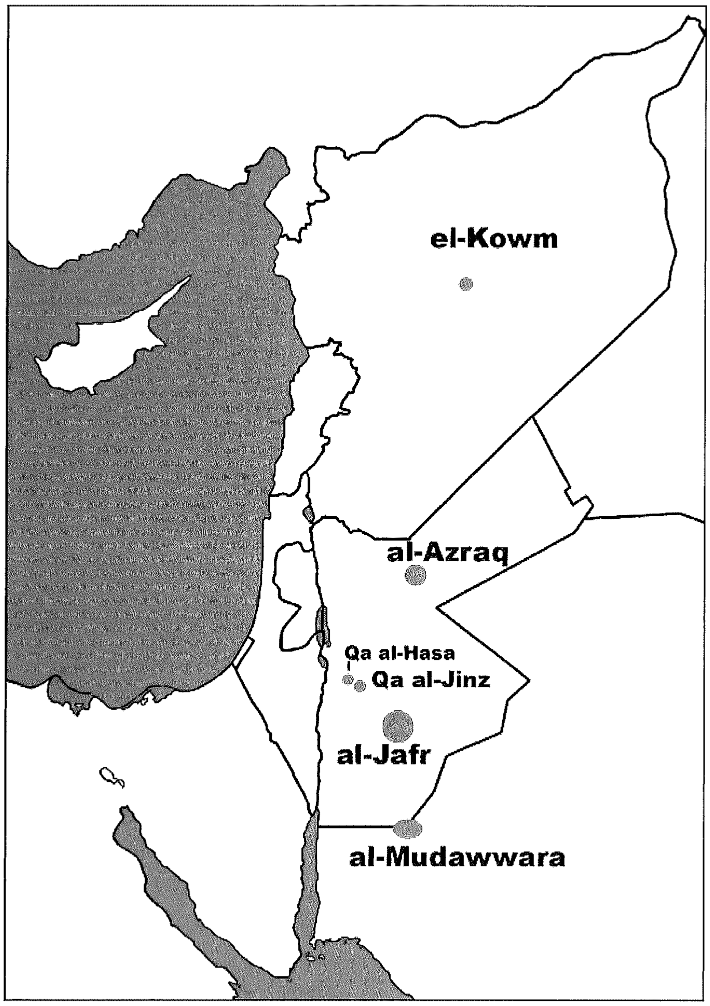
An Eastern Jordan Perspective on The Lower Paleolithic of The "Levantine Corridor"

Introduction

For nearly two decades the concept of the "Levantine Corridor" has been employed as a guiding framework in discussions of Lower Paleolithic archaeological sites in the Levant and the eastern Mediterranean Basin (Bar-Yosef 1987). The concept has figured prominently in Lower Paleolithic studies more broadly across much of Eurasia. Discussions of both the Lower Paleolithic archaeology and of the Corridor itself have emphasized the movement of hominids (generally considered *Homo erectus*), technologies, and ideas between Africa and Eurasia. Because of the number of ancient sites found and studied in the Mediterranean Coastal zone, the Rift Valley system of the Levant, and the adjacent uplands, this westerly Levantine strip has emerged as a critically important avenue in studies of human geography during the Middle Pleistocene for much of the Old World. Major sites in this zone, including Tabun Cave on the coast near Haifa, Ubeidiya and Gesher Benot Ya'aqov along the Jordan River, and Latamne on the Orontes River in Syria, have yielded abundant information on the technology and life ways of Middle Pleistocene hominids. Many other important sites help to round out the known record of the Middle Pleistocene of the Levantine Corridor (for a detailed treatment of relevant sites and issues, current to a decade ago, see Bar-Yosef 1994).

Other work conducted during the same two decades in the basins of eastern Jordan and Syria (FIG. 1) has significantly broadened the zone of geographic distribution of Middle Pleistocene sites in the Levant. Study of the assemblages from these sites enables a better understanding of the technological development, mental capacity (Roche and Texier 1996), and ecological adaptation of *Homo erectus* within the Levantine Corridor and more widely throughout the Near East and much of Eurasia. This paper provides a brief progress summary of ongoing work on the archaeology of Middle Pleistocene lake basins of eastern Jordan with comparisons to surrounding areas. What follows is a working model of the known Pleistocene archaeology that currently guides our fieldwork and laboratory analyses. As suggested herein, our work in these basins requires a broadening of the concept of the Levantine Corridor to include eastern Jordan



1. Map of lake basins in the eastern Levantine corridor.

nd Syria, and, probably, parts of northern Saudi Arabia as well (see also Copeland 1998).

Al-Azraq Basin

Al-Azraq Basin centers on the region where the panhandle of Jordan begins to extend northeastwards towards 'Iraq (FIG. 1). Its wider connections each nearly 400 kilometers to the southeast, deep nto Saudi Arabia along the length of the Wādī as-Sarḥān Depression. A major oasis occurs at al-Azraq on the northwestern margin of a substantial ephemeral lake of the same name. During much of he Pleistocene this lake undoubtedly was permanent. Even down to modern times major freshwater springs charged the al-Azraq Oasis for several kilometers stretching between the two modern towns of Azraq ash-Shīshān and Azraq ad-Drūz. The Azraq Oasis was a significant wetland of great biodiversity, seasonally visited by millions of waterfowl and other bird species migrating between Africa and Eurasia (Nelson 1973). These migrations continued into the mid-to-late twentieth century. The longstanding existence of the oasis is attested by a relict population of a small endemic fish, the Azraq Killifish (*Aphanius sirhani*). Rock drawings in the area portray the maned African lion, ostrich, leopard or cheetah, hyena, and other animals whose closest taxonomic affinities lie with the African faunal realm. These and other African-derived taxa survived until the widespread introduction of firearms in the last century. Of these, only the hyena is occasionally seen today.

Initial discoveries of rich Lower Paleolithic deposits in the area of the Azraq Oasis in the 1950s occurred at Lion Spring ('Ayn al-Asad), where hundreds of handaxes (hereafter 'bifaces') were unearthed in the course of an irrigation-development project. The site subsequently was excavated and yielded a large sample of Acheulian artifacts (Rollefson 1983; Copeland 1998). At nearby C-Spring, abundant bifaces were first exposed in connection with the same irrigation-development project, and later were found in context in limited stratigraphic excavations (see reports summarized and referenced by Copeland and Hours 1988, 1989). The artifacts occurred as "an extraordinary packed mass of Late Acheulean bifaces, bifacial cleavers, cores, flake-tools and thousands of flakes, mainly delicate biface-preparation flakes" (Copeland 1998: 17), all with a very fresh appearance. A study of the fauna recovered after the earthmoving operations (Clutton-Brock 1970, 1989) identified hartebeest, onager, rhinoceros, bison, and wild camel; faunal affinities were to both Eurasia and Africa. The fact that most of the animals were not fully grown led Clutton-Brock (1989) to conclude that the faunal remains were the food waste of ancient hunters.

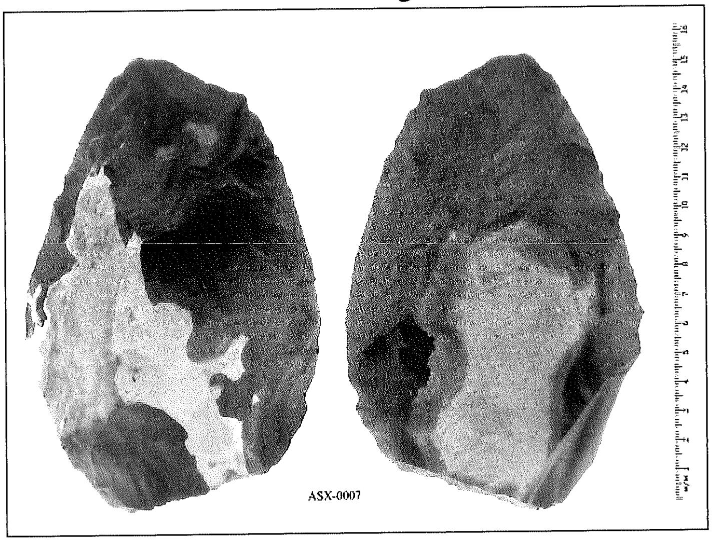
The deposits at both Lion Spring and C-Spring were tentatively dated to the Late Acheulian. Most remarkable was the fact that in these spring assemblages the lithic artifacts included many formed tools, and the tools in turn were mostly bifaces. A large percentage of the bifaces displayed flake scars from resharpening by the tranchet technique, in effect, making these artifacts tranchet cleavers. These findings compelled Copeland and Hours (1988) to propose the 'Late Acheulian of Azraq facies' as a distinctive spring-context entity, both geographically and technologically, in the eastern Levant. Based on typological comparisons with assemblages from Nadaouiyeh I Ain Askar in the al-Kowm Basin of Syria (Le Tensorer *et al.* 1993; Le Tensorer 1996), and with Tabun Cave, it is now thought that the Late Acheulian of Azraq facies must date from about 250 to 400 thousand years ago, or even older.

Jordan is a very dry country, and with the sole exception of its shared boundary waters, it is without a single significant river. It also has a burgeoning human population. A deepening water crisis became acute during the 1980s, and led to extensive pumping of Pleistocene groundwater in the al-Azraq Oasis to supply metropolitan needs. Predictably, the water table of the oasis declined drastically, and the wetland all but disappeared within a few short years. In an effort to restore a small portion of the former oasis and its aquatic habitat for waterfowl and endemic fish, the pond at ash-Shīshān Spring (now 'Ayn as-Sawda) was deepened and enlarged by dredging in the early 1990s. The restoration effort was doomed, however, by the continued pumping of groundwater. Nonetheless, the earthmoving operations had exposed rich Acheulian deposits, which were recognized finally in 1996. Our assessment of the salvaged material revealed that, as at Lion Spring and C-Spring, the tool assemblage was dominated by bifaces, and these included a majority of tranchet cleavers (Rollefson *et al.* 1997a).

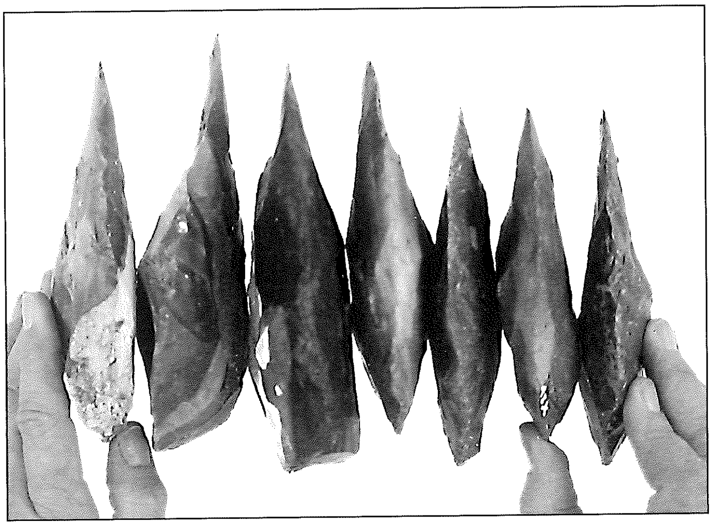
We undertook exploratory excavations at the 'Ayn as-Sawda pool in 1997 (Rollefson *et al.* 1997b). Lower Paleolithic occupation surfaces with abundant bifaces were exposed in two areas.

The dominance of tranchet cleavers in the biface assemblage was again evident (FIGS. 2, 3). Cores and debitage[1] and a few other tools, including Levallois elements, complete the Acheulian artifact inventory (TABLE 1). Importantly, these deposits also contained remains of megafauna, identified as Pleistocene elephant, rhinoceros, equid, and camel (Dirks *et al.* 1998). Other excavations disclosed rich Middle Paleolithic deposits in context, with abundant Levallois cores, blades, and points associated with equid and bovid remains. Nearby, deposits spanning the Middle-to-Upper Paleolithic transition, and others dating on into the Epipaleolithic, were revealed.

The Acheulian assemblages disclose a major emphasis on hunting and butchering of large game animals in this lakeside/spring-fed marsh environment during the Middle Pleistocene. A lack of production debitage indicates that the bifaces were for the most part not made at the places where they were excavated at 'Ayn as-Sawda. They were resharpened and maintained there, as indicated by the recovery of several distinctive tranchet sharpening flakes. And abundant exhausted cleavers were discarded in anticipation of retooling elsewhere. The presence of Levallois technology supports the interpretation that these assemblages date to the Late Acheulian.



2. Late Acheulian bifacial cleaver from 'Ayn as-Sawda showing distinctive resharpening by detachment of tranchet flakes. Scale here and elsewhere in centimeters.



3. Edge view of a series of Late Acheulian cleavers from 'Ayn as-Sawda. The specimen shown in Figure 3 is third from the left.

While the 1997 excavations at 'Ayn as-Sawda were limited in scope, they reaffirmed the enormous potential of the al-Azraq Oasis for studies of the Acheulian industrial complex and the life ways of Middle Pleistocene hominids of eastern Jordan. Further archaeological and geological work is planned at this important locality, and it is hoped that the temporal span of the archaeological remains can be extended backward to include earlier phases of the Acheulian.

TABLE 1. Levallois elements and tools from excavated *in situ* deposits at 'Ayn as-Sawda.

	n	%
Levallois points	64	
Levallois blades	32	
Levallois flakes	41	
Subtotal	137	17.25
Sidescrapers	80	
Endscrapers	5	
Burins	7	
Borers	2	
Backed knives	2	
Naturally backed knives	5	
Notches	11	
Denticulates	9	
Diverse	20	
Subtotal	141	17.76
Bifaces	516	64.99
Total	794	100.00

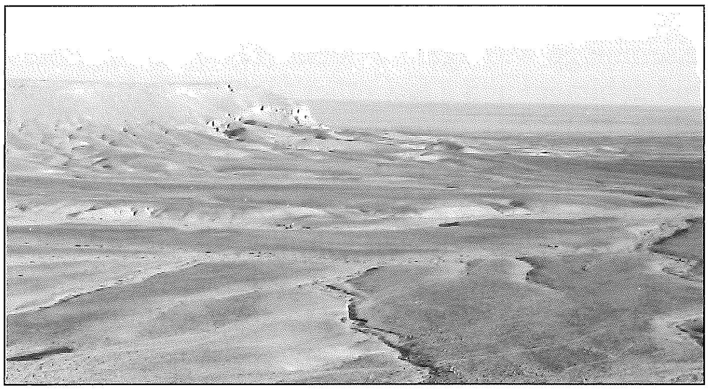
[1] Cores and non-Levallois debitage are currently being analyzed and figures are forthcoming.

l-Jafr Basin

l-Jafr Basin occupies a large area of the Ma'ān lateau of southeastern Jordan. Roughly oval in onfiguration, it measures about 150 by 100 kilometers, and is entirely a closed drainage system. he floor of the basin is marked by Qā' al-Jafr, a nudflat of 240 square kilometers. The Qā' is the nost recent small remnant of the immense Pleistocene Lake al-Jafr, which at times was one of the argest pluvial lakes in Southwest Asia (Huckriede nd Wiesemann 1968). Escarpments 50 to 70 meers high delineate the northern and eastern margins f the basin. The geologic section exposed in these scarpments consists of Paleocene marls overlain y Eocene limestones containing abundant deposts of nodular flint (Kherfan 1987). This flint was sed for tool production throughout all known peiods of the prehistory of the region (Wilke *et al.* .d.). The entire area is now hyperarid, receiving ess than 50 millimeters of precipitation annually. xcept on the floors of wadis, the basin is almost levoid of vegetation (Al-Eisawi 1996). This apearance, however, belies the fact that during much f the Pleistocene the region was well watered, and ts immense lake was surrounded by a savannah vith a fauna whose affinities would have been to he African realm.

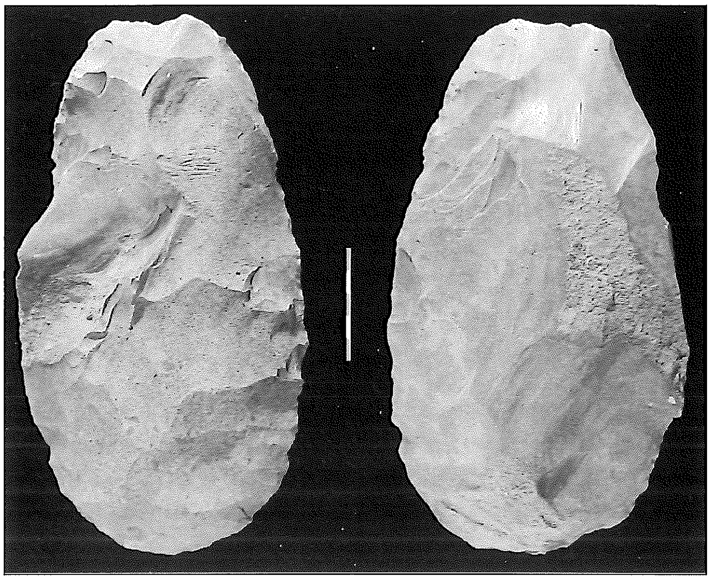
Prior to our work, which began in earnest in 997, the basin had received only cursory attention y archaeologists. Our research has emphasized urvey and reconnaissance, and has attempted to stablish the broad outlines of the prehistory of the egion and the relationships between ancient landorms and archaeological remains (Quintero and Vilke 1998; Quintero *et al.* 2002). A major effort as been made to locate and study sites relating to he Pleistocene human occupation of the basin, and o search for ancient sites with buried deposits.

A cluster of Acheulian sites was found along the orthern edge of the basin at a locality we named Ayūn al-Qadīm (Ancient Springs; Quintero *et al.* 004). The main topographical feature is a steepided box canyon cut by spring discharge into the ordering escarpment. This geomorphic structure s about a kilometer long and somewhat less wide t its mouth, tapering as it enters the headland (FIG.). On the floor of this box canyon is site J-83, vhich consisted of a large scatter of Late Acheuian bifaces and a few other artifacts. The scatter xtended over a linear distance of some 800 meters n the Pleistocene terraces flanking the main drainage. Several localized clusters of bifaces appear to represent ancient activity areas. In 1999 and 2004 this site was carefully mapped, the surface assemblage was collected, and test excavations were carried out. These tests revealed no intact subsurface deposits. Preliminary analysis of the extensive surface assemblage supports its attribution to the Late Acheulian. Thus the assemblage at J-83 is roughly comparable in age to 'Ayn as-Sawda.



4. Entrance to the box canyon at 'Ayūn al-Qadīm. The Late Acheulian site J-83 extends along the terrace of the main wadi draining the canyon, from left to right across the middle of the picture.

Just outside the mouth of 'Ayūn al-Qadīm, and within a distance of only 2 kilometers along the escarpment, five more Acheulian sites were found. They occur on ancient terraces and low hills that stand off a few hundred meters from the escarpment. Two sites (J-25 and J-92) appear to include older components, as many of the bifaces are much larger and less refined in form than those at J-83 or at 'Ayn as-Sawda (FIG. 5). These sites were mapped and surface collected also. Test excavations at two of them suggest that all of these assem-



5. Large tranchet cleaver from site J-92.

blages are confined to the deflated desert pavement, which rests on Paleocene marls. Preliminary field identifications of artifacts collected at these sites are shown in TABLE 2.

The Acheulian assemblages recovered at ʻAyūn al-Qadīm, as at al-Azraq, are overwhelmingly dominated by formed tools. The tools, in turn, largely are bifaces, and the bifaces mostly are tranchet cleavers[2]. Tranchet resharpening flakes are well represented. At the sites just outside the box canyon of ʻAyūn al-Qadīm there also are many biface-production flakes. Critical to our study is the distribution, among all of the ʻAyūn al-Qadīm sites, of all categories of artifacts, including biface-production debitage, which will assist in the location of discrete knapping areas. When the analyses are complete, we anticipate being able to distinguish sites and/or discrete loci used primarily for living and tool-kit maintenance from those used primarily for hunting and butchering. As at al-Azraq, most of the ʻAyūn al-Qadīm assemblages also contain Levallois elements, again supporting a Late Acheulian attribution, at least for portions of these assemblages.

No subsurface deposits have yet been found at ʻAyūn al-Qadīm, and therefore there are no faunal remains to help guide interpretation of the significance of the sites discovered there. Nevertheless, data from ʻAyn as-Sawda and from C-Spring attest to the existence of an African-derived megafauna in eastern Jordan during the Late Acheulian. The cul-de-sac configuration of ʻAyūn al-Qadīm and the occurrence of substantial cleaver assemblages along its main drainage suggest to us that the landform served as a natural trap for ambushing large animals that came there for water. The walls of the canyon are quite precipitous. If animals such as elephants were cornered and attacked there, they would have been unable to gain the headland to

TABLE 2. Lower Paleolithic debitage and tools, including Levallois material, in al-Jafr sites.

Site	J-25		J-83		J-92		J-136		J-138		J-140		Total	
Cores	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Non-Levallois	61	46.92	2	22.22	6	46.15	5	71.43	3	27.27	57	47.90	134	46.37
Levallois point	11	8.46	1	11.11	2	15.38	0	0.00	1	9.09	5	4.20	20	6.92
Levallois blade	24	18.46	3	33.33	0	0.00	1	14.29	4	36.36	27	22.69	59	20.42
Levallois flake	34	26.15	3	33.33	5	38.46	1	14.29	3	27.27	30	25.21	76	26.30
Subtotal	130	100.00	9	100.00	13	100.00	7	100.00	11	100.00	119	100.00	289	100.01
Levallois cores		53.08		77.78		53.85		28.57		72.73		52.10		53.63
Debitage														
Unclass. flakes	48	13.87	1	25.00	3	30.00	4	28.57	3	25.00	31	32.63	90	18.71
Biface prod. flakes	271	78.32	3	75.00	5	50.00	8	57.14	7	58.33	45	47.37	339	70.48
Tranchet flakes	4	1.16	0	0.00	0	0.00	1	7.14	2	16.67	8	8.42	15	3.12
Levallois points	6	1.73	0	0.00	0	0.00	0	0.00	0	0.00	4	4.21	10	2.08
Levallois blades	7	2.02	0	0.00	0	0.00	1	7.14	0	0.00	2	2.11	10	2.08
Levallois flakes	10	2.89	0	0.00	2	20.00	0	0.00	0	0.00	5	5.26	17	3.53
Subtotal	346	100.00	4	100.00	10	100.00	14	100.00	12	100.00	95	100.00	481	100.00
Levallois debitage		6.65		0.00		20.00		7.14		0.00		11.58		7.69
Tools														
Scrapers	2	0.23	0	0.00	0	0.00	0	0.00	0	0.00	3	0.32	5	0.25
Bifaces & bif. blanks	408	46.15	287	95.67	77	77.00	25	54.35	39	62.90	732	77.05	1568	67.07
	884		300		100		46		62		950		2338	
Levallois material		10.41		2.3		9.00		6.52		12.90		7.68		8.21

Note: figures given here include fragmentary specimens. artifact counts for site j-140 reflect fieldwork in progress; total may exceed 1,000.

[2] No 'African flake cleavers' of the kind found at Gesher Benot Yaʻaqov (Goren-Inbar and Saragusti 1996) have been found.

escape. While the means of killing such animals are not identified in the assemblages at ʻAyūn al-Qadīm, the cleavers used for butchering are abundantly represented.

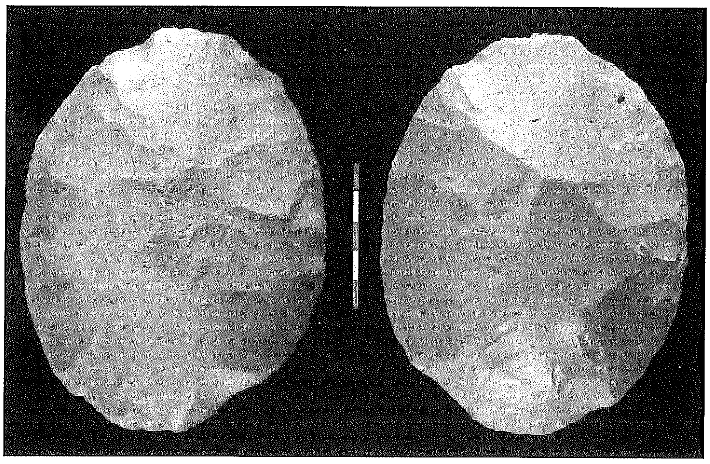
The Acheulian Assemblages

The most striking and distinctive feature of all the assemblages from both the al-Azraq and al-Jafr basins is the abundance and dominance among the formed artifacts of bifacial, tranchet cleavers, which have long been accepted as butchering tools (Jones 1980; Keeley 1980; Ashton and McNabb 1993; Schick and Toth 1993: 260). This situation contrasts sharply with that of most other known Acheulian sites in the western Levant, as at Tabun Cave, for example (Jelinek *et al.* 1973). There, a greater diversity of formed tools points to a broader range of industrial activities, perhaps in a living space where a variety of tasks were carried out, as opposed to a more specialized activity area dominated by hunting and butchering.

The distinctive presence of tranchet cleavers in Acheulian assemblages at al-Azraq Oasis was clearly recognized in Copeland and Hours' *The Hammer on the Rock* (1989). But the *overwhelming presence* of cleavers in Late Acheulian assemblages in eastern Jordan was not realized until analysis of the bifaces from the 1997 excavations and surface collections at ʻAyn as-Sawda was completed. Our detailed study of over 1,000 classifiable bifaces revealed a diagnostic set of technological attributes that together define the use-life history of the Acheulian bifacial cleaver (Quintero and Wilke 1997; Quintero *et al.* 2000, 2001, 2004). These attributes permit classification of Late Acheulian bifaces as tranchet cleavers even after many resharpenings, much consequent reworking of the tool margins, and gross alteration of the form of the original tool. The work has enabled classification of cleavers into approximate use-life stages, from selection of the tool blank, to initial tool production, through various stages of resharpening, to exhaustion and ultimate discard, all with attendant changes in tool form.

Briefly, our analysis revealed the following patterns. Late Acheulian bifaces encompass two major classes of butchering tools, those used for cutting (cleavers), and those used for piercing. The latter (i.e., ficrons, micoqians) constitute a very small percentage in the eastern Jordan assemblages and are not considered here. It is our firm conviction that the other class of bifaces, whether recognizable as cleavers or not, was used primarily for butchering large game animals. When initially made, Late Acheulian bifacial cleavers were formed with a basal grip area, an expendable midsection, and a distal cutting edge. The grip was intentionally configured for ease of holding, with mass retained to facilitate heavy-duty butchering tasks. Gripping the cleaver was facilitated by retention when possible of cortex, presence of *meplats*, steep unifacial flaking, and intentional dulling of edges. The cutting edge was conceived initially to accommodate multiple resharpenings. In most cases this edge, or bit, was created wide with ample length and width for repeated rejuvenations. These attributes are clearly shown in FIGS. 2 and 5. With use and resharpening, the bit usually became both narrower and shorter; finally it was resharpened down to the grip and its use-life ended (FIG. 6). The tranchet technique generally was used whenever possible to create and restore a sharp cutting edge, but bifacial thinning was also used.

Our analysis recognizes stages of production, and rejuvenation processes that vary depending on the configuration of the raw material and reduction events. In essence, the traditionally recognized handaxe forms or "types" (e.g., ovate, cordiform, amygdaloid, etc.) reflect stages in the use-life history of individual cleavers[3]. Ours is a pragmatic analysis of tools, technologically and behaviorally



6. Small cleaver from site J-140. The tool is completely exhausted.

[3] This analysis was initially presented at the 1997 annual meetings of the American Schools of Oriental Research in Napa, California (Quintero and Wilke 1997). A detailed presentation of the data is expected in 2005.

conceived. We perceive the form of an Acheulian biface recovered from an archaeological deposit to be more the result of its use-life history than of its original design. But more importantly, we see its conception, design, and creation as irrefutable proof of the extraordinary mental acuity of *Homo erectus*. The conceptualization of the tool and its longevity and use-life transformations were in the mind of the maker from the beginning of the process, when the raw material was selected.

Thus analyzed, among classifiable specimens, the frequency of cleavers in the biface assemblage from both excavated and surface contexts at 'Ayn as-Sawda is over 90 percent[4]. Our analysis of the various site assemblages from 'Ayūn al-Qadīm in the al-Jafr Basin (in progress at this writing) suggests that the results will be comparable.

The main clear difference we already note between the two study areas is that the bifaces in the al-Jafr assemblages are on average somewhat larger than those from 'Ayn as-Sawda. And many of the bifaces from sites J-25 and J-92 are much larger. We recognize that early-stage biface production could present an appearance of both irregularity of form and of larger size than would be evident in completed bifaces that were heavily used and resharpened. At the same time, such differences are also seen as chronological markers. We anticipate resolution of this issue as our analysis progresses. If the relationship between size and age of Acheulian bifaces, as suggested by Gilead (1970), has merit, some of the known sites at 'Ayūn al-Qadīm are older than the assemblages unearthed at 'Ayn as-Sawda. For the present, we can only estimate their ages at somewhere between 300 and 500 thousand years. Efforts are being made to date these surface assemblages more firmly, but this task is formidable. Whatever the outcome, the very large bifaces recovered at sites J-25 and J-92 are, with just several exceptions, completed tools; they are considerably less refined and regularized in form; and they may well date to older periods of the Acheulian, perhaps deriving from the Middle Acheulian of a half-million years ago.

And there are a few isolated bifaces from the 'Ayūn al-Qadīm locality that are very large indeed, reflective of the largest specimens from the Middle Acheulian site of Latamne in Syria. They possibly point to an even older Acheulian presence in the region. But so far we have been unable to locate any substantive sites with such ancient assemblages, or with even older ones.

Middle Pleistocene Hominid Adaptations in Eastern Jordan

Taken together, the information currently available on the Late Acheulian of the al-Azraq and al-Jafr Basins of eastern Jordan points to a focus by Middle Pleistocene hominids on exploitation of megafauna. In eastern Jordan the focus clearly was on megafauna attracted to aquatic settings – especially lakeshores and associated springs and marshes. This focus gave rise to the development of a specific tool assemblage dominated by tranchet cleavers. We believe that cleavers are integral to understanding critical aspects of the lifeways of these early hominids.

The obvious fact is that tranchet cleavers are simply, and only, heavy-duty butchering tools used for cutting and chopping. They have the sharpest and most efficient cutting edge obtainable in stone. Our replicative research has shown that this working edge is quickly and readily restorable, perhaps up to ten times on a given biface. The primary context in which such a tool would seem to have been used in these spring, stream, and lakeside settings would be in the butchering of large game animals. While much remains to be learned and understood about the exact nature of this behavioral niche, at this point we believe that megafaunal hunting and butchering was a major ecological pose of Middle Pleistocene hominids in the lacustrine basins of eastern Jordan. The presence of megafaunal remains associated with lithic assemblages in which nearly all of the tools are bifaces, and nearly all of the bifaces are tranchet cleavers is strong evidence. And certainly the discovery of self-tipped wooden spears at Shöningen, Germany, dating to nearly 400 thousand years ago (Thieme 1997), puts the hunting of large herbivores fully within the hominid technological grasp at the right time to shed light on the lifeway indicated by the Late Acheulian of eastern Jordan.

The patterns interpreted here are not limited to the lake basins of eastern Jordan. Already alluded to is Nadaouiyeh I Aïn Askar in the al-Kowm Basin

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[4] A traditional analysis of the same material from 'Ayn as-Sawda, employing biface types defined by Bordes (1981), still revealed the presence of over 60 percent cleavers.

›f Syria where preliminary reports of its Acheulian ecord depict a bifacial tranchet cleaver assemblage imilar to that at 'Ayn as-Sawda. We suggest that in aggressive search should be made for Acheuian sites in other lake basins and ancient oasis settings of the eastern Levant. To date, only Middle Paleolithic remains have been found in the al-Mulawwara Basin on the Saudi Arabian border southvest of the al-Jafr Basin (Abed *et al.* 2000) and in he al-Ḥasā lake basin to the east of Wādī al-Ḥasā Clark *et al.* 1988). However, numerous unstuded Pleistocene lake basins exist in eastern Jordan. And the above-mentioned Wādī as-Sarḥān Depresion extending southeastward from al-Azraq deep nto Saudi Arabia hosted the immense pluvial Lake Hazawza. While largely unstudied, a few Acheuian localities were recently discovered on the edge ›f this depression (Whalen and Kolly 2001). And here are many lesser basins farther north across ordan (especially in the panhandle) into Syria, ind south into Saudi Arabia that in the Pleistocene iosted lacustrine environments that may contain ecords of relevance. In all of these diverse regions, here are bound to be sites with buried deposits and aunal remains, as at 'Ayn as-Sawda, that can enich our reconstruction of hominid lifeways during he Middle Pleistocene of the eastern Levant.

mplications For The Acheulian Elsewhere

Our emerging interpretation of the known Acheuian of eastern Jordan lake basins has emphasized a iominid subsistence niche focused on the hunting ind butchering of large herbivores. This interpreation is suggested by the dominance of tranchet cleavers in the bifacial tool assemblages at 'Ayn as-Sawda and 'Ayūn al-Qadīm sites. These tranchet cleavers are essentially identical to those at Boxgrove in England (Roberts and Parfitt 1999) and at iumerous sites elsewhere, and the very widespread pattern of their adaptive utility across continents or hundreds of thousands of years is now clearly evident.

It is now apparent that scholars of the Acheulian n general have failed to appreciate the overwhelmng dominance and the behavioral significance of ranchet cleavers in Acheulian biface assemblages. We think the tendency has been to focus too much ittention on bifaces as morphological, but largely static, entities as described by Bordes (1981) and others, so that tranchet cleavers generally have not been recognized when they are heavily resharpened, reworked, and exhausted. It is in this exhausted and analytically challenging condition that these artifacts usually would have entered the archaeological record. As a consequence, Acheulian bifaces have more often than not been classified simply as one or another form of 'handaxe' of undetermined (and, we believe, often unappreciated) function and significance. Instead, most of them should be viewed as cleavers, butchering tools whose forms changed constantly from use and resharpening.

A fresh look at the known Acheulian assemblages in the Levant and the regions flanking it clearly is in order. Such studies should be made with an eye to identifying the initial production forms of the generally heavily reworked and altered bifacial tools these assemblages contain. Emphasis should be given to raw materials from which Acheulian bifaces were made, and to the consequent formal tool trajectories these materials were likely to predetermine. Surely, the distinctive configuration of 'African' or 'African-related' handaxe assemblages with cleavers made on large flakes of extrusive volcanic rock, as at Gesher Benot Ya'aqov (Goren-Inbar and Saragusti 1996), is constrained and predetermined by the raw material character and configuration, as well as by its availability. Likewise, flints (especially the conveniently shaped, flat nodular ones) and related microcrystalline rocks would have enabled the production of efficient, repeatedly resharpenable, tranchet cleavers, as seen both in the eastern Levant and at far-away localities such as Boxgrove. Both of these general cleaver forms may have typified Acheulian assemblages in different regions, but the option to produce one form, or the other, is likely to have depended largely on the raw material available. More importantly, the utility of the cleaver in day-to-day situations must have been critical to hominid survival, and may have had profound evolutionary consequences for *Homo erectus* in its ongoing successful colonization of the lands beyond Africa.

Broadening The Concept of The Levantine Corridor

We suggest that there is a need to broaden perceptions of the Levantine Corridor and the important hominid adaptations and developments that occurred there during the Middle Pleistocene. This broadening should be a geographic one to include new interpretations of Pleistocene hominid adaptations in what are now the steppe/desert zones of the eastern Levant, especially in ancient lacustrine environments. It should be a strongly behavioral and evolutionary one that incorporates heretofore unrealized interpretations of hominid ecological niches that lie hidden in the lithic clutter of Acheulian industries. It should view these industries as similar or different only after all raw material constraints and likely behavioral contexts have been thoroughly considered and accommodated. It should include very careful analyses to determine if the assemblage character seen in the eastern Jordan lake basins typifies assemblages elsewhere in the Levantine Corridor. It should focus afresh on the basic subsistence actions that our hominid ancestors are likely to have carried out on a daily basis in the ecological niche they had come to ever-more-efficiently occupy. Finally, it should seek new ways to extract information on how these early people must have cooperated to organize, provision, and defend themselves in this critical corridor between continents.

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Nabataean Water Supply Systems: Appropriateness, Design, and Evolution

A full understanding of Nabataean society, economy, and settlement strategies depends, in large part, on a thorough knowledge of the way in which the Nabataeans dealt with the problems of water supply and agriculture throughout their largely desert kingdom (Oleson 2001a). In much of the northern Nabataean territory or at higher altitudes, for example near Wādī Mūsā or around 'Ammān, annual direct precipitation was sufficient to allow drought farming without extensive human intervention. But elsewhere, as around ancient Ḥawrā' (modern Al-Ḥumayma) in Jordan's southern desert, all crops required irrigation through the harvesting of run-off water from occasional rain showers. The provision of drinking water for humans and their domestic animals relied everywhere on some combination of cisterns, wells, springs, and aqueducts, but the character of each system varied according to local circumstances of topography and water sources, and techniques naturally evolved over time. Nabataean hydraulic techniques were based in part on regimes inherited from their Bronze Age and Iron Age predecessors, and on some Hellenistic Greek accomplishments, such as the reservoirs roofed with stone slabs carried on transverse arches, found on Delos and other arid Aegean islands. Nevertheless, the final systems bear an unmistakable local stamp.[1] Both large settlements, such as Petra, and small ones, like Ḥawrā', depended on water-supply and agricultural systems that were the result of numerous interrelated decisions. The final arrangements were determined not only by local topography, geology, and hydrology, but also by size of the population, character of the economic system, choice of crops and domestic animals, and political and cultural forces. This paper will present a brief account and analysis of the desert water-manipulation regimes at Ḥawrā' documented for the Nabataeans before and after the Roman conquest. Case studies of individual sites, such as those for Ḥawrā' and Petra, are the best route to a full understanding of the relationship between hydraulic technology and Nabataean society.

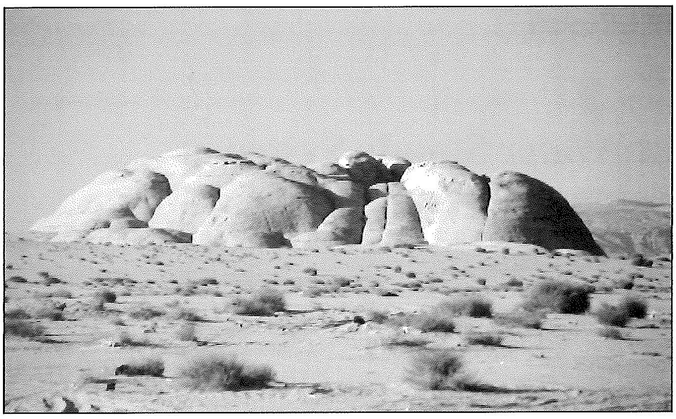
The Nabataean settlement centre of Ḥawrā' was founded sometime in the first century BC at a previously unoccupied site. An account of the foundation, part of the first book of Uranius's *Arabica,* names a King Aretas as the founder.

Auara: a town in Arabia, named by Aretas from an oracular response given to his father Obodas. Aretas set out in search of the oracle's meaning, for the oracle said "to seek out a place *auara*" — which in the Arabian and Syrian languages means "white" And as he lay in wait, a vision appeared to him of a man clothed in white garments riding along on a white dromedary. But when the apparition vanished, a craggy hill appeared, quite natural and rooted in the earth; and there he founded the town.

The punning value of the Nabataean name and the totemic animal probably have something to do with the hump-like ridges of white Disi sandstone that are such a prominent part of the landscape around al-Ḥumayma (FIG. 1).

Unfortunately, the text does not explicitly indicate whether King Aretas III (85-62/61 or 60/58 BC) is intended, or Aretas IV (9/8 BC-AD 39/40), and the artifacts from the earliest occupation levels at the site cannot be dated with sufficient accuracy

[1] For the Hellenistic influence, see Oleson 1991, 1992a, 1992b. On Nabataean water-supply systems in general, see Oleson 1995, 2001a, Bellwald and al-Huneidi 2003.



1. Hump-shaped jabal northeast of al-Ḥumayma.

to support either interpretation.[2] The context of intentional sedentarization at Ḥawrā' fits in particularly well, however, with the mid-first century BC. At this time King Aretas III fostered sedentarization, Hellenization, and an enhanced monarchy in order to stay competitive in long distance trade, to fill the power gap left by the Seleucids in Syria, and to compete with the Ptolemies of Egypt (Schmid 2001a: 415, 2001b: 370-71; cf. Parr 1978; Young 2001: 100-12). Aretas III's royal epithet, "Philhellene", emphasizes his connections with the Hellenistic world, and in the second quarter of the first century BC Petra was transformed by settlement, stone houses and an aqueduct, and the organization of long-distance trade (Schmid 2000: 123-27; Bellwald and al-Huneidi 2003: 4, 35). The Romans also recognized the importance of Ḥawrā', constructing a fort there immediately after the conquest of the kingdom in 106 (Oleson 2001b, 2003), as did the Abbasids, who purchased it in the late seventh century (Foote 1999; Schick 1995: 312-13).

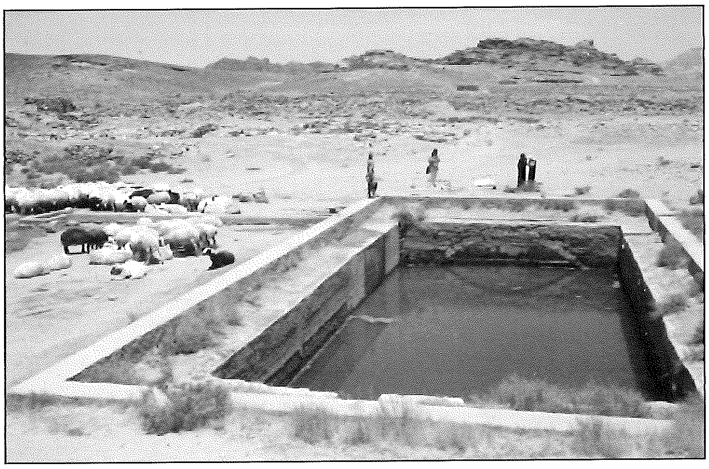
The foundation story is a historical *topos*, involving a king, an oracle, a successful vision quest, and a topographical landmark, but let us assume for the moment that it reflects reality and try to recreate the event. When Aretas III stood blinking in the desert sun after his vision had evaporated, some characteristics of the landscape must have convinced him that the divine guidance was based on an appreciation of practical human needs, particularly the potential water-supply. As Aretas looked around with the keen eyes of a desert dweller, the advantages of the site were obvious. Regional patterns of precipitation undoubtedly were common knowledge among the Nabataeans, but a glance at the local vegetation also provided Aretas with information on the extent and reliability of the rainfall in this particular locality. At Ḥawrā', annual precipitation totals about 80mm, very low, but predictable. Aretas could also see the ash-Sharā Escarpment towering above the desert to the north, an obstacle that caught winter rainstorms and channeled enormous amounts of run-off water into the Wādī Qalkha, which skirted the eastern boundary of the future settlement. The white sandstone ridges to the east and southeast formed enormous catchments that shed run-off water on large areas of relatively fertile and easily cultivated soil in close proximity to the site. Aretas also noted that an eroded Pleistocene lake bed at the northwest edge of the settlement site constituted a large catchment field focused on the location indicated by the vision, but at a slope allowing relatively easy control of the water. Experience at Petra had already shown that the red and white sandstones around Ḥawrā' were sufficiently impermeable to allow the excavation of cisterns (Bellwald and al-Huneidi 2003: 17-21). Finally, this ambitious king must have found the green smudges surrounding the far-off springs high on the escarpment a tantalizing promise of spring water. The resources at this previously uninhabited spot were more than sufficient to support pastoral and agricultural activities, and the location, on an established caravan route, was well placed to satisfy the political and economic needs of a society newly energized by the absorption of Hellenistic culture and involvement in transit trade between

[2] Preserved in Stephanus of Byzantium, 144, 19-26; cf. Jacoby 1958: Preserved in Stephanus of Byzantium, 144, 19-26; cf. Jacoby 1958: 340. Although the Nabataean king list is not certain until Obodas III (30-9BC), most recent reconstructions indicate that the reigns of both Aretas III (85-62/61 or 60/59BC) and Aretas IV (9/8BC-39/40AD) followed those of kings named Obodas (Obodas I, 96-85BC and Obodas III) (Fiema and Jones 1990). Aretas IV, however, was not in fact the son of Obodas III (Josephus, *Ant* 16.9.4; Starkey 1965: 907-9, 913-14; Wenning 1993: 34), so if we interpret strictly the terms "son" and "father" used in the passage from Uranius, Aretas III should be the founder of al-Ḥumayma. Recently, there has been a proposal to move the reign of Rabbel I from the mid-second century down to 85/84BC, placing him between Obodas I and Aretas III (Wenning 1993: 30-31; Schmid in Frösén and Fiema 2002: 254). But since the reconstructed reign is only one year, this interpolation does not invalidate the dynastic link between Obodas I and Aretas III. Furthermore, Wenning assumes that Rabbel I and Aretas III were brothers, both sons of Obodas I. On the foundation of Ḥawrā', see now also (Hackl, Jenni, Schneider 2003: 280-82, 294, 596), who propose several unsustainable hypotheses about the name of the site.
A worn coin possibly struck by Aretas III was found in a surface layer at the site (reg. no. 1998.0484.01), but it may or may not have been brought to the site during his reign. For an account of recent excavations at the site, see (Oleson *et al.* 1999, 2003).

Southern Arabia and the Mediterranean.[3] This site called "White" had great promise.

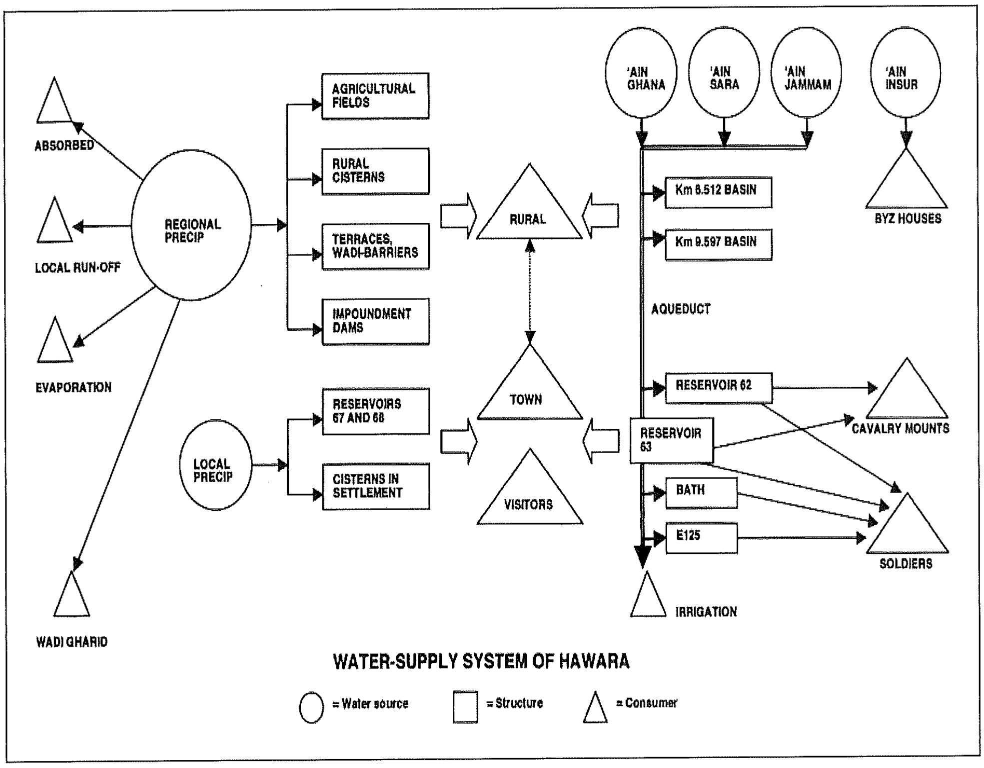
Back to reality, the water-supply system of Ḥawrā' involved input from precipitation and springs, artificial structures for transporting and storing the water, enhanced soil storage, direct consumers, and natural losses. A diagram of the system as it functioned from the arrival of the Roman garrison to the abandonment of the fort around 400AD clarifies the input and consumption patterns (FIG. 2). In fact, the only Roman period and later modifications to the Nabataean system were the addition of more consumers and the diversion of some of the aqueduct flow to the fort reservoir and a Roman bath.

The main lines of the chronology and evolution of the water-supply system serving Nabataean Ḥawrā' and the succeeding ancient communities are clear. Permanent occupation of the site would have been impossible without facilities for storing run-off water, and a pair of reservoirs in the settlement centre belongs to the foundation period (FIG. 3). Given their atypical size and design, it is likely that these reservoirs were commissioned by the royal founder. Soon after, private individuals attracted to the site by the public water system, and presumably by promises of arable land, began



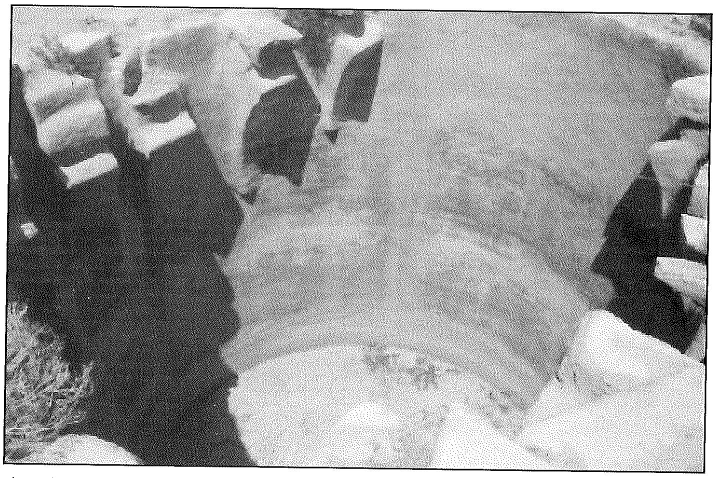
3. Reservoir in settlement centre (survey nos. 67), view.

to build or excavate cisterns to collect run-off water in the settlement centre, the surrounding hillsides, and throughout the catchment region, to supplement the public supply. Seven cylindrical cisterns were built along the path the run-off followed through the settlement centre; they may have been used for some time by tent-dwellers before houses were constructed around them (FIG. 4). The aqueduct, and the pool it filled at the north edge of the settlement, belong to the end of the first century BC or very beginning of the first century AD (FIG. 5). Given the design of the pool, the whole aqueduct system now seems, surprisingly, in large part

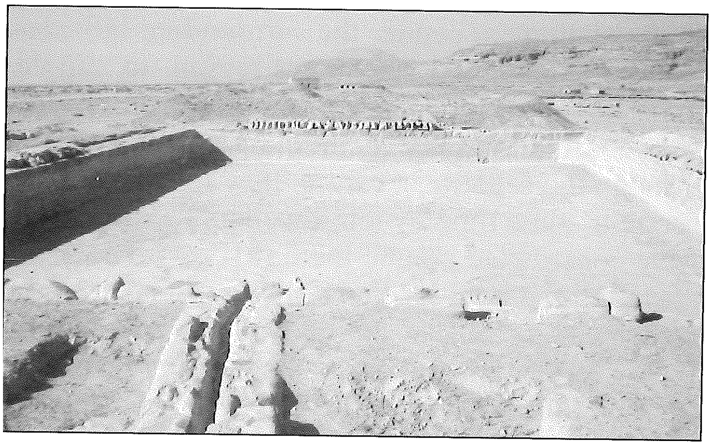


2. Diagram of Ḥawrā' water-supply system.

[3] The old King's Highway (*Numbers* 20:17, 21:22) must have passed across or close to the site, since its reincarnation as the *Via Nova Traiana* passed through Ḥawrā' (Graf 1995: 256-57; Bienkowski 2001: 348; Freeman 2001: 433; Young 2001: 97-99).



4. Cylindrical domestic cistern in settlement centre (survey no. 54), view.



5. Aqueduct pool in settlement centre (survey no. 63), view.

a prestige project built by King Aretas IV on the model of his pool and garden complex at Petra, de-signed to highlight, in a spectacular manner, Naba-taean control of the desert (Bedal 2001). If Ḥawrā' was in fact founded by Aretas IV rather than Aretas III, the aqueduct and three reservoirs in the settle-ment centre represent part of a very ambitious and comprehensive regional water-supply system. The aqueduct discharge caught by the pool was most likely used for livestock, craft processes, agricul-tural irrigation, and bathing. There may have been a Nabataean bath house as well, 100m south of the aqueduct reservoir (Reeves and Oleson 1997).

In the reign of Trajan, or soon after following the conquest of the Nabataean kingdom, the Ro-mans constructed a fort, including a reservoir fed by a branch line from the aqueduct. At least some of the overflow from the reservoir served a pressur-ized water system in the fort. Later on, in the sec-ond or early in the third century, the free-flowing overflow conduit at the aqueduct pool was replaced by a stopcock and pressurized pipe providing wa-ter to a heated bath constructed over the remains of the Nabataean structure to the south (Oleson 1988, 1990). The stopcock is a metaphor for the more formal Roman methods of administering wa-ter supplies. All or some of the remaining aqueduct discharge was diverted through terracotta pipelines to the *vicus* associated with the fort.

Very few of the other elements of the water-sup-ply system in the settlement centre and throughout the catchment can be dated with any precision on the basis of artifacts, particularly the many cis-terns. Nevertheless, the design and execution of most of the structures, and the associated sherd scatters or occasional block-like representations of the god *Dhūsharā*, are Nabataean in character and indicate that the regional system was for the most part complete by the second century AD. Fur-thermore, no cisterns were built into Ḥawrā's five known Byzantine churches, as at Petra, Mampsis, Oboda, and other sites in the region (Fiema *et al.* 2001: 70-73; Negev 1988: 36-38, 57; Negev 1997: 109-13, 129; Shereshevski 1991), indicating that the reservoirs and cisterns in the settlement centre already provided sufficient capacity. The Roman foot (*pes monetalis*, 0.296m) does not appear in use outside the Roman fort, and the Byzantine foot of 0.3089m, which was used for the Ḥawrā' churches, does not appear as the planning module for any of the cisterns or reservoirs in the settlement centre or surrounding region. There is also no indication that cisterns were constructed in the early Islamic period. None have been found in the Abbasid fam-ily manor house. Renovation of older storage struc-tures, of course, was ongoing, and many of them are still in use today. This regional, largely Naba-taean, system includes 27km of aqueduct, five res-ervoirs, 57 cisterns, three containment dams, along with numerous wadi barriers, and a few terraced fields.

How did this water-supply system relate to set-tlement patterns? The applications to which water might be put in a small, pre-modern settlement in the Jordan desert are varied, but predictable. The highest priority use, of course, was direct human consumption. An average adult accustomed to an active life in this arid environment needs to con-sume approximately 2.0 litres of water per day in order to feel comfortable. In addition, water is re-quired for cooking, and for washing the body, cloth-ing, and eating utensils. Estimates of the amount of water needed in antiquity to satisfy all these basic human needs (including drinking) vary, but 8.0 l per day is a reasonable minimum figure (Helms 1981: 188-89, 1982; Evenari, Shanan and Tadmor 1982: 148; de Vries 1987). If we assume that all the water in the reservoirs and cisterns in the habitation centre was intended entirely for human consumption, and that the system was designed with a safety margin of 100% — that is, the inhabitants counted on the cisterns being filled only every second year (cf. Shereshevski 1991: 191-93) — the 2300m^3 stored there could have sustained a population of approximately 390 souls. This figure excludes the aqueduct discharge and its pool, which may have been used for other purposes, and the Roman reservoir no. 62, which is part of an essentially separate and later system.

The eleven domestic cisterns found in the settlement centre can serve as a check. They have an average capacity of 122.25m^3, a total capacity of 1,345m^3. Assuming the 100% safety margin, an average capacity domestic cistern could support 21 individuals, and all eleven together 230 individuals. Given the significant size of the domestic structures visible at present in the settlement centre, an estimate of 21 individuals per household does not seem excessive — assuming the presence of several generations of the family, closely associated clan members, servants or slaves, and visitors.

The reservoir in the Roman fort was undoubtedly refreshed at frequent intervals from the aqueduct, but any calculation of the through-flow remains completely conjectural. Although the dimensions of this reservoir — 10 x 50 x 100 Roman feet — are too regular to suggest that the resulting volume (1,273m^3) had been carefully calculated to support a certain anticipated garrison size, the planners must have considered the possibility of withstanding a siege after interdiction of the aqueduct flow. Assuming loss of half the water in the unroofed reservoir to evaporation, which can total 3.4m/year in this region (Natural Resources Authority 1977: Map SW-5), and a hypothetical worst-case siege lasting no longer than six months, the water stored in the reservoir could have supported a human garrison numbering approximately 436. This figure corresponds well enough with the size of the camp, which is suitable for an auxiliary *cohort* of approximately 500 men (Parker 1986: 105; Webster 1985: 145-51). Any mounts present in the fort, of course, would have required a large daily allowance of water as well.

The maximum possible flow of the aqueduct can be calculated as 19.6m^3/hour. Any discharge from the aqueduct could have supplemented the stored water. If we assume a real, average discharge of half the theoretical maximum, or 9.8m^3/hour, and diversion of 63.7m^3/day to the fort reservoir (an amount which would have replaced the stored water every 20 days), the hypothetical resulting daily discharge of 171.5m^3 still could have sustained an astonishing 21,000 individuals. The daily discharge, or course, may have been much less, and in fact it is likely that very little of the aqueduct water was used for human consumption, since the pool it feeds is better suited for swimming or irrigation than for the storage or provision of drinking water for humans.

Some of the water available in and near the settlement centre and much of the water in the rural cisterns must have been designated for use by livestock. If we assume that half of the capacity of the two central, public reservoirs was designated for consumption by animals, the potential population supported by water stored in the civilian centre falls to 310. As for the livestock, camels and donkeys require approximately 5.0 litres/day when eating dry fodder, goats or sheep 3.0 l/day (Helms 1981: 188-89, 1982: 97-113; Evenari, Shanan and Tadmor 1982: 148; de Vries 1987). If we assume that the herds consisted of 10 percent camels and donkeys, along with 90 percent goats and sheep, we get the figures of approximately 18 camels or donkeys and 183 ovicaprids supported by a 50 percent share of the water in the two public cisterns. It is reasonable to assume that 90 percent of the 7,994m^3 of water stored in the reservoir, cisterns, off-take tanks, and dammed pools outside the settlement centre was intended for livestock, since the human population was more thinly scattered in the rural district, and since unroofed pools holding poor-quality water constitute 44 percent of the total. Assuming both a safety margin of 100 percent, and the same proportion of camels, sheep and goats as in the settlement centre, this water supply could have supported 140 persons, 280 camels or donkeys, and 2,800 ovicaprids. The combined regional total is 450 persons, 300 camels or donkeys, and 3,000 ovicaprids. This figure, of course, is a minimum, since the output of the aqueduct is ignored and 100 percent redundancy is assumed.

The resulting regional population density reconstructed from these calculations is 2.2 persons/km^2. These figures, of course, are highly hypothetical, but they give an idea of the significant carrying capacity of this arid landscape. In the 1977 National Water Master Plan of Jordan, al-Ḥumayma is counted as part of the Wādī ar-Rummān Catchment, an area of 1416km^2. The population of this region in 1975 was 3,918, or 3.0 inhabitants/km^2 (National Resources Authority 1977: Map ED11). Since there have been improvements in nutrition, health care, and security and a subsequent rise in population in the later twentieth century, the hypothetical density of 2.2 persons/km^2 for the catchment area of ancient Ḥawrā' seems reasonable.

Although the total maximum amount of stored water in the Ḥawrā' water-supply system is impressive (12,345m^3), it constitutes only a tiny fraction of the total amount of run-off theoretically available in the catchment area (between 320,000 and 2.4 million m^3). In fact, in antiquity as today the activity "consuming" the largest amount of water in the catchment was agriculture. There were numerous fields in and around the wadi beds and at the foot of natural run-off catchments that effectively multiplied the available precipitation. These were provided with low earth or stone barriers to slow the passing streams and allow the water to soak into the soil. The fields that received sufficient moisture during the winter rains were seeded with wheat or barley and protected from grazing until the crop had been harvested. Both six-rowed barley (*Hordeum vulgare*) and bread wheat (*Triticum aestivum*) are extensively represented in the plant remains from al-Ḥumayma (Oleson 1997). It is impossible to reconstruct how much water was "consumed" in this fashion around Ḥawrā', but it must have been many times the volume of the stored drinking water. In the Negev, the minimum annual amount of precipitation needed to grow barley without irrigation is around 230mm, a consumption of approximately 2,300m^3/ha; for wheat the figure is 250mm or 2,500m^3/ha (Evenari, Shanan and Tadmor 1982: 191-205; Hillel 1982: 148). If all the water stored artificially in the al-Ḥumayma catchment were used for irrigating this type of crop, it would have sufficed for only about 5.0ha of fields, sufficient to sustain only eight persons. Although production of grain by direct, artificial irrigation would have been impossible, archaeological and literary evidence testify to the irrigation of small patches of vegetables, grapes, and fruit and olive trees in the immediate vicinity of Ḥawrā' (Oleson 1997), both from cisterns and by making use of the aqueduct run-off. At least one rock-cut wine press can be seen near al-Ḥumayma (Oleson survey no. 51), indicating the presence of a vineyard that would have required irrigation. The 500 olive trees planted by 'Ali ibn 'Abd Allāh ibn al-'Abbas required some irrigation as well (al-Duri and al-Mutallabi 1971: 107, 108, 149, 154; al-Balādhurī 1978: iii, 75). Olive, fig, and apple trees have been cultivated with modest success by landowners at the site over the past 50 years.

Could the run-off water provided by the al-Ḥumayma catchment have supported sufficient agricultural activity to sustain the hypothetical minimum population of 450 persons? Assuming that the farmers of Ḥawrā' experienced an average yield 646kg of wheat per hectare — as restored for the ancient farmers of the Negev (Bruins 1986: 86-95) — that they kept back one-third as seed (215kg), and that 10 percent of the remaining grain was lost (43kg), each hectare would have produced 388kg of wheat for consumption. Since a human needs approximately 250kg of wheat per year to survive (Broshi 1980; Bruins 1986: 175-81), 288ha of wheat fields would have been required to feed the hypothetical minimum population in the Ḥawrā' catchment. A well-documented "principle of least effort" tends to restrict field agriculture to within a radius of 5km of a traditional Middle Eastern settlement (Simmons 1981; Beaumont *et al.* 1976: 164-65; Wagstaff 1985: 52-53). Tree crops can be cultivated at a greater distance, while critical hunting and gathering activities can take place up to 10km or a two-hour walk away from the settlement. The plots recently tilled by the Bedouin are in fact generally within a 5km radius of al-Ḥumayma. Since even one-quarter of the territory within a circle 5km in diameter equals 2,000ha, it is clear that just the fields in the immediate vicinity of Ḥawrā' could have provided sufficient grain to support a regional population much larger than 450 persons.

In summary, the occupants of Ḥawrā' created a water-supply strategy appropriate to local conditions and materials and dependent on technologies developed or perfected over the previous century at other Nabataean settlement sites. The system was linked with a mixed pastoral/agricultural economic strategy enlivened by the presence of a long-distance trade route, and it allowed a density of occupation close to that supported in recent times by a more complex and integrated economy. The system functioned well enough that there was little expansion of the original facilities after the fall of the Nabataean kingdom, despite continued intense occupation of the site through the Early Islamic period. There are still some issues associated with Nabataean water-supply that we know little about: for example, planning procedures; sources of funding; the composition and organization of teams of designers and builders; construction procedures; the local administration and division of water; ownership water rights; responses to variation in run-off or spring flow; religious beliefs and rituals surrounding consumption and actual consumption rates for humans, large and small livestock, and crops. Nevertheless, it is clear that King Aretas planned a sustainable water-supply system that functioned effectively in a hyper-arid desert for 800 years.

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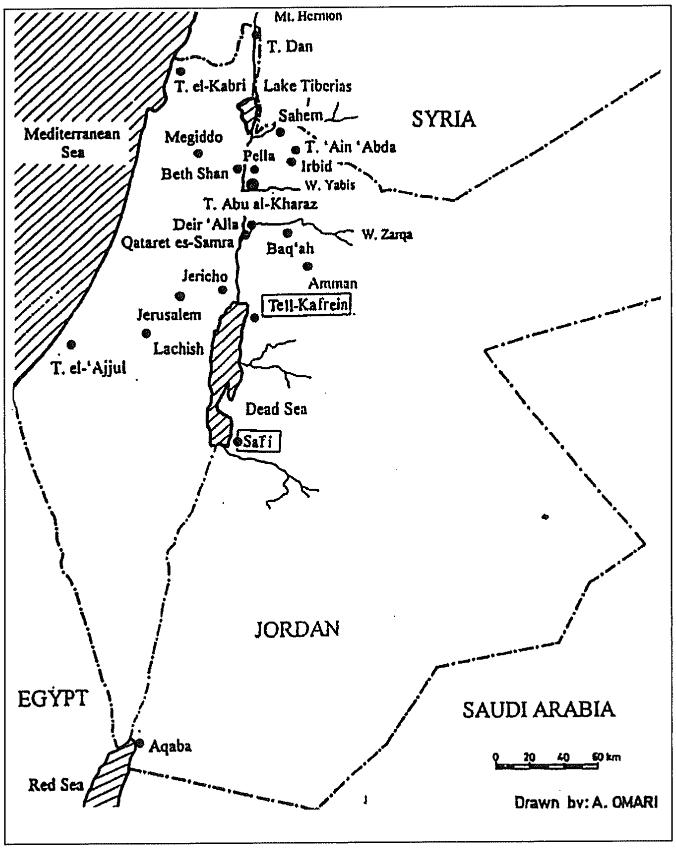
The Hellenic Archaeological Project of the University of Ioannina in Jordan: A Preliminary Synthesis of the Excavation Results at Ghawr aṣ-Ṣāfī and Tall al-Kafrayn (2000-2004)

In 2000, under the auspices of the Department of Antiquities and the Department of History and Archaeology of Ioannina University, a Hellenic research-excavation project directed by the author commenced in Jordan.

The present paper should be considered as a brief and preliminary synthesis of the results of our excavations at the sites of Ghawr aṣ-Ṣāfī and Tall al-Kafrayn during the past five years (2000-2005) (FIG. 1). As the excavation at Tall al-Kafrayn and a further and detailed study of the material from both sites are in progress our conclusions are provisional.



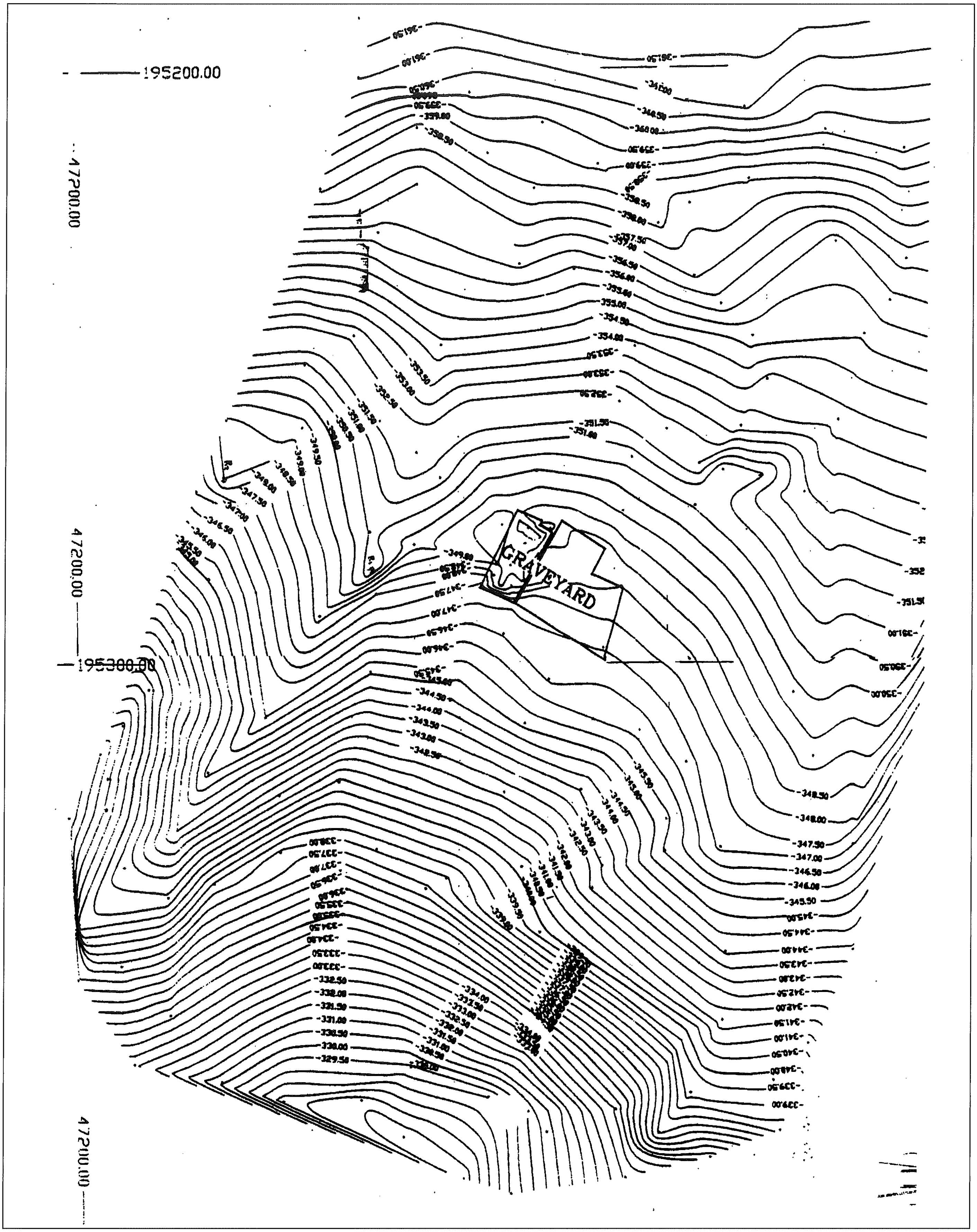
1. Map showing the location of aṣ-Ṣāfī and Tall al-Kafrayn.

The first objective of the project was to continue excavations at the badly robbed prehistoric cemetery at an-Naq‘ in the Ghawr aṣ-Ṣāfī and to search for the settlement belonging to it. An-Naq‘ lies on the western edge of aṣ-Ṣāfī ridge, in the neighborhood of the present-day aṣ-Ṣāfī town, immediately SE of Wādī al-Ḥasā, at the south-eastern end of the Dead Sea (map reference, E 195.6, N 1048.1). It is here on the southern and eastern banks of the wadi that this extensive, and perhaps the largest, prehistoric cemetery in South Levant has been found by tomb robbers. The cemetery extends over an area of about 200 dunams, at an elevation of 194m below sea level (FIG. 2). Thousands of tombs are in such close proximity that they often overlap at different levels. Perviously, a team under the direction of Dr. Mohammad Waheeb from the Department of Antiquities and Dr. Hamza Mahasneh from the Department of Archaeology at Mu'ta University conducted small rescue excavations in an effort to protect the cemetery from further illicit intruders (Waheeb 1995: 553-555; Politis 1997: 342, 1998: 627-634). Dr. Mohammad Najjar has continued investigation of the cemetery.

During the short first season (April 2000)[1] 14 tombs were excavated to the south of those excavated by the Department of Antiquities (FIG. 3). Although most of the tombs had been robbed-out we gained important information regarding their architecture and chronology.

They were constructed of wadi pebbles and irregular medium to large size stones neatly stacked

[1] The first excavation-team consisted of the authors, Khalil Hamdan, representative of the Department of Antiquities, the post-graduate students and field archaeologists K. Paschalidis, D. Basakos, E. Papadopoulou, A. Tsonos, K. Politis and G. Papaioannou and archaeologist A. Dalamanga, representative of the Greek Ministry of Foreign Affairs.

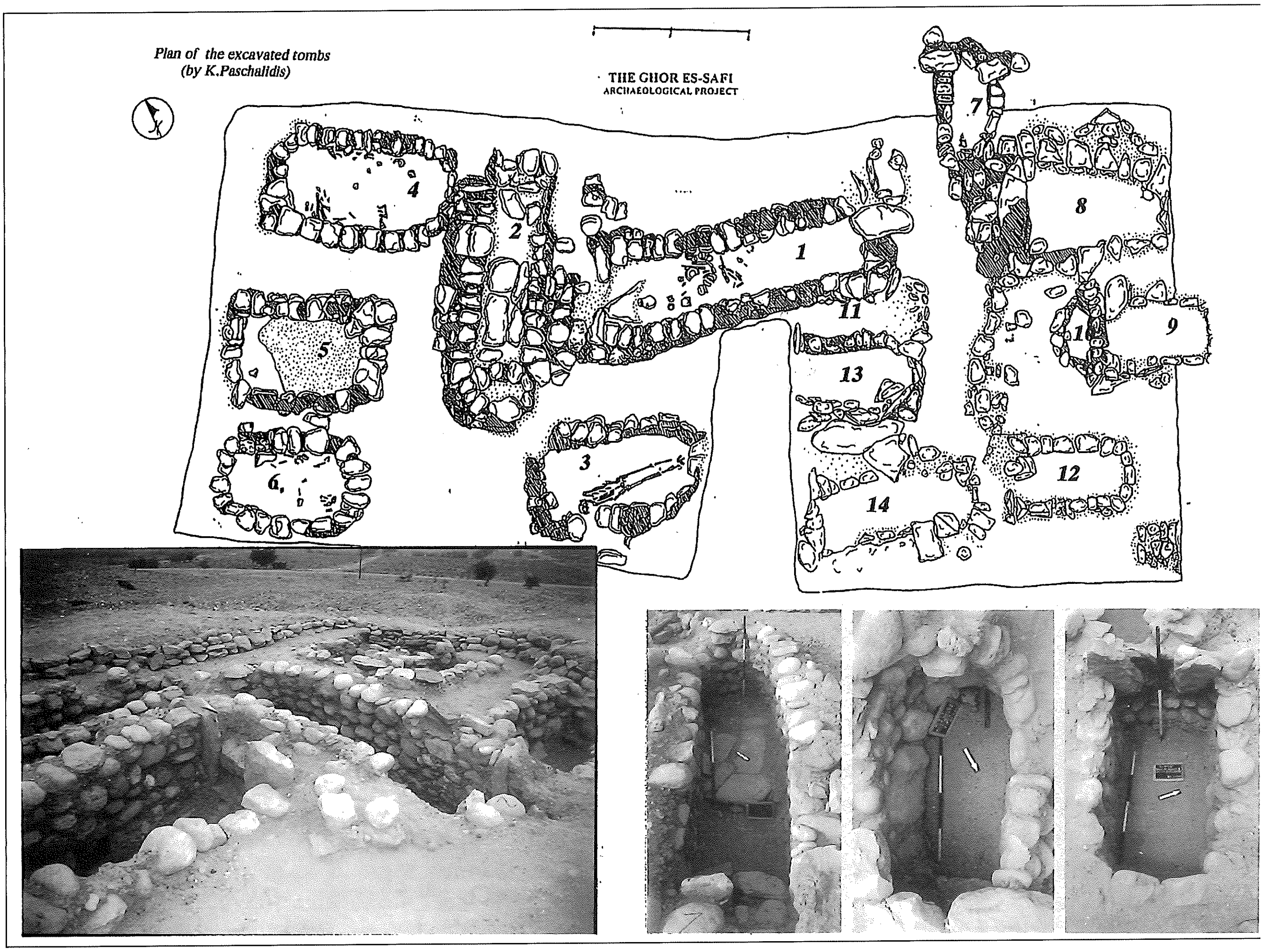


2. Contour plan of excavation area of an-Naq‘ (by AEGEK Co).

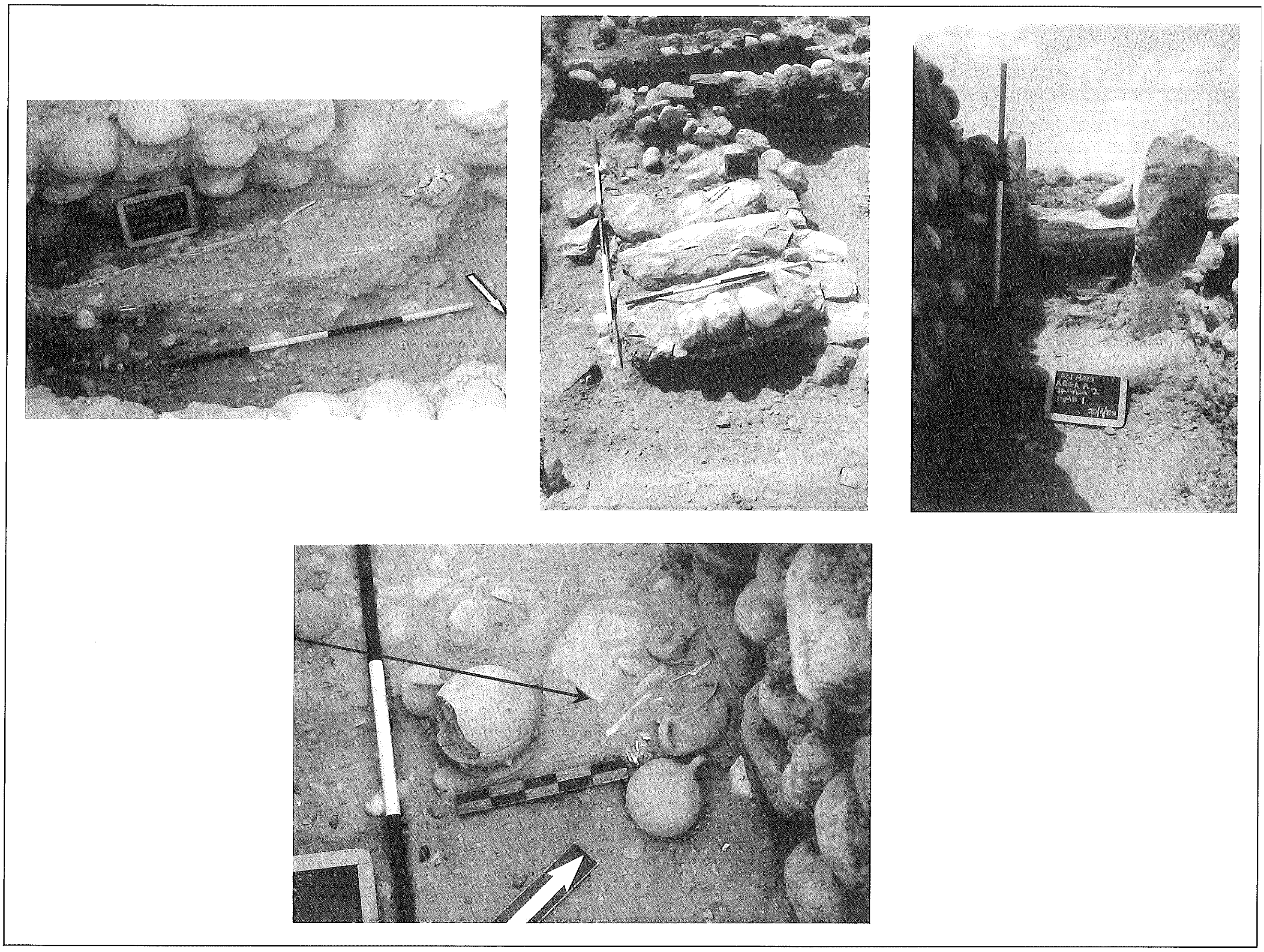
around the interior edge of the tombs, thus encasing them. They belong to two main types: (a) roughly rectangular cists with one of their narrow ends apsidal and the other closed by orthostats; and (b) roughly ellipsoid. Their dimensions range between 1.80 x 1.30m to 4 x 1m. Their floors were paved by packed soil, small slabs or pebbles (onto which sometimes several stones from the tomb casing wall had fallen) and were roofed by three or more large irregular slabs.

Skeletal remains were found much disturbed in almost all tombs. Only a single burial of an adult was found *in situ* in Tomb 3, placed on its back in an extended position with hands crossed over the lap (FIGS. 3-4). This seems to represent the burial practice, i.e. inhumation, for this cemetery. The dead were accompanied by several gifts, consisting of clay pots and basalt bowls, similar to those known from Bāb adh-Dhrā‘ (Thomas and Rast 1989: 294-302, figs.168-170) Tall al-Fār‘a (N) (deVaux and Steve 1949: 120, fig. 6:21), Jāwā (Helms 1976: 13 fig.9:1) and Lachish (Tufnell 1958: 72, fig. 26:7) stone mace-heads, comparable to those found a Bāb adh-Dhrā‘ (Thomas and Rast 1989: 289-294 fig. 167, 183) and Abū Ḥāmid (Bienkowski 1996 89-90, fig. 104) glass-paste beads, a bronze ring whorl-shells and shell-bracelets with parallel: from Palestine and the Sinai peninsula (Thoma: and Rast 1989: 310-312, fig. 183). One exceptiona find was a broken andesite-porphyry spheroid bow with flat, with a finely undercut collar and two per forated roll handles (reg. no. GS-AN 16), simila to Egyptian Predynastic-IInd Dynasty types, an(probably an import from there (Petrie 1901a: Pl XLIX O131, U130, 132) (FIG. 5a-d).

On the basis of the plain and painted pottery assemblage, corresponding to Jordan Valley type (ledge-handled and wide-necked jars, painte(spouted-jars, deep bowls, plates, cups, amphoriskoi, juglets), the excavated tombs could be date(



3. Ghawr aṣ-Ṣāfī (an-Naq‘) Cemetery.



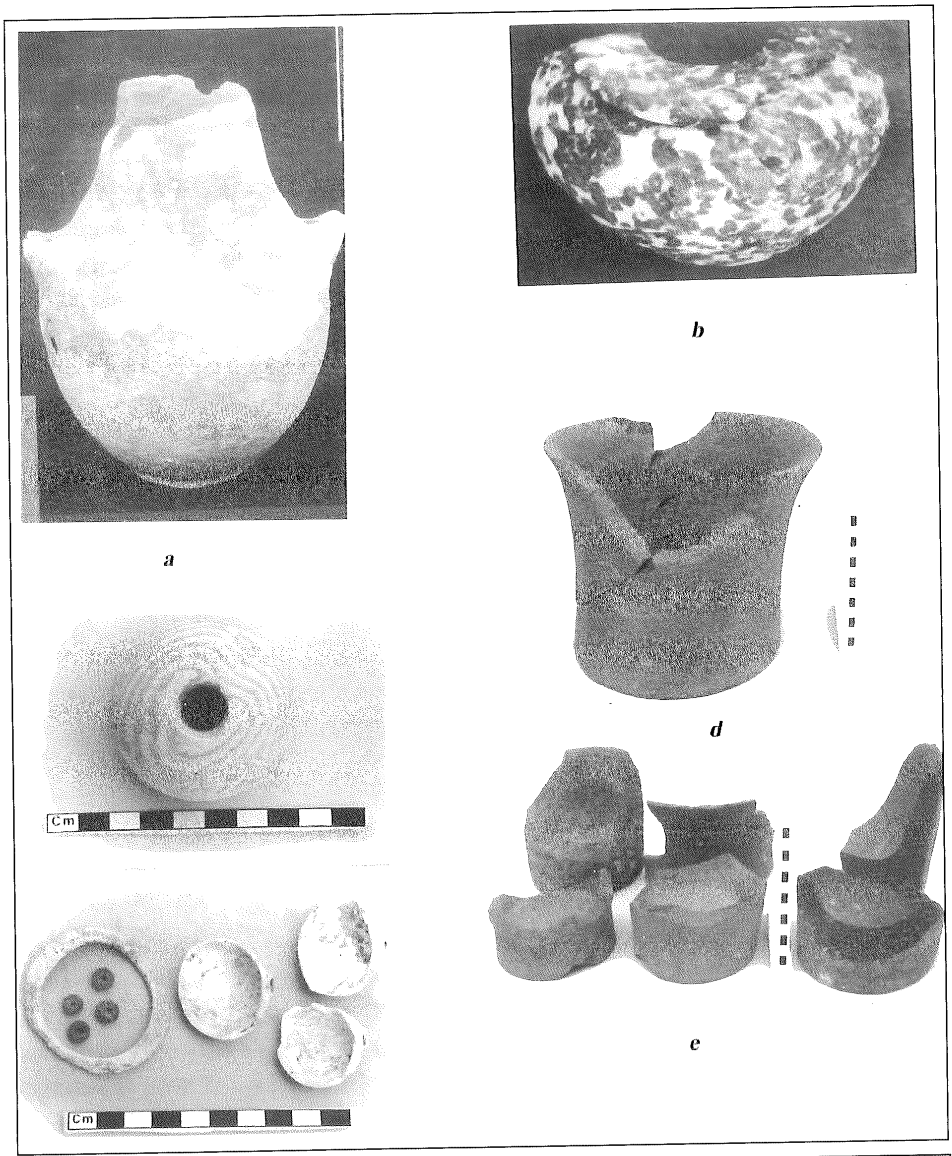
4. An-Naq‘ cemetery: tombs and burials.

to the EBA I-II, contemporary to those from previous excavations at the site (Waheeb 1995: 553) and to those at Bāb adh-Dhrā‘ (Thomas and Rast 1989: 235ff., figs. 148-149, 153-154). The same date could be also assigned to some fragmentary basalt vases (Amiran and Porath 1984: 11-19) and artefacts from surface exploration conducted to the north and south of the excavation area (FIG. 5e).

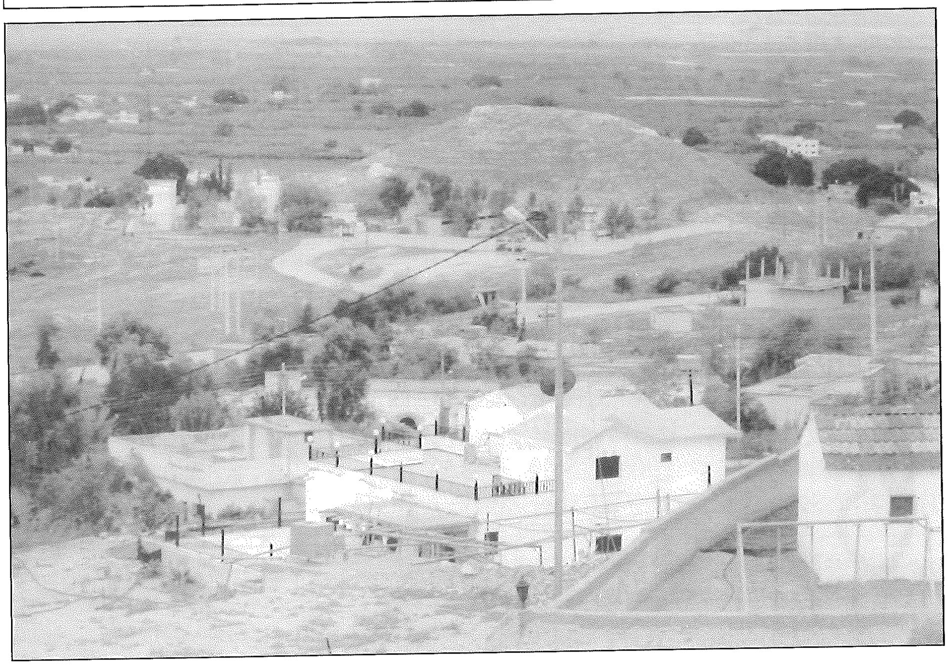
Unfortunately the search for an associated contemporary EBA settlement was inconclusive, but trial trenches revealed remains of a large Iron Age II agricultural settlement at the site Tulaylāt Qaṣr Mūsā al-Ḥamid, in a small distance west of the prehistoric cemetery, under alluvial deposits and modern agricultural fields

Further investigation of the cemetery has been interrupted for technical and other reasons and in 2002 we moved northwards, in the central Jordan Valley. Since then our project has been continued in four successive seasons at Tall al-Kafrayn, nearly a kilometre north of Wādī al-Kafrayn).

Tall al-Kafrayn is an isolated cone-shaped site, rising 35m above the valley floor (FIG. 6). The small, flattened summit of this natural rock-hill has been used during the last century as a cemetery. It is surrounded by modern roads and buildings, traditional local houses, and its slopes have been to some extent damaged by erosion, and military defensive activities. The site lies near the King Hussein Bridge, on the border with Israel, and next to the town of South ash-Shūna, overlooking all the approaches to the Valley, with a view all the way to Jerusalem and Jericho across the Jordan River. In ancient times it was the site of a fortress or fortified village, commanding a strategic location astride an established communication caravan route that linked Central Jordan Valley with Jericho, Lebanon, Syro-Palestine, Cyprus and the Aegean to the



5. Finds from the an-Naq‘ cemetery.



6. Tall al-Kafrayn. View from E.

west and with the hills and settlements of the inland Jordan and the Arabic peninsula to the east.

The ancient habitation of the site is attested by visible architectural remains of several buildings and by a cemetery of rock-cut tombs along the east and west bases of the hill, which suggest the existence of an important settlement here (Khouri 1988: 75).

The work area was located at the East-South-Eastern upper part of the tall, overlooking the modern village, Tall Shrup, to the east and south and downtown Dead Sea and South ash-Shūna to the west.

The main objectives of the first season (May 2002) were to prepare a detailed contour map for the site, conduct a surface survey, and record every visible ancient remain. Thus, after preparing the contour map (scale 1: 300 and elevation 0,50m) (FIG. 7), the whole surface of the tall (45hectares) had been sherded systematically and produced a great number of various finds (pottery sherds, fragments of stone vases and tools, flint implements and a few metal objects, indicating an almost continuous habitation of the site from prehistoric to Byzantine and Islamic periods, with the greatest concentration during the EBA and the LBA/Iron Age I-II periods.

During the next season (November 2002), after preparing a detailed excavation grid, work started in three trenches (L18, N18, P12) near the top of the tall, where some stone foundations of structures were visible. Several walls of undressed stones and mud bricks have been revealed belonging to a building badly destroyed by earthquake and fire. Of great importance was the discover, in trench L18, of carbonized wooden beams, belonging to the fallen roof of the building and of an apsidal plastered wall in trench N18 of unknown use and purpose. Equally important were the architectural remains in trench P12, part of a retaining wall, destroyed and collapsed, and a room with mud-paved floor. Finds include flint blades, grinding stones, clay loom weights and abundant pottery of Iron Age I-II date.

Excavation continued in the following season (June 2003) in trench L18 and in a new one, L17, near the top of the hill. Apart from the architectural remains of a structure, built of irregular stones and mud bricks (FIG. 8), more carbonized pieces of wooden beams have been found together with a quantity of carbonized seeds of wheat, an Islamic intramural cist tomb, several small finds and Iron Age I-II pottery.

During the next season (March 2004)[2], excavation at Tall al-Kafrayn continued for three weeks. It was restricted to a small part of the top of the tall, where two new trenches were opened and to its S-SW slope, in two new trenches and in a third one, partly explored in the previous seasons.

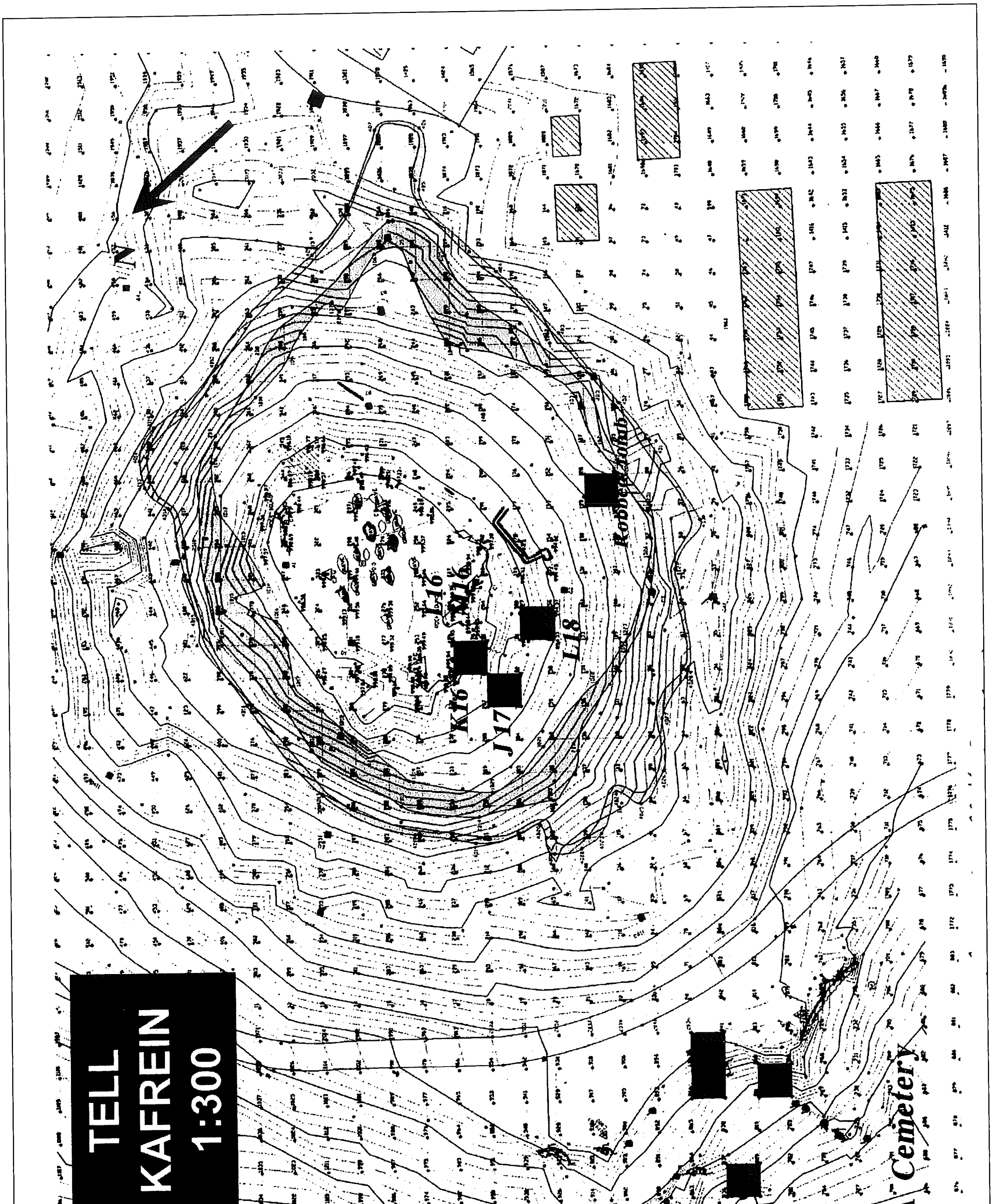
As regards the two new trenches (L16 and M16) on the top of the hill they produced very few finds, mainly common Iron Age pottery, a broken board-gaming stone with two parallel rows of six circular impressions each (FIG. 9), i.e. of a type found in Umm Saysabān north of Petra (Lindner *et al.* 2001: 291, fig. 9) in Arad (Israel) (Amiran 1992: 76-77; Hübner 1992: 67-71) and Episkopi-Phaneromeni (Cyprus) (Meyers 1997: 380-1) and some scattered bones thrown into a deep and irregular cavity of the bedrock.

Work continued in trench L18, revealing a tripartite domestic building divided into three rooms by intermediate stone and mud brick walls (FIGS. 10-11). Two successive stratigraphic layers have been discerned, corresponding to two building phases of the house. Finds include sherds of LBA and Iron Age I-II pottery including fruit bowls decorated with horizontal rows of solid triangles, pithoi(s), bowls, cooking pots (cf. Homes-Fredericq and Franken 1986: 142: 371; Amiran 1969: pls.81, 66:10, 62:23, 24, 75-76; Hendrix *et al.* 1997: 151:172, 169: 210-211, 175: 215, 217), a limestone grinder, a round glass-paste pin-head (FIG. 12), more fragments of carbonized wood beams and seeds of wheat.

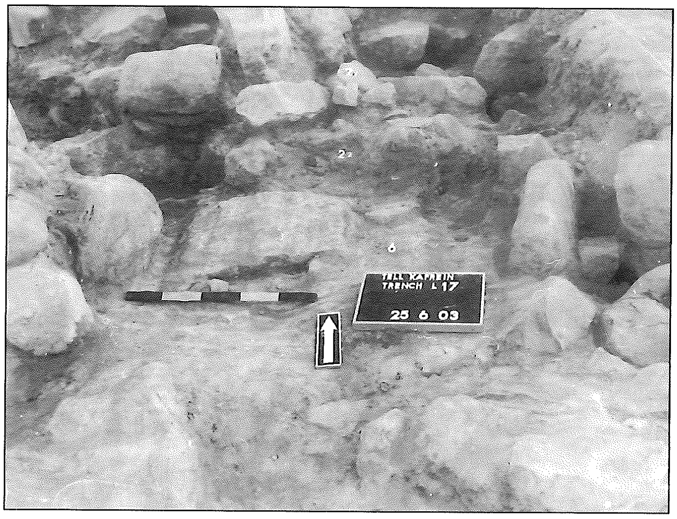
Northwest of trench L18 and just below the tall's top, the area of new trench K16 was much disturbed and divided into three units by a thick stone wall, while its western part was sub-divided by a partly preserved mud brick wall. It produced very few finds, namely a fine flint blade, an iron javelin head, a stone cylindrical button with incised decoration (FIG. 13) and sherds of common Iron Age II pottery (cooking pot, bowl, cf. Amiran 1969: 75:11, 63: 5).

The second new trench J17 was the most prob-

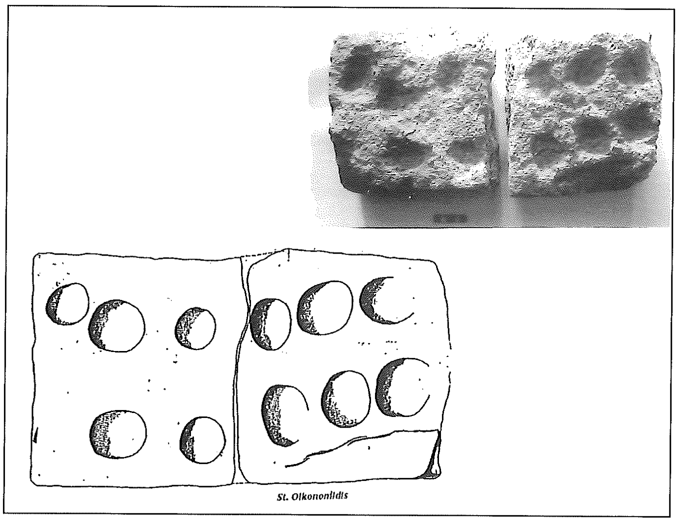
[2] Trench supervisors were the following post-graduate students in archaeology of the University of Ioannina and close collaborators to our digs in Greece: K. Paschalidis, D. Basakos, E. Papadopoulou, A. Tsonos, St. Oikonomidis, K. Theodoridis, D. Meggidis and G. Nikolakaki, assisted by a team of more than 30 undergraduate students (S. Thermos, G. Panoutsopoulos, E. Dio, K. Lambri, M. Sofikitou *et al.*).



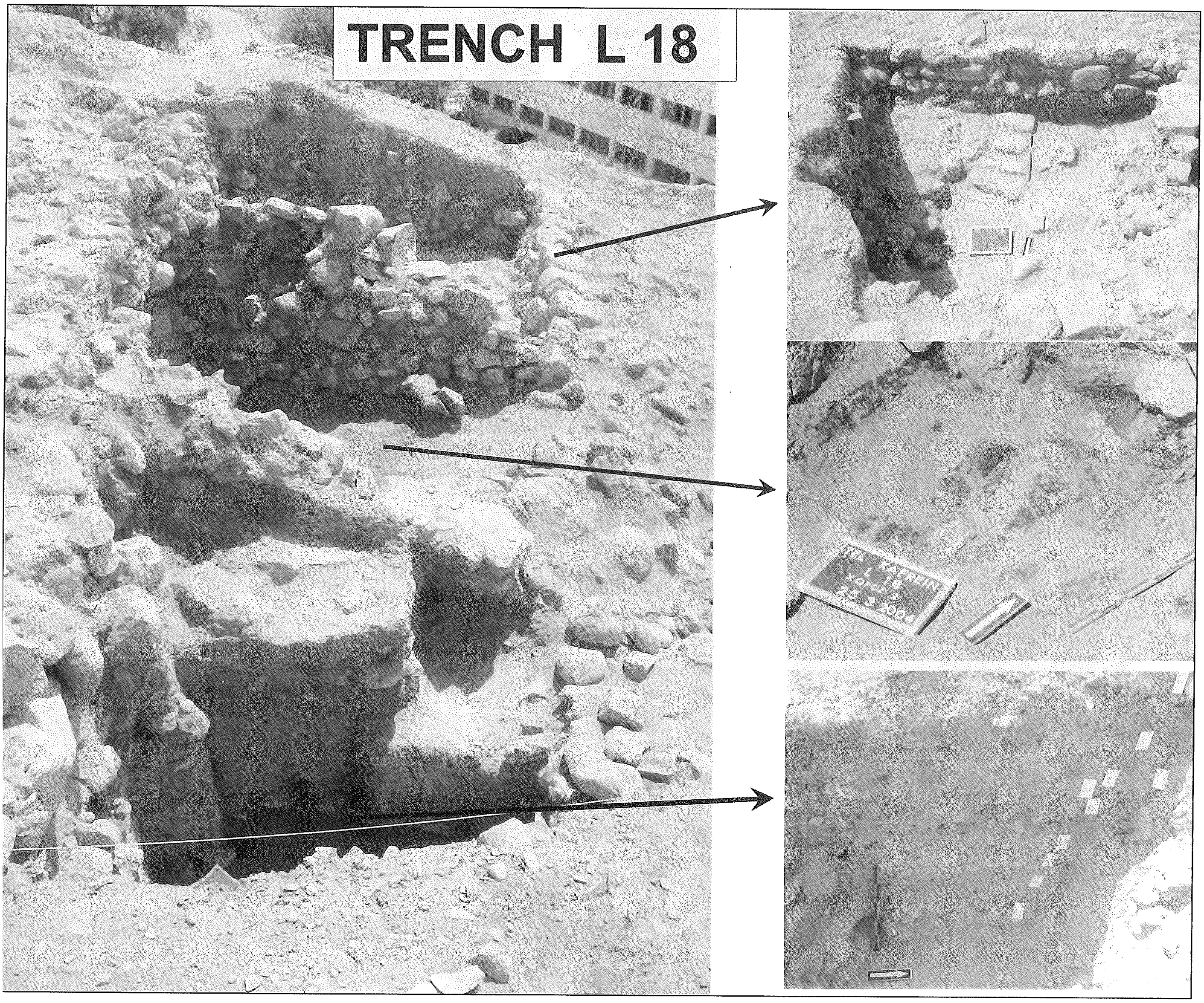
7. Tall al-Kafrayn. Topographical plan (by Samir Abdel Mohsen).



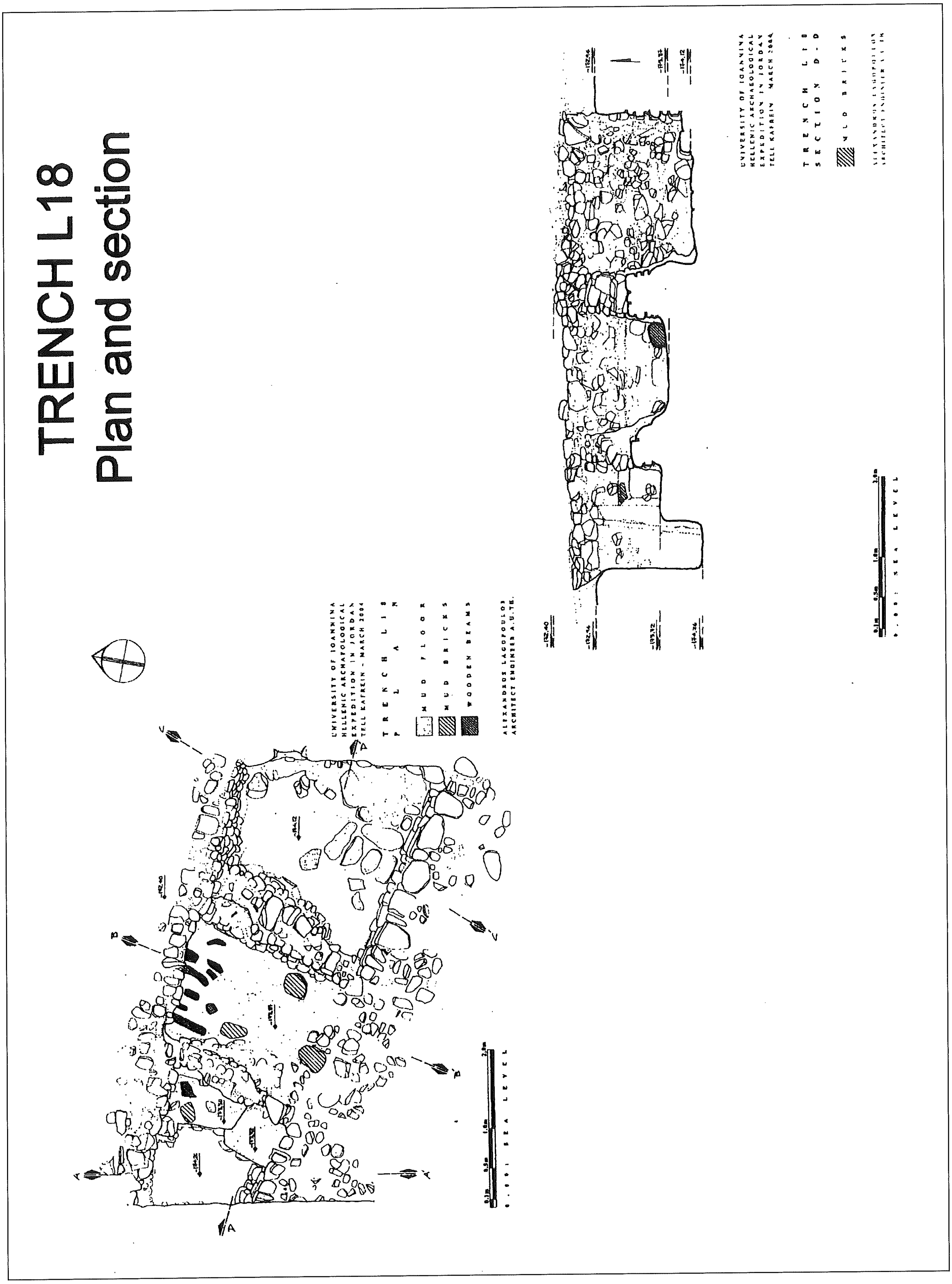
8. Trench L17.



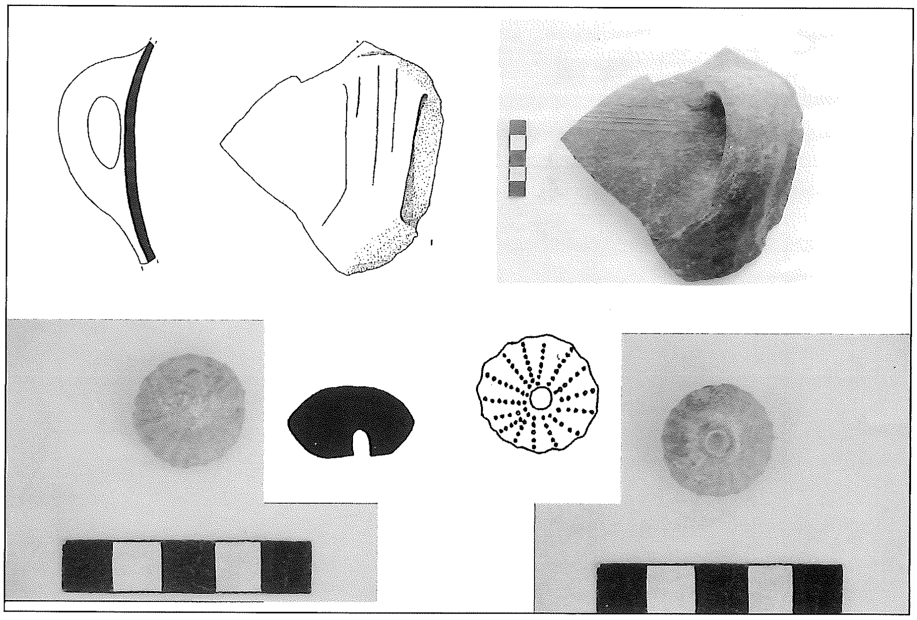
9. Board-gaming stone.



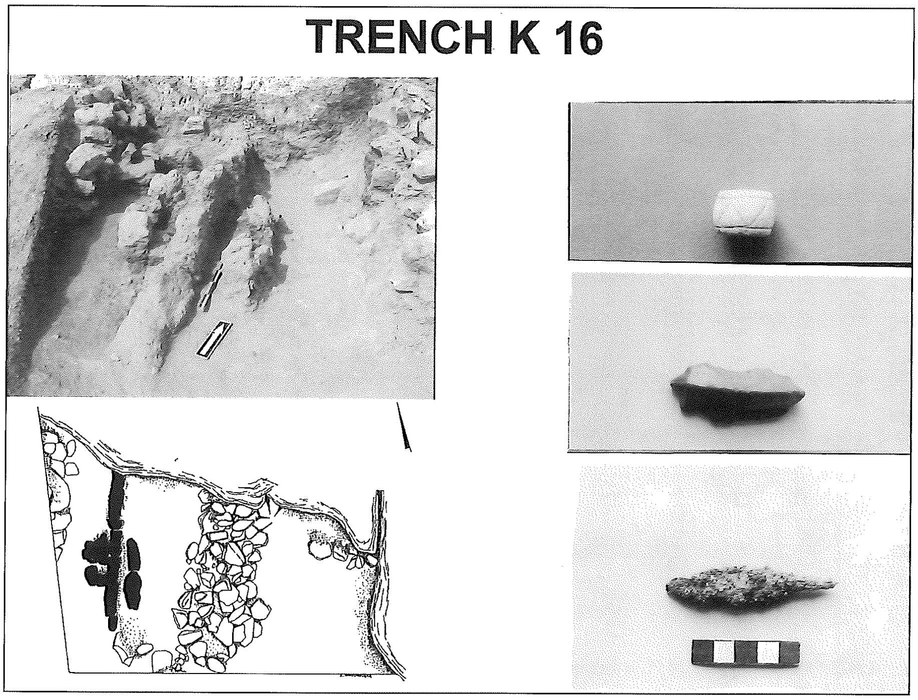
10. Trench L18: Tripartite building.



11. Trench L18: Plan and Section.



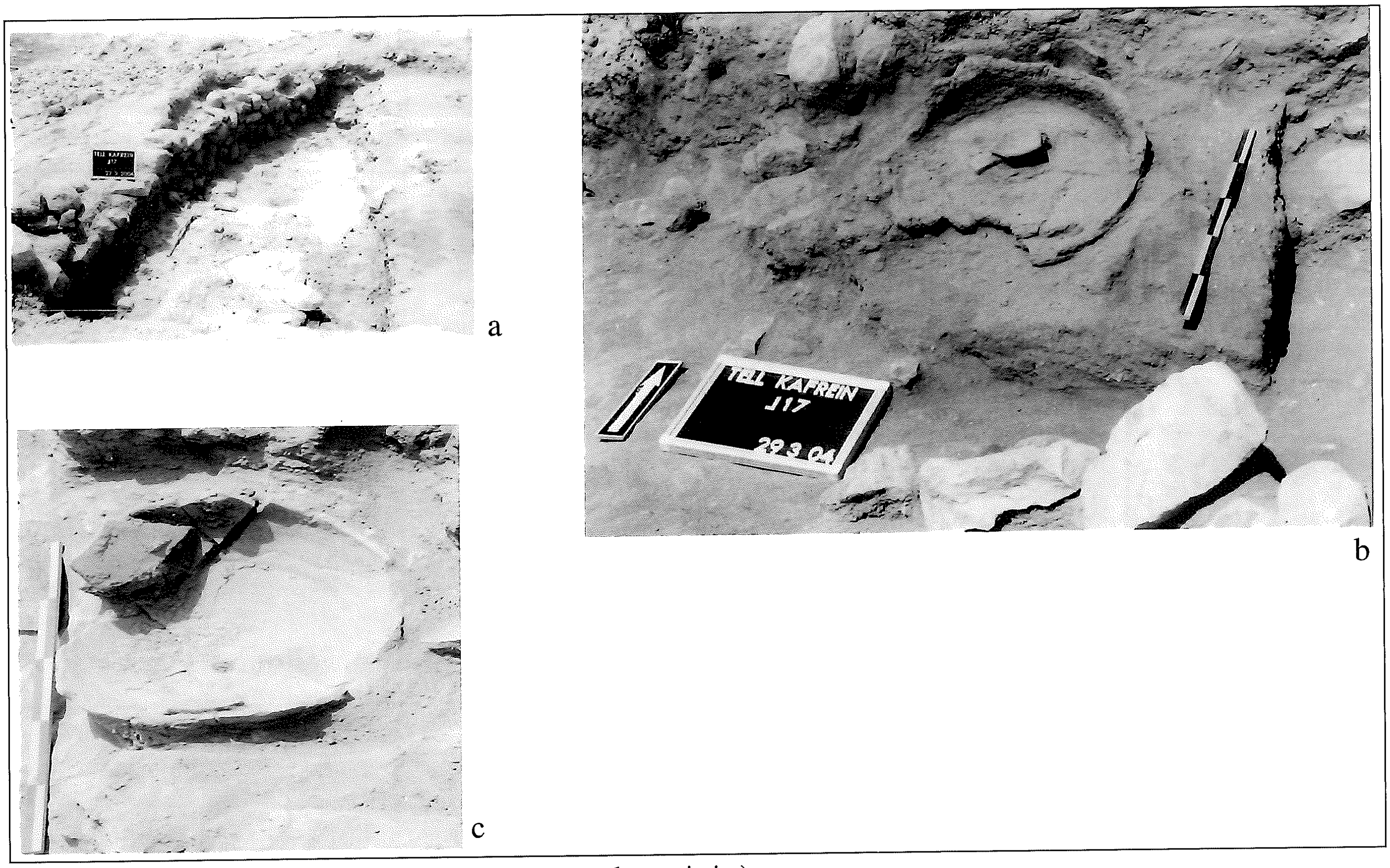
12. Finds from trench L18.



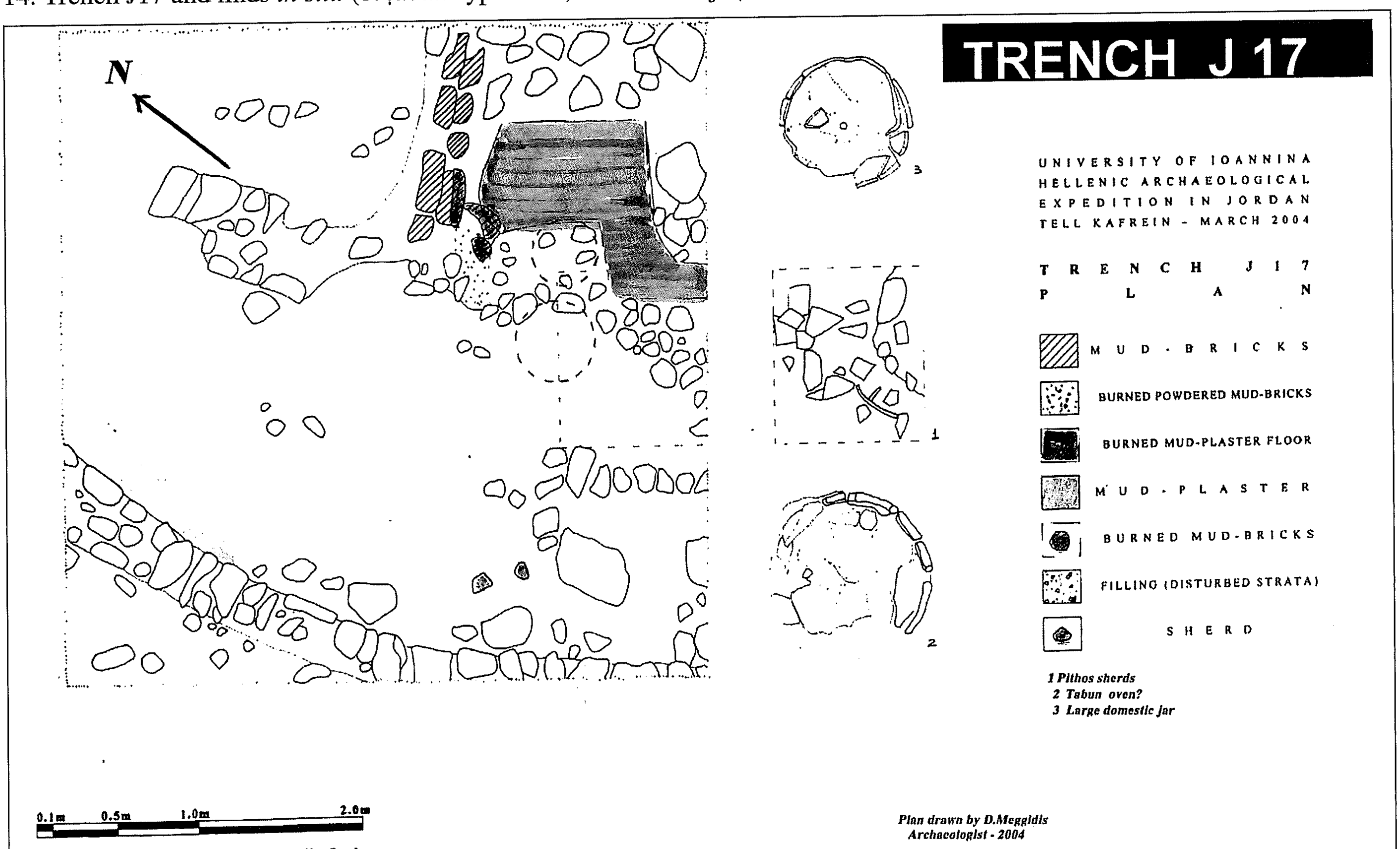
13. Trench K 16 and finds.

lematic, productive and important (FIGS. 14-15). Although much disturbed on its upper surface layer, it revealed in the lower strata architectural remains of great importance, dated from Iron Age I-II down to the fourth century BC. In addition to abundant sherds of local common Iron Age I-III pottery included jars, pithoi, lamps, juglets, bowls (cf. Amiran 1969: pls. 82, 77, 100, 88, 67; Hendrix *et al.* 1996: 167: 209, 175: 216, 181, 189, 195; Worschech 2003: 170: BUD 27-30, 87-88) (FIG. 16e), basalt grinders, imported attic black-glazed ware, and, the most exciting and important find, an fine Attic red-figured sherd of the Classical period (second half of the fifth century BC) showing a seated lady wearing an elaborate garment (FIG. 16b). This last piece can be assigned to the works of the famous Washing Painter (cf. British Museum, ARV2 1931.1-14.3; Richter 1936: pls.144-48; Boardman 1989: 97, figs. 207-212; Robertson 1992: fig. 234; Sabetas 1993)[3].

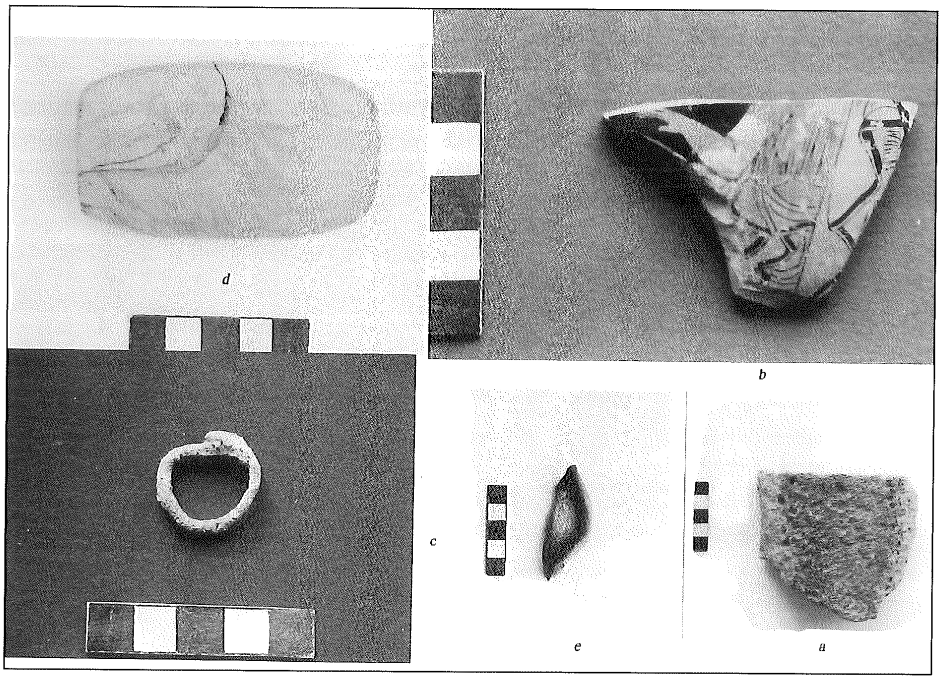
[3] We warmly thank our colleagues Prof. P. Valavanis and M. Tiverios, as well as our post-graduate student D. Meggidis for their help in dating the sherds.



14. Trench J17 and finds *in situ* (b: *ṭābūn*-type oven, c: domestic jar).



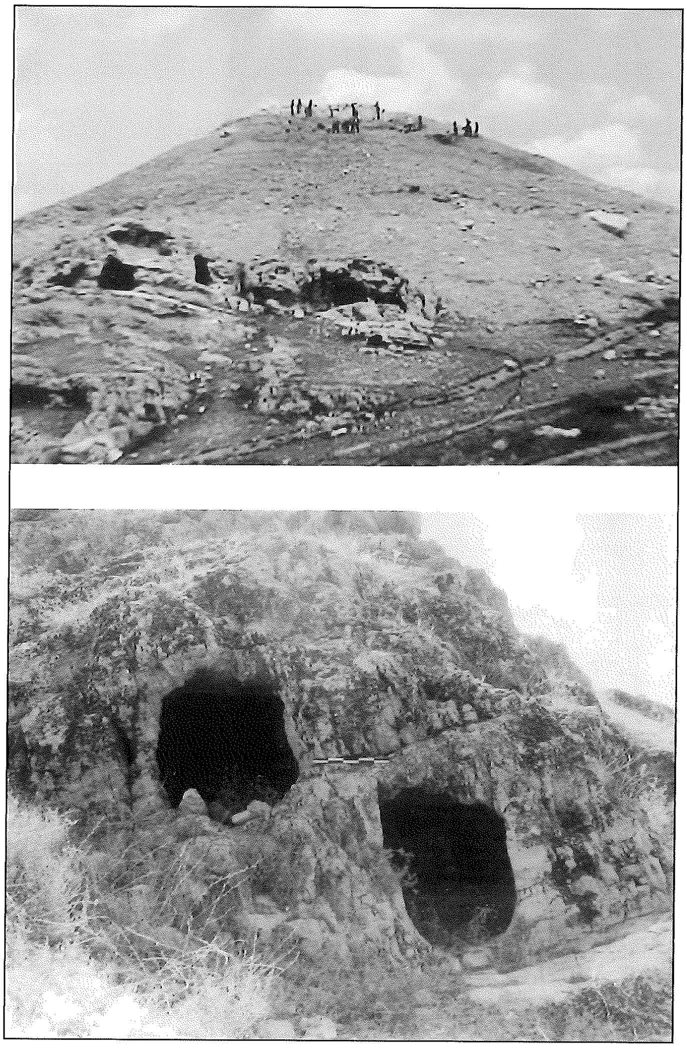
15. Trench J17.



16. Finds from Trench J17.

Other important finds are a *ṭābūn*-type oven(?), similar to one found at Dayr 'Ayn 'Abāṭa (Politis 1995: 477, 479, fig. 4), probably serving cooking purposes. Just beside it was the lower half of a large domestic jar with a hole at its base, possibly used as a cap of the oven or for libations (FIGS. 14-15), a bronze ring in the form of a snake biting its tail and an alabaster cosmetic palette, probably imported from Egypt (FIG. 16c-d) (cf. Schaub and Rast 1989: 452-56, fig. 261).

During this season (2004), it was decided to extend our investigation of the Tall al-Kafrayn area to the nearby prehistoric cemetery at the base of the hill, in order to save and protect some of the as yet intact tombs from local robbers. As one traverses the cemetery today, opened tombs or abandoned robber trenches are encountered approximately every meter (FIG. 17). Given this situation, we thought that little had to be found *in situ*. Our attention was drawn to the cemetery by some pots and artefacts shown to us by local villagers and our workers during the previous seasons. Since this was a previously unexplored cemetery, we felt that before initiating investigation all visible tombs ought to be mapped and included to the general topographical plan of the site. The tombs belong to two main sectors 1-2, lying to the north-eastern and western sides at the base of the hill respectively. One partly destroyed (there is no entrance and the SW part of its rectangular chamber are missing) and entirely robbed tomb (Tomb II) has been investigated in sector 1,

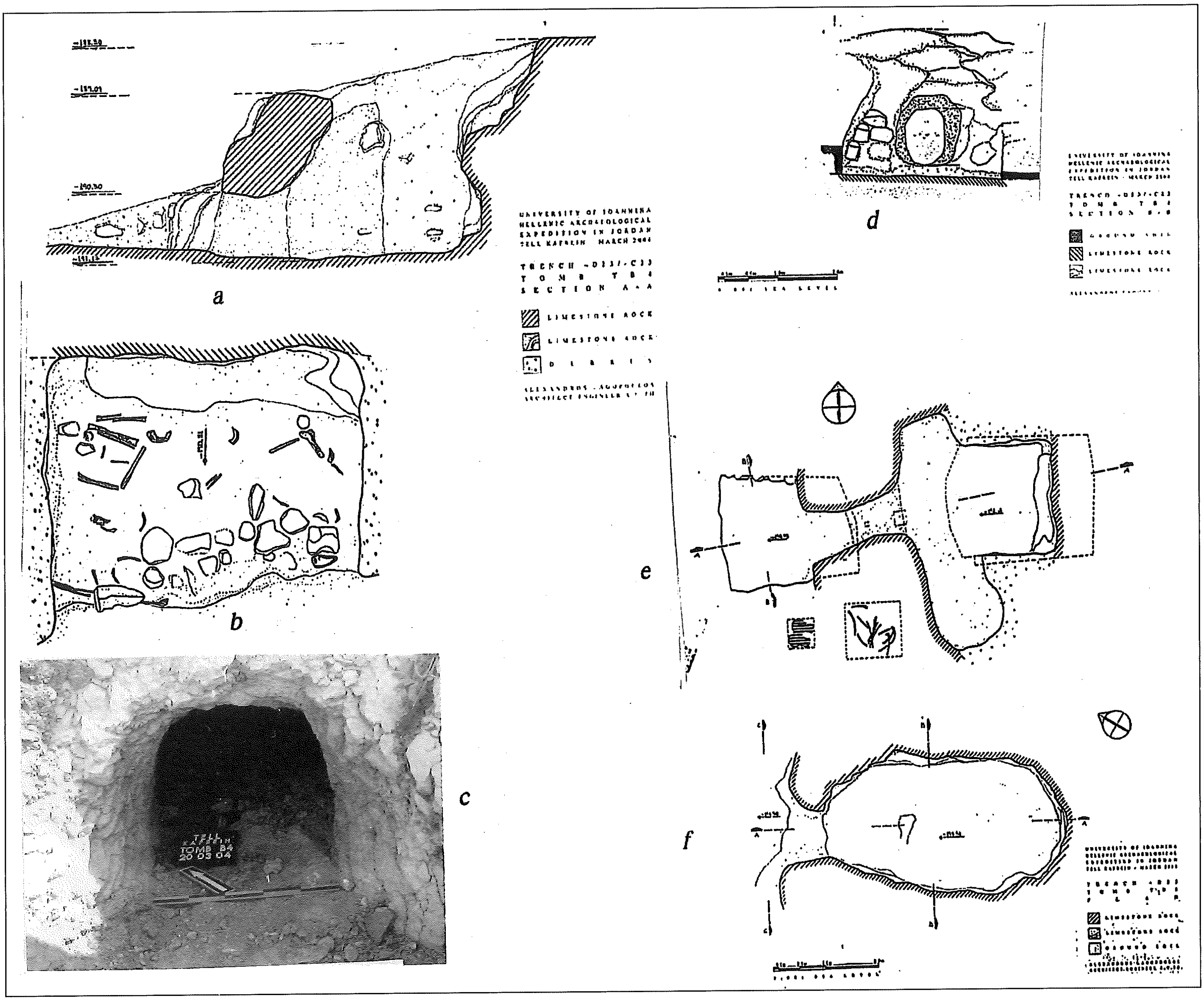


17. Tall al-Kafrayn: EBA cemetery and two robbed tombs, view from W.

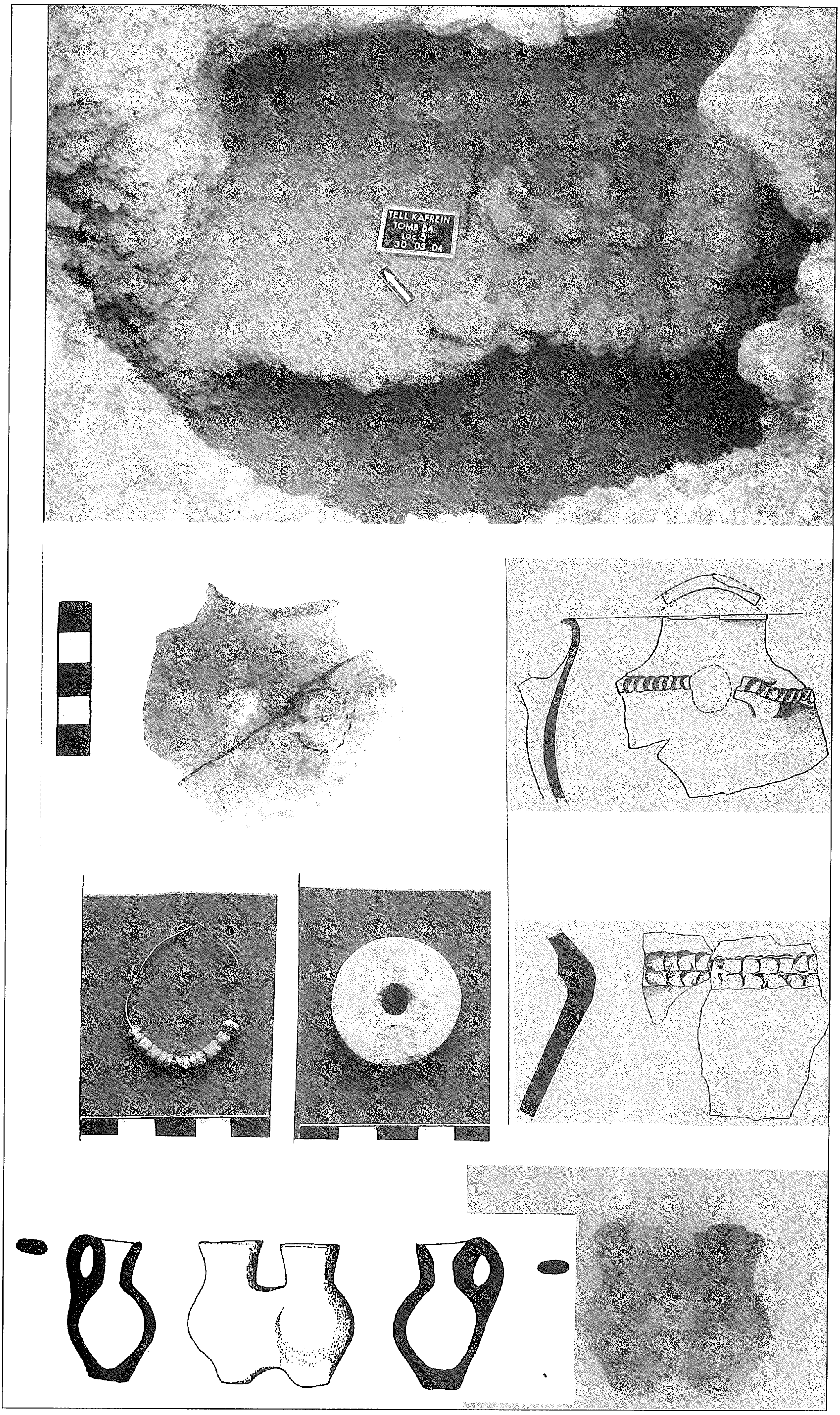
which produced a sherd of an LBA (?) deep bowl, some flint blades and scattered human bones. More tombs have been traced in sector 2, belonging to three main groups (A, B, C). They are small rock-cut tombs with low entrances (average height 0,80-1,00m) closed with irregular blocking stones and roughly circular or rectangular chambers, some of them with lateral niches and apsidal ceilings. They are usually arranged in groups of two or three, sharing common interior chamber walls. Seven of them partly or entirely robbed have been cleared out and one (B4) semi-robbed was thoroughly excavated (FIG.18). *In situ* blocking stones were lacking, but several stones outside the entrance of the tomb may have belonged to its original sealing. The only finds from the three lower, intact, strata of the chamber were some scattered skeletal remains belonging to three disarticulated burials furnished with at least five whole EBA I-III vases: a two-handled bowl, a handle-less deep bowl, two amphoriskoi, and a juglet (cf. Amiran 1969: pls. 12:19, 12:4, 13:10, 15:114, 17: 9; Schaub and Rast 1989: fig. 153) and many sherds from other similar pots, a clay spindle whorl, two sea-shells pendants and a number of small glass beads of a necklace (FIGS. 19-20a, d, e). Outside and near the entrance an EBA II-III twin juglet was found (cf. Schaub and Rast 1989: 373, fig. 230: 13-14) together with some other broken contemporary pots (FIGS. 18, 20b, c, f) thrown out by illicit intruders.

Concluding Remarks

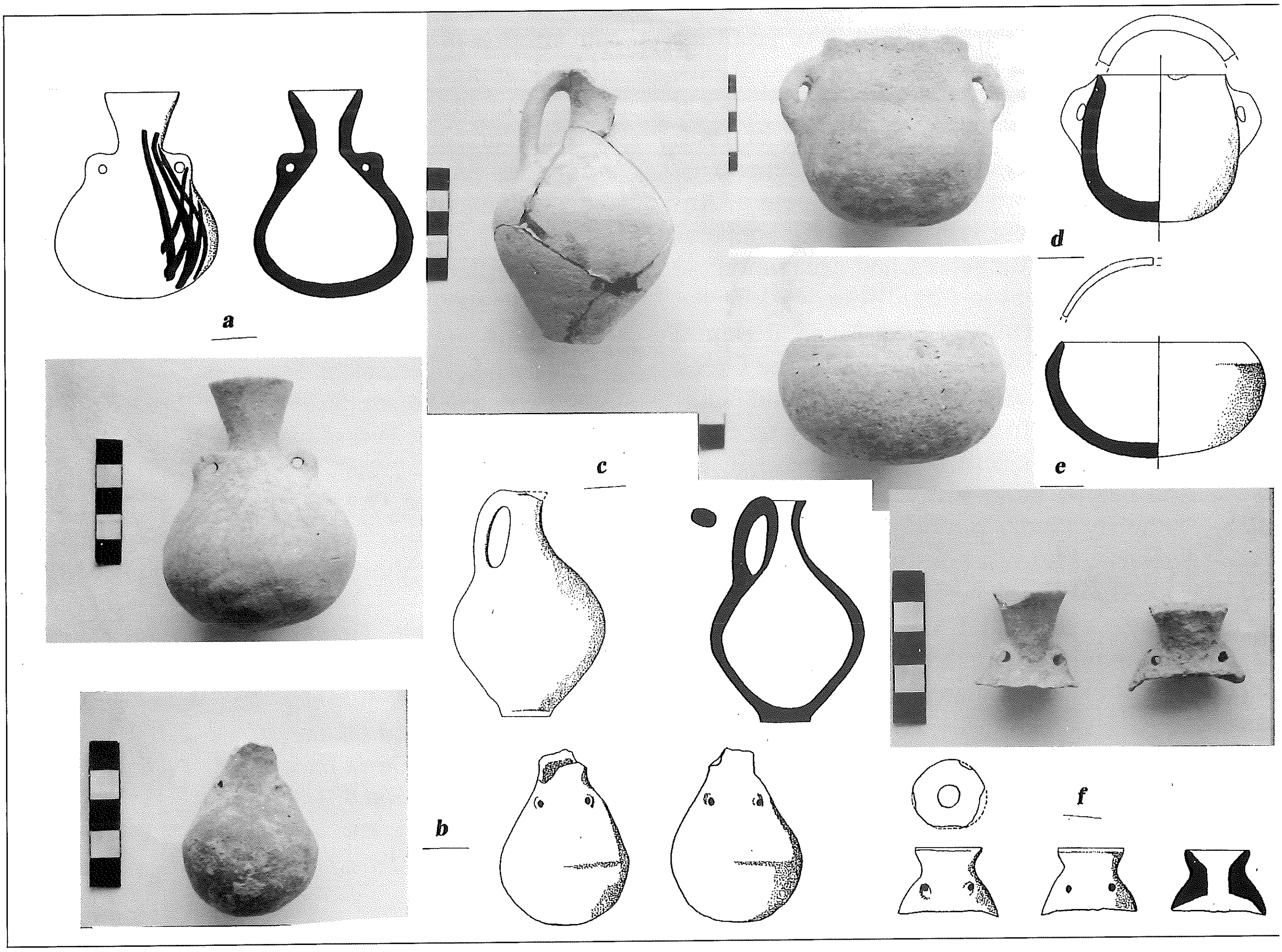
So far the excavations at Tall al-Kafrayn have confirmed the great scientific importance and potential



18. Tombs B4 (a-e) and B6 (f).



19. Tomb B4 and finds.



20. Finds from Tomb B4.

of the site. It has been identified as a multi-period settlement and continued excavation will certainly provide further precious archaeological data on the site's character, periods of construction and its human activities, including connections with other regions, the tomb architecture and burial habits.

On the basis of the available evidence from the tall and the adjacent EBA cemetery one might provisionally suggest that the site of Tall al-Kafrayn has been inhabited since Early Bronze Age times with a floruit during the LBA/Early Iron Age. Of great interest is the discovery of carbonized wooden beams and wheat seeds in squares L18 and K16, as well as that of the *ṭābūn*-type clay oven, which indicate both domestic activities and the destruction of the settlement by fire during the transitional period LBA/Early Iron Age.

Equally important is the occurrence of some possibly imported objects: the alabaster cosmetic palette, the gaming-board stone with rows of circular impressions and the decorated sherd of a fiftl century BC attic red-figured vase, all of which suggest links with Egypt, Palestine, Cyprus and Classical Greece.

Work will continue next season both on the tal and in the adjacent prehistoric cemetery.

The recent illicit excavation of a wide trencl round the tall (at a depth of 15m) has severely damaged the ancient remains. This, in conjunction witl the continuing robbery of the nearby prehistori cemetery, highlights the considerable dangers facing the site. In light of the significant discoverie that have been made so far, it is imperative that ou excavation-program should be continued and tha the site of Tall al-Kafrayn be fenced in and well guarded by the Department of Antiquities and th local authorities.

Acknowledgments
The project is jointly sponsored and supported b

the University of Ioannina and the Hellenic Ministries of Culture and Foreign Affairs. Our gratitude is expressed to all these authorities and institutions. We enjoy the firm and constant support of the local Jordanian authorities and especially that of Prof. Dr. Fawwaz Al-Khraysheh, Director General of Antiquities, and the staff of the Department of Antiquities to whom we are very grateful for cooperation and permissions for survey and excavation.

During the first season (2000) our work at the site of an-Naq' and Tulaylāt Qaṣr Mūsā al-Ḥamid in the Ghawr aṣ-Ṣāfī was sponsored by the Greek Ministry of Foreign Affairs. The staff and additional support came from the University of Ioannina. Dr. Dino Politis acting as co-director in the first season helped us in many ways. The Jordan Valley Authority kindly provided accommodation in their *Sakan al-Mazra'a* housing unit. Thanks are also due to AEGEK (General Construction Company, Athens, Greece) and Samir Abdel Mohsen, surveyor, 'Ammān, for making the contour maps of the an-Naq' excavation area and Tall al-Kafrayn respectively.

We also thank Khalil Hamdan, Hussien Al-Jarrah, Ahmad Al-Tawahiah and Yasid Elayan, Department of Antiquities representatives and Widad B. Said, architect, and the archaeologists Maria-Elena Ronza, Siba Ayyoub, Ibrahim Fayoumi, Ahmad Losh, for their help and kind cooperation. Special thanks are due to the Vice-Rector of the University of Ioannina, Prof. Dr. Niki Agnanti, who visited us during the last season at Tall al-Kafrayn and for her manifold support and encouragement and to Prof. Dr. Lutfi Khalil of the Jordan University for his kindness, moral support and scientific help. We are grateful to Mr. Khaldoun Abu Ghonmi, Director of City Planning and Irrigation in the area of South Shūna for offering the basement of his offices for study and temporary storage of the finds from Tall al-Kafrayn.

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Last but not least, we thank the trench supervisors and close collaborators in our digs in Jordan and Greece, post-graduate students in Archaeology of the Ioannina University: K. Paschalidis, D. Basakos, E. Papadopoulou, A. Tsonos, St. Oikonomidis, K. Theodoridis, D. Meggidis and G. Nikolakaki, as well as all participant students of Archaeology for their valuable cooperation and assistance.

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Woodworking Implements from Neolithic 'Ayn Ghazāl: Tools of Chance

Introduction

Flaked and ground-bit axes and adzes form a significant portion of the chipped stone assemblages from Levantine Neolithic sites, thus attesting to a lengthy use of wood and the pursuit of woodworking by Neolithic townspeople. Axes and adzes, as well as chisels and pick-like tools of assorted forms, generally are found throughout assemblages, often in various stages of production and use. Such is the case at 'Ayn Ghazāl, a sprawling Neolithic townsite located on the northern fringes of 'Ammān along the Zarqa River. 'Ayn Ghazāl's thirteen hectares of Neolithic structures, courtyards, and pathways encompassed a community of over 2,000 people at its peak during the Late Pre-Pottery Neolithic B (LPPNB) period between 8,500 and 8,000BC. (All dates herein are in uncalibrated radiocarbon years before present.) During its 2,200 radiocarbon years of occupation, beginning in the Middle Pre-Pottery Neolithic B (MPPNB) about 9,250BC, 'Ayn Ghazāl grew from a small hamlet to become a leading socioeconomic center. Finally, dwindling in size, it was abandoned during the Pottery Neolithic (PN) at about 7,000BC (Rollefson 1987, 1997; Rollefson and Köhler-Rollefson 1989; Rollefson *et al.* 1992). Found within its extensive deposits is a chipped-stone record of the growth and demise of the town, undoubtedly aided by exploitation of the nearby wooded environment and affected, ultimately, by environmental collapse. Ground-bit tools play an important part in this story.

While the purpose of this research is to understand the significance of these tools to the evolutionary history of the townspeople, the analysis presented below is necessarily mundane. To reach our goal we consider two bodies of data relating to four categories of tools. Understanding the use-life history of the tools is our first goal. Thus, the technology of tool production, patterns of use, tool damage, strategies of tool repair, and reuse are all necessary information that help us relate to the significance of the tools and the woodworking needs and strategies of the townspeople. Our understanding of these processes is guided by our own replicative experiments in axe/adze production (Quintero 1998), as well as by a substantial body of literature in this field. Next, the distributional history of these tools and the context of their deposition help reveal the significance of working wood during the various phases of 'Ayn Ghazāl's occupation, as well as certain organizational aspects of this portion of the lithic economy.

'Ayn Ghazāl and its Assemblage

The Town and its Timber

The structural use of wood and the need for firewood undoubtedly were important issues for the residents of 'Ayn Ghazāl during its lengthy occupation. Thus, the location of the town on the margins of what probably was open oak/pistachio woodland, and the exploitation of this resource, are important to consider here. The establishment of the initial hamlet during the MPPNB (9,250-8,500BC) marked a major step towards sedentary living for Neolithic people. As the hamlet grew, its structure grew, eventually consisting of semi-rectangular, stone residences with two or three interior rooms (for an overview of these developments see Rollefson *et al.* 1992). Methods of construction relied on wooden beams for structural supports and on wood for production of lime plaster for covering floor and wall surfaces. Because lime production required large amounts of firewood to burn limestone, house construction had a significant impact on local timber supplies (Rollefson 1990).

During the LPPNB (8,500-8,000BC) larger, multi-storied buildings were constructed. These large rectangles were divided into smaller parallel rooms. The frequency and density of these structures is strong evidence that 'Ayn Ghazāl's population had increased substantially (Rollefson 1997). Construction methods continued to rely on wooden beams for structural supports and on lime plaster for facing floors and walls, so procurement of wood was substantial.

The ensuing collapse of the Neolithic socioeconomic structure during the PPNC (8,000-7,500BC) is now well documented, although its causes are a matter of some debate. Central to this problem is the extent to which climatic deterioration and increased aridity, and human activities such as local deforestation, overgrazing, and other human practices may have precipitated an ecological crisis (cf. Rollefson and Köhler-Rollefson 1989; Goldberg and Bar-Yosef 1990). In any case, the use of wood changed dramatically. Buildings were constructed with as little timber as possible and they often had stone roof supports. Lime plaster coating of floors and walls, with its huge fuel requirement, was discontinued. Existing PPNB structures were made smaller and reused, and new residential structures, some of which may have had fabric walls, were smaller and more widely spaced than in the LPPNB (Rollefson 1997). Dung for fires was the fuel of choice. The inferred decrease in population reflects a monumental socioeconomic change for the inhabitants of the town, probably leading to pastoral nomadism for some (Rollefson and Köhler-Rollefson 1989). This socioeconomic reversal is documented in aspects of the lithic economy, which give evidence for loss of specialized blade-production, for reliance on domestic production of flake tools, and for extensive reuse and recycling of lithic material (Quintero 1998; Quintero and Wilke 1995). The place of ground-bit tools in this reconstruction is discussed here.

The ensuing Pottery Neolithic settlement (Yarmoukian phase) was dispersed over nearly as much ground as the PPNC settlement. However, structures were much more widely spaced and exterior courtyards and open spaces were common. By this time, the population of 'Ayn Ghazāl decreased to its lowest limits. Thus, wood consumption for structures and fuel probably would have been at its lowest. The prevalence of other cultural uses of wood is unknown.

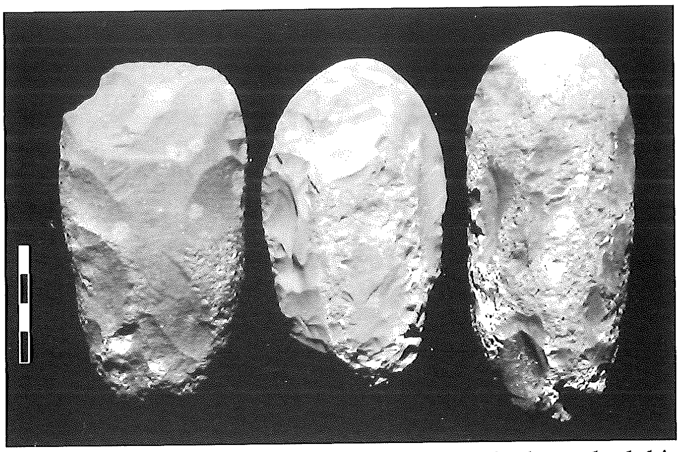
Ground-Bit Tools From 'Ayn Ghazāl

Because of the duration of occupation of the town, tools that aided its construction and assisted in the maintenance of its population provide a valuable data base for behavioral information. The database consists of all excavated and surface tools of this sort: 80 axes, 30 adzes, 23 axe/adzes, 16 chisels, and 20 picks from all periods of excavation, or 169 artifacts. It should be noted also that approximately one percent of the site deposit has been excavated, so our sample is necessarily small for a site of this size. Nonetheless, these tools and their context present a significant contribution to understanding the behaviors of the people who occupied 'Ayn Ghazāl.

Given an understanding of how structural needs and fuel use changed throughout the town's occupation, possible related functions of woodworking tools in the assemblages need consideration. Again, much of what we surmise comes from replicative research and analogies with modern life ways.

Axes: Axes have a long history of use in both recent and ancient life as woodworking tools of various sizes and with some variation in morphology. In most cases that we are aware of, however, axes are configured so that their bits are hafted generally parallel with their handles.[1] Large axes are used for a variety of "heavy-duty" wood-chopping chores. Appropriate tasks can vary from felling trees for construction of houses, boats, etc., to acquisition of fuel for fires. Small axes may have been used for lighter duty chores, such as are accomplished by small modern-day hatchets. The axes from 'Ayn Ghazāl (80) are all made from bedded chert or moderately silicic nodular flint chosen for their toughness and ability to withstand sturdy blows without breakage (FIG. 1). Their sizes vary from small to quite large (5.7-14.7cm long). All have two common attributes regardless of size: (1) a stout hafting region, which in some cases appears to have been fashioned to engage with a socket-type haft rather than with a split haft; and (2) a sturdy, slightly curved bit in plan view that allowed the center of the bit to strike a target before its edges, thus decreasing the risk of shattering of the bit.

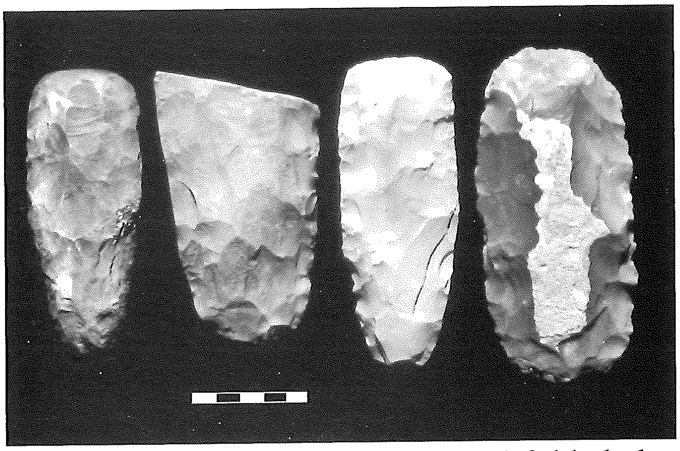
[1] The reader should be aware that this trait is not universal. In contemporary New Guinea, for example, axe heads apparently are fastened perpendicular to the haft (Heider 1967; Toth *et al.* 1992).



1. Axes. Left: Blunt-ended axe, body extensively pecked, bit reconfigured and ground; impact fracture on bit. Center: Broad axe, body and edges slightly pecked, bit ground and rounded. Right: Large axe, body heavily pecked to fit haft, bit ground.

Adzes: Also comparable to modern tools, adzes perform light duty woodworking tasks that require shaping by shaving and light chopping of wood fibers. It is of course possible that adzes might be used to shape materials other than wood, such as soft limestone. Adzes are hafted with their bits perpendicular to their handles. Adzes in this collection (30) are all of flint (FIG. 2). They are relatively smaller and thinner than axes, although there is much variation (4.3-13.9cm long). Some bear residue of hafting mastic across their flat faces, which delineates their haft zone. The most important diagnostic attribute of an adze is its relatively flat, square bit (in plan view). Adzes also generally are plano/convex in cross section. These are functional attributes that facilitate their usefulness in chopping/planing wood.

Convention and experimentation by others have suggested that chisel and axe bits are symmetrical in their lateral cross section, and that axe bits tend to be thicker and stouter than adze bits. Also, adze bits are generally thought to be asymmetrical in cross section, an attribute that facilitates their use in shaping wood by shaving off small portions of material. However, while morphological distinctions of bit profiles may be made during initial production of these tool in most cases, we caution that vagaries of production (such as flaws in material), personal idiosyncracies in knapping, and levels of knapping skill mitigated against this ideal. Also, bit resharpening and repair during use tend to alter the ideal bit configuration. Consequently, we do not use asymmetry of bit profile as a diagnostic attribute that distinguishes adzes from axes in archaeological assemblages. Our replicative work in production and maintenance of the bits of these tools demonstrates such a distinction to be unreliable.



2. Adze production. Left: Pecked and ground, finished adze. Left center: End-shocked production failure prior to pecking. Right center: Finely flaked preform, neither pecked nor ground. Right: Percussion-flaked blank.

We note here that the 'Ayn Ghazāl collection contains 23 axe/adze tools which have ambiguous attributes that defy more specific classification. In some cases these are broken or reworked tools, or tools used as cores that have lost essential attributes. However, one tool that is configured like an axe has clear mastic residue indicating that it was hafted perpendicular to its handle. Apparently there is room for variation or overlapping function of an axe head, a situation also noted in tool assemblages from other cultures (Heider 1967; Toth *et al.* 1992).

Chisels: Modern chisels are hand-held woodworking tools that are useful for fine carving and shaping. Neolithic chisels are less securely described and understood. The shape and size of those in the 'Ayn Ghazāl collection (16) suggest that they were used for light carving of soft materials, much as modern chisels are used, which they resemble. Thus, they would have been useful in delicate woodworking tasks. As a group, they are long and narrow (5.3-9.1cm long and 2.3-3.2cm wide), and have finely ground, refined, curved bits. Their long thin profiles suggest that they were not necessarily hafted, but may have been hand-held tools for much of their use-lives.

Picks: Picks in this assemblage (20) comprise the most diverse set of possible woodworking tools. They are distinguished by their roughly-flaked shapes, relatively robust bodies (8.6-16cm long), and crudely configured, small bits. In general, picks appear to be "heavy-duty tools" that were made to withstand hard use and strong impact. They may have been used as wedges to split wood. Some may have been used as tools to quarry limestone for building blocks or for plaster, or to mine flint. Some may have been hafted, while others may have been used with indirect percussors. At present, their uses are mostly conjectural and await unambiguous attribute studies. Consequently, most of the following study relates to axes, adzes, and chisels.

Analytical Techniques and Rationale

Methods of ground-bit tool production, and tool use, breakage, repair, reuse, and eventual disposal, are revealed by the discarded tools, by production and retooling debitage found in tool-production and waste-deposit loci, and by replicative experiments in tool production and use. Experimentation for this study disclosed subtle manufacturing techniques (especially of axe and adze production), including the use of grinding slabs and grinding strategies for the final stages of production of bits. This experimentation also allowed identification of a unique archaeological bit-grinding block which was located within a structure at 'Ayn Ghazāl, and which is discussed below.

The artifacts were examined to identify methods and stages of tool production, patterns of tool damage, and strategies of tool repair and recycling. Material choices and acquisition were a concern. To this end we recorded the material type that was used, if cortex was observed, and the kind of cortex (e.g., wadi-rolled, fresh chalk, etc.).

Production stages were determined that reflected our observations during replicative studies. Accordingly, we noted if an artifact was a blank, a preform, a finished (or "working") tool, an exhausted tool, or one reused in another function. A "blank" was identified as a biface that had a roughly shaped form and unfinished bit. A "preform" had a carefully shaped form and a bit that was percussion-flaked or pressure-flaked and that was ready for grinding. A "finished" tool had a ground, functioning bit. An "exhausted" tool had a bit that was no longer useful for cutting or chopping, or was broken so that it was no longer functional. Reused tools had attributes that denoted their use in other capacities. We also recorded artifact shapes in plan view, if the bit was ground, the direction of grinding, and the shape of the bit. Further, we noted if an artifact was broken, what type of fracture had occurred, and if an artifact had been reshaped/repaired. Beyond these technological attributes, standard metric data were collected. Finally, we also identified the stratigraphic distributions of the tools to ascertain chronological data and recorded their depositional contexts.

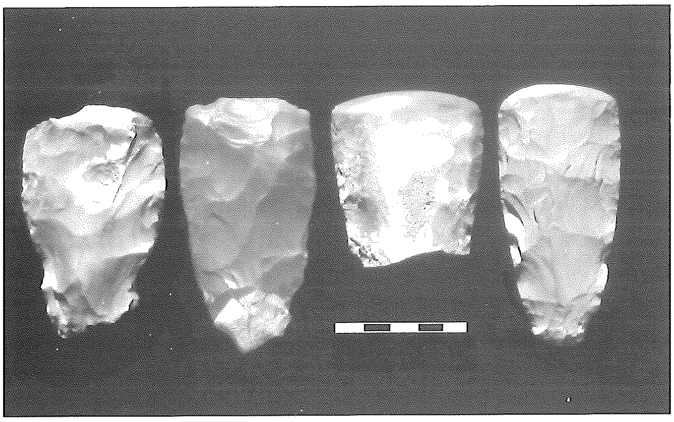
Axe, Adze, and Chisel Production

Analysis of the archaeological collection of woodworking tools from 'Ayn Ghazāl and replicative experimentation disclosed the following production strategies.

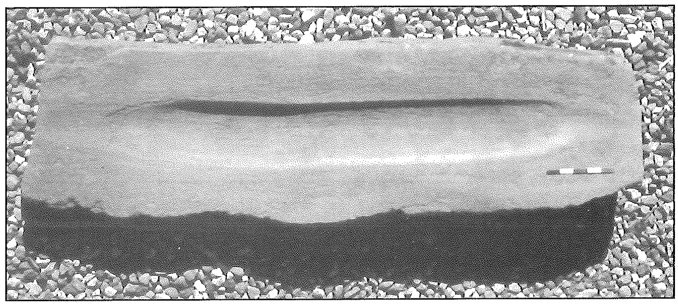
Blank Selection and Production: Flint nodules, tabular pieces of flint, or quarry flakes or blocks of bedded chert were chosen that generally were of sturdy quality rather than highly siliceous. Surveys of lithic resources near 'Ayn Ghazāl (Quintero 1996) revealed bedded chert underlying the site and in adjacent wadis, and an area where flint nodules of good-to-superior quality were being mined from the limestone matrix by Neolithic occupants of 'Ayn Ghazāl. These materials were carried to the site, then shaped into blanks of the appropriate configuration by direct percussion (FIG. 2), probably with a moderately soft hammer stone, such as a hard limestone nodule or a flint nodule with chalky cortex. Axe and adze blanks are basically lenticular in cross section, although adze blanks tend to be flatter and somewhat plano/convex. Chisel blanks are usually triangular in cross section. In some cases, crested blades from blade-core reduction may have been used for chisel blanks. We also note here that blank-production debitage may be identified archaeologically and consists typically of early-stage biface-production flakes.

Preform Preparation: Blanks were then fine-tuned into preforms (FIG. 2) with additional late-stage bifacial thinning and shaping, flaking by percussion or occasionally by pressure. At this point, axe and adze preforms were generally pecked on their lateral edges in the haft zone, and on ridges, or arrises, that needed to be reduced in size and smoothed. This procedure strengthened the haft area and was used to fit the axe or adze head to the haft.

Working Tools: The finished, working tool emerged with grinding of the bit and further pecking in the haft zone, if needed (FIGS. 1, 2, 3). Bits of pre-



3. Adzes. Left: Heavily reworked adze with fractured bit. Left center: Ground adze with reflaked bit. Right center: Adze with bending break that occurred during use. Right: Large finished adze.



4. Sandstone grinding block used to grind the bits of replicated axes and adzes.

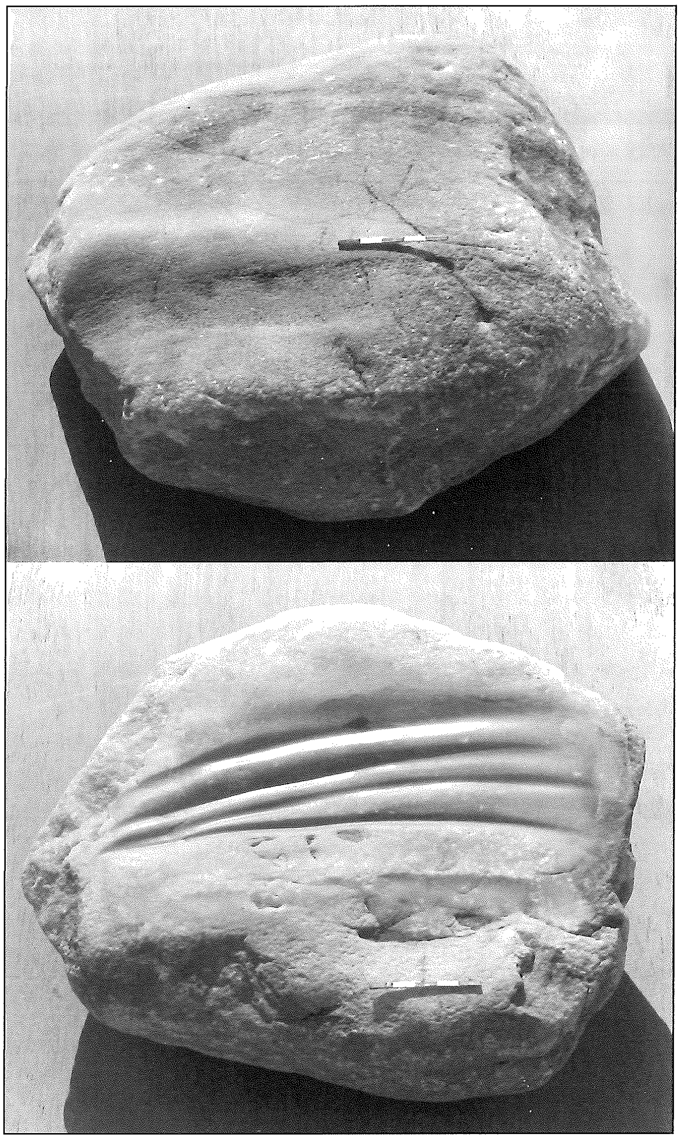
forms received final careful edge-shaping by being ground on a grinding surface usually consisting of a coarse, granular material, such as sandstone, quartzite, or granite. The grinding action initially was parallel with the length of the tool, whether axe, adze, chisel, or pick. Addition of grit (fine sand, ocher, etc.) and water facilitated the grinding and polishing process. Grinding of the bit was necessary to remove tiny fissures or cracks in its surface, thereby strengthening it. Finally, there is evidence that in some instances the bits of axes and adzes were ground parallel to the bit edge. This action would have removed any small nicks or flaking scars that would weaken the bit, and put a smooth, sharp finish on the edge. Pictured is a non-archaeological, sandstone grinding slab (FIG. 4) that was used in our replicative experiments to grind and polish the bits of replicated axes and adzes, and that illustrates a typical axe-grinding wear pattern on its surface.

Breakage, Reuse and Recycling: Axe, adze and chisel assemblages from 'Ayn Ghazāl also give evidence of production and use-breakage, and reuse of these tools. Typical production breaks were "end shock" bending breaks (FIG. 2), a common occurrence during biface reduction, or breaks from angular perverse fractures. Use-damage from impact usually was evidenced by chipping on the bit, observed as small flakes detached from the bit, and by spalling along the margins of the end of the bit (FIGS. 1, 3). This damage generally was repairable, so that the tool was returned to use, but was smaller. Debitage from resharpening damaged bits (and possibly producing tools) was discovered in some of the secondary deposits of debitage in what are interpreted as waste or dump areas near residential structures at 'Ayn Ghazāl. Catastrophic breaks from severe impact caused such great shock to axes and adzes that they sometimes spalled and snapped from distal overshot fractures, or contorted with flexing breaks that "killed" the tool (FIG. 3). On occasion, some discarded axes were given a second life and were reused as flake cores or as pecking tools. Chisels frequently suffered bending breaks and impact damage to their bits during use. However, because of their length, broken bits could be reflaked and reground several times; tools just became shorter until they were too short to use and were discarded. Picks often suffered impact damage to their distal ends, which required reshaping of the tool. At times, the distal end simply broke away from severe impact, destroying the tool.

Tool Exhaustion and Discard: Predictably, heavily used and exhausted tools are prominent artifacts in the collection. These are recognizable by their dulled and damaged bits and by irreparable use-breaks.

Axe-Grinding Stone

Of particular significance was the discovery within an LPPNB structure at 'Ayn Ghazāl of a quartzite block that evidently was used for grinding chisel, axe, and adze bits (FIG. 5). This large flat stone (31 x 25 x 12cm) was pecked to shape and has two working surfaces. One flat side of the block has two broad grinding grooves that would have been used for the first grinding process of bit preparation (whether in initial production or during bit maintenance), similar to those depicted in the experimental slab. The opposite face of the stone has four long (24cm), narrow, arching grooves that are asymmetrically V-shaped. Grooves such as these are likely to have been produced by the final bit-



5. 'Ayn Ghazāl LPPNB axe/adze-grinding block of quartzite. Upper: Two bit-grinding grooves on face one. Lower: Opposite face of same block with four well-developed grinding grooves and traces of red ochre.

polishing process wherein a bit was ground parallel to its edge. Of note is the abundant presence of red ocher on both surfaces of the block, no doubt added to facilitate the grinding and polishing process. This unique artifact provides strong confirmation of the final stages of axe and adze preparation and bit maintenance in these Neolithic industries.

The data presented here demonstrate clearly that all stages of production, use, reuse and maintenance, recycling, and discard of axes, adzes, and chisels, occurred within the town of 'Ayn Ghazāl. What remains to be discussed is the relative frequency of these tools, their distribution through time and space and the behavioral information that we might glean from these data.

Distribution Studies

The following discussion focuses on tool distributional patterns and implications for understanding how the production, use, and discard of worn-out tools were managed within the town. Considered here are the 130 tools from securely dated contexts, so that items from mixed deposits and the surface are not included. The tool sample is fairly large, but when distributed through 2,200 years of occupation and diverse occupation areas, it becomes quite small. The evaluations presented here and their perceived behavioral implications must be somewhat tentative. We believe that they explain the data at hand, and hope that with future expanded excavations they will hold true.

Tool Frequencies: Woodworking tool assemblages from 'Ayn Ghazāl give evidence not only for production and use of these tools within the town site, but also for frequencies of tool use, and thus their usefulness to the townspeople during the long history of occupation. TABLE 1 presents the chronological distribution of tool types throughout the various periods. These data were regularized for

TABLE 1. Tool Frequencies.

	MPPNB		LPPNB		LPPNB/ PPNC		PPNC		PN		Total	
Type	n	%	n	%	n	%	n	%	n	%	N	%
Axe	7	43.7	17	41.5	4	100.0	14	48.3	23	57.5	65	50.0
Adze	3	18.8	9	21.9	0	0.0	4	13.8	4	10.0	20	15.4
Axe/Adze	2	12.5	6	14.6	0	0.0	3	10.3	4	10.0	15	11.5
Chisel	0	0.0	4	9.8	0	0.0	2	6.9	7	17.5	13	10.0
Pick	4	25.0	5	12.2	0	0.0	6	20.7	2	5.0	17	13.1
Total	**16**	**100.0**	**41**	**100.0**	**4**	**100.0**	**29**	**100.0**	**40**	**100.0**	**130**	**100.0**

Note: Figures here and in the following tables are for datable contexts only. LPPNB/PPNC numbers are too small for meaningful analysis.

comparison by assessing relative frequencies of artifacts from datable contexts from each period of occupation.

First, while ground-bit tools were found in deposits from all periods, there are great differences in the frequencies of their occurrence. From all periods, axes were recovered more often than any of the other tool types. They occurred from two to five times more often than adzes, the next most abundant of these tools. Also, their relative importance increases by nearly 14% from the MPPNB to the PN. There was an apparent slight decrease in axe usage during the LPPNB, but this figure likely is the result of excavation strategies for LPPNB deposits, which tended to focus on public/ritual buildings rather than on domestic structures as in the other periods. In sum, there appears to have been no time when the people living in the town did not need and use axes for heavy wood cutting, regardless of changes in structural designs, fuel consumption, or the availability of natural resources. This need appears to have been at a relatively consistent level through time, regardless of environmental or economic changes.

Such is not the case for the lighter woodworking tools. While adzes were used throughout the site's occupation, their use appears to have decreased almost by half by the PN. By contrast, chisels apparently were scarce in the MPPNB but grew to almost 18% of the woodworking tool kit by the PN. While both of these tools are used for shaping wooden objects, they are used in different ways, suggesting that the woodworking needs of the community had shifted somewhat by the PN.

Frequencies of Technological Stages: With the exception of picks, for which we lack production data, all stages of the use-lives of woodworking tools are present at the town (TABLE 2). Consequently, it is clear that all of these tools were produced, maintained, and finally discarded on the site during its occupation. They also may have been used on the site, or elsewhere, but no data survive to attest to these events. In any case, the tools apparently were not traded into the site, but were of local origin.

Tools that are considered "functional" (or still in working condition) and those deemed to be "exhausted" comprise the bulk of the collection, and were found in about equal relative proportions. These data suggest that tool storage and loss, and tool discard were all common occurrences throughout the occupation of the town. Evidence of tool production consists mainly of tool blanks and preforms, and tools that "died" from mishaps during production. Such artifacts comprise about 20% to 30% of the collections from each period. There is also a small presence of axe/adze bit-sharpening flakes in the debitage collection. Tool recycling was present to a small extent in all periods. Most commonly, exhausted axes were reused as flake cores. Such recycling was most prevalent in the LPPNB deposit, but overall frequencies are very small, so the differences may be insignificant.

Distribution of Tools By Use-Life Stage: Patterns of tool production, curation, and discard within the town during all periods of its occupation are presented in TABLE 3. These behaviors are suggested by the occurrence of tools in various stages of their use-lives in specific contexts throughout the town. Important contextual distinctions are "living areas", which include loci where tool production occurred (i.e., knapping areas), floors of structures, structure walls, and exterior surfaces (such as courtyards) within the town. Disposal areas consist of "fill" deposits inside and outside of structures, which accumulate as various types of debris over time, and intentional trash pits or dumping regions. We recognize here that fill can be ambiguous in that it sometimes can mask *in situ* deposits. Nonetheless, these are useful distinctions that generally are valid.

Only two possible knapping areas, both in LPPNB deposits, were recognized that were associated with ground-bit tools. However, we believe this shortage is likely due to the difficulty of distinguishing such production debitage from other types of biface-production debitage (e.g., from naviform cores, bifacial knives, etc.). More important is the fact that unfinished tools, both whole and broken, were found distributed throughout the town, especially from the LPPNB through the end of the PN. Some of these artifacts were located on floors of domestic structures, some were in structure walls, and some were scattered on living surfaces outside of buildings. These areas contained both working and exhausted tools too.

Nonetheless, the highest frequencies of all tools in all stages of production, use, and discard were in interior (16.7%) and exterior (46.8%) fill deposits. These deposits very probably reflect accumulations of living debris, including discarded and lost tools,

TABLE 2. Frequencies of Tool Use-Life Stages.

	AXE		ADZE		AXE/ADZE		CHISEL		PICK		Total	
Stage	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**N**	**%**
MPPNB												
B	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
P	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0	1	6.2
F	2	28.6	0	0.0	0	0.0	0	0.0	0	0.0	2	12.5
W	1	14.3	1	33.3	0	0.0	0	0.0	4	100.0	6	37.5
E	4	57.1	1	33.3	2	100.0	0	0.0	0	0.0	7	43.7
(R)	(1)	(14.3)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(1)	(6.2)
Total	**7**	**100.0**	**3**	**100.0**	**2**	**100.0**	**0**	**0.0**	**4**	**100.0**	**16**	**100.0**
LPPNB												
B	1	5.9	1	11.1	1	16.7	1	25.0	0	0.0	4	9.8
P	3	17.6	4	44.4	0	0.0	0	0.0	0	0.0	7	17.1
F	0	0.0	0	0.0	1	16.7	0	0.0	0	0.0	1	2.4
W	5	29.4	4	44.4	1	16.7	2	50.0	3	60.0	15	36.6
E	8	47.1	0	0.0	3	50.0	1	25.0	2	40.0	14	34.1
(R)	(4)	(23.5)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(4)	(9.8)
Total	**17**	**100.0**	**9**	**100.0**	**6**	**100.0**	**4**	**100.0**	**5**	**100.0**	**41**	**100.0**
PPNC												
B	1	7.1	0	0.0	0	0.0	1	50.0	0	0.0	2	6.9
P	3	21.4	1	25.0	0	0.0	0	0.0	0	0.0	4	13.8
F	2	14.3	0	0.0	0	0.0	1	50.0	0	0.0	3	10.3
W	4	28.6	2	50.0	0	0.0	0	0.0	3	50.0	9	31.0
E	4	28.6	1	25.0	3	100.0	0	0.0	3	50.0	11	37.9
(R)	(1)	(7.1)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(1)	(3.4)
Total	**14**	**100.0**	**4**	**100.0**	**3**	**100.0**	**2**	**100.0**	**6**	**100.0**	**29**	**100.0**
PN												
B	1	4.3	0	0.0	0	0.0	0	0.0	0	0.0	1	2.5
P	3	13.0	2	50.0	0	0.0	0	0.0	0	0.0	5	12.5
F	1	4.3	0	0.0	0	0.0	1	14.3	0	0.0	2	5.0
W	9	39.1	1	25.0	2	50.0	0	0.0	0	0.0	12	30.0
E	9	39.1	1	25.0	2	50.0	6	85.7	2	100.0	19	50.0
(R)	(1)	(4.3)	(0)	(0.0)	(2)	(50.0)	(0)	(0.0)	(0)	(0.0)	(3)	(7.5)
Total	**23**	**100.0**	**4**	**100.0**	**4**	**100.0**	**7**	**100.0**	**2**	**100.0**	**40**	**100.0**
TOTAL	**61**	**48.4**	**20**	**15.9**	**15**	**11.9**	**13**	**10.3**	**17**	**13.5**	**126**	**100.0**

Note: Use-live stages are: B=blank, P=preform, F=production failure, W=working tool, E=exhausted tool, (R)=recycled into other tool or core. A small number (4) of tools from transitional contexts were not used in this table.

TABLE 3. Distribution of Tool by Use-Life Stages.

	LIVING AREAS								DISPOSAL AREAS							
	Knapping Area		Structure Floor		Structure Wall		Exterior Surface		Interior Fill		Exterior Fill		Trash Dump		Total	
Stage	n	%	n	%	n	%	n	%	n	%	n	%	n	%	N	%
MPPNB																
P	0	0.0	0	0.0	0	0.0	0	0.0	1	16.6	1	14.3	0	0.0	2	12.5
W	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	5	71.4	1	33.3	6	37.5
E	0	0.0	0	0.0	0	0.0	0	0.0	5	83.4	1	14.3	2	66.3	8	50.0
(R)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(1)	(17.0)	(0)	(0.0)	(0)	(0.0)	(1)	(6.3)
Total	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**6**	**100.0**	**7**	**100.0**	**3**	**100.0**	**16**	**100.0**
LPPNB																
P	0	0.0	0	0.0	0	0.0	2	22.2	2	50.0	7	36.8	1	25.0	12	29.3
W	1	50.0	0	0.0	2	66.6	3	33.3	1	25.0	5	26.3	3	75.0	15	36.6
E	1	50.0	0	0.0	1	33.3	4	44.4	1	25.0	7	36.9	0	0.0	14	34.1
(R)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(2)	(22.2)	(1)	(25.0)	(0)	(0.0)	(0)	(0.0)	(3)	(7.3)
Total	**2**	**100.0**	**0**	**0.0**	**3**	**100.0**	**9**	**100.0**	**4**	**100.0**	**19**	**100.0**	**4**	**100.0**	**41**	**100.0**
PPNC																
P	0	0.0	1	50.0	1	33.3	2	66.6	0	0.0	5	33.3	0	0.0	9	31.0
W	0	0.0	0	0.0	0	0.0	0	0.0	3	60.0	6	40.0	0	0.0	9	31.0
E	0	0.0	1	50.0	2	66.6	1	33.3	2	40.0	4	26.7	1	100.0	11	37.9
(R)	(0)	(0.0)	(1)	(50.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(1)	(6.7)	(0)	(0.0)	(2)	(6.9)
Total	**0**	**0.0**	**2**	**100.0**	**3**	**100.0**	**3**	**100.0**	**5**	**100.0**	**15**	**100.0**	**1**	**100.0**	**29**	**100.0**
PN																
P	0	0.0	0	0.0	0	0.0	3	42.9	2	33.3	3	16.7	0	0.0	8	20.0
W	0	0.0	3	42.9	2	100.0	1	14.2	2	33.3	3	16.7	0	0.0	11	27.5
E	0	0.0	4	57.1	0	0.0	3	42.9	2	33.3	12	66.7	0	0.0	21	52.5
(R)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(0)	(0.0)	(3)	(16.7)	(0)	(0.0)	(3)	(7.5)
Total	**0**	**0.0**	**7**	**100.0**	**2**	**100.0**	**7**	**100.0**	**6**	**100.0**	**18**	**100.0**	**0**	**0.0**	**40**	**100.0**
TOTAL	**2**	**1.6**	**9**	**7.1**	**8**	**6.3**	**19**	**15.1**	**21**	**16.7**	**59**	**46.8**	**8**	**6.3**	**126**	**100.0**

Note: Use-life stages are: P=any unfinished tool (in production), W=working tool, E=exhausted tool, (R)=recycled into other tool or core. A small number (4) of tools from transitional contexts were not used in this table.

dirt, and trash that developed over the many years of site use. This pattern of accretion is widespread throughout the site in all periods. In fact, during the MPPNB no ground-bit tools were found on recognizable living surfaces whether inside or outside of structures. Trash pits were used to dispose of a few tools, but this apparently was not a common practice during any period, and was not noted at all during the PN. One may conclude that unwanted flint tools such as these, even broken ones, were not considered hazardous waste that required special treatment or disposal. This attitude towards waste treatment contrasts sharply with that observed for flint blade-production debitage, which was generally removed from living areas and dumped in trash pits and refuse areas (Quintero 1997, 1998).

Summary Discussion

The above patterns reflect a consistent, town-wide behavior of tool production, use, and disposal primarily in domestic areas. Some curation of tools probably is indicated where tools were placed in wall niches, possibly for storage, or on floors by household members. However, most tools appear either to be inside house structures, where they were lost or discarded and eventually became part of fill, or, more often, outside houses where they were made, maintained, discarded, and ultimately left as part of the landscape. We believe this pattern reflects an organizational structure that is solely domestic in origin. That is, the economic organization of production, distribution, use, and discard occurred entirely within individual households by people for themselves. This aspect of 'Ayn Ghazāl's lithic economy, regardless of the period of occupation, falls within the realm of self-sufficient household economies. Put another way, we see no evidence for specialized production of these tools by a few for consumption by others at any time.

Given all of the evidence supporting intensive consumption of wood for construction, fires, plaster, etc., through the LPPNB and the implied gradual deforestation of the environment immediately around the site, the consistent use of axes and adzes during these periods is no surprise. Certainly these tools facilitated the construction and maintenance of structures and various wooden implements, such as handles for tools, as well as innumerable tons of firewood over the centuries. It is easy to envision the gradual decline of nearby woodlands through the passing years.

But the persistent use of these tools into the PPNC and PN when other archaeological evidence for the use of wood is scarce seemed initially a puzzle. At present we are inclined to believe that the evidence still strongly supports wood chopping, but perhaps farther and farther away with greater cost of time and labor. It is also quite probable that much of the earlier structural wood used in the MPPNB and LPPNB was reconfigured and reused as needed, as time went by from the PPNC onward. Both axes and adzes would have been useful for this task. Certainly in many respects people's needs and the resolution of these needs did change. Timbers and beams of MPPNB houses gave way to less-substantial structures in the PPNC, and finally to roofs and slender ramadas probably constructed of small trees and branches in the PN (Rollefson 1995). In this last reconstruction it is easy to envision chopping down small trees (remnants in the woodland?) some distance from the now-small town, hauling these back home, shaping the poles with an adze, and finally swapping the adze for a chisel to groove and lash the poles.

And there are, of course, countless other tasks that can explain the increased presence of small woodworking tools like chisels from the LPPNB into the PN. Since chisels generally are used for fine shaping tasks, there was perhaps an increasing need for more delicately crafted wooden implements, or tools that satisfied a wider range of uses. Not preserved, and thus unimagined until now, are probable wooden accoutrements like furniture, utensils, tools such as carefully grooved sickle hafts and perforated axe hafts, combs, bowls, boxes[2], cups, pendants, and so on. But we can perhaps envision their existence now that the tools of their production are better understood. So, we have an inkling of a rich wooden material culture for these later years. Such is the advantage of probing the roots of technologies and the behavioral implications of their place in the archaeological landscape. The long history of 'Ayn Ghazāl and its people and their strategies of living become real and more understandable.

Acknowledgements

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[2] Recall here the discovery of a wooden box in LPPNB Bayḍā by Mortensen (1988).

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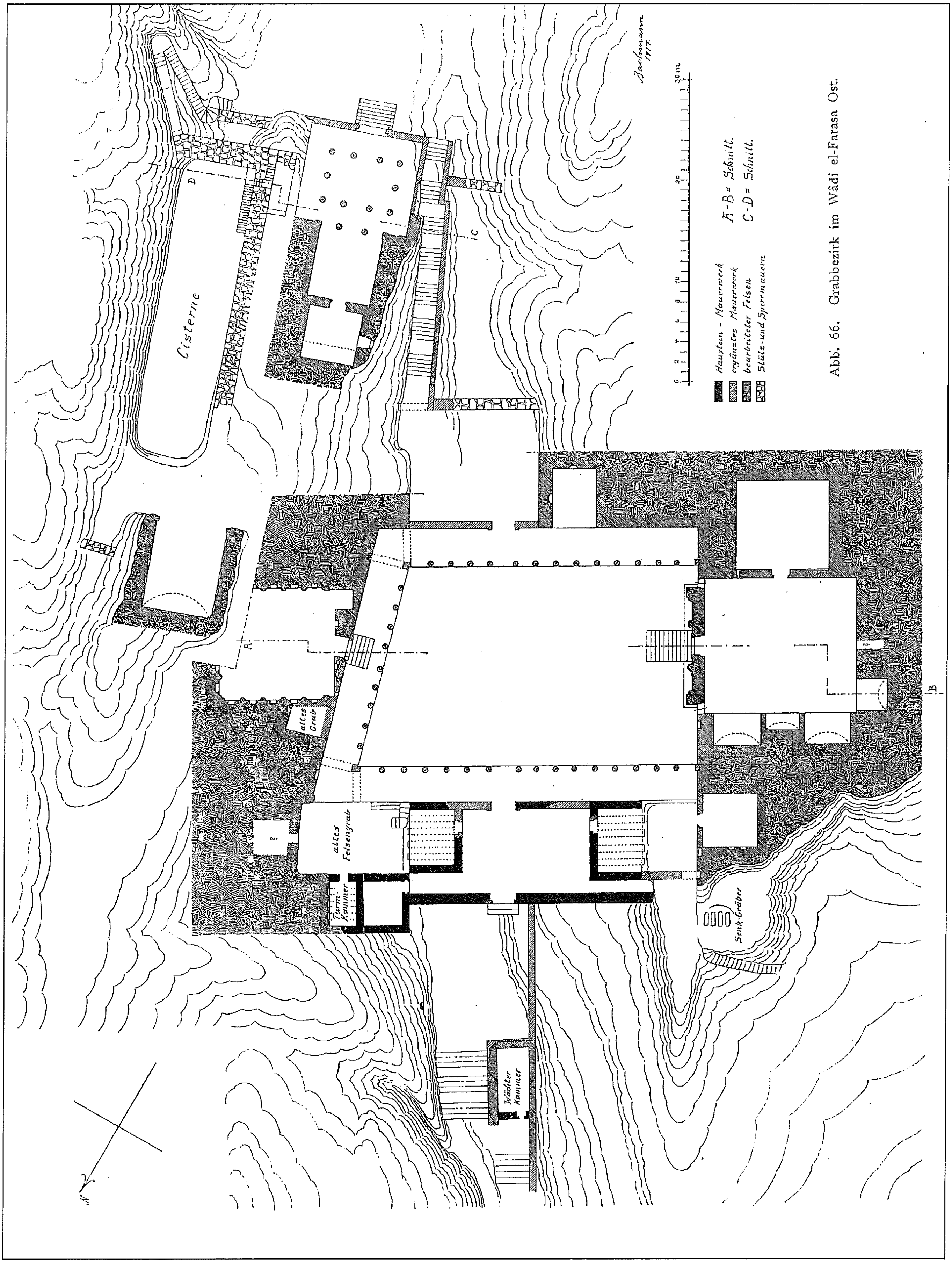
Nabataean Funerary Complexes: their Relation with the Luxury Architecture of the Hellenistic and Roman Mediterranean

I. Introduction

Since 1999 the International Wādī Farasa Project (IWFP) has been carrying out the exploration of the so-called Soldier Tomb complex in the outskirts of Petra, the ancient Nabataean capital in southern Jordan (www.iwfp.ch.vu). The goals of this project are not limited to the excavation of the complex of the Soldier's Tomb proper, but include a thorough study of comparable phenomena within the Nabataean culture and an understanding of the areas from which ideas and architectural prototypes of such complexes were influenced (for preliminary reports and some further reflection see Schmid 1999; 2000a; 2001a; 2002, 2003; Schmid 2001b; 2004). Therefore, the results obtained so far not only allow us to establish a precise chronology of the different installations under investigation, but also to place the complex of the "Soldier Tomb" in a wider context, first within the Nabataean culture and secondly within the Greek and Roman Mediterranean.

In 1921 the results of a two weeks visit to Petra by the "Deutsch-türkische Denkmalschutz-Kommando" during December 1916 were published (Bachmann and Watzinger and Wiegand 1921). Although the small team of German scholars did not carry out any excavations, their observations and plans remain a valuable source and important departure point for research on the monuments of Petra. The discovery of the Nabataean funerary complexes as sophisticated installations with went well beyond the famous rock-cut façades can probably be considered one of the main contributions of the "Denkmalschutz-Kommando" to the field of Nabataean studies. It was precisely the analysis of the complex of the Soldier Tomb and related structures that let the German scholars to their discovery (Bachmann and Watzinger and Wiegand 1921: 75-94). In short, the general outlook of the Soldier Tomb (Brünnow and Domaszewski 1904: 273 no. 239; McKenzie 1990: 147-148), the opposite *triclinium* (Brünnow and Domaszewski 1904: 272-273 no. 235; McKenzie 1990: 148-149) and surrounding structures as well as observations of rock-cut traces of roofing, probably belonging to the implantation of a peristyle courtyard in the space between the two main elements, led to the proposal of an overall plan as visible in **figure 1**. This study also included the installations on the upper terrace of the Wādī Farasa East, the so-called "Garden Temple", "Garden Triclinium" or even "Garden Tomb" according to other scholars (Brünnow and Domaszewski 1904: 275 no. 244; McKenzie 1990: 171). Meticulous observation of rock-cut remains belonging to additional features and detailed knowledge of Graeco-Roman architecture let to a reconstruction as a living area, in other words a typical Hellenistic peristyle house, adapted to the local conditions and therefore partially cut into the sandstone (Bachmann and Watzinger and Wiegand 1921: 85-88; cf. here FIG. 1). We will not focus on the structures of the upper terrace in this paper, however in general terms the results of the Denkmalschutz-Kommando were confirmed though slightly modified (cf. Schmid 2001a; 2002; 2003). The last step, already completed in 1916, consisted in the combination of the monuments within Wādī Farasa East with the features mentioned in the inscription of the Turkmaniya tomb and their comparison with other remains of Hellenistic type luxury architecture, for instance in Alexandria (Bachmann and Watzinger and Wiegand 1921: 89-94).

Although mentioned from time to time in modern research, the results obtained by the "Denkmalschutz-Kommando" have not yet found the attention they deserve. This may be partially linked to the fact that a definitive confirmation of the pro-



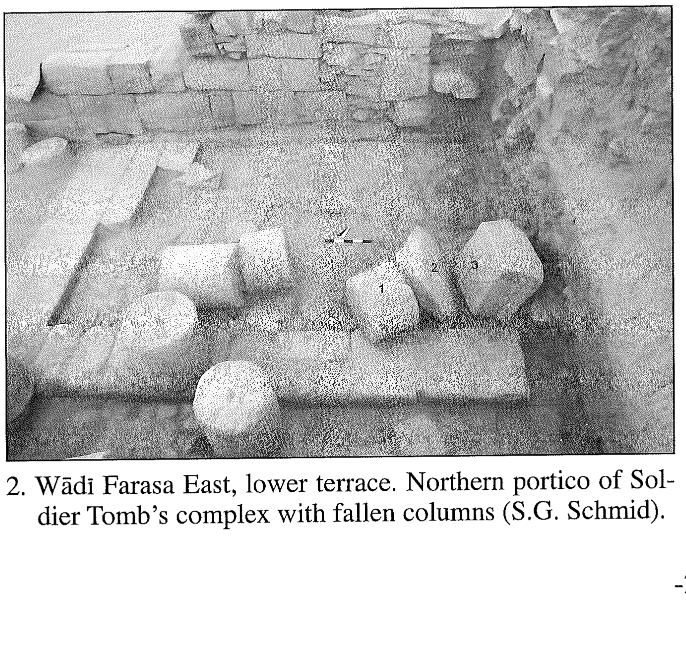
1. Plan of the structures in Wādi Farasa East as recorded by Bachmann, Watzinger and Wiegand 1921: 76 fig. 66.

posed hypothesis was still missing and needed further investigation, i.e. excavation. This is why during the first stage of the International Wādī Farasa Project (IWFP) the crucial points of the reconstruction proposal by the German scholars were verified. Another crucial point that has to be investigated is the chronology of the complex. Since the "Denkmalschutz-Kommando" did not carry out any excavation, and since knowledge of the material culture of the Nabataeans still was at its beginnings, the date of the various structures remained far from clear until very recently.

II. The Archaeological Data

One of the first objectives related to the verification of the proposed reconstructions for the complex of the "Soldier Tomb" was the presumed peristyle courtyard. Since the amount of sand is at its lowest level on the northern side of the area and since this is also the area of the main entrance to the complex, excavations were focused on the northern portico of the courtyard and the structures to the North of it, forming the entrance building to the entire complex (cf. FIG. 1 and FIG. 12).

Several columns belonging to the northern portico, or at least their remains, have been found so far, revealing a standard *intercolumnium* of 187cm, a bay of 247cm and a width of the portico of 3.65m (FIG. 2). The columns have a diameter of 60cm. However, it is possible that the columns were covered by a layer of applied stucco and measured 62cm in diameter. Initially, the floor of the portico as well as the floor of the courtyard proper were covered with stone floor slabs at a level of about 930.60m asl. However, most of the original floor slabs had been taken away, most probably in antiquity. Since most of the fallen column drums and other architectural fragments were standing and lying on several centimeters of earth accumulated directly on the foundations of the slabs, the slabs had already been robbed out at the time when the columns collapsed.



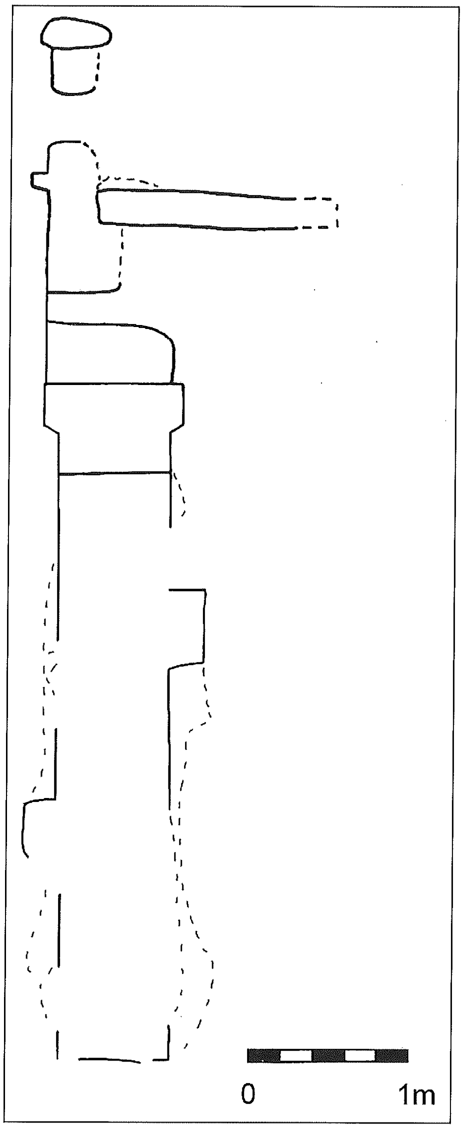
2. Wādī Farasa East, lower terrace. Northern portico of Soldier Tomb's complex with fallen columns (S.G. Schmid).

From the architectural fragments found in the debris, several interesting pieces of information can be gained. From one of the columns, most probably belonging to the central entrance way according to its position, the uppermost column drum, the capital and the first block belonging to the roofing construction were found in a row (FIG. 2 no. 1 [column drum]; no. 2 [capital]; no. 3 [roofing construction]). Surprisingly, the stone just above the capital clearly shows the beginning of two arches. When looking closer, one realizes that there are small differences in the degree of inclination of the two arches, and, therefore, one of them was wider with the same height or one was higher with both of equal width. Two possible solutions can be proposed at this stage of our investigations. Either the colonnade had a front of columns crowned by arches, or we have to propose a second colonnade, at least for the northern part of the complex. Indeed, one could easily imagine a second colonnade of a slightly reduced height. There is further supporting evidence in favor of a second colonnade: with just one colonnade at the northern side of the complex, the façade of the Soldier's Tomb is clearly decentralized, with just 2.40m space between the southern portico and the façade of the tomb, while there are 6.00m space between the northern portico and the façade (cf. FIGS. 1 and 12). With a second portico at the northern side, measuring 3.65m as the first one, the space would be reduced to rather exactly 2.35-2.40m and, therefore, offer a perfect symmetry! However, for the time being there is no physical evidence for a second colonnade at the northern side and there would be a mathematical problem: the joining of the second colonnade from the northern side with the one on the eastern side in front of the *triclinium*. Meanwhile, there are other arguments that seem to speak in favor of just one colonnade at the northern side. Since the *intercolumnium* of the two columns forming the entrance indeed is wider as the above-mentioned standard of 187cm (224cm), the different inclination of the arches could be due to this. When reconstructing arches above the already excavated colonnade, the southernmost arch would be positioned directly on the rock cuttings visible in the southwestern corner of the portico (FIGS. 3 and 4) and, therefore, find a perfect inset avoiding any problems pressure of the arch on the column. Further, this solution would explain why there is a difference of 90cm between the top of the capital and the rock-cutting for the roofing, both clearly visible on figures 3 and 4. These observations lead to a reconstruction of the portico (figure 5) with one colonnade covered by arches.

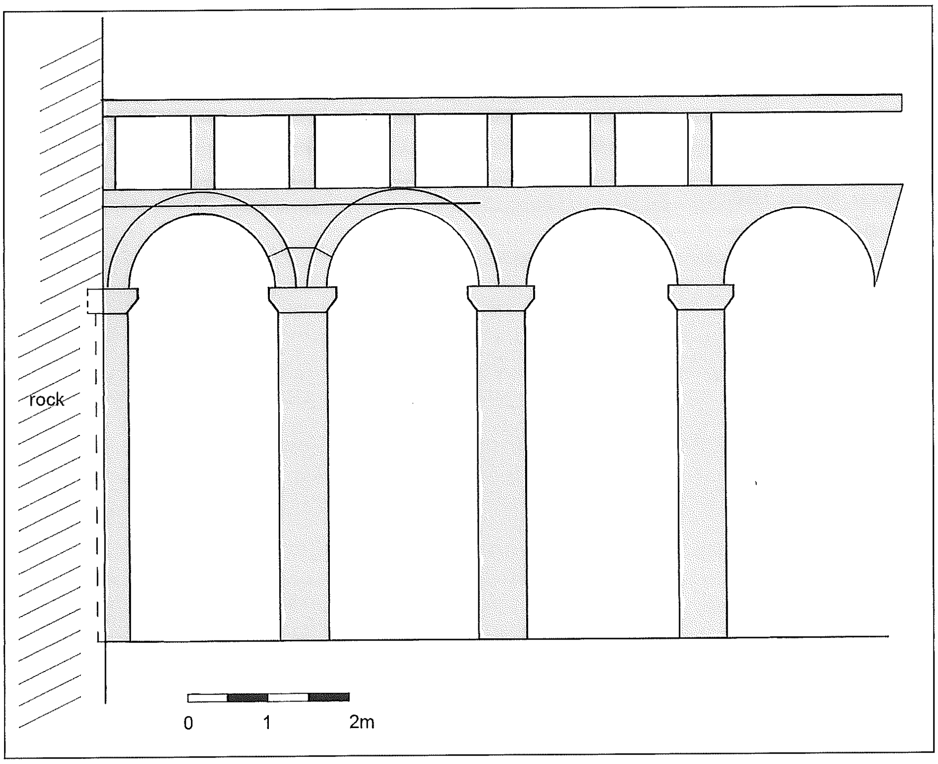
As became clear above, another area of interest is the western corner of the courtyard, were the northern portico began. The first column of the north portico is a half column abutting the rock cut surface, which had already been posited by Bachmann and Watzinger and Wiegand (1921: 75ff.). In trench 3 several drums and the capital of the half column were found which have provided the missing elements to explain the carved out rock features (FIG. 6; cf. FIGS. 3 and 4). In addition, their relationship is confirmed by the corresponding measurements of the carved out space on the one hand, and the half column and the half capital on the other. In two cases, the rock carvings show a lateral enlargement. Into these enlargements fit analogous enlargements of two half column drums, of which one was actually found (center on FIG. 6). The height of the columns to the capitals can be calculated by comparing the plinths (930.71-73m above sea level) with the rock carvings for the half capital (lower level: 934.74-79m, top level: 935.04m above sea level): this comes to a height for the columns of ca. 4m without capitals and with capitals of about 4.27-4.30m. The different capitals and the half capital from trench 3 found so far measure between 27cm and 29cm in height.

Most of the capitals discovered so far are badly corroded and, therefore, let to the initial hypothesis of a simple, not decorated Doric order (Schmid

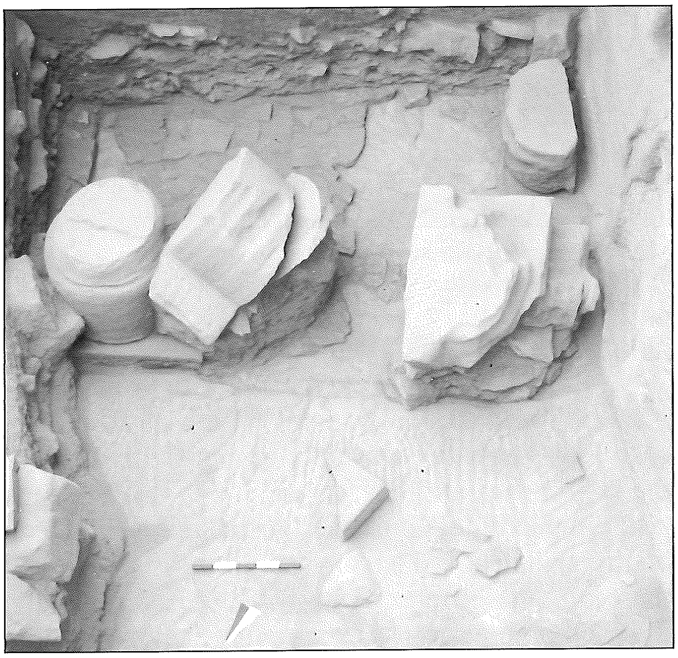
3. Wādī Farasa East, lower terrace. SW corner of northern portico of Soldier Tomb's complex with rock cuttings for first column and roofing (S.G. Schmid).



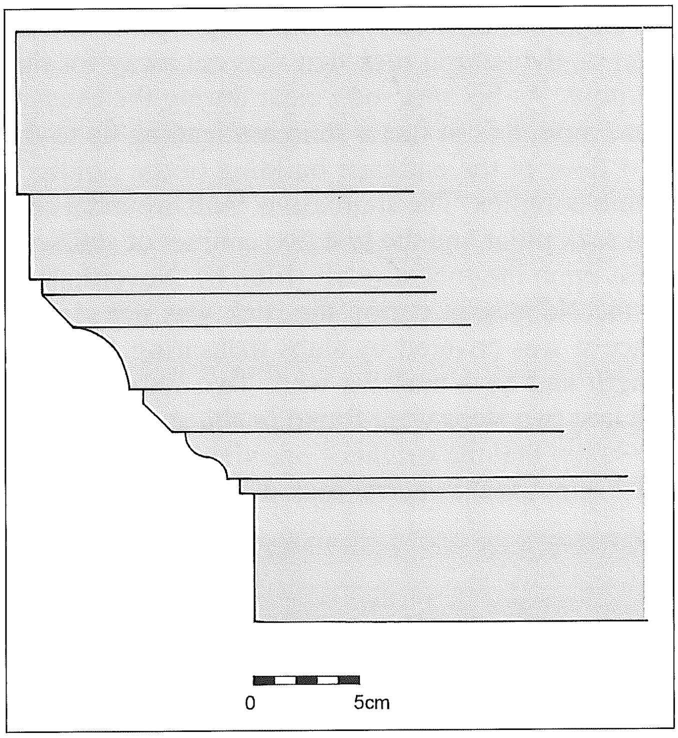
4. Wādī Farasa East, lower terrace. SE corner of northern portico of Soldier Tomb's complex with rock cuttings for first column and roofing (M. Seyer and S.G. Schmid).



5. Wādī Farasa East, lower terrace. Tentative reconstruction of SW corner of northern portico of Soldier Tomb's complex (S.G. Schmid).



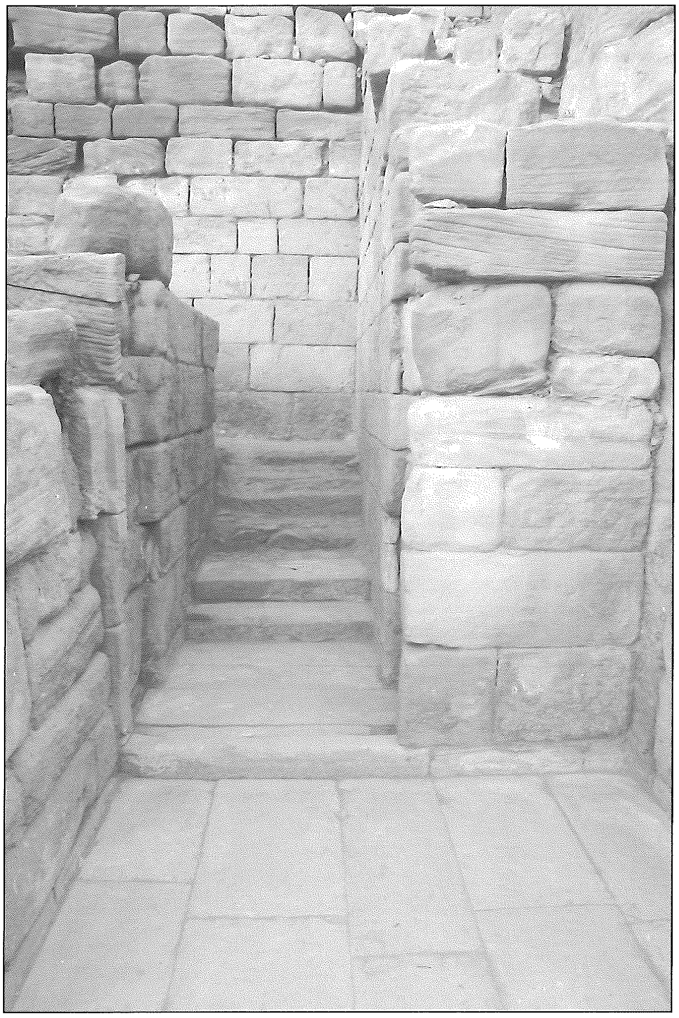
6. Wādī Farasa East, lower terrace. SW corner of northern portico of Soldier Tomb's complex with second column in situ (left), first fallen half column (center), fallen first half capital (right) of the colonnade (S.G. Schmid).



7. Wādī Farasa East, lower terrace. Profile of moulded capital from N-portico (S.G. Schmid).

2000a), whilst Bachmann, Watzinger and Wiegand proposed a Corinthian order according to the huge opening for the first half capital carved into the rock (Bachmann and Watzinger and Wiegand 1921: 75ff.; cf. below). As one better preserved capital shows (FIG. 7; cf. no. 2 on FIG. 2), we are in reality dealing with a form of richly moulded capitals (on different types of capitals used by the Nabataeans, cf. Netzer 2003: 159-164; on modeled capitals especially p. 159 fig. 222, 2 and p. 164). This observation is also interesting in terms of the overall planning of the complex. So far, three different architectural orders are identified within the complex of the "Soldier Tomb". The tomb properly shows Nabataean capitals, in the *triclinium* 235 another variant is on display that is called either pseudo-Ionic (McKenzie 1990: 149) or pseudo-Doric ("dorisierend": Schmidt-Colinet 1983: 309f.). With the newly found examples we witness yet another type within the same overall installation. This variety is all the more astonishing as the entire complex is clearly the product of a well planned and organized building program (see below). Therefore this emphasises the deliberate handling of different architectural features by the Nabataean architects and craftsmen in order to create new compositions.

The next important element of the entrance building was revealed by the excavation of room 8 (cf. location on FIG. 12). Room 8 is a stunning combination of rock cut and built up architecture. Its maximum outer dimensions are of 4.30m x 5.60m (FIGS. 8 and 9). Whilst its southern and western parts are freely constructed of well set, high quality blocks, the northern and eastern walls, although constructed from the same type of blocks, lean on the natural rock that was cut away for that purpose. As became soon clear during the excavation, room 8 is in fact a staircase leading up to the first floor of the entrance building of the Soldier's Tomb complex. The staircase is built around a central rock pillar and the first two courses of stairs are built upon the rock as well (FIG. 8). Nevertheless, in the Nabataean period the rock was not visible, since it was covered by slabs measuring 1.10m in length and by a massive wall. Two slabs forming the first two steps were found *in situ* and, therefore, we know that the height of one slab corresponds to 16-17cm. On the central rock pillar, a small rectangular zone is visible, that was carefully cut away (FIG. 8, on the spot of the meter). This is a first indication for additional courses of steps, as the staircase most probably was continuing: the bottom of the staircase is at 930.73m asl; the top of the rock pillar in the middle is at 932.90m asl, plus the 16cm of the slabs (now lost) brings us to 933.06m asl; therefore, the difference is of 2.33m. Interestingly, the rock on the top of our structure, i.e. the bottom of the first floor, is at 935.26m asl, plus the 16cm of the slab (now lost) gives 935.42m asl and, therefore, a supposed difference between the middle of the staircase and the top of it of 2.36m, almost exactly the same one than for the first half. One can suppose that the staircase was used in order to give a discrete access to the first floor, probably for private purposes, while the official visitors to the complex were directly led through the central *propylon* into the courtyard and then into the tomb or the opposite banqueting hall. The construction of the



9. Wādī Farasa East, lower terrace. Room 8 (staircase) from SW (S.G. Schmid).

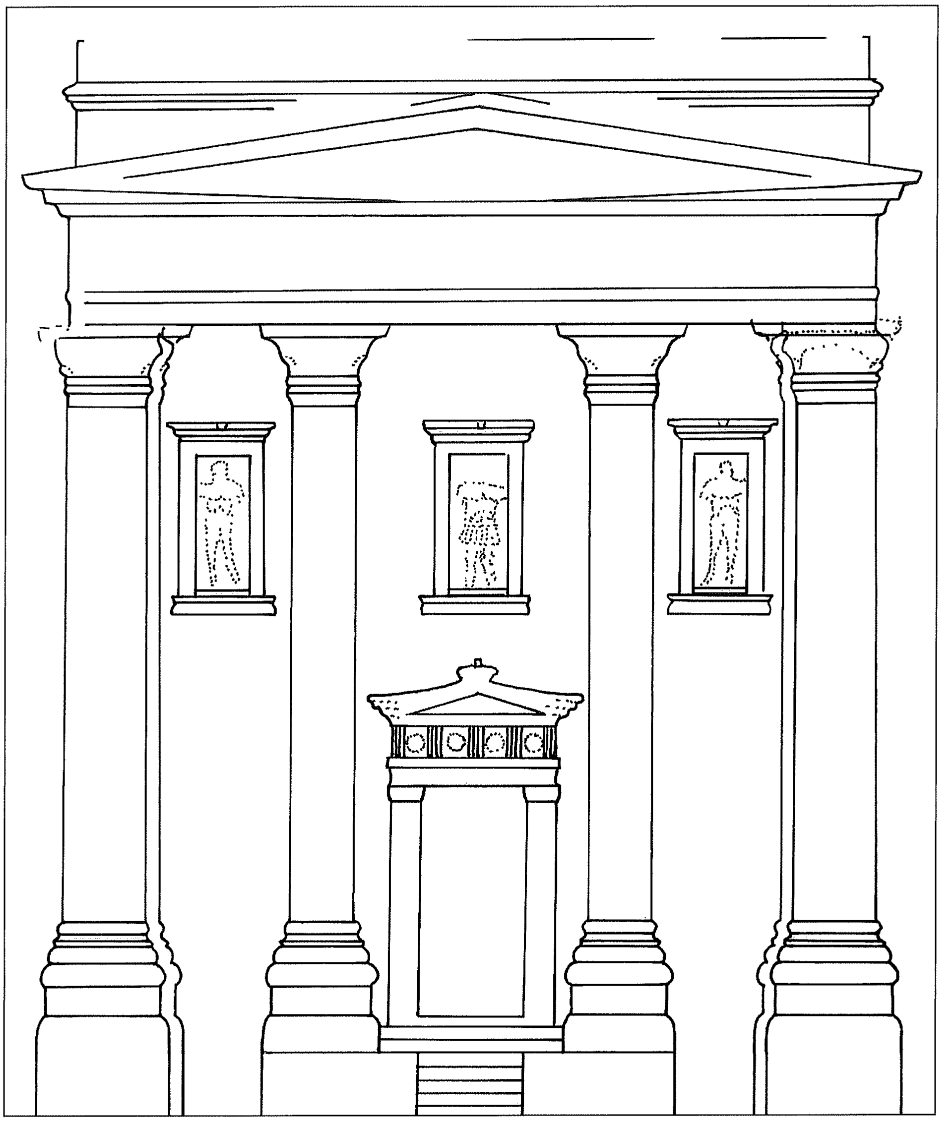
8. Wādī Farasa East, lower terrace. Room 8 (staircase) from above (S.G. Schmid).

staircase strongly recalls similar installations within free built Nabataean architecture, usually called staircase-towers (Negev 1973). Although rather frequent in Nabataean architecture, such structures are not limited to the Nabataean area. In several of the palaces of the Hasmonaeans, and of Herod the Great, similar staircases constructed around a central pillar were found and are even a characteristic common feature of these buildings (cf. Netzer 2001A: 155, 167ff; 1991: 156, 170, 263, 601)

The central entrance hall, or propylon, measures roughly 10m x 9m and is built in a very accurate technique (room 1 on FIG. 12). In its initial, i.e. Nabataean phase, the room was covered by four vaulted arches, on each side of which the pillars remain, each measuring 80cm in width. In the first phase the room must have been entirely covered by huge floor slabs, of which a single one remains *in situ* in the SW corner of the room and two more or less complete rows on the W side of the room. The second one of these rows served as a water drainage at the same time, as is suggested by a water channel leading into the room on the southern side, by the slightly depressed middle part of the entire row of slabs due to the floating water during a considerable period of time, and finally by the gully on the NE corner of the room leading downwards. Most probably the gully is connected to a rock cut water channel that was discovered in 2001 immediately outside the main terrace wall, leading further down the Wādī Farasa (Schmid 2001a). The careful installation of this water drainage system shows once again how perfectly organized the water management in the entire complex was. Not only the complete area above the rock cut installations was covered with water channels and cisterns, but also the central part of the area, as is underlined by the newly discovered installation. Due to the long history of use and re-use — the complex of the "Soldier Tomb" was probably destroyed by the earthquake of 363AD but saw an important reuse during the Medieval period — only a few indications for the interior decoration and installation were found, mostly out of context. On the one hand, small fragments of painted stucco and polychrome *opus sectile* floors point to lavishly decorated rooms. On the other hand, fragments of hypocausts and *tubuli*, used for floor and wall heating systems respectively, indicate that one or several rooms of the complex were heated, either in order to be used in winter or as part of Roman style baths (on these finds see Schmid 2001a: 261). Although by the mid-first century (see below for the chronology of the Soldier Tomb's complex) such heating installations must have been more or less common within the luxury architecture of the Nabataean upper class. Their introduction probably occurred in the very late first century BC or at the beginning of the first century AD, and one could argue that the Nabataeans adopted such Roman style heating systems as a kind of reaction to similar features in Herodian luxury architecture (for similar heating systems in the Nabataean and Herodian realm cf. Kolb and Keller 2001: 319; 2000: 361-363; Netzer 1999).

The above-mentioned floor slabs measure usually about 40cm x 80cm, with the exception of the slabs forming the water drain that measure about 60cm x 80cm. All the slabs are bedded into a foundation layer consisting of smaller and broken fragments of slabs and clay containing earth — the so called *samaga*. The same construction technique is applied for all the floor slabs of the complex belonging to its first building phase. More specifically, this foundation technique was observed in rooms 1, 7 and 8 (cf. plan on FIG. 12) as well as within the northern portico and inside the courtyard. On the other hand, rooms 2 and 4 show a different foundation for their floor slabs. In both latter rooms, a layer of whitish mortar was used for the bedding of the slabs, a technique otherwise not known from the Nabataean period.

Some additional information regarding the façade of the "Soldier Tomb" and its relation to the rest of the complex, more specifically to the courtyard, were also obtained. A small sounding immediately in front of the entrance to the tomb furnished important details regarding different aspects of the lowest part of the façade, never visible since antiquity (Schmid 2002). The new elements allow us to propose a complete reconstruction of the façade as on figure 10. Further, the excavation revealed a rock-cut podium in front of the entrance, measuring 3.5m in width. For the moment it is not know how large the podium was, but it seems reasonable to propose an extension corresponding to the inner half columns of the façade (cf. FIG. 10). The interior of the "Soldier Tomb" is at 932.23-27m asl; two steps give access to the podium being at 931.55-62m asl (the surface of the podium shows some irregularities and was probably covered with slabs analogous to the courtyard). The courtyard is at approximately 930.60m asl (small variations in the

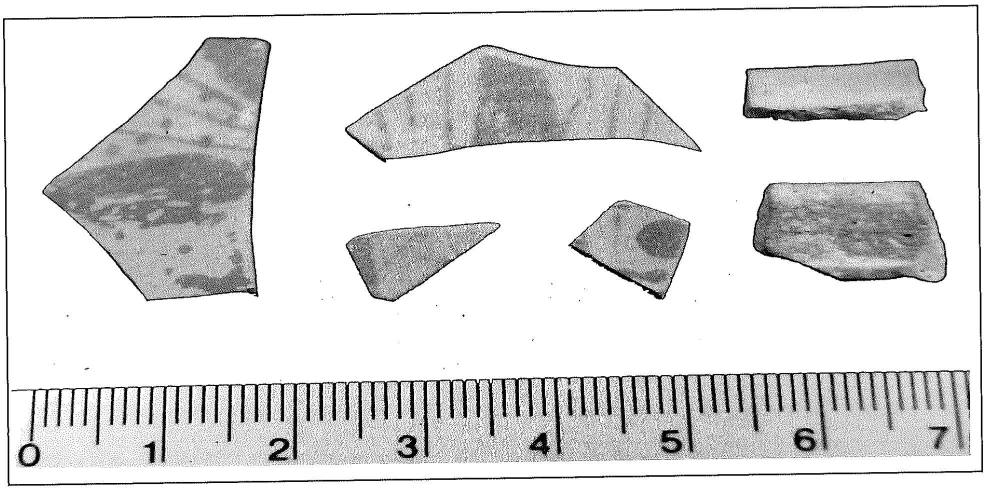


10. Wādī Farasa East, lower terrace. Tentative reconstruction of Soldier Tomb's façade (S.G. Schmid).

actual levels do occur and were probably compensated by the — now mostly missing — floor slabs); finally, the interior of the opposite *triclinium* is at 931.58m asl. In other words, the podium in front of the "Soldier Tomb" is at the same level as the *triclinium* BD 235 and both were accessible from the courtyard by a flight of steps. If we take the height of the preserved steps within the staircase of the *propylon* building (cf. above), i.e. 16-17cm, six steps would conveniently cover the difference of levels. However, nothing excludes the possibility that the steps leading to these principal installations were somewhat higher. For instance, the two rock-cut steps leading from the podium into the "Soldier Tomb" measure 21cm in height.

Finally, we have to consider the question of the chronology for the complex of the "Soldier Tomb". On several occasions it was possible to carry out small soundings beneath the level of the original floor slabs and, thereby, obtain chronological indications for the date of the construction.

Such was the case in rooms 1, 2, 4 and 7 (one sounding each) as well as inside the portico (two soundings) and inside the courtyard (two soundings) (cf. locations on FIG. 12). The floor slabs of the Nabataean period as described above are bedded in a layer of clay containing earth, the so-called samaga. The pottery from the samaga-layer that was found on all occasions in rooms 1 and 7 as well as in the portico and the courtyard (FIG. 11 shows a small sample) belongs to the second and third quarter of the first century AD (phase 3a of Nabataean pottery according to Schmid 2000b). Although only small samples, the fact that there were corresponding results from all six different soundings means that the complex of the Soldier Tomb must have been built somewhere around the middle of the first century AD, during the third quarter of that



11. Wādī Farasa East, lower terrace. Nabataean pottery of second and third quarters of the first century AD from below floor slabs (S.G. Schmid).

century the latest.

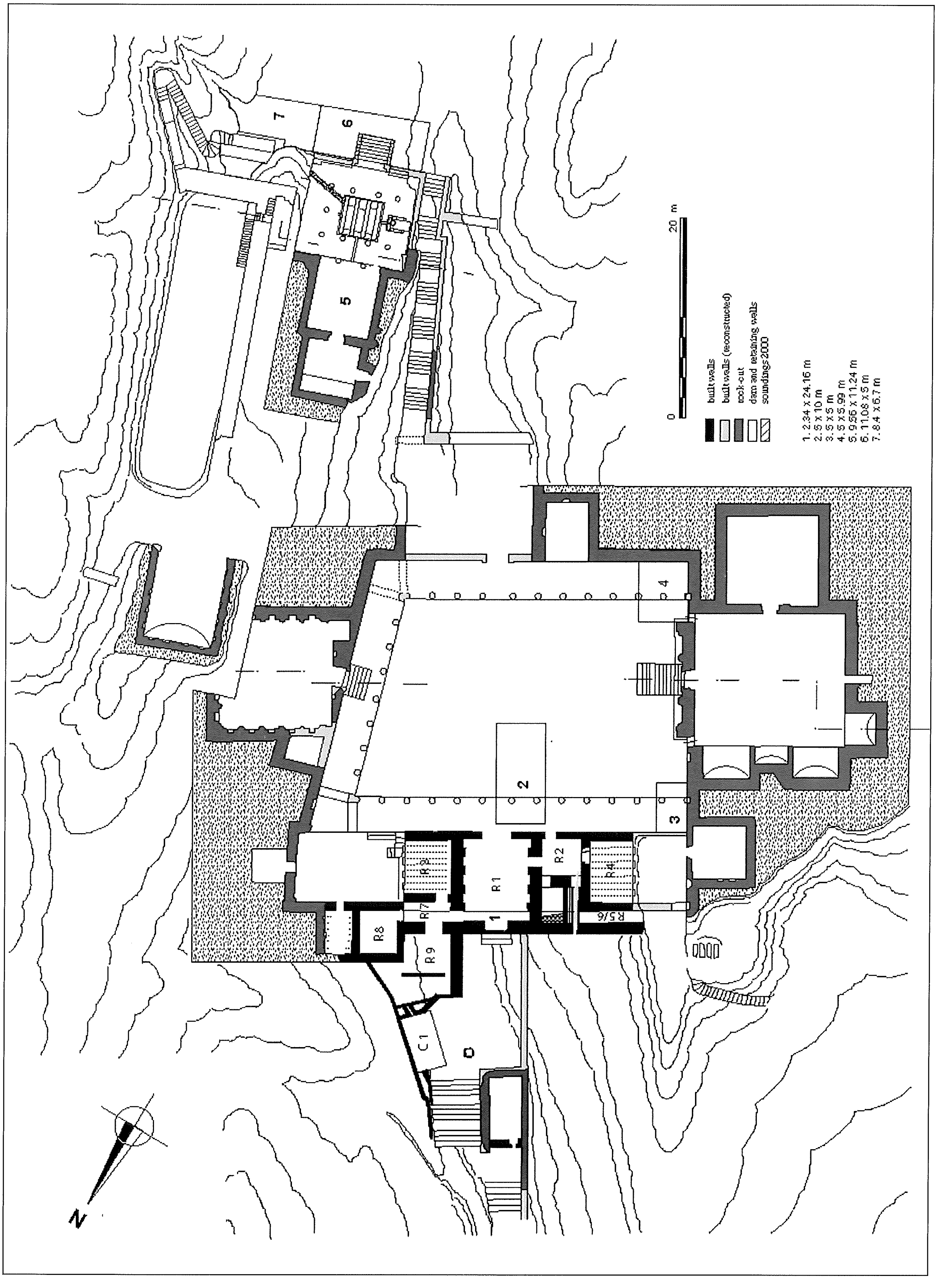
The picture was slightly different in rooms 4 and 7, i.e. the two rooms with a different kind of foundation for the floor slabs (cf. above). Within the mortar bedding described above fragments of pottery and lamps were found belonging already to the second century AD. In other words, the area of these rooms underwent substantial changes after the Roman annexation of the Nabataean kingdom in 106AD. This impression was confirmed by corresponding observations related to the main retaining wall of the entire complex (Schmid 2001a).

III. Comparative Material

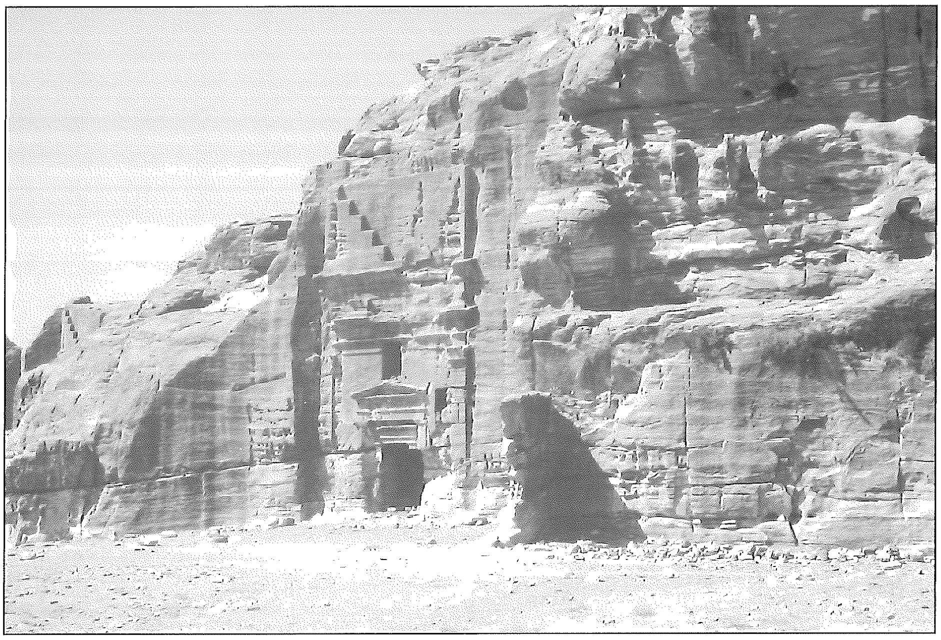
Although for sure the best-preserved and most easily understandable exponent of a multifunctional Nabataean tomb complex, the installations related to the Soldier Tomb are by no means the only such complex, as is already suggested by the inscription of the Turkmaniya tomb (cf. above). The overall plan of the Soldier Tomb's complex as provided by the recent investigations (FIG. 12) can be found, slightly modified, within other installations at Petra as well.

Prominent other examples of such complexes include the Urn Tomb (Brünnow and Domaszewski 1904: 393-398 no. 772; McKenzie 1990: 144-147), ad-Dayr (Brünnow and Domaszewski 1904: 331-335 no. 462; McKenzie 1990: 159-161) and al-Khān (Brünnow and Domaszewski 1904: 195-197 no. 4), now serving as a restaurant at the entrance of the archaeological site of Petra (on these and a few more see Schmid 2001b; 2004; Netzer 2003: 51-57). But the list can easily be lengthened and includes also less spectacular tombs, i.e. tombs of simpler types. Such is the case for instance with tomb no. 676 in the Wādī al-Maṭāḥa on the eastern boundary of the city (FIG. 13; cf. Brünnow and Domaszewski 1904: 373-375 no. 676; Lindner 1978: 88; Wenning 1987: 273). So far this tomb was mentioned mostly for its façade and the inner space, showing 15 rock-cut *loculi*. Lindner pointed out a vaulted cistern some 15m in front of the façade. This cistern, measuring 4m x 4m is a very good parallel of the vaulted cistern in front of the "Garden Triclinium" in the Wādī Farasa East (cf. Schmid 2002; Schmid 2004). Nobody so far has mentioned the remains of built walls in front of the façade, clearly visible especially from above (FIG. 14). These form two porticoes around a courtyard, apparently including other built structures. A preliminary plan and reconstruction (FIGs. 15 and 16) reflect a general similarity with the lower terrace of the Wādī Farasa East and other structures mentioned above. Without the results from the International Wādī Farasa Project one could question the contemporaneity of the rock-cut structures of Tomb 676 and the built ones in front of it, especially since no excavation has been carried out yet. However, as pointed out above, the entire complex of the "Soldier Tomb", including porticoes, courtyard, *triclinium* and other structures, was constructed in the second or third quarter of the first century AD and was the result of a well planned and organized building program. Therefore, one can suggest with some confidence the planned unity of façade and built structures in the case of Tomb 676 in the Wādī al-Maṭāḥa.

Another similar case is tomb no. 649 (Brünnow and Domaszewski 1904: 369 no. 649), the so-called tomb with the armour (FIG. 17). Until now almost exclusively known for the decorations in its Attica-zone, representing a frieze of weapons and heads (McKenzie 1990: 168 being one of the rare authors realizing that their may have been colon-



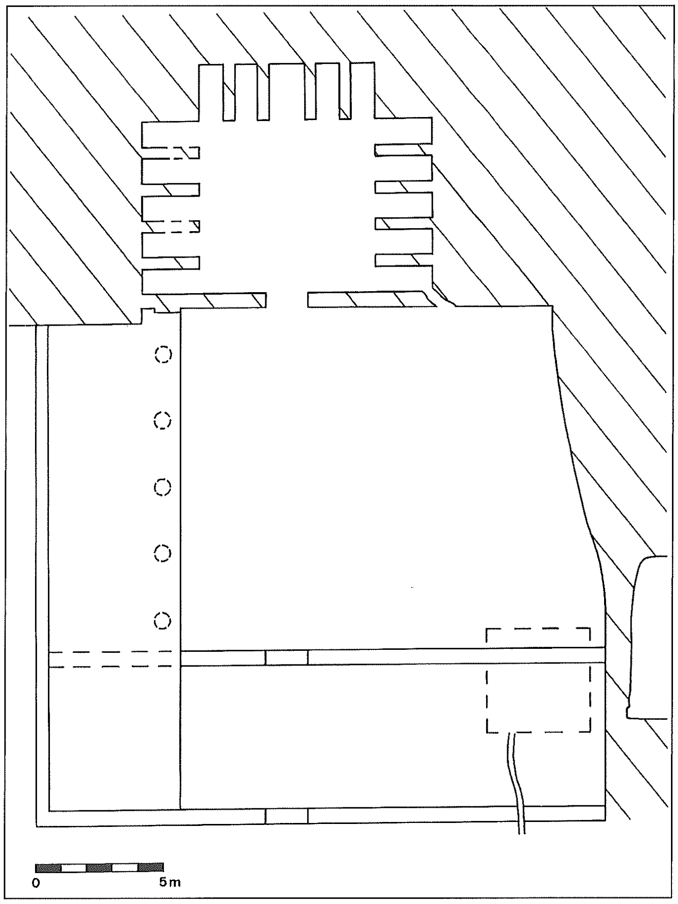
12. Wadi Farasa East. Overall plan of lower and upper terraces, as provided by recent investigations (A. Barmasse and S. Fachard after Bachmann, Watzinger and Wiegand 1921).



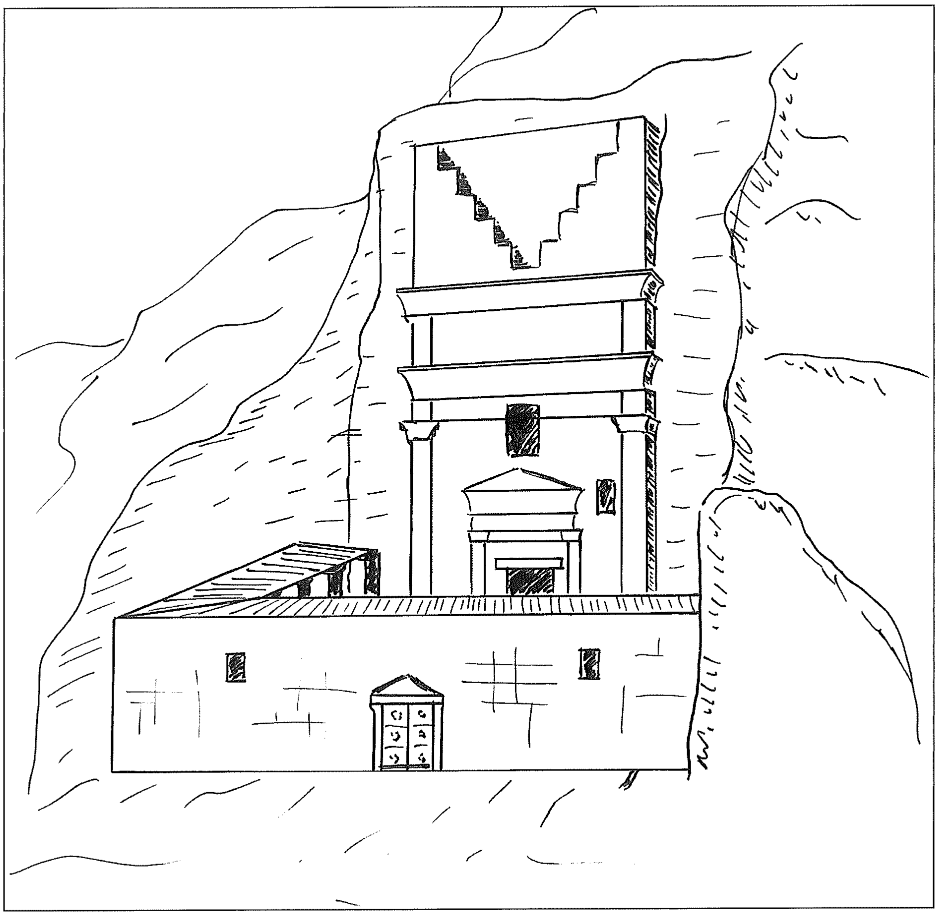
13. Petra, Wādī al-Maṭāḥa. Complex of tomb BD 676, general view (S.G. Schmid).

nades on both lateral sides of the courtyard), the huge courtyard in front of the façade as well as the different adjacent rooms, clearly outlined on the ground, surely belonged to a complex very similar to the ones above described (FIG. 18). Since there is a substantial rock-cut water channel leading to a huge underground cistern a little bit further away,

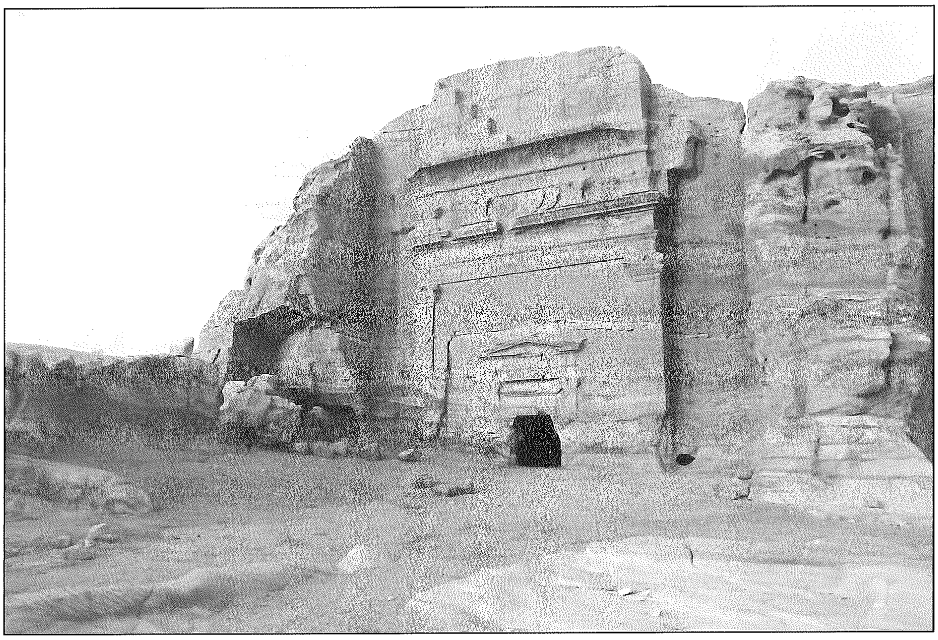
14. Petra, Wādī al-Maṭāḥa. Complex of tomb BD 676 from above (S.G. Schmid).



15. Petra, Wādī al-Maṭāḥa. Complex of tomb BD 676, plan with additional structures (S.G. Schmid).

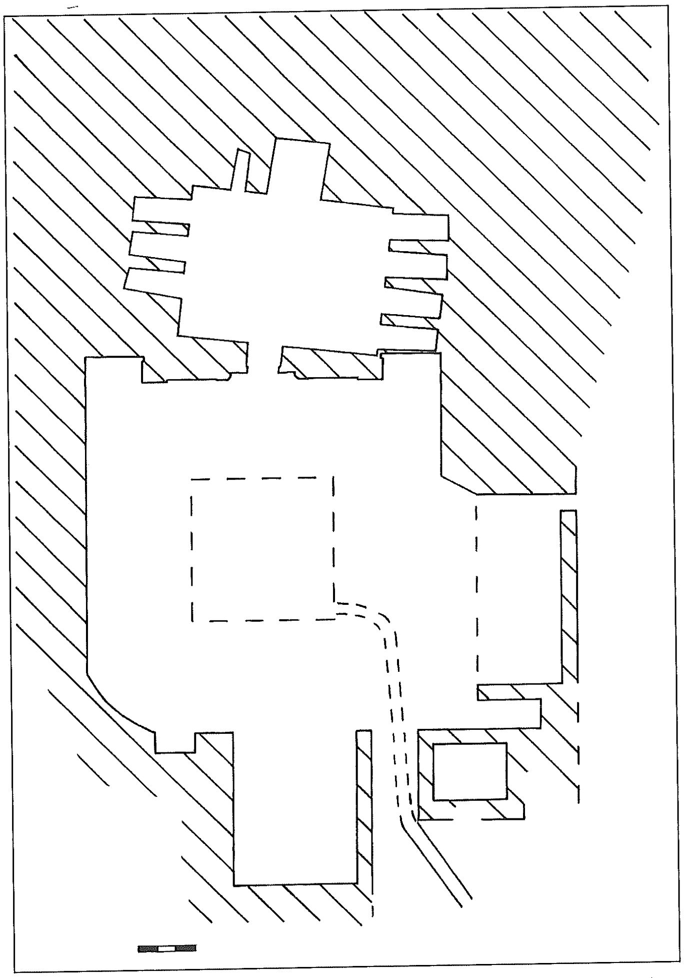


16. Petra, Wādī al-Maṭāḥa. Complex of tomb BD 676, tentative reconstruction (S.G. Schmid).



17. Petra, complex of tomb BD 649 (tomb with armour), general view (S.G. Schmid).

As far as the Roman sphere is concerned, influences of Hellenistic architecture within the rich private buildings start considerably before the late first century BC as pointed out above. However, a clear intensification of these influences, as well as a clear influence of Roman innovation in the luxury architecture of the eastern Mediterranean can be observed during the period we are dealing with. It is probably not a pure coincidence that these phenomena of intercultural exchanges increase immediately after the Roman conquest of Ptolemaic Egypt in 30BC. Some of these aspects can prob-



18. Petra, complex of tomb BD 649 (tomb with armour), plan (S.G. Schmid).

ably be explained by simple fashion, but others go beyond such a superficial explanation and seem likely to be the result of a kind of architectural rivalry between Herod and the Nabataean realm. It is probably not a coincidence either that the monumentalization of Nabataean public and private architecture starts taking place from the last quarter of the first century BC onwards: after the annexation of Ptolemaic Egypt by Rome in 30BC, Alexandrian artists and artisans went to Italy and to Rome as is widely known. It is possible that others found new clients on both sides of the river Jordan. The intercultural contacts between different areas of the eastern Mediterranean and Roman Italy finally led the way to the creation of such spectacular buildings as the palaces and *villae* belonging to the imperial family on the island of Capri, e.g. Tiberius' "Villa Iovis" (on the "Villa Iovis" see Krause 2003; on other *villae* on Capri cf. Lafon 2001: 406 CAP 1-10 with further bibliography).

In this respect, research focusing on structures like the "Soldier's Tomb" complex at Petra will contribute to a better understanding of above mentioned developments and, last but not least, lead the way for the localization and interpretation of the Nabataean royal residences, yet to be identified.

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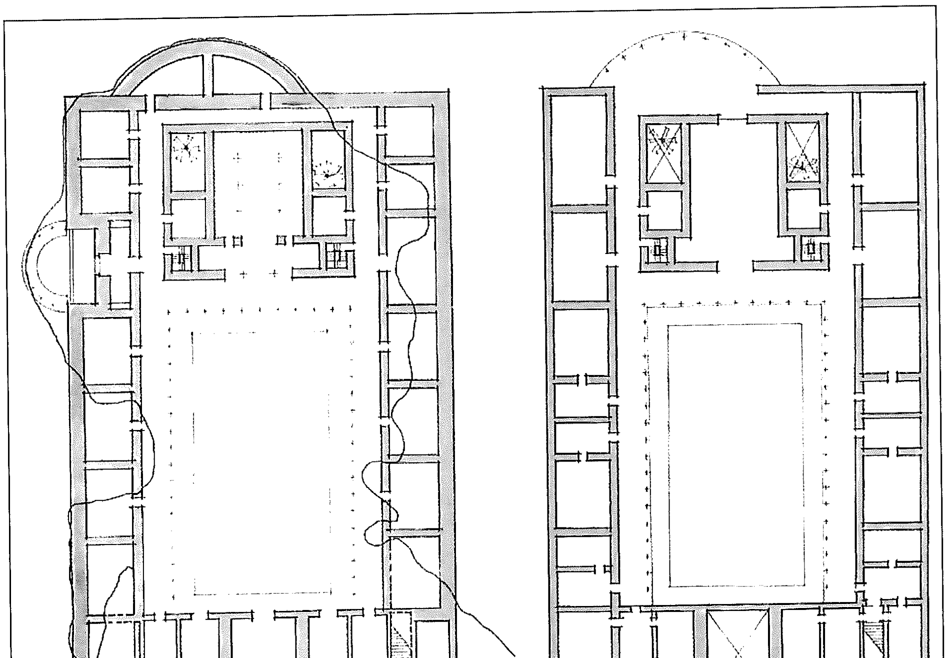
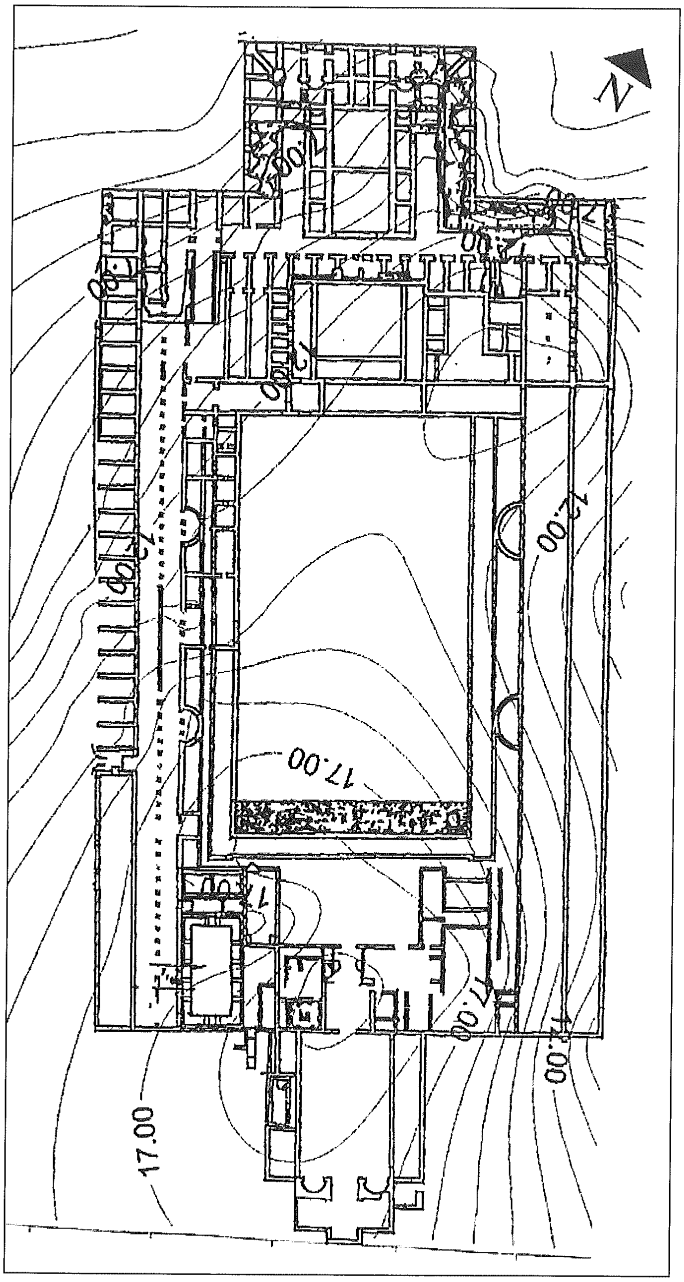


19. Caesarea Maritima, seaside palace of Herod the Great (after Netzer 2001B: 111 fig. 157).



20. Sirmione (North Italy), "Villa of Catull" (after Roffia 1997: 147 fig. 8).

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Echos from Mt. Parnassos
Representations of Muses in the Decapolis*

The Muses, daughters of Zeus and Mnemosyne (the goddess of memory), inhabited the central Greek mountain range of Parnassos. According to literary sources they were believed to have settled the Boeotian Helikon, the pastures of the poet Hesiod, or even Olympus, the official seat of the Greek pantheon. Far from being mere personifications of the arts, these goddesses are considered as an expression of human self-reflection and the ability to identify an individual's position within historical processes. Already in the theogony of the Boeotian poet Hesiod they appear in the canonical number of nine, with each Muse thought to preside over a specific area of intellectual endeavour: Calliope, goddess of the military epic; Kleio, the corresponding divinity of man's peaceful deeds; Euterpe, the flute-player; Erato, guardian of lyric poetry; Urania the guardian of astronomy; Terpsichore, mistress of choric dance; Melpomene, responsible for tragedy; Thaleia, presiding over the Comedy; and Polyhymia, the inventor of the polyphonic chorus and of the lyre play. They were visualised as eternally dancing virgins under the guidance of Apollon: in sum, as divine powers of joy and order serving mortals. The rocky mountain of the Muses is shown on the famous relief signed by Archelaos from Priene, found at Bovillae and preserved in the collections of the British Museum (FIG. 1)[1].

1. Relief representing the Muses dedicated by Archeoloos from Priene. London: British Museum.

* This study on representations of the Muses in Southern Syria and Jordan, submitted as a paper to the VIII. International Conference in the Archaeology and History of Jordan held at Petra in May 2004, is based on a survey of sculpture assembled during the late 1980s in the archaeological collections of the Hashemite Kingdom by the author. It was supplemented with field research in 2002 and 2003 in the archaeological collections of Syria. The author gratefully acknowledges permissions and support provided by the Jordanian and Syrian Antiquity authorities, namely the then and now Directors Generals G. Bisheh, T. Fakhush, A. Hadidi, F. al-Khraysheh, and A. Mo'az.
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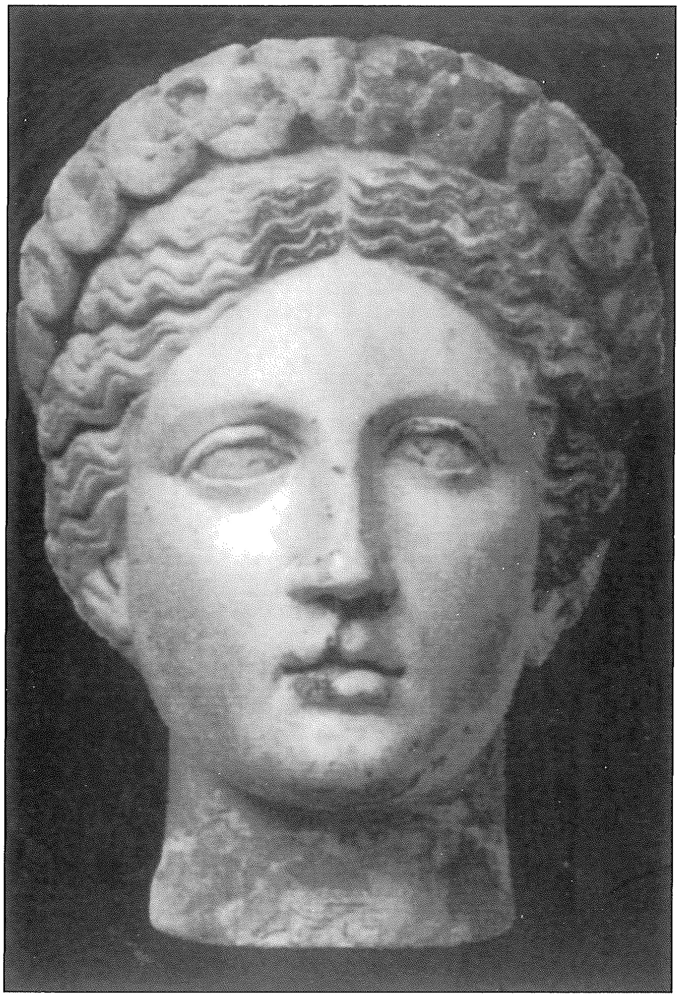
[1] Pinkwart 1965: 15ff. and passim, Pl. 1. In general for the representation of the Muses in Greek and Roman Art s. Faedo and Lancha 1994, passim.

In Syria and elsewhere the Muses were often associated with the Nymphs (Ruge 1937: col. 1566). They are rarely attested in the Province of Arabia. A Greek inscription found in the orchestra of the theatre at Philadelphia/'Ammān is a dedication in verse to the Nymphs and the Muses by a certain Capitolinus (Gatier 1986: 38 No. 12). Theatres are naturally the main places of worship of the Muses where they were sometimes also depicted in decorative sculptures, as a mask-holding female statue found at Caesarea Maritima (now in Milan) suggests[2]. In private spaces the Muses were also the favourite goddesses of Oriental intellectuals who regarded them as embodiments of their Greek cultural lifestyle and education. This is how the numerous depictions in mosaics, at Gerasa, in the environs of Baalbek, and in Antioch, should be interpreted (Zayadine 1986: 416; Faedo 1994: 1013). One room of a late Roman house in al-Ḥumayma (South Jordan) was decorated with frescoes representing the Muses, confirmed by the painted Greek inscription identifying Kleio[3]. A magnificent limestone block from Petra shows the bust of a female goddess in high relief, crowned with a laurel wreath and holding a theatrical mask. F. Baratte interprets this bust as Melpomene,[4] the patroness of tragedy, even though the mask points to another genre of ancient theatre. Gadara of the Decapolis was praised as *Chrestomouseia,* "the one who loves the Muses" (Weber 2002: 310 No. IS 65) in antiquity, yet the physical presence of these goddesses in the Transjordan is virtually unknown.



2. Marble Head of Polyhymnia from Jarash. 'Ammān: Jordan Archaeological Museum. Inv.-No. J. 1837.

This paper is focused upon identifying some sculptural representations of the Muses from the Decapolis hitherto unknown, and linking these statues with two leading art centres of the late Hellenistic and Roman Imperial Era: with Alexandria in Northern Egypt and with the Eastern Aegaeis. The Decapolis, the geographical area of the following survey, includes the southern parts of Syria, the northwest region of Transjordan and a small section of the Palestinian Jezreel plain around the urban centre of Scythopolis.

Polyhymnia, Clio or Calliope (?) from Gerasa

A fine female head (FIG. 2) worked in marble was first published by F. Baratte[5] in the context of the international exhibition on the King's Highway. Allegedly it was found in Jarash. It shows the idealized face of a young woman. The hair is parted in the middle of the forehead and combed towards both sides in fine wavy strands towards the temples. The hair is fixed at the neck by a knot. The head is crowned by a thick wreath arranged in two rows of circular four-leafed flowers each with a small raised ovary. With its well-smoothened slender cheeks, pointy chin and small almond-shaped eyes rendered by sharply incised lids the face is endowed with a detached, classicising appearance. Traces from the running drill, visible at the wreath

[2] Civico Museo Archeologico di Milano, Inv.-No. A 4078, found in 1962 at Cesarea Marittima, in the area north of the scena of the theatre, H. 28cm. Camporini 1979: 57 No. 45 Pl. XXX fig. 45a. b.

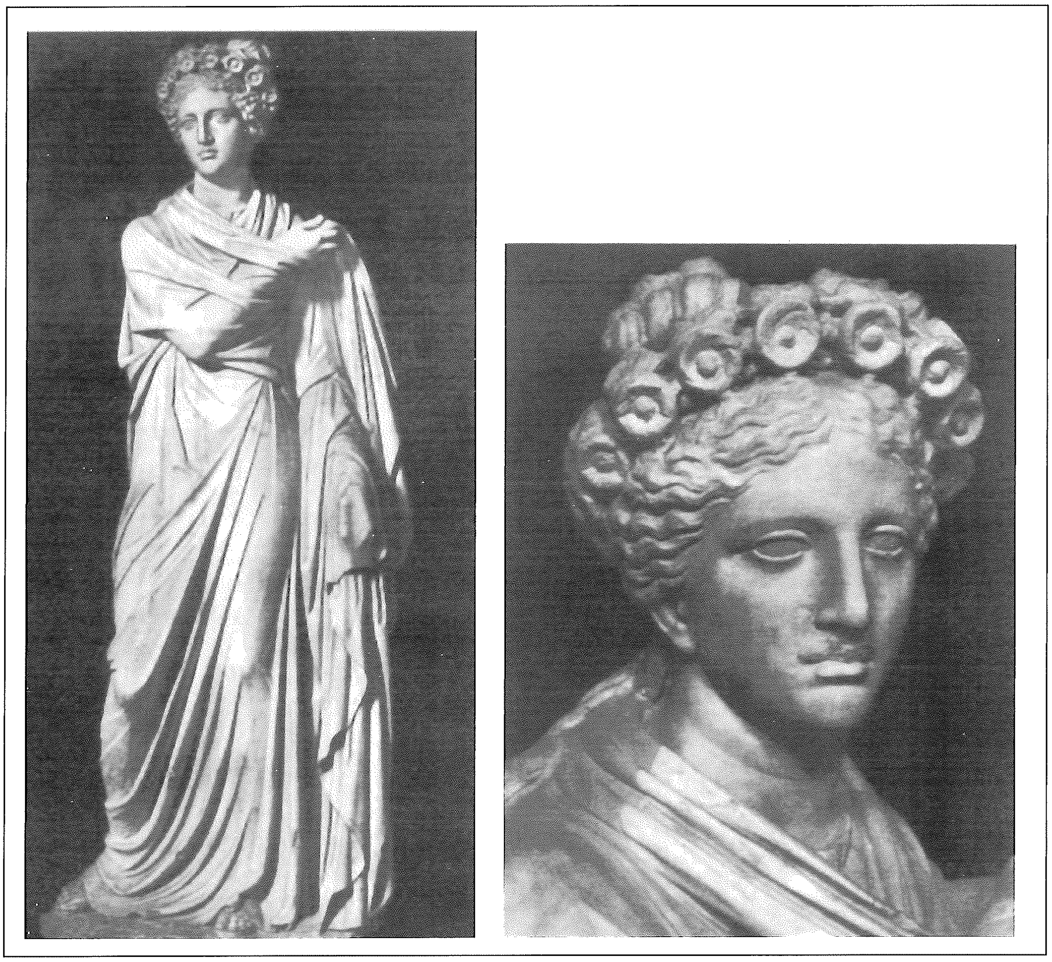
[3] Oleson, Amr, Foote 1999: 422 with ill. The author acknowledges gratefully Prof. Oleson's reference to this fresco by a communication after the Petra conference.

[4] F. Baratte, in: Königsweg 1987: 227f. Nr. 212; Faedo 1994: 1013; R. Wenning, ZDPV 120, 2004, 165 Nr. 12,8. The relief was curiously interpreted as Heriodias, mother of Salome, holding the severed head of John the Baptist by Toynbee (1978: 151, fig. 303).

[5] F. Baratte, in: Königsweg 1987: 278, No. 251; Bakig 1988: 29 fig. 45; Will 1997, colour plate without number; Weber 2002: 489, No. C 9 Pl. 123:A.

and in the separation of the lips, point to a date around the mid-second century AD.

The identification of the person shown can be easily determined: the attribute of the flower wreath and the style of coiffure find close analogies in twelve copies and three variations of a well known sculptural type[6] : The head of one of the so-called Thespiads (FIG. 3b)[7] found in the villa of Cassius south of Tivoli offers the most convincing comparison and leads to the conclusion that the Jarash head once belonged to a statue of Polyhymnia (FIG. 3a). It shows the young lady in a dancing pose, her right leg is slightly inclined backwards, the right arm is inflected and the hand lay on the left shoulder. Her body is entirely covered by a long cloak, whose thick fabric is drawn into oblique folds over the chest by the movement of the right arm. The type of the torso is that of a female draped statue, closely related to that of the so-called small Herculanean[8].



3. (a, b) Polyhymnia of the so-called Thespiads, from Tivoli, found in the Villa of Cassius, Vatican. Sala delle Muse. (a) Statue (b) detail of the head.

[6] Türr 1971, P.63Ff. No. II.

[7] Basing on a reference by Pliny (Nat. Hist. 34.69 and 36.39) W. Amelung (1895) first associated the Vatican Group of Muses and Apollon Musagetes with a sculptural ensemble, which was transported by Mummius from Thespiai in Boeotia to Rome and re-errected there near the shrine of Felicitas. It remains obscure if these "Thespiads" were in fact representations of the Muses, because their appear in Cicero (Verr. 4,2,4) as "profana".

[8] The so-called small Herculanean is one of the most prominent type of draped female statuary, predominantly used for the representation of notables with portrait heads. In the Oriental provinces of the Roman Empire the following specimen of this type are knewn:

a) Beirut, Parc at Charles Maliq Avenue opposite of the Greek Orthodox Church Mar Oula, found at the Rue Fouad Chéhab: Jidejian 1973, fig. 88.

b) Beirut, National Museum, Inv.-No. 2021, from Tripoli. Doumet-Serhal – Maila-Afeiche – el-Dahdah 1998, p. 100 No. 59; 179.

c) Petra, Archaeological Museum, Inv.-No. unknown, found at the northern banks of the Wadi Musa close to the cam of Th. Wiegand's expedition, Parr 1957, p. 12f. Np.22 Pl. XV:B; McKenzie 1988, p. 95 No. 86; Weber 2002, p. 524 Cat.-No. G 16, Pl. 173:F.

d) Damascus, National Museum (garden), Inv.-No. 5693 / 13000, provenance unknown (Syria), with Greek inscription, unpublished.

e) Jarash, Archaeological Museum, Inv.-No. not known, from Gerasa: Weber 2002: 493 Cat.-No. C 20 Pl. 125:E.

f) Damascus, National Museum, Inv.-No. not known, from Palmyra: Bieber 1977, Pl. 102 fig. 611.

A second female draped statue from Gerasa (FIG. 4a)[9] can now definitely be identified as a Muse of a second well known sculptural type: a torso preserved up to the hips was found by the American team under the direction of C. Kraeling in the area of the oval forum close to the sanctuary of Zeus. Perhaps it was originally displayed in the southern theatre. After its recovery the statue was brought to the Citadel at 'Ammān where it broke into three pieces and was scattered in the garden of the Archaeological Museum. A photograph taken by F. Braemer in 1974 (FIG. 4b)[10] shows the torso in a fragmented but still more complete state of preservation which allows an attribution to the type of the so-called Muse of the book roll – Clio or Calliope. One of the most complete Roman replicas of this type is preserved in a statue in the Museo Archeologico at Venice (FIG. 5) to be dated according to C. Schneider to the Antonine period[11]. It shows the Muse leaning with her outstretched

4a. Fragment of a draped female statue from Jarash found in the vicinity of the oval forum. 'Amman: Jordan Archaeological Museum, without Inv.-No. (garden).

4b. Torso of the same statue reconstructed by fragments (situation in 1976). 'Amman: Jordan Archaeological Museum, without Inv.-No. (garden).

5. Roman Marble statue copying the hellenistic prototype of the Muse called "Muse with the book scroll". Venice: Museo Archeologico, Inv.-No. 53.

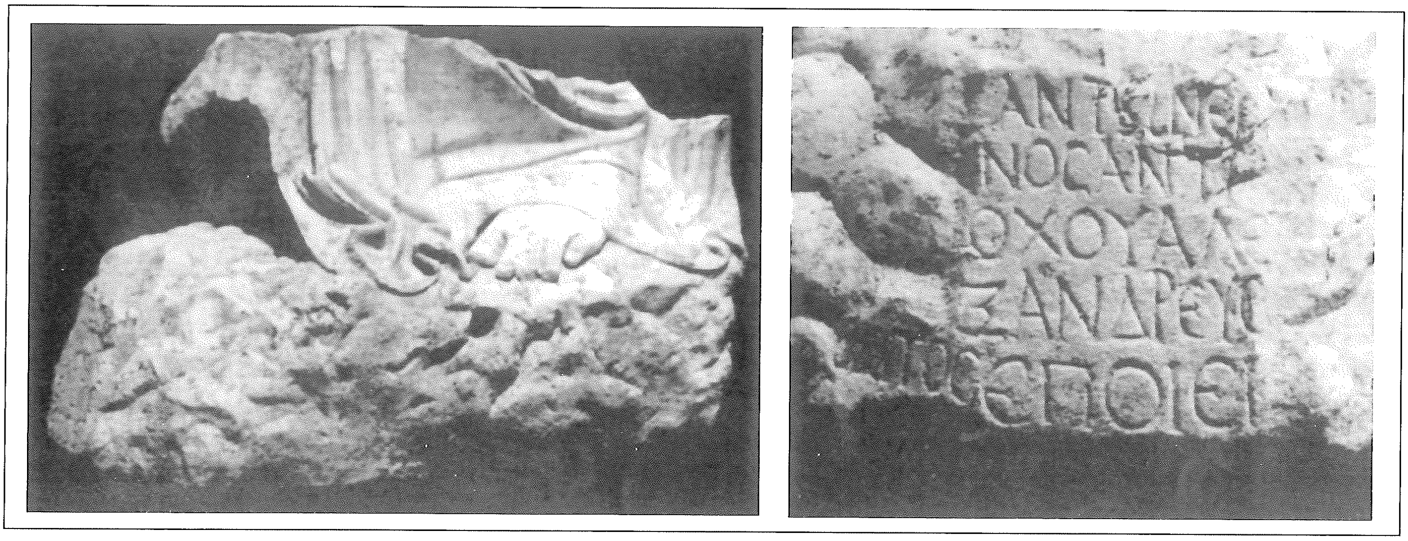
[9] C. S. Fisher, in: Kraeling 1938, Pl. XXXI C; Fischer 1998, p. 264 note 384; Weber 2002, p. 492 Cat.-No. C 18 Pl. 125:A-D.

[10] Neg. No. 1974, 41, 11. I owe sincere thanks to Professor François Braemer (Paris) who kindly attracted my attention to his photo, and for his permission to reproduce it in the forthcoming Studies in the History and Archaeology of Jordan. Today the fragments of the statue are on display in the Jordan Archaeological Museum.

[11] Schneider 1999: 129f. No. 8. The left lower arm of this statue with the pillar and the head are modern restorations.

left arm on a low pillar while the depiction on the Hellenistic relief of Archelaos suggests that the Hellenistic prototype was shown leaning on a rock. The Venice Muse displays the typical drapery, a long chiton and a thin cloak, which is repeated in the Jarash statue and shows that both belong to the same type. From the hem of the cloak, which runs diagonally across the chest, a large panel of fabric is wrapped around the left wrist and covers the outstretched arm, thus creating folds of drapery in an unnatural slanting angle. The lowered right arm, which is covered to the elbow by the half-sleeved chiton, appears inclined forwards; it originally held the identifying attribute, the book scroll[12]. A marble statuette from Ascalon[13] is geographically the closest parallel to the Jarash torso, but it differs in terms of size and date: While the Jarash fragment with a preserved height of 124.6cm suggests the complete statue approximated life size, its counterpart measures only 58cm from the feet up to the broken neck. Due to the fluent treatment of the folds of the garment, R. Wenning has proposed a date in the early first century BC for the Ascalon copy (Wenning 1983: 111, No. 3). In contrast to this, the larger size of the Jarash torso and the harder treatment of the surface by the application of the drill in order to produce deeply cut folds suggest a considerably later date towards the mid second century AD. The Jarash Muse may thus be considered as a Roman imperial copy of a Hellenistic group, whose best-preserved representative is a series of replicas found in the baths of Faustina at Miletus in western Asia Minor[14].

A third fragment (FIG. 6)[15] associated with the Muses comes from Gerasa and was found in the atrium-shaped building adjacent to the eastern baths. This structure was tentatively identified as a Palaestra, probably belonging to the thermal compound by E. Friedland. Amongst the sculpture fragments uncovered in the colonnaded courtyard, a marble plinth stands out: it depicts a rocky ground on which one can discern the lower part of a person in a long garment walking or dancing barefoot in wide steps with naked feet. In 2002 I proposed an interpretation of the person depicted as Apollon (Musagetes), dating it to the reign of Hadrian (second quarter of the second century AD), and attributed the work to an Alexandrian artist (Weber 2002: 488). The tent-shaped lower hem of the long Chiton was caused by the movement of the lost naked right foot, which originally must have been shown vigorously advancing, probably in an act of dance[16]. It had been inserted as a separate piece. The rocky surface of the plinth supports the



6. (a, b) Pedestal with lower part of a Muse or Apollon with the artist's signature, (b) found in the building north of the eastern baths of Gerasa. Jarash Archaeological Museum, without Inv.-No (NEB 2).

12 The book roll is preserved at a terracotta figurine of the same type from Myrina, Paris. Louvre, Inv.-No. Myrina 204, Schneider 1998, 138 No. 19 Pl. 45c.

13 Merker 1973: 178ff. Pl. 47; Wenning 1983: 111f. Pl. 16:4; Kabus-Preisshofen 1989: 147 note 585; Fischer 1998: 139 No. 104; 1; p. 67 mit fig..; Fischer, Tal 2003: 32 Nr. 3; Schneider 1999: 135f. Nr. 15 Taf. 42c.

14 Schneider 1998: 7ff. and passim.

15 Weber 1990: 352; Weber 1993: 50 note 89; SEG XL (1990) 438 Nr. 1392; Friedland 2001: 468ff. No. 3 figs. 9-11; Weber 2002: 488 Kat.-No. C. 7 Pl. 127:D-F; Friedland 2003: 439ff. No. 3 fig. 3.

16 For similar attachments of one protruding foot to a statue of a Muse cf. Bol 1983, p. 139 fig. 39,1.

assumption that the person depicted should be attributed to the circle of the Muses or Apollon the Citharoede. The sculptural workmanship of the fragment is of remarkable quality. According to the isotopic analysis, that marble was quarried at Cape Vathy on Thasos/Greece (Friedland 2003: 441). The sculptor's Egyptian provenance is explicitly indicated by a Greek inscription in five lines on a smooth rectangular field set into the frontal part of the plinth. It reads:

ΑΝΤΩΝΕΙ
ΝΟΣ ΑΝΤΙ
ΟΧΟΥ ΑΛΕ
ΞΑΝΔΡΕΥΣ
ΑΥΤΟΣ ΕΠΟΙΕΙ

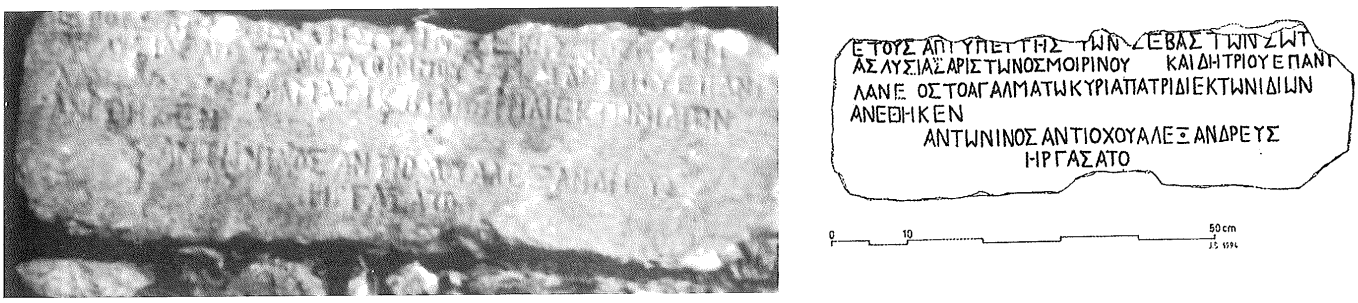
Antoninos,
Son of Antiochos,
the Alexandrian,
made (the sculpture)
by himself

This sculptural fragment may be supplemented by a new epigraphical testimony. Unfortunately, it does not contribute much to the controversy about the date[17]. In the façade of one of the shops at the Circassian Sūq of Jarash, an inscribed block (FIG. 7) had been re-used, referring almost certainly to the same statue. The shape and the material, a yellowish Gerasene Malki limestone, give rise to the suspicion that this block was part of the base of the marble sculpture of which only the pedestal survives. Its deplorable state of preservation makes the deciphering quite difficult[18]

ΕΤΟΥΣ ΑΠ[Ρ] ΥΠΕΡ ΤΗΣ ΤΩΝ [Σ]ΕΒΑΣΤΩΝ ΣΩΤ[ΗΡΙ] | ΑΣ ΛΥΣΙΑΣ ΑΡΙΣΤΩΝΟΣ ΜΟΙΡΙΝΙΟΥ [ΤΟΥ] ΚΑΙ ΔΗ‹ΜΗ›ΤΡΙΟΥ ΕΠΑΝΓ[Ε] | ΛΑΝΕ[Ι]ΟΣ ΤΟ ΑΓΑΛΜΑ ΤΗ ΚΥΡΙΑ ΠΑΤΡΙΔΙ ΕΚ ΤΩΝ ΙΔΙΩΝ | ΑΝΕΘΗΚΕΝ | ΑΝΤΩΝΙΝΟΣ ΑΝΤΙΟΧΟΥ ΑΛΕΞΑΝΔΡΕΥΣ | ΗΡΓΑΣΑΤΟ

In the year (1)81(?) for the welfare of the Augusti Lysias, son of Ariston, son of Moirinios who was also named De(me)trios [followed by a word with unclear meaning] dedicated the statue to the Lady Patria (i.e. hometown) at their own expense. Antoninos, son of Antiochos, the Alexandrian made (it).

There can be little doubt that this inscription refers to the same Alexandrian artist. The dedication of the statue by Lysias to the Lady "hometown" is a common formula, attested in various other imperial inscriptions of the area. Also the use of the plural of ΣΕΒΑΣΤΟΣ as an imperial acclamation does not necessarily point to the co-regentship of two Au-



7. (a, b) Limestone inscription block, the base of the marble fragment of (FIG. 6), re-used in the façade of a shop in the Circassian Sūq of modern Jarash (east). The drawing is by J. Seigne.

[17] Friedland 2001, 468 ff. No. 3 figs. 9-11; Friedland 2003, 439 ff. No. 3 fig. 3. proposes a date in the last quarter of the second century AD, i.e. to the late Antonine or Severian period. Friedland's arguments are mainly basing on paleographic and onomastic criteria. The Greek letters of the pedestal inscription are attested already in the Gerasene early "round alphabet" (C.B. Welles, in: Kraeling 1938, 362 fig. 10), also the form of the Xi with four strokes occurs already in the mid second century AD (ibid. 363 fig. 12 No. 122). One would in fact expect the name Antoninos for an Alexandrian artist after a Roman emperor bore it for first time, i.e. Antoninus Pius. The Name was extremely popular from the mid second century AD to the Byzantine period onward, but it is occasionally attested already in the first century AD, such as Antoninos from Kos (antedates the younger Asklepiades, 100 AD), cf. Fraser – Matthews 1987, 49 s.v.

[18] The inscription was briefly mentioned without a reading by Donderer 2001: 178 f. Nr. 6. The author extends his thanks to the Director General of the Department of Antiquities of Jordan, Dr. Fawwaz al-Khraysheh, and to his deputies in the Jarash branch of his Department who kindly permitted me to re-study this inscriptional block in March 2005 and to produce a Latex mould. Further, he owes gratitude to J. Seigne who supported the deciphering by a drawing of the inscription, executed by him in 1996. W. Eck, R. Haensch, and M. Sartre kindly assisted with critical and helpful comments.

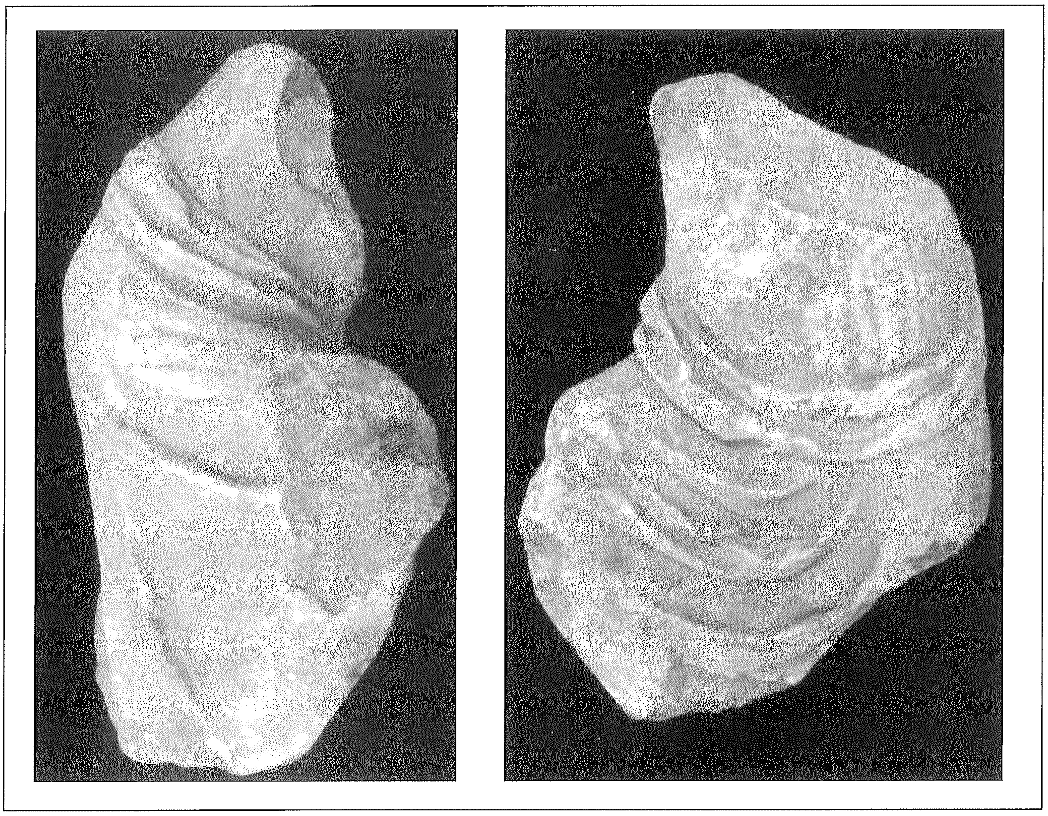
gusti from 161AD onwards (cf. Thomasson 1983). ΣΕΒΑΣΤΩΝ is variously attested at Gerasa even in instances of absolute power of only one single emperor.[19] The date in the first line of the text is much weathered but the characters Alpha for 1 may firmly and – according to J. Seigne's drawing (FIG. 7b) – Pi for the numeral 80 may reasonably be discerned, reading απ´ (= 81). The entirely destroyed third letter excludes a date in the first century and must be either the Greek numeral Pho for 100 or Sigma for 200. Not only the style and technique of the sculpture, but also the scarce trace of what looks like a vertical hasta seen by J. Seigne (cf. FIG. 7b) makes us prefer the first possibility. Thus the numeral should be thus restituted as the year 181 (απρ´) of the Gerasene era. In consequence the date of fabrication of the statue may be fixed to 117/18AD, the time of Trajan's death and Hadrian's succession to the Roman throne.

Melpomene (?) and Apollon Musagetes from Bosra

The excavations at Bosra have yielded considerable amounts of marble sculpture. Among this material two pieces may be highlighted for the sake of the present discussion.

The first fragment (FIG. 8 a, b)[20] of interest consists of a dark bluish-grey, nearly black, marble, covered on most its surface by a translucent patina of ocre colour. In was found re-used in recent masonry of a house in the vicinity of the so-called Nabataean arch. The fragment preserves the waist zone of a draped woman in a stepping pose. The right knee is emphatically lifted and the upper part of the body slightly bent forwards. The woman wears a Chiton of thin fabric producing fine vertical crease folds. Additionally she is dressed with a cloak covering only the lower part of her body. The upper hem of this garment is twisted to a flat bulge crossing her belly shortly above the lap.

This fragment seems to be a simplified variation of the so-called Tiber-statue (FIG. 9) (Neutsch 1956: 46ff. Pl. 13-17) found in 1885 at Rome close to the banks of the Tiber. It displays the characteristic motif of "stepping with one feet upon a



8. (a, b) Torso of a Muse, black Marble (Bigio Morato) from Bosra found in the masonry of a house in the vicinity of the so-called Nabataean Arch. Bosra Archeological Museum (Citadel), without Inv.-No.

[19] Cf. C.B. Welles, in: Kraeling 1938, 373f. No. 2 (Gerasene era 85 = AD 22/23); 3 377f. No. 5 (Gerasene era 132 = AD 69/70); 389 No. 28 (=Gerasene era 142 = AD 79/80); 389 f. No. 29 (= Gerasene era Artemios 21, 160 = AD 98).

[20] Bosra, Archaeological Museum at the Citadel, without Inv.-No., preserved height 41cm; preserved width 24cm; reserved depth 13,5cm. Unpublished.

rock"[21], which was commonly applied to the representations of Muses from the fourth century BC onwards (Türr 1971: 9; Bol 1983: 142).

B. Neutsch associated the "Tiber-statue" with the Muse Vescocali (Neutsch 1956: 51). Among the "Thespiads", the statue type of Melpomene constantly repeats this movement scheme of the lifted leg, for instance in the replica in mirror image in Frankfurt/M. (Bol 1983: 141ff. No. 40 figs. 40,1-5). But the formal spectrum of Roman imperial replicas, with their possible transformations ("Umbildungen") and alterations ("Abwandlungen") is much too wide to attribute the rather mutilated Bosra fragment to any particular sculptural type with final certainty. An interesting aspect of the Bosra piece is its material, a bluish-grey marble, a sort of *Bigio Morato*.[22] It hints at a provenance of the piece in southern Greece or Asia Minor.

9. The Tiber-statue, formerly Rome — private property (D. Vitali).

To the survey of representations of the Muses in the Decapolis region a male beardless head (FIG. 10 a, b) worked in fine-grained white marble and found in Bosra[23] may be added. It represents a person with idealized physiognomical features; the hair is parted on the forehead and fixed by a thick knot (*krobylos*) in the neck. On each side a corkscrew lock is falling towards the shoulders. The head is crowned by a bulky laurel wreath, which points to a person from the Apollonic circle, most probably to the god himself. In his function as the guide of the Muses ("*Musagetes*"), in which he is depicted within the group of the "Thespiads" (Türr 1971: 36ff. Pl. 28-31a) Apollon is shown with this hairstyle and the laurel wreath. Iconographically similar and in terms of chronological style ("Zeitstil") close to the Bosra-head is an Apollon Daphnophorus from Vaison-la-Romaine (FIG. 11)[24]: both may be dated to around the mid-second century AD.

A so-called Philiskos-"Polyhymnia" from Syria

The two female draped statues from Gerasa belong to two different iconographical series, the so-called Thespiads and the cycle of Muses from Miletus. Both go back to Hellenistic prototypes, as does a third famous group, called the "Muses of Philiskos" (Pinkwart 1965: 91ff.; Faedo 1994: 1001f. No. 254a-f). A large marble fragment (FIG. 12)[25] was acquired in 1957 by the Damascus National Museum from a local dealer. A woman draped with a long Chiton and Himation is shown with her upper body slightly bending forward and her right elbow leaning on a pillar-shaped high rock, while her lower arm is raised in order to support the chin of the now missing head with the outstretched palm

[21] Pausanias, Perieg. X 30,3, refering to the motiv in the paintings of Poly- gnotus.

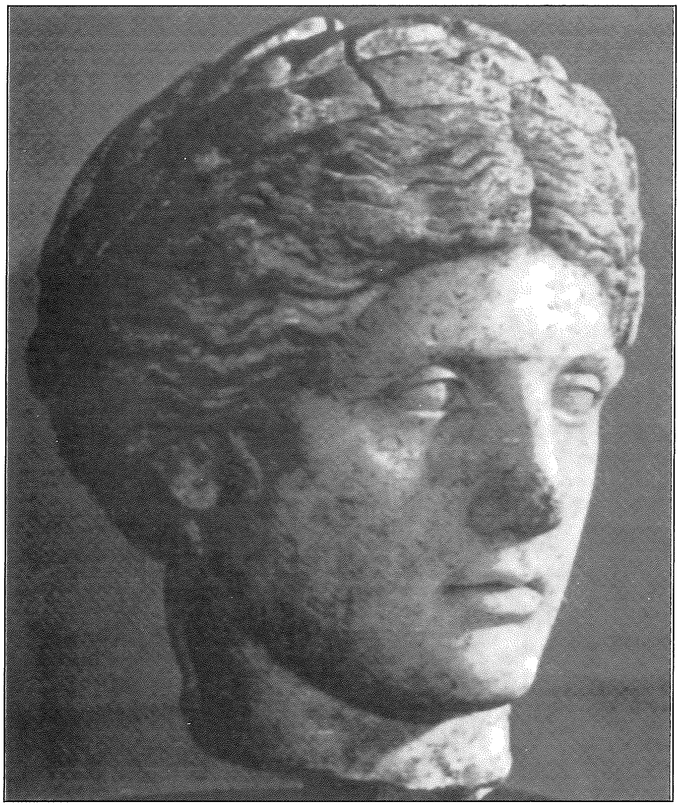
[22] This stone comes from more than one locality. It was extracted from quarries on the western side of the Taenarum promontory on the southern Peloponnese. Other quarries are probably at various localities at Asia Minor and the Dodecanese islands, cf. Ciofarelli 1990: 67.

[23] Bosra, Archaeological Museum at the Citadel, Inv.-No., 532 / 7660 preserved height 26,4cm; preserved width 22,2cm; reserved depth 21,8cm. Weber 2002: 245 note 1971, otherwise unpublished.

[24] Dumoulin 1976, cover.

[25] Damascus, National Museum, Inv.-No. 7824., preserved height 33cm; preserved width 23cm; preserved depth 31,5cm.

10. (a, b) Marble Head of Apollon Daphnephoros from Bosra. Bosra Archeological Museum (Citadel), Inv.-No. 532/ 7660.



11. Marble Head of Apollon Daphnephoros from Vaison-la-Romaine. Vaison-la-Romaine, Musée Archéologique.

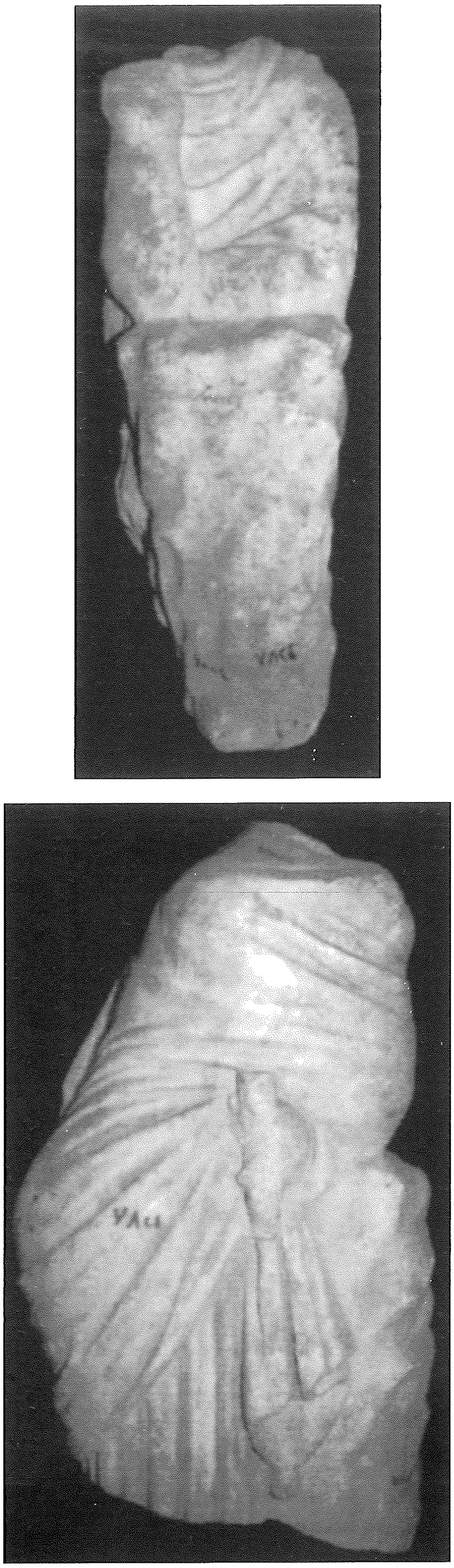
of her hand. Again the motif of the movement can be compared with a series of Roman copies FIG. 13 — (Faedo 1994: 1001 No. 254b.), which are commonly named Polyhymnia. As other Muses, the "Philiskos-Polyhymnia" appears on Roman sarcophagi. Probably the gesture of the hand on the chin, which resembles the mourning pose of numerous Palmyrene loculi reliefs, led to an adaptation of the "Philiskos-Polyhymnia" for other marble sculptures of funeral character in Syria: the upper half of a marble statue in Damascus (FIG. 14a, b)[26] has a female head with idealised traits. Even though the lady repeats the arm gesture of the said "Philiskos-Muse", the veiling of the head indicates a funeral context.

Conclusions

This brief survey of representations of Muses on the territory of the Syrian Decapolis yields the following results:

1. Amongst the female draped statues preserved in the archaeological heritage of the Decapolis, various examples can be singled out as Roman copies of renowned Muse statues. Even though

[26] Damascus, National Museum, Inv.-No. 6146 / 14702, provenance unknown (Syria). The missing lower part of this statue was made separately and joined.



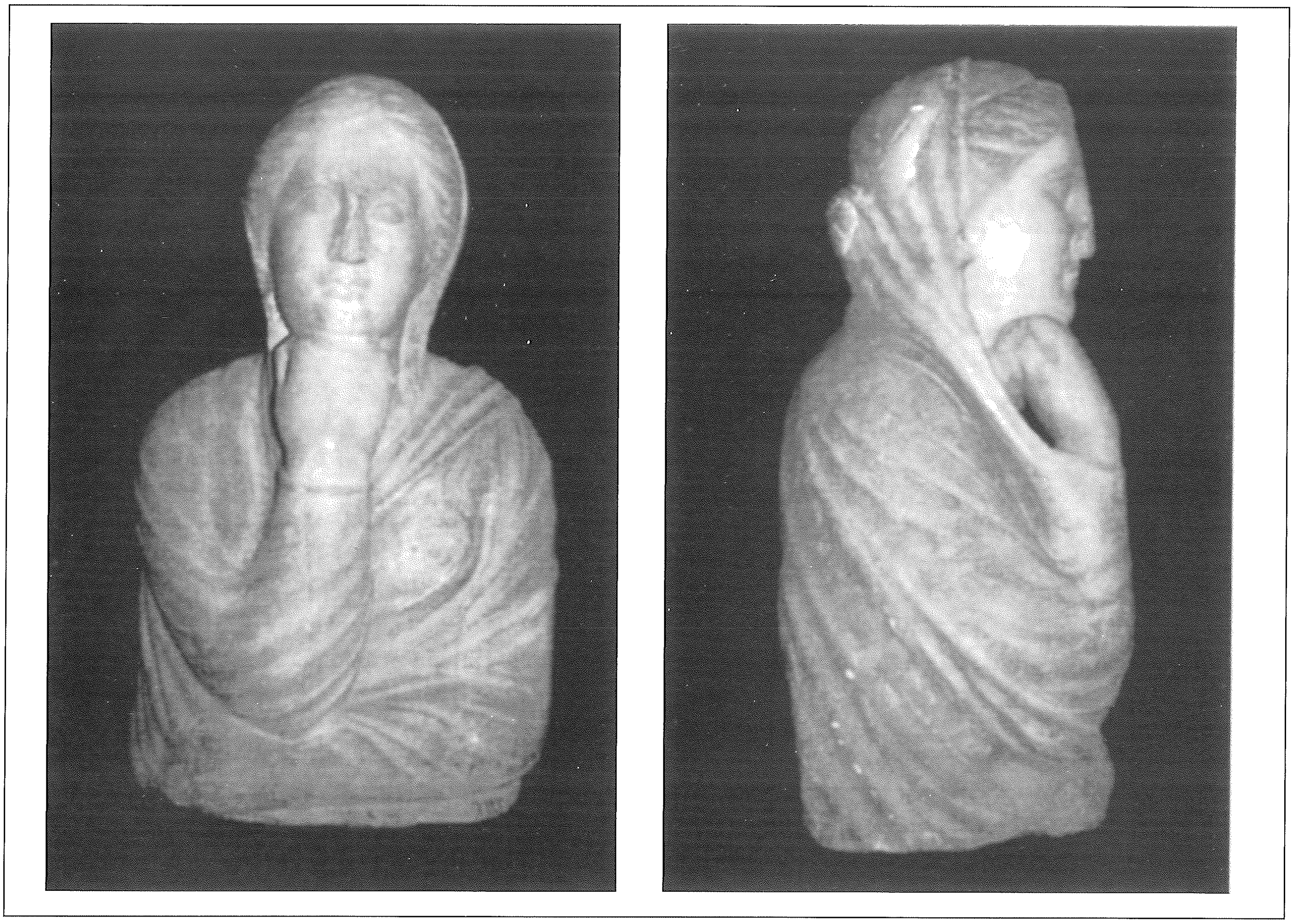
12. (a, b) Marble Torso of the so-called Philiskos-Polyhymnia, from Syria. Damascus National Museum, Inv.-No. 7824.

13. Marble statue representing a Muse leaning on a rock, head and shoulders, left leg with foot, both hand and lower part of the rock restored, found 1729 in the so-called villa of Marius in the vicinity of Frascati. Berlin, Pergamonmuseum, Inv.-No.221.

they are bereft of their iconographical context, they can be attributed to three famous groups, which are derived from Hellenistic prototypes: the so-called Thespiads, the group of the Faustina-baths at Miletus, and the "Philiskos"-Muses.

2. The majority of monuments from the Decapolis representing Muses can be dated to the first half of the second century AD.
3. The statues of the Muses do not provide any evidence of a local sculptural production. Instead an Alexandrian sculptor is testified by inscription. The white marbles are imported from the Mediterranean; the dark grey marble of the Bosra sculpture most likely from Greece or Asia Minor.

The representations of Muses prove an influence of the major cultural centres in Italy, Greece, Egypt and Asia Minor on the artistic production and the mentality of the oriental nobility. Statuary inventories as discussed in this paper displayed in public spaces at the Decapolitanian and Arabian cities may be interpreted as an expression of the Hellenic attitudes in the cultural life of the Semitic population.



14. (a, b) Marble funeral bust representing a veiled woman, , from Syria. Damascus National Museum, Inv.-No. 7824.

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The Hellenistic Period in the Dhībān Plateau: a Quantitative Analysis

The 1996-99 archaeological survey in the Dhībān Plateau has successfully filled out the gap in our knowledge in the region's history (Ji and 'Attiyat 1997; Ji and Lee 1998, 2000). To combine the three seasons of fieldwork from 1996 to 1999, from the evidence gathered, it appears that following the decline in settlement during the Persian period, the Hellenistic period is likely to have experienced a return of settlement and population with about 80 sites occupied. This settlement intensification cycle continued to the end of the Middle Islamic period, possibly without any substantial disruptions. Eight of the 80 Hellenistic sites may be regarded as significant population centers. These eight are the following: Khirbat Sāliya (Site 3), al-Jumayl (Site 4), ar-Rāma (Site 23), al-Mudayna as-Sāliya (Site 20), al-Mushayrifa (Site 254), Qaryat Falḥa (Site 293), al-Qubayba (Site 283), and Duhfura (Site 334). Since the completion of the survey, however, little has as yet been published in detail with respect to the Hellenistic settlements in the Dhībān plateau. The purpose of this paper is fill this lacuna by presenting a quantitative analysis of the survey data from the Dhībān plateau region giving special attentions to the characteristics of the Hellenistic sites and their environmental features.

This paper proceeds in three parts. We first analyze the survey data by site typology, location, size, and regional distribution. It is followed by the analysis of environmental features of the Hellenistic sites such as terrain, vegetation, the position on the slope, and the nearest water source for the site. The final section discusses these findings in a broader historical and archaeological contexts of the Hellenistic period in central and northern Jordan.

Typology, Location, and Size

The characteristics of the Hellenistic settlements are summarized in the columns and rows of TABLE 1. For settlement type, 27 (33.75%) of the 80 Hellenistic sites are classified as cites or towns, while 23 (28.75%) take a form of circular watchtower-like structure (hereafter watchtower-like structure). Twelve and 14 of the sites, together comprising 32.50% of total Hellenistic sites, appear to have related to farming activities as they are interpreted as agricultural installations (cistern, dam, and/or rock-cut cup-hole and basin) and non-military, residential buildings, respectively. Given that in the Dhībān plateau, the watchtower-like structures are associated with either seasonal nomads or farming activities rather than defense purposes, combination of the three types of sites indicates that about 60 percent of Hellenistic sites are to be perceived as rural or pastoral, while approximately 35% pertain to a form of urban life in cities or towns. This indicates a relatively high level of demographic concentration to urban settings.

With respect to site location, 68 (85.00%) of the 80 Hellenistic sites are situated within an area 2km from the plateau edge, while 11 (13.75%) are found in the central plain area. This unequal distribution is typical of the Dhībān plateau as they are also noted in other chronological periods. During the Hellenistic period, human activities were largely confined to the rim of the plateau much as it was in the Early Bronze, Iron Age, and Byzantine-Islamic periods. On the other hand, Hellenistic sherds tend to be found at ancient ruins of various size, but in general show a bimodal distribution pattern in terms of site size. They come from 35 (43.75%), 16 (20.00%), 21 (26.25%), and 8 (10.00%) sites classified as small, medium, large, and very large

TABLE 1. Cross-Tabulation of the Hellenistic Sites by Site Location, Type, and Size (N = 80).

Site Location	Plain	Rim	Wadi	Total
	Site Type*			
City/Town	5	21	1	27
Watchtower-like Structures	1	22	0	23
Cistern/Dam	5	7	0	12
Farmstead Buildings	0	14	0	14
Sherd Scatter	0	4	1	4
Total	11	68	1	80
	Site Size**			
Small	3	32	0	35
Medium	1	15	0	16
Large	5	16	0	21
Very Large	2	5	1	8
Total	11	68	1	80

Note. *Chi-Square (df) = 15.12 (9), p = .06; **Chi-Square (df) = 13.60 (6), p < .05.

respectively.[1] That is, Hellenistic sherds are more likely to center in either small or large-very large sites as compared to the medium-sized sites.

TABLE 1 also presents the results of the cross-tabulation and chi-square analysis of location of Hellenistic settlements according to the type and size of the sites. For site type, the result is statistically significant at the level of $p < .06$ with chi-square = 49.54, df = 13.60. The rim area contains 21 (77.78%) of the 27 cities/towns and 22 (95.65%) of the 23 watchtower-like structures. All four and 14 sherd-scatter and independent buildings, respectively, are also clustered in the band along the rim of the plateau. This points to a uniform pattern of settlement concentration along the plateau rim across all types of settlements except for the agricultural catchment sites tied with cisterns and agricultural dams but no other forms of architectural remains. This is hardly surprising granted that dry farming was probably conducted in the small wadis clustered in the central plateau area; therefore, the cistern and dam sites are associated with these dry-farming activities. The cross-tabulation of location and size posits that sites larger in size tend to be better represented in the plain area than the rim area, while small- to medium-sized sites are predominantly located in the rim area. Small to medium-sized sites are relatively sparse in the plain area. The result for site size is statistically significant, chi-square = 13.60, df = 6, $p < .05$. Despite this variation, however, the overall picture clearly indicates that Hellenistic sites are clustered along the rim of the plateau regardless of type or size.

Regional Analysis of Site Attributes

Turning to the geographical distribution, the southeastern and northeastern quarters constitute almost 80 percent of total Hellenistic sites as they include 40 and 22 sites, respectively.[2] These figures are substantially greater than the five and 13 sites in the southwestern and northwestern sections, respectively. There is apparently a degree of site concentration in the area east of the modern King's Highway. This is not true, however, when the total number of sites of each region is taken into account. The survey recorded total numbers of 14, 90, 114, and 203 sites in the southwest, northwest, northeast, and southeast quarters, respectively. These can be converted to percentages, producing 36, 14, 19, 20%, respectively. That is, the southwestern region shows the highest intra-regional representation of the Hellenistic period, while the northwestern region demonstrates the lowest level of intra-regional density of Hellenistic settlements. The area east of Tall Dhībān is placed somewhere in the middle of these two areas.

The subsequent association of subregion with site type, location, and size yields a couple of tentative suggestions. The results are summarized in TABLE 2. First, Hellenistic sites are situated predominantly along the 2km band of the plateau rim across the four subregions. The ratios of sites in the rim over total sites in the region are 80.00%, 86.36%, 92.31%, and 100.00% for the southeastern, northeastern, northwestern, and southwestern sectors, respectively. Second, for site size, small sites comprise of 45.00%, 40.91%, and 53.85% for the southeastern, northeastern, and northwestern regions. These figures for large and very-large sites combined change to 35.00%, 31.82%, and 38.46% for the regions in the same order. The figures indicate no significant differences in site size across the three regions. The southwestern region is an exception to this generalization since 20.00% and 60.00% of its sites are classified small and large sites, respectively. This extreme ratio seems associated with

[1] A small site is defined as the one with area less than 20 x 20m, medium as 20 x 20m - 50 x 50m, large as 50 x 50m -100 x 100m, and very large as greater than 100 x 100m.

[2] For data presentation, the Dhībān plateau is divided into four geographical sectors, using Tall Dhībān and the King's Highway, the two most prominent ancient city and road system of the entire survey area, as the center point and dividing line. The survey region is first longitudinally divided into east and west along the line of Dhībān-King's Highway, and each then subdivided further into two latitudinal units, north and south of Tall Dhībān.

TABLE 2. Cross-Tabulation of Hellenistic Site Type, Location, and Size by Sub-Regions (N = 80).

Region+	SE	NE	NW	SW	Total
Site Type*					
City/Town	11	8	5	3	27
Watchtower-like Structure	13	7	3	0	23
Cistern/Dam	9	2	1	0	12
Farmstead Building	4	4	4	2	14
Sherd Scatter	3	1	0	0	4
Total	40	22	13	5	80
Site Location**					
Plain	7	3	1	0	11
Rim	32	19	12	5	68
Wadi	1	0	0	0	1
Total	40	22	13	5	80
Site Size***					
Small	18	9	7	1	35
Medium	8	6	1	1	16
Large	9	5	4	3	21
Very Large	5	2	1	0	8
Total	40	22	13	5	80

Note. +SE = southeast, NE = northeast, NW = northwest, SW = southwest; *chi-square (df) = 8.00 (9), p = .74; **chi-square (df) = 12.15 (12), p = .43; ***chi-square (df) = 2.78 (6), p = .84.

a smaller number of total sites in the southwestern region; the small number of total sites has inflated the values of small — and large — site ratios.

Related to site size is the typology of settlements. The analysis shows an interesting pattern of disparity across the five types of settlement by subregion. The shares of watchtower-like structures, cisterns/dams, and sherd-scatter sites are higher in the two eastern regions, whereas those of cities/villages and farmstead buildings are higher in the two western regions. Specifically, the percentage of cities and villages over total sites range from 27.50 to 60.00: 27.50% for southeast, 36.36% for northeast, 38.46% for northwest, and 60.00% for southwest. The northwestern and southwestern regions, respectively, show 30.77% and 40.00% of the farmstead building representation; yet these figures drop to 10.00% and 18.18%, respectively, for the southeastern and northeastern regions. In contrast, watchtower-like structures comprise 32.50% and 31.82% of total sites in the southeastern and northeastern regions, yet they decrease to 23.08% and zero percent for the northwestern and southwestern areas. A similar pattern exists for the sherd scatter sites. All four sherd scatter sites are in the eastern section of the survey area; one (4.55%) in the northeastern sector and three (7.50%) in the southeastern sector. There are no sherd scatter sites in the western half of the survey region. Although slightly different from those of watchtower-like structures and sherd scatters, the analysis of cistern and dam distribution posits higher shares of cisterns and dams in the east. Eleven of the 12 cistern and dam sites are located in the eastern half of the survey area.

The foregoing analysis seems informative for understanding land use by region. Presumably, as stated elsewhere, in the Dhībān plateau watchtower-like structures are closely associated with pastoral nomadism (Ji and Lee 2003). This being the case, the higher concentrations of watchtower-like buildings in the east may posit that pastoral nomadism was more widespread in the eastern area near the desert when compared to the western region. For the same reasons, dams and sherd scatters are likely to be the remains of pastoral nomad's encampment and dry-farming activities. Pastoral nomads used this eastern desert-fringe and steppe area to graze animals; they also may have built dams to conduct seasonal farming activities. This suggests sedentary farming was more typical of the western region than its eastern counterpart. This view receives support from the higher representation of cities, villages, and farmstead buildings in the western region.

The preceding suggestions, however, should not be taken seriously or at best remain tentative, since the subsequent chi-square analyses fail to yield statistically significant results. This fact strongly indicates no substantial regional variations across the four sectors in terms of Hellenistic site typology, size, and location. It also posits that the suggestions in the foregoing section apply to the Dhībān plateau in general. That is, in the Dhībān plateau, Hellenistic sites, regardless of their regional location, concentrate most heavily in the area within 2km from the plateau edge, measure either small or large in size rather than medium, and associate more often with city, towns, and watchtower-like structures as compared to other forms of archaeological sites.

Environmental Features

The Dhībān plateau survey documented four forms of environmental features for the Hellenistic sites. They are environmental terrain, environmental vegetation, nearest water source, and position on the slope. Specifically, as shown in the first tier of TABLE 3, the survey manual categorizes environmental terrain of the sites into four groups; bedrock, rocky, cultivated, and other. Thirty six (45.00%) of 80 Hellenistic sites are located in the areas currently in cultivation or recently cultivated, whereas half of the sites are situated on the bedrock (six, 7.50%) or rocky terrain (35, 43.75%). In light of vegetation, as shown in the second tier of TABLE 3, dwarf shrub is dominant at four (5.00%) sites and 46 (57.50%) sites are barren, while only 28 (35.00%) sites are associated with a certain form of crops or horticulture.

The third tier of TABLE 3 categorizes the water source nearest to the sites. Over 50 percent of the settlements (42, 52.50%) appear have relied on the canyons (the Wādī al-Mūjib and the Wādī al-Wāla) for water; cisterns and reservoirs are found to have been primary water sources for 27 sites (33.75%). The survey team could not identify any near water sources at 11 sites. Water springs are completely absent on the plateau proper. The position on the slope is summarized on the bottom tier of the table.

TABLE 3. Frequency of Hellenistic Sites by Environment and Sub-Regional Division.

Environment	Region+					Chi-Square (df)
	SE	NE	NW	SW	Total	
Environmental Terrain						
Bedrock	3	2	1	0	6	18.21* (9)
Rocky	19	14	2	0	35	
Cultivated	16	6	10	4	36	
Others	2	0	0	1	3	
Total	40	22	13	5	80	
Environmental Vegetation						
Dwarf Shrubs	3	1	0	0	4	20.61* (9)
Bare	25	16	5	0	46	
Cultivated	12	5	7	4	28	
Others	0	0	1	1	2	
Total	40	22	13	5	80	
Position on the Slope						
Hill Top	15	8	7	4	34	23.94** (15)
Upper	3	7	5	0	15	
Middle	9	1	0	0	10	
Lower	3	0	0	0	3	
Valley Bottom	2	0	0	0	2	
Plain	8	6	1	1	16	
Total	40	22	13	5	80	
Nearest Water Source						
Wadi	20	13	6	3	42	9.04 (9)
Cistern	10	7	7	2	26	
Reservoir	1	0	0	0	1	
Unknown	9	2	0	0	11	
Total	40	22	13	5	80	

Note. +SE = southeastern, NE = northeastern, NW = northwestern, SW = southwestern; *p < .05; **p = .07.

Thirty-four (42.50%) sites are located on top of low hills, followed by 15 (18.75%) and 10 (12.82%) sites on the upper and middle parts of the slope, respectively. Only two (2.50%) and three (3.75%) sites are documented as located at the bottom of the valley and the lower part of the slope, respectively. Only 16 (20.00%) sites are situated in the flat plain area. This indicates that the Hellenistic settlers preferred the gently rolling, low hills and their slopes as places for their settlement to the open, flat plain areas in the center or around the plateau.

Regional Analysis of Environmental Features

Having explored the environmental features of the settlements, let us next discuss whether or not there are regional differences in conjunction with environmental features. For environmental terrain, as shown in the top tier of TABLE 3, there are statistically significant incongruities across the four regions, chi-square = 18.21, df = 9, $p < .05$. Hellenistic sites are more likely to be found in the rocky or bedrock terrain in the eastern region as compared to the western region. Rocky and bedrock terrain is associated with 22 (55.00%) of the 40 sites in the southeastern region and 16 (72.73%) of the 22 sites in the northeastern region. Compare these proportions to the 25.08% (three of 13) and zero percent (zero of five) of the northwestern and southwestern regions, respectively. These figures contrast with the 76.92% (10 of 13) and 80.00% (four of five) for cultivatable terrain for the two western regions, respectively. They are also significantly higher than the 40.00% (16 of 40) and 27.27% (six of 22) for the southeastern and northeastern sectors, respectively.

Closely linked with this disparity are the regional differences in environmental vegetation, and the results of the analysis are summarized in the second tier of the table. The vast majority of the sites are associated with dwarf shrub or bare terrain in the southeastern (70.00%, 28 of 40) and northeastern (77.27%, 17 of 22) areas, whereas they relate to less than 30% of the sites in the northwestern (30.76%, four of five) and southwestern (zero percent, zero of five) regions. The differences are again statistically significant, chi-square = 20.69, df = 9, $p < .05$.

The third tier of TABLE 3 indicates that in the northern areas, Hellenistic sites are likely to be located neither at the middle and lower positions of hill nor at the wadi bottom; only two sites are found on the flat plain terrain in northwestern and southwestern areas. This stands in sharp contrast with the 55.00% (22 sites) for the southeastern area and 31.82% (seven sites) for the northeastern area. An opposite picture surfaces for the categories of hilltop and upper position sites. Only 45.00% (18 sites) and 68.19% (15 sites) of the sites are located on a hilltop or upper position of the slopes in the southeastern and northeastern regions, respectively, while 80.00% (four sites) and 92.31% (12 sites) are found in these positions in the southwestern and northwestern regions. The differences are statistically significant, by slightly generous standards, at the $p < .07$ level.

Finally, the bottom tier demonstrates no significant differences across the four regions when water source is taken into account. Cisterns and wadis are the two most common water sources for all the four regions, though the northwestern region shows a slightly higher level of dependence on cisterns than wadis and other water sources.

Put together, two distinctive regional variations stand out in terms of environmental terrain, vegetation, and site position. First, Hellenistic sites in the eastern regions are more likely to be located in rocky or bedrock terrain and relate to dwarf steppe vegetation or bare terrain as compared to those counterparts in the western region. Second, in the eastern area, the Hellenistic period is generally well represented at the lower level of slope and the plain area, while for the western region most of the Hellenistic sites are related to the higher positions of slope but rarely found at the lower levels of slope and in the plain area.

Discussion

Given the Hellenistic evidence from the 80 sites, the Dhībān plateau seems to have been relatively densely populated during the period. It seems to mark a strong resurgence of human activities in the region following the Persian-period settlement hiatus. This finding leads to a few questions with respect to historical and anthropological considerations.

A first question is when this Hellenistic settlement surge took place between the early and late Hellenistic periods. The as yet scant evidence prevents any firm conclusions. Yet there is some circumstantial evidence to show that the intensification of Hellenistic settlement began no earlier than the late Hellenistic period, while the early Hellenistic period is conceived as a continuation of the Persian settlement gap.

First, in view of the survey, the Dhībān plateau lacks typical early Hellenistic pottery such as bag-shaped jars with a thickened everted rim with a triangular-section rim (Guz-Zilberstein 1995: Types JR 1-2) and fish plate with a sharply angled rim (Gitin 1990: Types 214-215). In contrast, the late Hellenistic storage jars with a flanged rim (Gitin 1990: Type 161) are common along with thin, incurved-rim bowls (Guz-Zilberstein 1995: Type BL 8) in the Hellenistic pottery assemblage from the Dhībān plateau.

Second, according to the survey results, pottery of the Roman period is present at 65 of the 78 Hellenistic sites; that is, 81.25% of the Hellenistic settlements are likely to have continuously been used during the Roman period. This figure corresponds to almost 60% of the total Roman sites in the survey region. In a similar vein, 24 (30.00%) of the 80 sites also contained fragments of Nabatean painted ware, comprising 88.89% of the total 27 sites that included Nabatean painted sherds. The evidence indicates a strong settlement continuation from the Hellenistic period to the early Roman-Nabatean period in the Dhībān plateau. This continuity may posit that the majority of the Hellenistic sites are likely to be dated to the late part of the Hellenistic period rather than the early period.

The view that in the Dhiban plateau the settlement intensification took place late in the Hellenistic period has some implications for the study of Hellenistic history in Jordan. In a review of archaeological evidence in Jordan, the lead author suggested that the vicissitude of Tobiah's fortune in the Wādī as-Sπr region closely relate to the overall prosperity of early Hellenistic settlements and their geographical confinement to the central Transjordan plateau and the southern Jordan Valley (Ji 1998, 1999). In light of this thesis, the early Hellenistic period was characterized as the beginning of a return of intensification in settlement. Although the heaviest concentration of early Hellenistic sites occurs in the ʻIrāq al-Amīr region and the southern-central Jordan Valley, the Transjordan plateau also witnessed the outset of a settlement intensification early in the Hellenistic period, which continued to the late Hellenistic period.

Should early Hellenistic remains in the Dhībān plateau prove to be few, we may propose that the Dhībān plateau was still a place of low population level during the early Hellenistic period, even though the period was one of increased population and proliferation of settlements in the areas north of the Dhībān plateau (Smith 1997; Tidmarsh 2001). The onset of Hellenistic settlement in the Dhībān plateau perhaps lags behind by a couple of centuries those of central Jordan and the Jordan Valley. This suggestion, given that the Dhībān plateau was apparently outside of the region that scholars traditionally associate with the Tobiads, lends support for the thesis that the Tobiads played important roles in shaping the landscape of settlements and population in Jordan during the early Hellenistic period. In contrast, the increase in human settlements in the late Hellenistic period dovetails into the picture of northern Jordan that witnessed a new flourishing population late in the period as well. This late increase in settlement, as in northern Jordan, was possibly linked with the dominance of in the region of the Seleucids over the Ptolemies after their victory against this Egyptian kingdom.

Is it possible to further pinpoint the onset of this Hellenistic settlement intensification in the Dhībān plateau? To address this question, it seems worth exploring the Hellenistic settlements in the immediate north of the Dhībān plateau. Ongoing excavations at Khirbat ʻAṭarūz have uncovered Hellenistic evidence, most likely to have been initiated in the mid or late second century BC. At ʻAṭarūz, late Roman evidence is as yet to be discovered, indicating that the Hellenistic settlements at the site did not last long, possibly less than two hundred years. This suggestion also receives support from the relative sparsity of typical late Hellenistic storage jars with a flanged rim (Gitin 1990: Type 161), thin, shallow bowls with vertical side (Lapp 1961: Type 54), and late Hellenistic, folded lamps (Lapp 1961: Type 81). In line with this view is the Hellenistic pottery from the surface of Khirbat al-Qurayyāt. The lead author's 2004 survey of the site points to the presence of human activities at al-Qurayyāt during the late Hellenistic period. Typical first-century early Roman forms, as at ʻAṭarūz, are rather sparsely represented in the pottery corpus from al-Qurayyāt. Overall, ceramic evidence strongly indicates the mid to late second century BC as the chronological range of the Hellenistic settlement intensification in the ʻAṭarūz-al-Qurayyāt area. Given the close geographical proximity, the beginning of the Hellenistic settlements in the Dhībān plateau may correspond to the outset of its counterpart settlements in the ʻAṭarūz area.

Another question is why the northwestern region demonstrates the lowest level of intra-regional density of Hellenistic settlements in the Dhībān plateau. One interpretation is that it associates with the conflict between the Hasmoneans and the Nabateans along the Wādī al-Wāla and the Sayl al-Hīdān (Ji and Lee 2004). These canyons formed the border between the two nations during the second and first centuries BC, although during the early Roman period, Herod appears to have encroached further south into the Wādī al-Mūjib as demonstrated by a couple of Herodian military fortresses in the middle of the Wādī al-Mūjib and the Sayl al-Hīdān (Strobel 1997). There is, however, neither historical nor archaeological evidence showing that the Hasmonean Jews settled down on the Dhībān plateau proper. Should this suggestion be tenable, the Hellenistic inhabitants of the Dhībān plateau very likely came from non-Jewish population groups, possibly the Nabateans or those associated with the Nabateans whose fortunes began to grow rapidly in central Jordan late in the Hellenistic period. Josephus and other historical data attest to intermittent military conflicts and wars between the two rivals during the second half of the late Hellenistic period. This political instability may account for the relatively lower level of Hellenistic settlement density in the northern half of the western section. To some extent, this instability may have deterred people from settling down in the northwestern edge of the plateau.

A final question is the concentration of Hellenistic settlements at major population centers and the area along the plateau rim, leaving the center of the Dhībān plateau more or less sparsely populated. This pattern of Hellenistic settlement appears to relate to the activities of pastoral nomads along the plateau rim (Ji and Lee 2003). In the Dhībān Plateau, the rim area is highly likely to have been the area occupied by nomads for seasonal camping grounds. Hellenistic tower-like remains, as in the Iron Age, probably were summer shelters, watchtowers, or storage facilities built by sheep- and goat-herding tribes who practiced pastoral transhumance, migrating in the Dhībān Plateau and the Dead Sea region during the given period. This does not mean that all the Hellenistic settlers were dependent on pastoral nomadism for their living. Farming also appears to have been a major source of substance and economic wealth. Residents at Falḥa, al-Qubayba, and Duhfuṛa in the central plain and the southern bank of the Wādī al-Wāla were unlikely to have heavily been involved in pastoral nomadism. These places are somewhat off from the main trade route in the region and are located in or near the fertile central plain. Instead, agriculture possibly formed the main part of their economic activities at these sites during the Hellenistic period.

Summary

The Dhībān plateau appears to have witnessed a resurgence of human settlements in the late Hellenistic period, most likely in the mid or late second century BC. This prosperity seems to have continued through the early Roman period, although their northern counterparts in the 'Aṭarūz area possibly decreased or came to an end during the transition from the first century BC to the first century AD or slightly later. In the Dhībān plateau, the late Hellenistic settlements may have come under the control of the Nabateans who began to advance into this region sometime in the first century BC.

A couple of distinctive regional variations stand out in terms of geographical and environmental settlement pattern. In the Dhībān plateau, the Hellenistic period is heavily associated with the rim of the plateau and the populations centers in the rim and plain regions. This seems to reflect the importance of pastoral nomadism in the region along with the farming activities mostly conducted by the sedentary residents of the cities. The analysis also shows a higher level of Hellenistic representation in the eastern part of the Dhībān plateau than in the western region, when measured by the number of total Hellenistic sites in the region. Second, in view of type of settlement environment, Hellenistic settlements in the eastern regions, which is close to the desert fringe, are more likely to be located in rocky or bedrock terrain and relate to dwarf steppe vegetation or bare terrain as compared to their counterparts in the western region. Besides, in the eastern areas, the Hellenistic period is generally well represented at the lower level of slope and the plain area, while for the western region most of the Hellenistic sites are related to the higher position of slope but rarely found at the lower level of slope or on the plain area.

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The Impact of Long-Distance Trade on the Pastoral-Nomadic Populations of Southern Jordan and Northwestern Arabia During the Iron Age

Introduction

It has long been accepted by most scholars that southern Jordan and northwestern Arabia during the Iron Age were home to wandering tribes of desert Bedouin who facilitated the development of long-distance trade between Arabia and the Levant (Albright 1953; Montgomery 1969: 175; Eph'al 1982: 12; De Maigret 1998: 223). Yet, despite this long-held sentiment that both the Arabian trade and "Arab" nomads had a large part to play in the socio-economic world of the Iron Age, few have tried to understand the exact nature of nomadic participation. To put it bluntly, most have been content to assume that the trade simply "happened" and that it in someway was "driven" by the camel nomads of northern Arabia.

This paper, while briefly reviewing the range of historical and archaeological evidence that has been used to connect these regions with ancient nomads and Arabian trade, will argue that both our archaeological and historical perspectives on the trade have been too narrow, focusing only on the most visible and accessible remains of the trade's northern outlets and nodal points. While it is argued that recent interpretive models based on ethnographic and ethnohistoric analogies have dramatically improved our understanding of the mechanics and social dynamics of Arabian trade, we are still lacking direct evidence for the participation of the "driving" mechanism — the ancient desert nomad.

Ultimately, what is needed is a broader archaeological perspective of long-distance trade that incorporates not only evidence from end-points and nodal points but also the very regions the trade traversed, no matter how barren or desolate. These were the areas where the trade was an everyday reality, where the caravans rested and camped, and where, most importantly, nomadic groups were brought into the fold of larger exchange networks.

Historical and Archaeological Background

There is, for certain, a good deal of historical evidence to suggest the trade routes from Arabia to the Levant were growing in importance throughout the Iron Age. We have, for instance, the early biblical traditions of nomadic Midianite/Kenite traders (Schloen 1993), the steadily increasing occurrence of "Arabs" from the Syro-Arabian desert in the annals of the Neo-Assyrian kings (Macdonald 1995: 1364-1367), and now the much cited Suhu inscription which details the sacking of a joint Sabaean-Taymanite camel caravan in the Middle Euphrates region around the mid eighth century (Liverani 1992). When we add to this the generally accepted view that the camel was domesticated as a pack and riding animal ca. 1200 (Kohler-Rollefson 1993: 183-184), that we have our first glimpses of a historical Sabaean kingdom in South Arabia by the mid-Iron Age (Breton 1999: 31-44), and the possibility of a historical Queen of Sheba (Kitchen 1997), most scholars have come to see the Arabian trade as the driving force behind Iron Age state and imperial economies (Eph'al 1982; Byrne 2003).

While very little archaeological evidence has been found to directly substantiate the existence of the Arabian trade (Stern 2001: 297-300), finds from a number of sites in southern Jordan, the Negev, and northwestern Arabia have allowed many to draw conclusions (often contentious) about the trade. The site of Qurayya and the distribution of its famous painted pottery (Parr 1988), along with the presumed development of other Northwest Arabian "oases" (notably Taymā', al-'Ulā, and al-Jawf) (Macdonald 1995: 1360-1362) have often been attributed to the first development of the Arabian trade. Exceptional and smaller "out-of-the-way" sites in these regions have often been interpreted as caravanserais, way-stations, or shrines (Hadley 1993; Finkelstein 1992) while the "ethnically" mixed ceramic assemblages of several major sites in the Negev, the Arabah, and the Edomite highlands have been used to evidence the diverse populations who took part in and benefited from the trade (Singer-Avitz 1999). At a broader historical level, the growth of major population centers and tribal-kingdoms in Jordan and Palestine (Bienkowski 1992: 8, but see n. 7), as well as the occurrence of Assyrian-inspired architecture at capital sites and key nodal points (Stern 2001: 21), has been attributed to the wealth of the Arabian trade or, at least, the desire of the Assyrian kings to control its northern outlets.

Slightly more complicated is the issue of nomadic involvement in the trade. For a variety of geographic, historic, and ethnographic reasons, scholars have assumed the pastoral-nomadic inhabitants of the southern regions were closely involved with the trade in some way (Eph'al 1982: 12; Stern 2001: 295; Hoyland 2001: 60). To evidence this point, it has often been sufficient simply to equate the regions the trade passed through with pastoral-nomadic populations or, at least, a non-sedentary, non-agricultural lifestyle (Eph'al 1982: 12-13). Thus, the nomadic Shasu groups that dominated Late Bronze Age southern Jordan and northwestern Arabia are seen as continuing into the Iron Age (Levy, Adams, and Muniz 2004: 67), eventually transforming into the various "Arab" or "Arab-like" tribes recorded in Neo-Assyrian sources. While the socio-economic nature of "Arabs" in this period can be debated, most scholars have seen them as tent-dwelling camel nomads inhabiting a range of locales within the Syro-Arabian desert. Their mastery of the camel and their knowledge of desert water sources made them both invaluable resources and elusive targets for the Assyrian armies (Macdonald 1995: 1357). Most importantly for our discussion here, however, is the fact that such "Arabs" are regularly mentioned in connection with camels, spices, and other exotic items that could only have been secured via their participation in or protection of the Arabian trade.

Unfortunately, little archaeological evidence for the presence of Iron Age nomadic-groups has surfaced. Depictions of Shasu in Egyptian reliefs, as well as the famous Shīḥān and Bālū'a steles from Jordan suggest that pastoral-nomadic groups may have occupied large portions of this region ca. 1200 (Kitchen 1992: 26-29). The slightly later phenomenon of Negebite pottery (Meshel 2002) and the new findings from the Wādī Fīdān cemetery (Levy, Adams, and Shafiq 1999) also suggest a large pastoral-nomadic population in the southern regions during this period. Some have argued that the numerous early Iron Age enclosures of the Negev highlands and central Jordan represent the sedentarization of nomadic groups, perhaps settling down to take advantage of the Arabian trade (Finkelstein 1988: 248). The large number of rock drawings and inscriptions found throughout southern Jordan and northern Arabia may evidence nomadic participation in trade, perhaps even during the Iron Age, but unfortunately, these are notoriously difficult to date (Betts 2001: 790-792). Finally, deposits of camel bones at Tall Jimma (Wapnish 1981) and the mining site of Timna/Wādī al-Munayi' (Grigson In Press) have been interpreted as signs of nomadic involvement at those sites.

The Traditional Focus

It is a commonly held assumption that the Arabian trade was so lucrative and so profitable that it became one of the major forces driving the territorial ambitions and luxury economies of Iron Age kingdoms and empires. One need only look at recent historical and archaeological syntheses on the Iron Age of the southern Levant to see how central the idea of Arabian trade is to our current economic and political reconstructions for the period (Bienkowski and Van Der Steen 2001; Byrne 2003). In particular, it has become very common to hear that the various conquering individuals and powers of the Iron Age Near East, whether Shishak the Egyptian (Ahlstrom 1993), David and Solomon of Judah (Miller and Hayes 1986: 211-212; Finkelstein 1988: 250-251) or, more typically, the kings of the Assyrian Empire (Eph'al 1982; Stern 2001: 295-296; Hoyland 2001: 60-61), all desired to bring the wealth of the Arabian trade — and by extension, those involved in it — under their control. Although many of these syntheses and interpretations are valuable in their own right and do make the best and most convincing use of the available evidence, they have an inherently top-down view of the trade and its importance. The trade is seen as occurring on a map of the entire Iron Age Near East, in which long routes through vast and unknown desert expanses connect key points in more fertile areas, these being controlled or influenced by state or imperial powers. Ultimately, our perspective on the Arabian trade has become so big that the crucial issues of the trade's mechanics and social-dynamics have largely been neglected in favor of addressing larger questions of economic and political importance.

This top-down approach is likewise mirrored in our archaeological investigations and interpretations. Investigations into the Arabian trade have largely been limited to end points or nodal points through which the trade passed, with the intervening areas assumed to be the territory of "invisible" nomadic groups. Thus, most of our current archaeological perspectives on the trade come from major settlement sites or oases (perhaps "gateways"), such as Tall al-Khalīfa, Beersheba (Bīr as-Sabi'), Qurayya, and Taymā', special function sites, such as Timna and Wādī Fīdān, or "exceptional" sites (interpreted as way-stations or shrines) in more remote desert regions, such as Kuntillat 'Ajrūd, En Haseva, and Horvat Qitmit. Moreover, while surveys undertaken in the desert regions of the southern Levant (Jobling 1993; Meshel 2000) and northern Arabia (Parr, Harding, and Dayton 1970; Adams *et al.* 1977; Ingraham *et al.* 1981) during the past three decades have tried to fill in our knowledge of the vast "in-between" areas, their goals, methodologies, and massive survey areas often allowed them to investigate only the most obtrusive remains and well-trodden paths of the regions they explored. But, it is exactly the data from these sites and surveys that are often used to substantiate broad sweeping generalizations about the origins of the trade, its local and regional importance, and even the role of local nomadic groups in its maintenance and operation (Finkelstein 1988; Schloen 1993; De Maigret 1998; Jasmin 2003). Again, many of these interpretive studies have their own merits but their explanatory power is inherently limited because we are still lacking any real knowledge of the nomadic elements that were driving the trade.

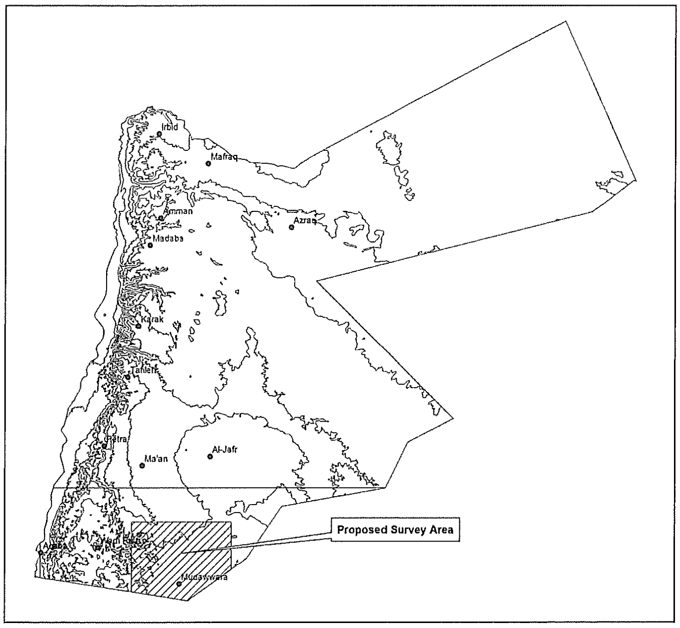
New Directions

A recent article by Bienkowski and Van Der Steen (Bienkowski and Van Der Steen 2001) attempted to take our interpretations one step further by trying to understand exactly how the Arabian trade affected (and was affected by) the nomadic tribal groups of the southern Levant in the late Iron Age. Their model for the available Iron Age archaeological data was based on ethnographic and ethnohistoric accounts for the same regions during the 19th century. The better-documented 19th century nomadic tribal groups provided a sound base for understanding how and why such groups participate in trade, how they relate both to each other and to overarching powers, and how trade is conducted from point to point. Although such methods are not entirely new to modern archaeological practice in the Near East (Adams 1974), they have rarely been applied to issues of nomadic participation in long-distance trade and, until now, never to the Arabian trade specifically.

The development of models rooted in ethnographic, ethnohistoric, and ethnoarchaeological research is essential for moving our understanding of the Arabian trade forward. When ethnographic accounts are used carefully, with a concern for detecting "recurring" socio-economic and political phenomena between different cultures, they can be incredibly valuable tools for interpreting the activities and behaviors that resulted in the silent and often ambiguous archaeological record that we see in the ground (London 2000). Ultimately, such models tell us much more about the mechanics and dynamics of Arabian trade than any map of "Iron Age Trade Routes" ever will. By focusing on the motivations and choices of the trade's participants, rather than on its ultimate economic and political consequences, such models shift our perspective toward the everyday reality of the trade and how individual groups, kingdoms, and even empires became involved in its regular maintenance and operation.

Despite these interpretive advances, however, we are still currently forced to rely upon existing archaeological data that, as argued above, have come largely from the end points and nodal points of the trade. Such interpretive models will only be of so much use unless we begin to investigate the vast desert regions between the known points — in other words, the "forgotten" areas the trade caravans actually traversed and the "invisible" nomadic populations that were so essential to the trade's operation.

It is just such an approach that forms the basis of my own research in the Southern Desert Basin of southern Jordan (FIG. 1). In both a historical and topographical sense, this shallow drainage ba-



1. Map of the Hashemite Kingdom of Jordan with proposed survey area highlighted.

2. Stone enclosure site located just east of Ma'ān — Mudawwara highway.

3. Stone wall enclosing the ancient Bīr al-Mudawwara.

sin, which stretches from the Rās an-Naqab ridge to the Tabūk area of Saudi Arabia, forms a natural corridor linking northwestern Arabia with Greater Syria. Most any map of the Iron Age Near East shows a major route going through this region and, indeed, the later Darb al-Ḥajj ash-Shāmī (Petersen 1989) and the al-Ḥijāz railway (Daher 1995: 342-343) passed right through it.

I believe that an intensive archaeological survey of this basin would help discover some of the "forgotten" elements of the Iron Age Arabian trade. A comprehensive, multi-season investigation of this large but geographically contained feature would be able to record and analyze the full breadth of possible archaeological sites within the basin, from prominent *khirbat(s)* and *rujum(s)* to rock art and epigraphic remains to the smallest sherd scatters (FIGS. 2 and 3). By studying each site's location (both in relation to other sites and surrounding resources), its probable function, and the date and distribution of its surface artifacts, it is likely that a good deal more data could be generated concerning the interaction between nomadic populations and interregional trading networks. When these broader classes of data are then interpreted in light of ethnographic and ethnohistoric accounts of nomadic participation in long-distance trade, we will ultimately be able to say much more about the mechanics and social-dynamics of such networks in ancient times.

Given the ongoing debate concerning the viability of "nomad" archaeology (Chang and Koster 1986; Finkelstein and Perevolotsky 1990; Cribb 1991; Rosen 1992; Frendo 1996), this approach may be optimistic and even a tad naïve but, if we want to achieve a more holistic understanding of the Arabian trade and its consequences, it is an approach that I believe is very much necessary.

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Mud-Brick Town Walls in the EBI-II Southern Levant and their Significance for Understanding the Formation of new Social Institutions

The third millennium BC has long been known as the first period in the Southern Levant during which major town walls were constructed. The mammoth stone fortifications at ʻAyy and Tall Yarmūt offer outstanding examples. In its third phase in EB III, the fortification system at Yarmūt had two separate wall lines with fill in between and massive bastions in places. At ʻAyy the total width of Walls A, B and C in EB III was 17m prompting one of the workman at the site to exclaim that the people who built this wall were very afraid.

Less well known but extremely important and interesting for understanding the emergence of the Early Bronze Age culture is the early development of the fortification system in EB I-II. During the last ten years new data has been published that challenges the accepted dating for the emergence of walled towns and highlights the early use of mud-brick in the late EB I-early EB II fortification walls. Better information on the timing, extent and especially the effort that went into the building of these walls should improve our understanding of the early development of social organization in Early Bronze Age Palestine.

The phenomena of these early mud-brick fortifications will be our subject here. Among the questions I will address are: the purpose, the timing, and the nature of social organization involved in the building of these walls.

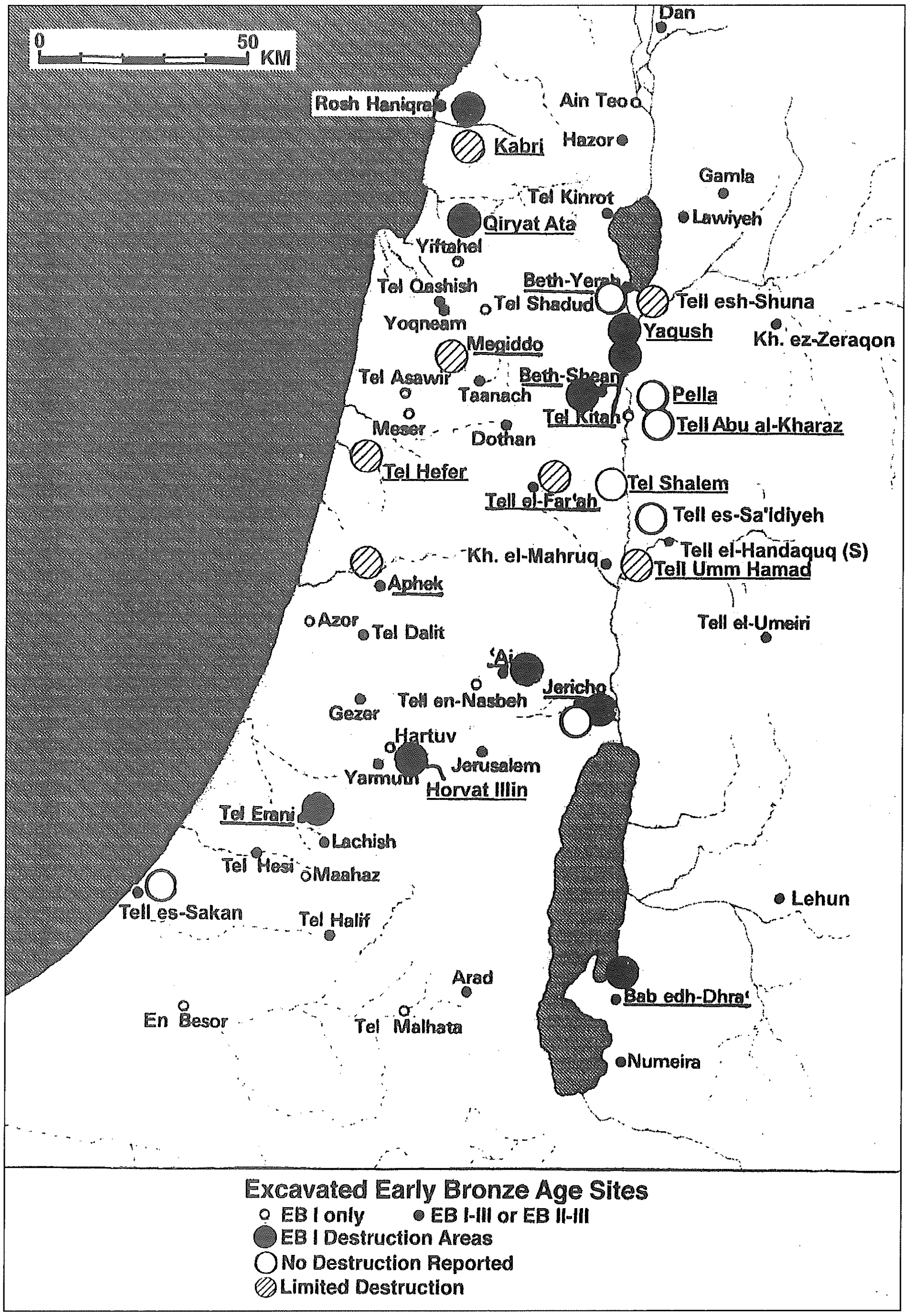
Limitations in the available evidence need to be noted. In the recent literature it is clear that the accepted terminology for the late fourth millennium is undergoing a change. The conventionally accepted terminology for many scholars of EB IA and EB IB is now often replaced with early EB I and late EB I. Other new terminology that has become more and more common for late developments is "the transition period between EB I and EB II". A second problem is that important details in the size of mud-brick and construction techniques are often lacking in preliminary reports (also some final reports).

Purpose of Building Town Walls

The basic reasons for building walls include keeping people in or out. This could mean building a compound or prison to keep people in or establishing borders of a polity to keep others out. Separating an elite group or sacred places by building an acropolis had symbolic meaning. Privacy concerns may come into play as in modern gated communities. A major reason, however, for constructing walls throughout history has clearly been for defense against attacks.

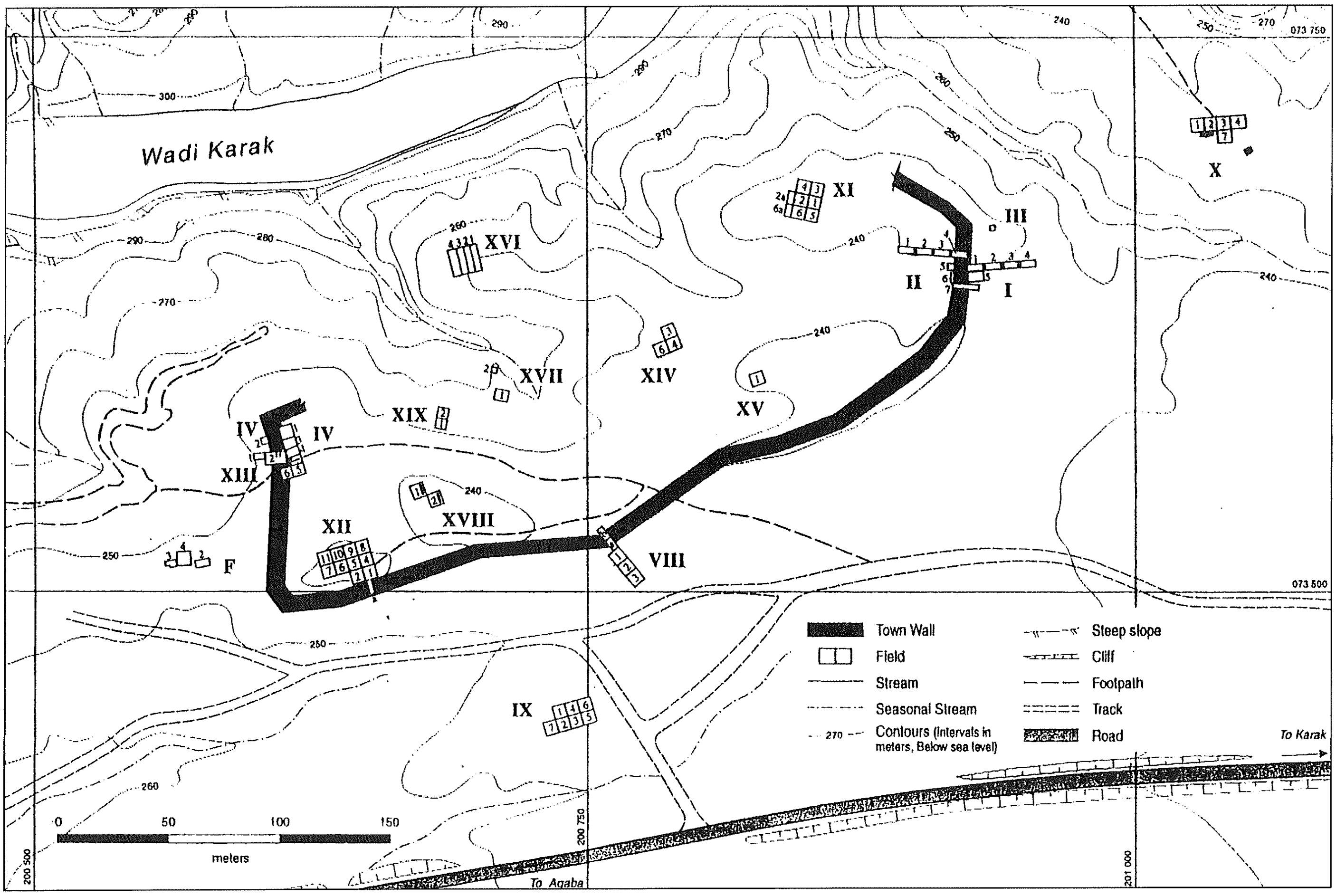
This purpose, defense against attacks, clearly appears to be the predominant reason why walled towns emerged throughout Cis- and TransJordan in late EB I or early EB II. Supporting this stance is the fact that there are clear changes in settlement patterns during EB I. In many areas open villages are relocated or replaced by settlements on more easily defended promontories. Also, when walls are constructed they often were first erected at the most vulnerable areas to attack. In addition, at many sites the construction of the walls appears to have been done in stages with successive thickening of the walls. Most compelling is the evidence for destruction levels at many village sites in the first part of the third millennium which supports the notion of regional conflicts to which defensive walls may have been a response.

The map in FIG. 1 summarizes the reported evidence for destructions at EB I-II sites. I have offered extensive detail on these destruction reports in a paper at the 3ICAANE conference (Schaub 2002) Here, given space limitations, it will suffice to mention only a few of the details. At Bāb adh-



1. Excavated Early Bronze Age Sites in the Southern Levant.

Dhrā' the key evidence is the widespread destruction associated with Stratum IV, the EB IB level of the site. Wherever this level was encountered on the site (FIG. 2), in the spread out village area to the west (Area F), on the periphery areas of the site proper (Fields II, IV, XIII, XII and XI) and also within the interior of the site (Field XIV), it was covered by a heavy burn layer, at times 30cm deep. Two Carbon 14 dates place the destruction between 3300 and 3000BC (Weinstein 2003: 641). One of the EB IB round burial houses of the cemetery, G1, also had a heavy layer of ash with burnt bones in the debris. Among the approximately 150 individuals represented in the scattered skeletal material there were at least three skulls with axe wounds (Ortner 1982: 94). A second round burial house, A 53, also showed evidence of deliberate destruction. There is little doubt that the EB IB unwalled village at Bāb adh-Dhrā' was destroyed and the cemetery was vandalized. In Stratum III, assigned to EB II, the first evidence occurs of a mud brick town wall, 3m wide, at the east end of the site probably associated with a tower (Rast and Schaub 2003: 166-71). The site of Yaqush, in the upper Jordan



2. Contour Plan and Excavated Fields of the Bāb adh-Dhrāʿ Town Site.

valley, slightly north of Beth-Shean, excavated by Esse, provides clear evidence for the destruction of a large village at the end of EB I (1993). Yaqush is a 6 acre site with 4 phases. The latest phase was uncovered both on the summit and at the southeast edge of the mound. This phase, with predominant grain-wash ware, is dated to the very end of EB I. A C14 date on wheat provides a calibrated date of approximately 3200BC. The excavator's description of the site reports that "both areas were dominated by evidence of an extremely destructive conflagration" (Esse 1993: 1502). On the southeast this destruction was labeled as dramatic, with four courses of vitrified brick. According to Esse "the village of Yaqush underwent its greatest development and expansion in the latter part of the EB I and reached its greatest extent at the transition from EB I to EB II, when the entire village was violently destroyed" (1993: 1503). It was later occupied in EB II-III with site size declining to one to two acres.

In the nearby site of Tall Kitan, Stratum VII, with grain wash ceramics, is assigned to the latest stage of EB I (Eisenberg 1993a: 880). Structures included long houses, some with rounded corners and pillar bases with plastered benches. The site apparently underwent sudden destruction and was not occupied again until MB IIA.

At Beth-Shean, the large EB IB building excavated by Mazar is a huge hall with 14 pillar bases and mud brick benches. Band slip or grain wash is distinctive in the ceramic assemblage and a calibrated C14 date ranges from 3300 to 2946. According to Mazar "a violent conflagration destroyed the building, resulting in the partial firing of the collapsed bricks" (1997: 63). There is some occupation in EB II, but it appears to be limited. These are a few examples of major burn layers interpreted by the excavators as associated with destruction at sites in the transition period between late EB I and EB II. In the same time frame mud-brick town walls are constructed at many sites.

The Dating and Consistent Features of the Town Wall Constructions

In the traditional terminology fortifications were usually assigned to EB II. This long established theory of the beginning of fortifications in EB II, however, has been challenged. Some scholars have argued recently for an earlier appearance of fortifications, namely in Late EB I or EB IB (Getzov, Paz and Gophna 2000: 22). Among the possible sites listed are Bayt Yerah, Tall as-Sa'īdiyya, Pella, Tall Abū al-Kharaz, Jericho, Tall Shalem, Aphek, and Megiddo. Tall Sakan in the Gaza area would have to be added to this list (Miroschedji 2002b).

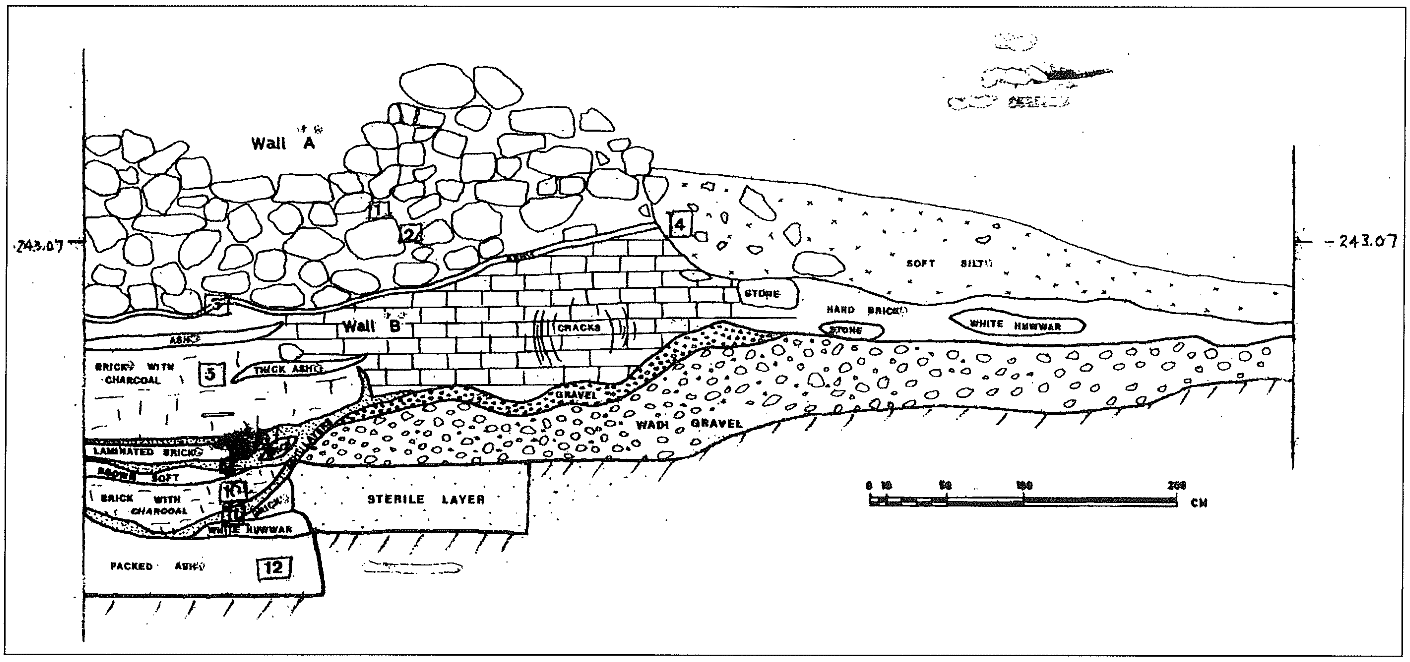
In addition, an examination of the details of these early mud-brick town wall constructions reveals some interesting patterns. The walls were often built on a base level of gravel for drainage. Complex bonding techniques were often employed. At several sites, the walls were built in stages with successive widening of the walls. A few examples from the Jordan valley will help to illustrate the timing and the construction patterns.

Reports on recent salvage excavations at Beth-Yerah describe a mud-brick town wall dated to EB IB (Getzov 1998: 20-21). It was built in several stages. The first stage was a 4m wide wall laid on earth terraces and preserved 4.5m high. This wall was widened in a second stage by a mud brick addition, 2.4m wide, again laid on an earthen terrace.

A not dissimilar situation is found at Tall Shalem in the central Jordan valley. Salvage excavations in 1987 and 1988 revealed a major fortification wall constructed of mud brick in several phases dated to EB IB (Eisenberg 1996: 20). Wall A had several phases of construction and repair with the final state consisting of three adjoined walls with a combined width of 4.5m At a later stage, partly contemporary with Wall A, a second mud-brick wall 2.8m wide was built running on the north side, parallel to wall A. Both walls consisted of sun-dried rectangular mud-bricks, 9cm in thickness.

In addition to these examples mud-brick fortification walls in the Jordan Valley from late EB I have been reported at Jericho, a 3m wall built in three 1m sections, according to Parr's recent hypothesis (2000); Pella, a 2m wall (Bourke 1997), Tall Abū al-Kharaz , an early mud-brick wall (Fischer 1993). In EB II, major mud-brick fortifications were constructed at Tall Rehov (Mazar 2002) and Khirbat Maḥrūq (Eisenberg 1993b).

Bāb adh-Dhrā' is another example for early EB II. At the east end of Bāb adh-Dhrā' a trench through the wall revealed the earliest town wall, built of mud-brick , 3m wide, on gravel (FIG. 3) and a possible tower gate on the exterior (Rast and Schaub 2003: fig. 8.7) Both have been dated in the recent final report to Stratum 3 or EB II, but it is also clear from the priority loci that they were built early in this period. Behind the tower against the high natural hillock Lapp cleared a mud-brick facing of eighteen courses (Rast and Schaub 2003: fig 8.5). The mud-brick fortification wall was not encountered in other sections of the circumference. In these areas it may have been removed in the build-



3. Section of Field II.7/7b at the east end of the Bāb adh-Dhrā' Town site with early EB mud-brick wall below later EB III Stone Town Wall.

ing of the later stone wall or its absence may also indicate that the fortification wall was only thought to be necessary in lower more vulnerable sections of the hillocks surrounding the site.

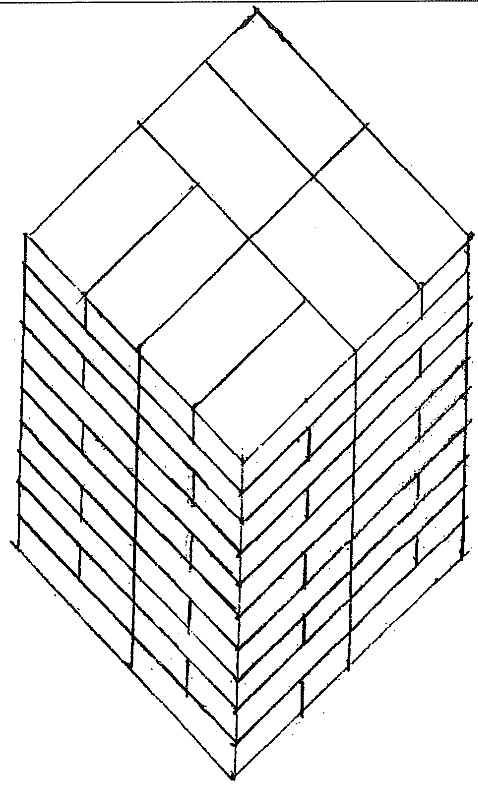
In summary, a 3m wide fortification wall was built at Bāb adh-Dhrā‘ with molded sun-dried mud-bricks directly on gravel early in EB II. A large mud-brick tower was associated with this wall. Similar features of mud-brick construction for walls were found throughout the site at every level in EB IB (Stratum IV). The people who built these were very accomplished in mud-brick construction. Where possible they used gravel as a foundation for drainage and in some instances bonded the walls securely with combinations of alternating header and stretcher courses. The widespread use of sun-dried molded mud-brick appears to be an innovation at the site in Stratum IV.

Social organization required

Compared to the later mammoth stone walls, twenty to thirty feet thick, of EB III these early mud-brick fortifications appear to be minor constructions. Yet, the time and organization involved in building these early walls is impressive on its own and clearly implies an effective social polity which was able to organize the material resources, labor groups and planning of the structures.

Let us look at some of the details. A section of mud-brick one meter square constructed of rectangular bricks in size 50 x 25 x 9cm (a common size observed in excavations) with bonded courses of four headers on one side and four stretchers back to back on the other side in each course requires eighty mud-bricks (FIG. 4). A mud-brick wall, 3m wide and 1m high, 240 bricks, the same 4m high, 960 bricks (at Beth-Yerah and Shalem walls were preserved to this height) and if it extended for 100m it would require 96,000 mud-bricks. If a 6 hectare site (300m long x 200m wide) were totally enclosed it would have required close to 1 million mud-bricks (960,000). No small investment of time and skill.

The manufacture alone of this quantity of mud-brick, although simple in basic process, would have required major organization and manpower. Teams had to dig out the raw material from soil or clay sources and collect the material in suitable areas. Molds had to be made. Large quantities of water would have been needed to mix with the soils to achieve a suitable consistency for putting



1 Cours=8Bricks 10 Course=80
Bricks
Wall, 3m wide, 1m High = 240 Brick
Wall, 3m wide, 4m High = 960 Brick
Wall, 3m wide, 4m High, 100m long = 96,000
Brick
6 Hectare Rectangular Walled Enclosure, 300m
long 200, wide with Wall, 3m wide, 4m
High = 960,000 Brick

4. Column of Mud-brick with Estimates of Bricks needed in various length walls.

into molds. A large area would have been needed for laying out quantities of bricks since one or two days in fairly hot weather would have been needed to dry the bricks. I have made some estimates for the time involved with the help of a modern mud-brick maker from Australia (Jirgens 2003): peter@makeitmudbricks.com.au) which are too detailed to go into here. Suffice it to say that for the forming alone it would appear to have required 600 work-days for one skilled worker to produce the 960,000 mud-bricks for the enclosure wall of a small 3ha. town. Thirty workers at the same skill level would have taken twenty days — if they had the raw materials and sufficient water and space to lay out all of those bricks.

Emergence of Complex Societies

Many reasons have been proposed to explain the origin of complex societies (Renfrew and Bahn 2000: ch. 12). For some, irrigation techniques, which required effective management, were a critical innovation which led to greater yields, and increasing population density. These new techniques required effective management and authority which developed into centralized control. Others have argued for warfare between adjacent polities as the prime stimulation for the emergence of individual warrior leaders and chieftans. Population growth in various forms, Malthusian or Boserupian, environmental constraints and external trade are other reasons frequently posited to explain the emergence of centralized authorities. Most today would argue for multivariate reasons rather than a monocausal explanation. Processes of increasing specialization and intensification and social ranking help to recognize the presence of more complex societies. Some of the correlates helping us to identify these processes in the archaeological record are evidence for full time farming, specialization in crafts, particularly if specialized craft areas may be identified in town plans. Among these correlates major wall building processes must also be included. The evidence and extent of the time and labor required in the building of the mud-brick town walls in EB I-II Palestine clearly points to the emergence of a complex society. The form that this early complex society took, group-oriented chiefdom, corporate village, city-state, may still be beyond our reach without documentation but it is clear that the first complex societies in this region began to emerge in late EB I or early EB II and one of the strongest lines of evidence for that emergence is the construction of the mud-brick town walls.

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The Politics of Land Management in Medieval Islam: The Northern Jordan Survey, 2004*

Today's Jordan suffers from chronic water shortages and a degraded landscape, the legacy of centuries of environmental decline, the direct result of destruction of forests and heavy grazing (al-Eisawi 1985: 56; Ahmad 1989).[1] Historians have attributed the worst of this process to natural and political events that combined in the 15th century AD to weaken Jordan's agricultural base by disrupting markets and destroying village life. They cite "gaps" in the settlement record and references to widespread banditry in written sources as evidence that villages were abandoned on a regional scale and that the tax base had eroded (an argument made most strongly in Brown 1992).

Although entrenched in Jordanian historiography, this model is simplistic and does not do justice to the myriad of other, more cultural, factors that may have been at work. Recent archaeological and archival research suggest that rural provincial administration and indigenous farming practices weakened village structure, on the short term, and negatively impacted the environment on the long term.

In the fourteenth century the Mamluks invested heavily in the infrastructure and agriculture of Transjordan. Yet, in spite of the prosperity and the obvious financial benefit gained from this region, the Egyptian government neglected large parts of Jordan during the fifteenth century (Walker 2003). This political and economic "pull-out" had a mixed effect throughout the region. While in some regions of the country villages were abandoned for permanent settlement and experienced agricultural decline, other areas continued to be productive, grew rapidly in population in the early sixteenth century, and continued to thrive until the Mandate period (Walker 2004b). In short, this period witnessed important shifts in land management regionally, the effects of which can be identified in some of the most pressing socio-political problems in Jordan today, such as water conflicts, demographic pressures, and volatile agricultural markets.

This paper suggests to what degree human factors impacted the country's physical environment during the critical watershed of the 15th century. It is argued that imperial land management policies and local agricultural practices, both responding to the complex relationships between the Egyptian government and Jordanian villages, led to an uneven economic and ecological recovery after the political turmoil of the late Mamluk period and account for the demographic shifts identified in archaeological surveys.

Debate over Mamluk decline

The decline of the Mamluk Empire as a whole is an issue of heated debate among historians of medieval Islam (Walker 2004a). While most historians agree that changing patterns of international trade, military weakness, political corruption, and the Black Death all contributed to the gradual collapse of Egypt in the 15th century, few scholars have explored the role the political structure and government policies had in the general economic

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[1] For recent policy recommendations to stem this decline, see Burrell 1986.

malaise of the period (Levanoni 1995). Much of the traditional focus on natural disasters and political conflict has to do with the kind of sources used, largely dynastic chronicles. The same is true of Jordanian historiography. There is little doubt that the amiral rebellions of the fifteenth century had a ruinous effect on many political centers in southern Syria (Shawkat 2002). However, by relying heavily on chronicles, which naturally emphasize political events in the region, as source material and by not coordinating the work of historians with that of archaeologists working in the country, Jordan's cultural history for the period has been largely neglected. In short, the social factors behind long-term developments, such as environmental and demographic decline, are passed over in favor of political and climatic deterministic models for such processes.

Human factors behind the decline of village life become apparent by consulting alternative bodies of primary data. Mamluk-period waqfiyyāt (written contracts recording the endowment of income-producing properties for social services) and early Ottoman *daftars* (tax registers) are rich sources of information on the medieval Jordanian landscape, agricultural markets, yield and profit, indigenous farming techniques, village structure, and demographics. In addition to these written sources, there are now growing databases of pollen and phytoliths, the result of well-designed geological and hydrological projects. Such archaeoenvironmental studies, combined with regional archaeological surveys, are identifying ways in which the local faunal population was greatly transformed by traditional farming methods (van Zeist and Heeres 1973; Banning 1985; Schoenwetter and Geyer 2000; Cordova and Lehman 2003). Analyses of archived documents combined with such laboratory work are creating a different picture of rural Jordan than was previously available. New models, therefore, must be developed to account for the transformation of landscape and demographic decline that have become hallmarks of the late Mamluk and Ottoman periods in Jordan.

The model adopted for this study is that of political ecology. This area of inquiry, as adapted to the Northern Jordan Survey, combines research methods culled from the disciplines of history, archaeology, geography, and geology and makes use of technologies originally developed in microbiology and electrical engineering to reconstruct the totality of human behavior that has transformed the environment.[2] The frame of reference for environmental studies in political ecology is that nexus where state control (official land management policies) and local practice (farming and cropping methods, settlement patterns, water management) intersect. While natural phenomena, such as temperature change and droughts, are certainly important factors, written documents of the period suggest that market pressures and peculiarities of the provincial administration had more of a long-term impact on village life and agriculture in general.

Climatic Change

Archaeologists studying late medieval Jordan have traditionally attributed the apparent abandonment of villages in agriculturally-rich regions in the fifteenth century to natural disasters (earthquakes, droughts, locusts, floods), plague, and Bedouin predations (Ghawanmeh 1985 and 1992; Brown 1984; Kareem 2000: 12 and 16-17). While many of these disasters were local events, their effects exaggerated by written sources, the physical sciences have corroborated one climatic factor that would have regionally impacted the most water-intensive cultivation: an episode of reduced rainfall after 1300 or 1400AD (Frumkin, Magaritz, Carmi, and Zak 1991: 199).[3] Supporting this picture is a peak in the arboreal pollen curve during the period 1100-1300AD from several boreholes in Israel, which would result from higher overall rainfall, higher humidity, and a richer vegetation (particularly in terms of oak forests and olive trees) than exists today, followed by a reduced rainfall in succeeding centuries (Horowitz 1974: 413).[4] Palaeoclimatic proxy data

[2] The combination of soil samples, ground-penetrating radar, and geological surveys have been adopted in several recent archaeo-environmental surveys in northern Jordan (Wādī Ziqlāb - Banning 1985) and the Jordan River Valley (Ṭawāḥīn as-Sukkar and Khirbat ash-Shaykh ʿĪsā- Photos-Jones *et al.* 2002). While we were unable to utilize GPR this season, as originally planned, we hope to incorporate this technology in locating subterranean walls and water installations in future seasons.

[3] I am grateful to Dr. Burton McDonald of St. Francis Xavier College for sharing with me these sources.

[4] More recent analysis of pollen from deep cores in the Dead Sea indicates longer trends, for the whole of the Islamic period: reduced rainfall accompanying an overall decline in agriculture, triggering forest rejuvenation and increased nomadism (Heim *et al.* 1997). Forest growth, then, can indicate either improved climatic conditions or abandonment of cultivated fields, and is an ambiguous factor in assessing agricultural conditions over the long term.

from the White Nile and the United States West suggests that the draught of the fifteenth century was, moreover, international in scope, (Wigand, n.d.). Alternative readings of the palaeoclimatic data, however, come to very different conclusions. Butzer, on the basis of geomorphological evidence, posits shorter, alternating cycles of increased and decreased rainfall from 1100-1900AD (following Shehadeh 1985: 28). In short, the years of drought recorded in written sources of the late fourteenth and fifteenth centuries likely describe short periods of reduced rainfall. Therefore, draught cannot characterize the entire fifteenth century. Nonetheless, Palmer reminds us that Mediterranean and semi-arid climates regularly experience annual variation in rainfall, which can be quite serious at times, in addition to multiple-year cycles of drought (Palmer 1998: 132). One year of insufficient rainfall would seriously impact the most water-dependant crops in rain-fed areas, causing the wheat harvest for that year, for example, to fail.

Both the phenomenon of demographic decline and the explanations for it, however, should now be reconsidered. While there were shifts in settlements in the Karak highlands, for example, recent fieldwork indicates that the local rural economy was doing generally well, and that some villages, such as Khirbat Fāris on the Karak plateau and al-Rujum (Sughur) in the southern Ghawr, may have been occupied well into Ottoman times, (McQuitty 1997; Whitcomb 1992: 116). If this is the case, then climatic change did not disrupt settlement, nor was there a universal abandonment, or large-scale relocation, of villages, as was once believed. Years of draught on their own do not account for the decline in village life reflected in archaeological surveys. Failed agrarian policies, however, may have exacerbated the economic suffering caused by draught, which together disrupted village life in some places. Inconsistent and short-sighted rural administration is one such example of poor management by the state.

Agrarian policies of the Mamluk state

The region of Transjordan constituted one complete Mamluk province (Karak Province), in addition to the southernmost districts of Damascus Province. The region was initially of strategic importance to the Egyptian state — the *ḥajj* and postal routes ran through its interior — but it gained in economic value in the fourteenth century with state investment in select agricultural enterprises, namely cane sugar plantations, olive oil export, and grains. This investment seems to have coincided with the cadastral survey and redistribution of amiral *iqṭā'āt*, Sultan an-Nāṣir Muḥammad's *rawk* of 1313-1325, and had mixed effects on rural life throughout Jordan.[5] Those districts with the heaviest state investment in infrastructure, such as the Jordan River Valley with its sugar plantations, were transformed into either sultanic or amiral estates and prospered for much of the fourteenth century (Walker 2004b). Many of these estates (*iqṭā'āt*) were subsequently made *waqf* for social services, primarily schools (*madrasa(s)*) in Damascus, Jerusalem, and Cairo (Walker 2003: 244ff). The endowment of Jordanian farms reached a peak at the end of the fourteenth century.

Whether this frenzy of endowments in the early Burji Mamluk period represents a period of economic prosperity or political instability is a matter of debate. The endowing of *iqṭā'āt* is both related to dependable agricultural revenues and the desire to protect land holdings from confiscation by the state. Those endowed estates dependant on state investment and international markets, such as the sugar industry, went into decline over the course of the fifteenth century.[6] Others less dependant on state initiative and geared towards more regional markets — estates producing olive oil, for example — as well as those with a wider agricultural base survived the political turmoil of the period. The fate of large towns at the turn of the fifteenth century was also precarious. Most largish settlements in Jordan were administrative centers of some sort: district or provincial capitals. Mamluk administration of the Transjordan was fluid, at best, with the rotation of rural district capitals among two or three towns or villages and provincial and district borders often adjusted (Walker 2003: 242). Such irregularities in provincial administration, at least for Jordan, may have been one response to the complicated role played by local tribes in the amiral power struggles of the day (Walker 2003: 245). Ḥisbān is a case in point. Made the capital of the Balqā' dur-

[5] For the impact of this survey on Egyptian agriculture and village life, see Sato 1997: 237.

[6] Kareem 2000: 15-17. Nimrīn seems to be one exception to settlements in the Jordan Valley, likely because of its multi-crop industry and its location on an important east-west corridor that allowed for transport of agricultural goods, of all kinds, across the river (Flanagan *et al.* 1992: 106).

ing an-Nāṣir Muḥammad's third reign, it benefited from the good political relations of local tribes with the sultan. However, the citadel was abandoned in the latter part of the fourteenth century, when the capital was moved to 'Ammān, and the village was gradually deserted sometime in the fifteenth century (Walker 2001 and 2003: 249-259).

The long-term economic decline of Jordan during the Late Mamluk period is, then, partially related, to the structure of relationships between Cairo (or Damascus) and Jordanian villages and tribesmen. Jordanian villages experienced the mixed benefits of an uneven investment in local agriculture by the Mamluk state, which was quite exploitative. Some regions, such as the Jordan Valley and central and southern Jordan, experienced a noticeable reduction in settlement, arguably the result of the withdrawal of state political and financial support and reduced rainfall in arid districts. On the other hand, written sources indicate that northern Jordan witnessed little change in settlement and continued to enjoy a viable and secure agricultural base.

Northern Jordan Survey[7]

To account for these anomalies, Oklahoma State University conducted a brief, two-week exploratory survey of select villages in Samar District the beginning of October 2003. This region of the country was targeted because of its successful history of market agriculture in medieval and modern times, its well developed network of roads, the extensive historical documentation about local crops and land in written sources from the Mamluk period to present, and the potential for recovery of pollen remains for soil and environmental history. The specific goals of the 2003 field season were threefold: to document land use from the Middle Islamic period until today, to quantify environmental change and developments in cropping patterns, and to assess the potential of the study area for long-term research on the Mamluk and Ottoman periods.

The area of study focused on the villages of Malkā and Ḥibrāṣ, two of the most important settlements in northern Jordan in the fourteenth century. We conducted an architectural and archaeological survey, combined with surface collection of pottery and soil collection, in three sites within this study universe: Khirbat Malkā,[8] Wādī 'Ayn 'Aṭiyya[9] (a major source of water for Malkā village), and "Old Ḥibrāṣ"[10], in the central eastern part of the modern village.[11] Malkā and Ḥibrāṣ figure prominently in Ottoman tax registers of the sixteenth century and traveller's accounts of the nineteenth.[12] Moreover, Mamluk Malkā is described in detail in an unpublished *waqfiyyah*, still in scroll form, in *Dār al-Wathā'iq* in Cairo.

Although the analysis of this document is still at a preliminary stage, the following observations can be made.[13] The document records the endowment of several urban properties and rural estates in Egypt and Greater Syria owned by the Mamluk sultan Barqūq in 796AH/1393AD. The recipient of the endowment of these properties is a *madrasah* (Islamic law school) that the sultan had recently built in the heart of Cairo. The parchment scroll is handwritten in semi-voweled *naskhī* in a form of legal Arabic used by the Egyptian chancery of this period and, from the facsimile copy available for study, appears to be adequately preserved, with limited water and insect damage.[14] Folia 18-21 of this 2.5 meter-long scroll describe the village of "Ḥay Malkā" at the end of the century and document in some detail the dimensions of the medieval village, the countryside's topography and water sources, the village's taxable agricultural production, and a few of its noteworthy monuments (including the village mosque) and roads. The text also notes what fields, buildings, and installations, such as presses (*ma'āṣir* — presumably for olive oil) have fallen into disuse. Neighboring villages are named, such as 'Ayn 'Aṭiyya, as they constitute the borders of

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[7] This preliminary report builds on Walker, n.d.

[8] JADIS site number 2223.016; UTM (of collection area) 36 75648 E and 3618329 N; elevation ca. 400m above sea level.

[9] UTM 36 234584 E and 399745 N; elevation ca. 350m above sea level.

[10] JADIS 2223.007 – "Hebras"; UTM (of historical mosques) 36 766500 E and 361880 N; elevation 460m above sea level. This is the oldest part of the village, located to the northeast of the Municipality and close to Wādī Ḥibrāṣ.

[11] A "site" for the purposes of this project, is a historically documented village that still retains its place name today. The villages of Malkā and Ḥibrāṣ were first documented in Arabic sources of the fourteenth century (Walker 2004). According to the waqfiyya of 1392, 'Ayn 'Aṭiyya ('Ayn 'Aṭā) was a village at the southwestern boundary of Malkā's estates (folia 18-21). Today it refers only to the spring, the lands watered by it, and a 1/2km stretch of Wādī 'Ayn 'Aṭiyya from the beginning of the valley.

[12] For a list of written sources, see Walker 2004b.

[13] The project director is currently preparing this manuscript for publication. For the published preliminary analysis of this document, see Walker 2004b.

[14] The scroll was restored by the Dār al-Wathā'iq in 2001.

the village estate. According to the *waqfiyyah* the village produced mostly olive oil and wine. It is an invaluable document and one that is ideally suited to an agricultural study of this sort.

Malkā

We identified seventeen features at Khirbat Malkā, the site described in the *waqfiyyah*. The majority of these features were installations related to water diversion and storage or processing of wine and olive oil, were originally Roman or Byzantine constructions, and many reused in the Mamluk period.[15] The centrality of wine and olive oil to the local economy is reflected in the *waqfiyyah*, which makes numerous references to vineyards and presses.

A series of olive oil presses was located in Cave 12; surface collection of sherds included Late Byzantine, Umayyad, Mamluk and Ottoman wares (KM.12). At 13.6 meters wide, 11 meters deep, and 2.14 meters high (from the current floor level), this was the largest of the caves identified this season. Structurally, this industrial complex is quite similar to underground plants in the Galilee and Golan, as one excavated example of an olive press in the Galilee at Horvat Din'ila, dated to the fourteenth century, demonstrates (Frankel 1985: 113).[16] Six shafts, the slots for wooden press beams, were carved deeply into the cave's northern wall surface. Two deep holes, each ten cm wide, supported the end of the vertical support for a screw-and-weight olive press. Almost directly below the northernmost of the two ceiling holes was a broken basalt millstone, 1.5 meters in diameter and 30cm thick. The worn edge was the narrow surface, clearly illustrating its use as a vertical grinding stone, of the sort associated with mortars used to crush large quantities of olives and driven by animals (donkeys). According to calculations made for similar weighted lever plants at Hellenistic Maresha, six hectares of olive groves would have supported this single plant at Malkā and could have produced 13,000-27,000 liters of olive oil annually. Of this amount, over 10,000 liters were surplus, exceeding the needs of local consumption, and were thus available for export (Sagiv and Kloner 1996: 276-277).[17]

Wādī 'Ayn 'Aṭiyya

The survey team walked the entire length of this valley and recorded terrace walls and dams, probably Late Ottoman in date (AA.1); a spring used from the Mamluk through modern periods ('Ayn 'Aṭiyya — AA.2); and a rock cut shelter equipped with its own spring (AA.3), likely used from the Late Ottoman through modern periods. The valley bottom is currently cultivated in olive trees, pomegranate groves, and isolated patches of yellow squash (*jira'*); wild grasses, wild corn, lilac, mint, fig, and natural herbs (such as oregano and phageon) grow wild here and provide forage for goats. The valley was probably once forested, as stands of wild oak, macquis, and scrub pine are still visible. The local government has developed this valley in recent years and has succeeded in its revitalization. The Natural Resources Water Authority of Banī Kināna District constructed concrete canals to carry water from the spring across the valley floor as recently as seven months ago.

There is clear evidence, however, of much earlier agricultural use of the valley floor in the form of dams, terrace and field walls,[18] and channels and drains cut into the bedrock on the lower slopes. At this point it is impossible to date these structures, except in the most general terms. Surface pottery on the valley floor was rare; most of the sherds were Byzantine in date and were from erosional contexts. Soil samples were taken from several of these features, as well as the spring and modern groves.

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[15] These included rock cut installations in bedrock used for water diversion and storage (KM.2 and KM.3) and possible wine presses (KM.4, KM.5, and KM.10); an initial reading of pottery from cleaning KM.4 was Roman, Byzantine and Mamluk. The bedrock plateau above Wādī 'Ayn Sukkar also produced extensive limestone quarries (KM.1 and KM.9 — dates unknown at this point); three tombs in natural caves, all robbed of their original contents and originally Roman or Byzantine in date (KM.6, KM.7, and KM.8 – published parallels in Waterhouse 1998); and a single-chamber tomb, likely Late Roman or Early Byzantine (3rd/4th c.) in date, with dromos entrance bearing crosses and a Greek inscription, a relatively recent donkey burial, and three arcosolea, (KM.11).

[16] For structural parallels of the lever-weight and screw presses from Byzantine Cyprus and Roman through Islamic Palestine, see Frankel 1985, 1988; Hadjisavvas 1990, 1992; Frankel 1999; and Sagiv and Kloner 1996.

[17] This is based on a conservative population estimate of 150 people, arrived at by using figures from an Ottoman census of 1596-7. The census records 27 families (*khane*) and 15 bachelors (*mufrad*) (Bakhit 1989: 22, Table I). A peasant family, for the purposes of Ottoman tax registers, consisted of a nuclear family (mother, father, and children) (Inalcik 1994: 144). Our modest estimate is deliberately low at a five-member household.

[18] The most recent of these marks the northern end of the valley. According to a shepherd tending his flocks there, the field walls were built 15-20 years ago. The walls at the southern end of the valley appear to be much older than this.

Ḥibrāṣ

One day was devoted to an architectural survey of the historical district of Ḥibrāṣ village, eight kilometers east of Malkā, as a preliminary step in documenting the physical development of the medieval settlement. Old farmsteads, ranging in date from the Mandate period through the 1950s, were recorded, as well as a formal architectural study of a pair of historical mosques, one built inside the other, nearby. The larger of the two, in construction and plan, resembles other mosques of 'Ajlūn District dated to the thirteenth and fourteenth centuries.[19] Such chronology is supported by an inscription on a tall, rectangular minaret that once abutted the north wall of the mosque. The inscription records that an amir of Sultan Qalawūn added the minaret in 686AH/1287AD (Ghawanmeh 1986a: 59; Meinecke 1992: 65, entry #43; 'Abaydat 1996: 22).

The structure reuses limestone blocks, perhaps entire walls, and basalt columns and capitals from a Byzantine church on the site. Although the interior plan is not clear, given the later construction of the second mosque, it appears that three aisles of columns running parallel to the *qibla* supported a triple barrel vaulted ceiling. The sanctuary was 25.5 meters long and 10.5 meters wide, originally contained three *miḥrāb*(s), although only two remain, and was entered through doors in the north and east walls.[20] The minaret of 1287 was, apparently, a slightly later addition.

Close inspection of the remains of the smaller mosque indicates that it was built within the remains of the Mamluk structure, replacing a segment of the *qibla* wall in the process. Although the roof is missing,[21] the form of the low-sprung arches and their masonry technique are almost identical to abandoned farmhouses nearby, which are only a couple of generations old. In addition, the basalt steps built into the exterior face of the rebuilt section of the *qibla* wall seem to be a later reinforcement of that wall and have parallels in the exterior staircases of nineteenth-century homes in the ruins of Umm Qays, as does the random use of basalt blocks in exterior walls. The ruined mosque described in Steuernagel's survey of the 1926 may have been the original Mamluk mosque, perhaps still in use earlier in the nineteenth century (Steuernagel 1926: 155-156).[22] According to local residents of modern Ḥibrāṣ, calls to prayer were held from either the roof of the "Ottoman" mosque or from the Mamluk minaret until the 1950s, when residents began to relocate to new homes built to the southwest.[23] The minaret was dynamited by Palestinian *fidā'iyīn* in the 1970s, and it was at this point that the mosque was abandoned for Friday prayers.

Human action in environmental decline — pollen analysis

In order to identify the human, rather than purely climatic, factors behind environmental developments in the region, we took twelve soil samples for palynological analysis from each of the three sites in our survey. While the laboratory work is still in progress, four samples have been read and the following observations can be made (Cordova n.d. throughout).[24] Sample 10 was taken from the chronologically earliest context: mortar from the *qibla* wall of the Mamluk mosque at Ḥibrāṣ. Evergreen oak (*Quercus calliprinos*) and pistachio (*Pistacia*), common components of the northwestern Jordan's woodlands, were identified in small quantities, in addition to various herbs and weeds, such as sage, thorny burnet (*Sarcopoterium spinosum* — a kind of rose), daisies (*Serratula, Aster, and Centaurea*), plantain (*Plantago*), and "snow-on-the-mountain" (*Euphorbia*). However, at 15-25% of the sample, olive (Olea europaea) was most abundant, indicating intense cultivation of olives in otherwise fallow and abandoned fields.

Sample 4 was removed from the mortar of a terrace wall in Wādī 'Ayn 'Aṭiyya. Although the wall could not be dated with certainty, — we did

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19 For a detailed discussion of this point, see Walker 2004b. Published parallels from 'Ajlūn can be found in Ghawanmeh 1986b; Walmsley 1997; and MacKenzie 2002.

20 The existence of a third miḥrāb to the southeast is suggested by the asymmetrical arrangement of the other miḥrābs and by parallels with contemporary mosques near 'Ajlūn.

21 Roofs of traditional architecture in northern Jordan was often removed and carried to a new location, in the case of moving to another village, or lifted and reused in a new structure nearby. They were constructed, moreover, of wooden beams covered with thatch and then plastered; such materials will not last long in relatively wet environment of the region.

22 In the late nineteenth century medieval mosques were still being used by congregations in 'Ajlūn and Salṭ, and others in Irbid and Karak were in secondary use for purposes other than worship, (Rogan 1999: 36-37; Buckingham 1825: 42).

23 Information on the modern history of the village and the historical mosques were obtained from local residents and the Municipality.

24 No pollen was identified in Sample 1, which was removed from a plastered trough in a cave in Wādī 'Ayn 'Aṭiyya. Pollen is notoriously difficult to recover in Jordan, because of special environmental conditions, (personal communication, Dr. Cordova).

not dismantle it to recover sherds — comparison of its construction and the size of its enclosed olive trees with more recent terraces indicated that it was likely built in the Late Ottoman or Mandate period. Olive (*Olea europaea*) represented 15-20% of the total pollen in this sample. The sample also included herbaceous pollen, oak (*Quercus calliprinos and Quercus ithburensis*) and pine. The herbs represented were those at home in the desert and salty ground (*Suaeda-* and *Noaea*-type herbs and *Ephreda*) and others commonly retrieved from animal dung, together suggesting overgrazing.

Mortar from the *qibla* wall of the Late Ottoman/ Mandate-period mosque in Ḥibrāṣ constituted our Sample 11, which produced mainly herbaceous pollens: a weed in the daisy family (*Solidago*), a steppe herb (*Knautia*) and various mints (members of the *Labiatae* family). Oak and olive were present but rare, suggesting a receding of the forest cover. The readings, in all, represent either a dry period or human-induced degradation. Although reduced forests are often associated with an expansion in cultivation, as forests are cleared for fields, the predominance of weeds may indicate abandoned fields.

The pollen analysis, while still at a preliminary stage, supports the model of environmental decline proposed above. No cereal pollen was identified in any of the samples. Olive was more common in earlier samples and is predominantly associated with Malkā, which adopted a more or less mono-crop culture as early as the Mamluk period. Although the database is small, steppe pollens and weeds indicate a gradual abandonment of fields and overall reduction in cultivation. Whether this was the result of climatic change, as traditionally believed, or more the outcome of state management of rural lands calculated for high revenues, as suggested in this paper, can only be verified independently through continued soil analysis. Nonetheless, by combining a careful reading of documents related to rural estates with archaeological survey and palynology, it does appear that decisions made seven hundred years ago about how the land would be used — what planted and for what financial purpose — impacted the rural landscape of northern Jordan in the long-term.

Conclusions

Northern Jordan provides an important lesson in how paradigms to explain "decline" need to be adjusted when considering different geographical regions and different sources of data. While certain regions of Jordan were gradually abandoned through the fifteenth century, much of the remainder of country retained viable local market and a productive agricultural base.[25] Northern Jordan not only survived the political vicissitudes of the late Mamluk period, but, on many levels, its villages thrived. Using the examples of Malkā and Ḥibrāṣ, one can argue that there was no wholesale collapse of village life or of agriculture in the fifteenth century, merely a shift in marketing and subsistence. The trend towards mono-crop production (centered on olive oil) is apparent at Malkā in the fourteenth century and further develops through the Ottoman period and into modern times. This village was a sultanic estate and was overshadowed by neighboring Ḥibrāṣ, which had a population double its size in the Mamluk period. Nonetheless, Malkā, in time, became a more prosperous village. The ceramic record from the 2003 survey documents the continued settlement of Malkā from the thirteenth through nineteenth centuries. Mamluk Ḥibrāṣ, on the other hand, received special attention from the state. It had, at one time, two mosques, and, in its environs, several *zāwiya*(s), was the largest village in the region, and enjoyed economic prominence because of its market. In the early Ottoman period this village was divided into amiral estates, which were primarily based on wheat and barley taxes. By the late Ottoman period, the population had been reduced to such an extent that it did not require such a large mosque for its congregation, so the villagers built a much smaller one inside the ruins of the medieval *jami*'. Many fields were abandoned. Today the village is defined by more or less subsistence agriculture and a more diverse agricultural base than exists at Malkā (Walker 2004b: 11-13).

Was it climatic change that set into motion these trends? Was it political turmoil or Bedouin attacks on villages? The axiomatic "Bedouin predation" explanation for settlement abatement in Late Islamic Jordan does not do justice to the regional differences in settlement history and clear examples of agricultural success in the late Mamluk and Ottoman periods. The land-use history of northern Jordan suggests, instead, that state land policies, markets, and conscious economic decisions by vil-

[25] For the general decline of settlement on the Karak plateau, see Miller 1991 and Brown 1984.

lagers may have as much to do with the settlement fluctuations as security issues. The shift from the lowlands to the highland plateaus in Karak District in the fifteenth century, for example, may in part be explained by changes in agricultural production, which responded to years of drought and economic insecurities.[26] An agricultural model, therefore, may be a useful one in evaluating settlement cycles. It may also be applied to environmental studies. The impact of sugar cane cultivation on the soils of the Jordan Valley, for instance, and the clearing of forests in the north for grain cultivation (such as at Ḥibrāṣ) are areas of inquiry with great potential for understanding the long-term ecological effect of imperial agricultural policies and traditional cropping practices.

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[26] Brown, among others, cites security issues as paramount in explaining the scarcity of sites of this period identified during the Karak regional survey (Brown 1984 and 1992). For an opposing view, see Johns 1992, 1993, and 1994.

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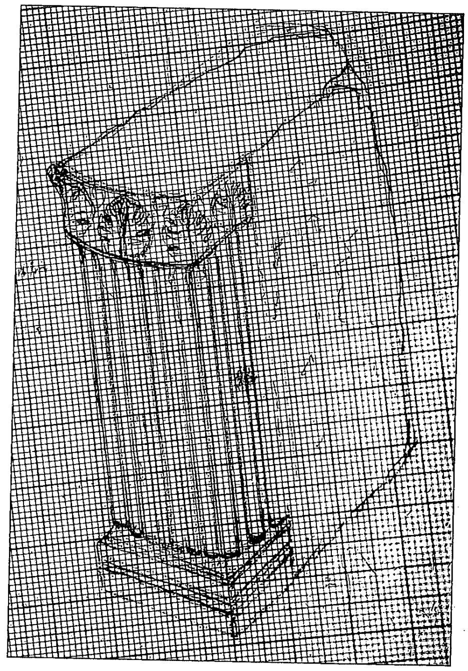
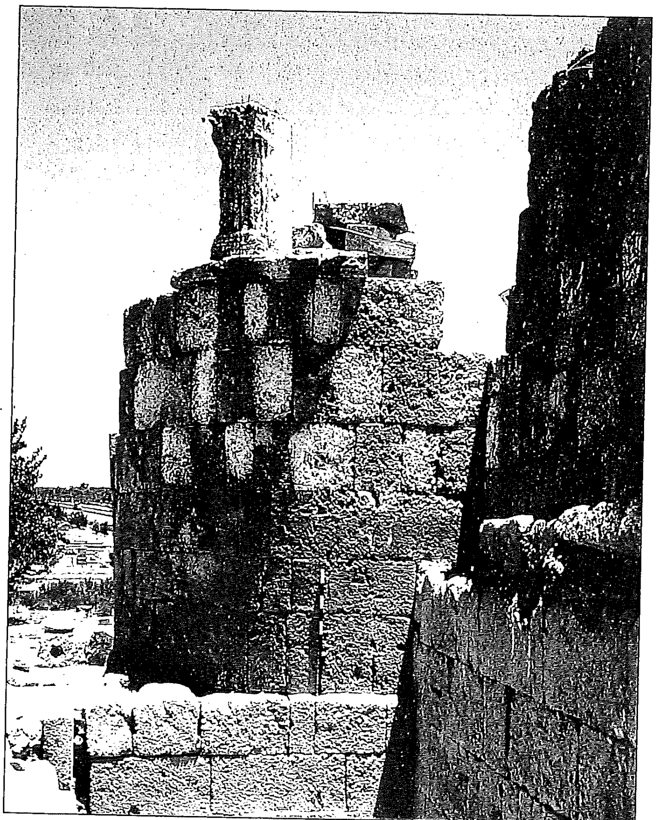
and the lower three courses of the inner (southern) face only of the northern wall belong to the original building. The southern and eastern walls are recent and probably date from the late Ottoman period.

Recognizing the importance and uniqueness of the minaret at al-Qasṭal, the Department of Antiquities initiated a project to restore the first storey of the minaret, a project that lasted from March 16th to May 11th, 2004.*

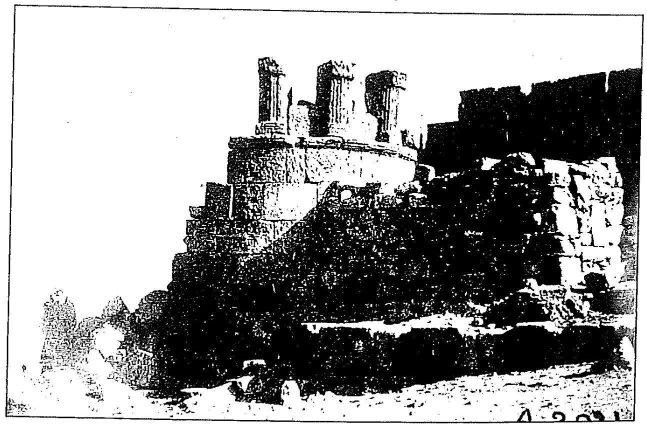
The minaret has a cylindrical shaft 5.00m in diameter and rests on a rectangular base of three courses, 1.35m high, measuring 2.55m from the south, 5.00m from the west, 4.95m from the north and 2.57m from the east. The shaft consists of six courses 3.27m high, a projecting moulded cornice marks the beginning of the second storey and serves as a base for the chanelled Corinthian pilasters (FIGS. 2, 3). Although only six pilasters have been recovered, it seems that originally ten such pilasters stood on the cornice. Initially we thought that arched panels of alternating blind and open niches stood between these pilasters; however, a photograph in Harding's photographic archive taken in 1951 shows a rectangular stone with a smooth face between the standing pilasters (FIG. 4); this, together with the recovery among the tumbled stones of a partially broken rectangular slab with an arched narrow opening in the middle, would indicate that recessed blind niches with slits stood between the pilasters (FIG. 5). The minaret was entered from the northwestern corner of the mosque's courtyard through a narrow door, 0.60m wide, and the interior space was taken up by a spiral staircase that, until the year 2000, stood at a



3. A chanelled Corinthian pilaster.



2. The minaret: looking north.



4. The minaret: looking E-NE (Harding's archive, 1951).

* My gratitude to Dr. Fawwaz al-Khrayshah, Director General of the Department of Antiquities, for his moral and practical support, to Mr. Abd al-Majid Mjalli and his technical staff from Jarash who carried out the actual restoration work, and to Sahar al-Nsour for help in providing access to the photographic archive in the Registration Center. My thanks also go to Shaykh Shibli al-Fayez (Abu Abd-Allah) and his sons for hospitality and unfailing friendship.

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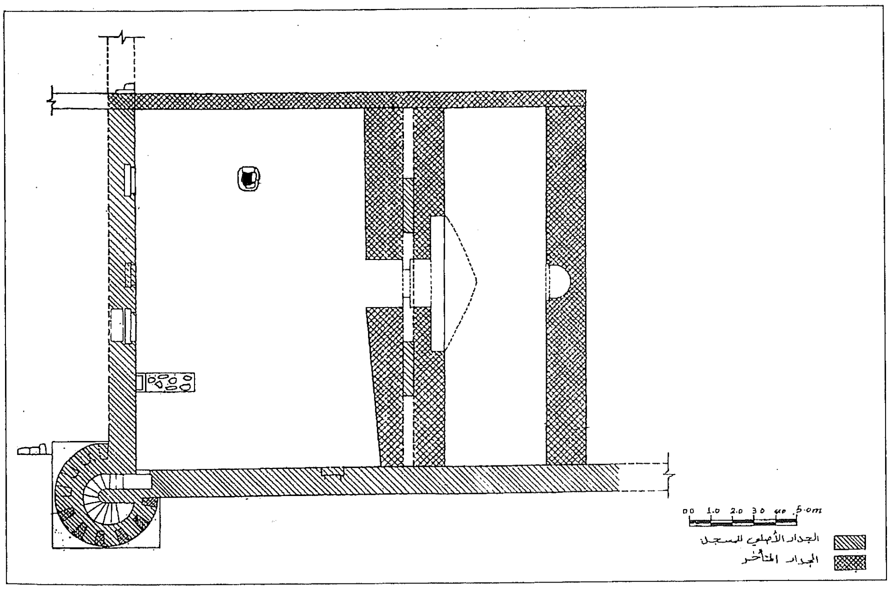
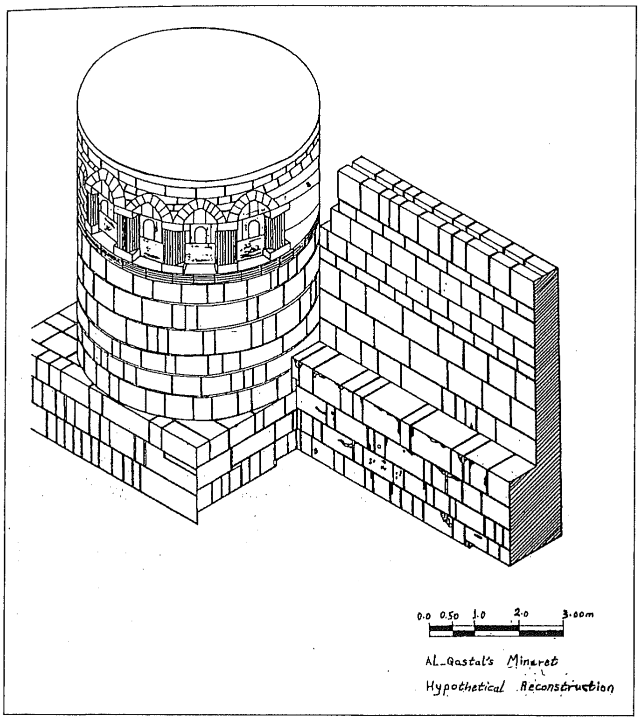
Ghazi Bisheh

The Umayyad Minaret at al-Qasṭal and its Significance

Although the minaret attached to the northwestern corner of the mosque at al-Qasṭal has been known from as early as the 19th century, and its plan was drawn by Brünnow and Domaszewski in 1897 (Brünnow and Damoszewki, 1905, II: 100-101, Figs. 681-3 — the mosque is referred to as Praetorium), yet it never figured in the extensive literature dealing with the minaret and its architectural origins. In his study of the qaṣr and mosque at al-Qasṭal, Heinz Gaube was the first to make two important observations: first, he referred to the existence of a minaret in a relatively small mosque, and second that the minaret has a circular form (Gaube 1977: 77), the rest of Gaube's article dealt with establishing the architectural phases of the mosque. Later, between 1979-1981, Patricia Carlier and Frederic Morin excavated at al-Qasṭal and drew a new plan for the mosque which, for no cogent reason, they attributed to the reign of 'Abd al-Malik bin Marwān (65-86AH/ 685-705AD) (Carlier 1984: 343-52, 1989: 114-21, Fig. 8). In 1999 Erin Addison removed what looks like a stone platform outside the northwestern corner of the mosque and excavated down to bedrock. This excavation exposed four courses of the original (Umayyad) western wall (Addison 2000: 487, Fig. 10). Addison's study of the mosque, which relied on photographic archival material and analysis of mortar samples taken from various parts of the place, the mosque and the northwestern reservoir, is the most detailed so far (Addison 2000: 477-90). She also recognized the importance of the minaret, "the earliest minaret built as such still standing today". It is not my purpose here to discuss the architectural phases of the mosque, which, in its current state, seems to be a futile exercise because the mosque was damaged, rebuilt and repaired more than once since the middle of the 19th century (FIG. 1). Suffice it to say that only the lower courses of the western wall, preserved between one to four courses,

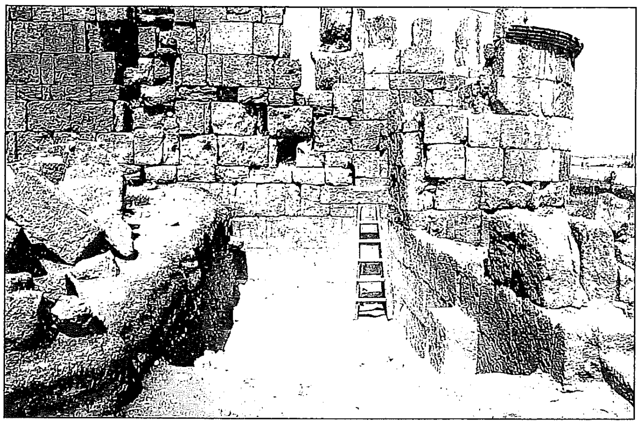


1. The Mosque at al-Qasṭal (ground plan).



5. A hypothetical reconstruction of the upper storey of the minaret.

level slightly below the top of the upright pilasters. The sill of the doorway is 2.10m above the original floor level, and there is no evidence of a stairway leading up to it, perhaps a wooden ladder was used to get up to the doorway (FIG. 6). At about 4.00m to the east of the inner face of the western wall, there is a pier resting on a rectangular base attached to the northern wall. A low wall, 0.80m wide and 0.50m high, takes off from the base in a southerly direction, it seems that both the base and the wall are cut off from the natural rock. If this wall served as a sort of stylobate for columns, it may be assumed that a portico existed on the western side of the mosque's courtyard. Only excavation can verify this point.



6. The narrow entrance to the minaret.

The masonry of the minaret that consists of fine ashlar laid randomly in header-and-stretcher fashion with tight joints indicated by a thin, slightly projecting plaster pointing is exactly like the exposed masonry of the original western wall (FIG. 2) and therefore, it is clear that the minaret was erected as an integral component of the mosque. It should also be noted that the semi-circular buttresses of the qasr's exterior walls rest on square socles as well (FIG. 7), just as the shaft of the minaret stands on a rectangular base.

Until recently most scholars agreed that the minaret developed in Syria during the Umayyad period, and that its standard square tower format was copied from the bell-towers of the Syrian churches (Creswell 1969: I, pt. II, 491ff). However, a thought-provoking recent publication on the minaret in Islam concludes that, "the minaret was invented not early in the first century of Islam, but at the end of its second century, not in Umayyad Syria but in Abbasid Mesopotamia, and that in the beginning it (the minaret) had little if anything to do with the call to prayer" (Bloom 1989: 7, 175). Bloom adds that, "Originally the 'Adhan (call to prayer) was made from a small, box-like structure above the mosque's roof which was reached by few steps". An often quoted verse of al-Farazdaq (110AH/ 728-9AD):

"And so that on the wall of every city
A herald called the Adhan from on top of it"

seems to support Bloom's conclusions, and shows that the minaret, as a distinctive feature of mosque buildings, remained relatively rare throughout the first century of Islam. However, the minaret at al-Qasṭal warrants a re-examination of

7. A half-round buttress resting on a rectangular base from the eastern facade of the Umayyad qaṣr (al-Qasṭal).

these conclusions.

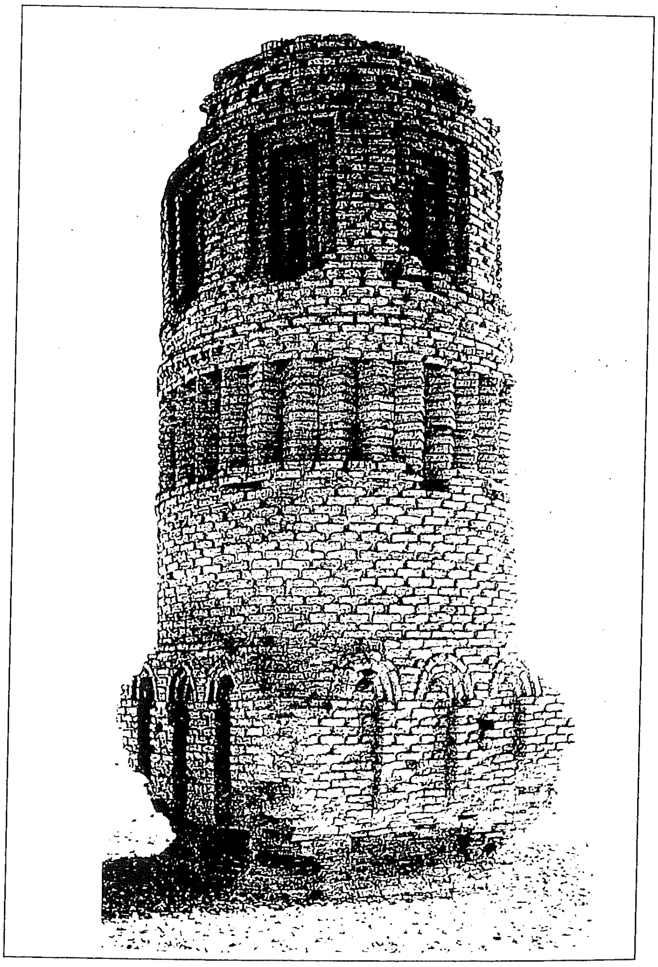
In a poem composed by Jarīr, al-Farazdaq's contemporary and rival, Khālid bin 'Abd-Allah al-Qasrī, the energetic governor of 'Iraq (105-120AH/ 723-38AD), is praised for having built a minaret so tall that it almost reached the stars, the like of which had never been seen before:

"You built the illuminated manar to guide

so you became a light whose sheen is not subsiding

you built a building the likes of which none had ever seen its walls almost attain the level of the four stars of Ursa Minor" (Bloom 1989: 36-7).

Bloom points out that the word "Manār" in these verses refers to a lighthouse rather than a mosque's minaret. Though this interpretation cannot be ruled out, it should be noted that the first hemistich of the first line in Jarīr's verses might be translated as, "You, i.e. Khālid al-Qasrī, built the illuminated minaret to guide to the path of righteousness (*'alā al-hudā*) which has a religious connotation probably associated with a minaret of a mosque. In a curios report al-Balādhurī (279AH/ 892AD) states that Ziyād bin Abīhi built a minaret of stone when he enlarged the mosque of Basra in the year 45AH / 665AD (Balādhurī 1932: 343). Creswell doubted this report because no author other than al-Balādhurī mentioned it (Creswell 1969: 45). Less than a century later, the encyclopedic author al-Jāhiz (255AH/ 869AD) speaks of the minarets of al-Kūfa as different from those of al-Baṣra. The former, he says, were modeled after the bell-towers of the Melkites and Jacobites, by which he probably meant that they were square in plan, in contrast to the cylindrical towers of al-Baṣra (Pellat, 1969: 193). In view of the close relationship between al-Balqā' and al-'Iraq in the Umayyad period, especially after the building of Wāsit by the redoubtable governor of 'Iraq, al-Hajjāj bin Yusuf ath-Thaqafī (Bisheh 1987: 196; Crone 1980: 47, 235N.), it is likely that the Iraqi minarets, as those in al-Baṣra, were the model for the minaret at al-Qasṭal, the earliest extant minaret attached to a mosque in the Islamic world. In fact there is an isolated, minaret-like tower, called Manārat Mujda, standing some 22km to the east of Ukhaydir (Bloom 1989: 44, 48 – Fig. 20); Creswell 1989: 260, Fig. 162) which is of some significance to our purpose. It is built of baked brick and has a cylindrical shaft resting on a square base decorated with shallow panels each topped by a triply-recessed arch, in the middle zone of the shaft there is a band decorated with triangular flutings (FIG. 8). Creswell thought that this tower was contemporary with al-Ukhaydir and attributed it to the early Abbasid period. However, re-evaluation of the structure by Finster and Schmidt showed that the tower functioned as a guidepost marking a desert route to al-Kūfa, and they dated it to before Ukhaydir (Finster and Schmidt 1976: 25-6). A tower like Manārat Mujda may have provided the inspiration for the cylindrical minaret at al-Qasṭal that was realized by local craftsmen accustomed to the use of stone. It is curious, however, that neither the congregational mosque in downtown 'Ammān nor the mosque on the 'Ammān Citadel had a minaret in the Umayyad period (Northedge 1989: 148, 150-1, 1992: 67-8; Almagro and Jiménez 2000: 459-75). Obviously al-Qasṭal was not a major urban center that had been the first to introduce the minaret, it was primarily a palatial residence that belonged to Yazīd bin 'Abd al-Malik (101-5AH/ 720-4AD) and his son al-Walīd (125-6AH/ 743-



8. Manārat Mujda/al-'Iraq.

4AD) (Bisheh 2000: 436-7). The minaret was introduced here not only for the call to prayer, but also as a statement of the faith and to reflect the piety of the patron.

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Variation in Late Iron Age Ceramic Assemblages in Southern Jordan: 'Edomite' Pottery Reconsidered

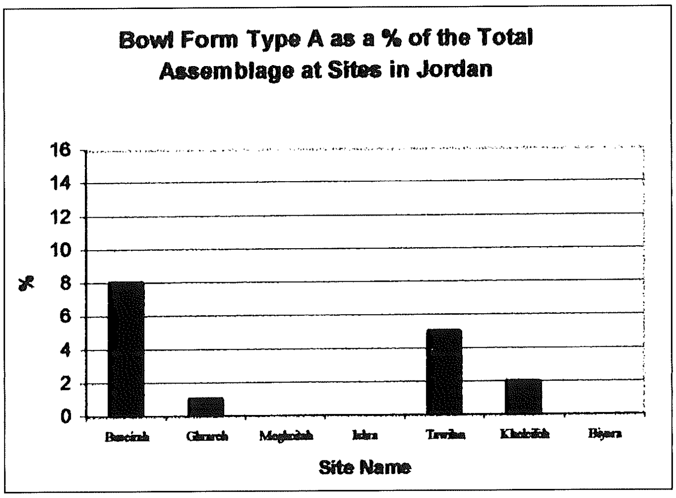
Archaeologists have generally approached the Iron Age — or 'Edomite' — pottery in southern Jordan from a broad, regional perspective of analysis. This has led it to be viewed as a homogenous, monolithic culture block that correlates with an equally monolithic ethnic group, the 'Edomites'. This paper addresses the fact that the concentration on the superficial unity of this pottery, as well as the focus on ethnic groups such as the 'Edomites', has resulted in distracting scholarly attention from the existence of significant variation and complex patterning in the way this pottery was employed. In particular, attention is drawn to the significance of such variation in terms of the social role of pottery in Iron Age society, an area, which until now has been little explored.

To do this, the Iron Age ceramic assemblages at a number of sites in southern Jordan were compared (Whiting 2002). These include Buṣayra, Ṭuwaylān (Ṭawīlān), Umm al-Biyāra, Tall al-Khalīfa, Ghrāra (Ghurāra), Khirbat 'Ishra, and Khirbat al-Megheitah. The analysis was based on the number of examples of all the main vessel forms represented in each assemblage as defined by Oakeshott's (1978) classification of Iron Age pottery from southern Jordan. To take into account the difference in size of the various assemblages, the proportion that each vessel type made up within each separate assemblage was compared.

The late Iron Age pottery of southern Jordan has a very distinctive style and is characterised by a high proportion of painted decoration. This decoration is most commonly in the form of black and sometimes coloured bands, and occasionally includes geometric designs (Hart 1995: 54). In addition, some vessels are decorated with denticulation. The undecorated pottery is characterised by large storage jars with 'triple-ridged' rims, shallow platters, small carinated bowls with out-turned rims, and cooking vessels with grooved rims (Hart 1995: 54). 'Edomite' pottery is generally dated to the seventh and sixth centuries BC (Bienkowski 1992a: 6).

While it is not possible to show the results of the study as a whole, a number of graphs of key vessel forms and their distributions are presented here, which very clearly demonstrate the great variety in vessel type distribution in southern Jordan (FIGS. 1-14).

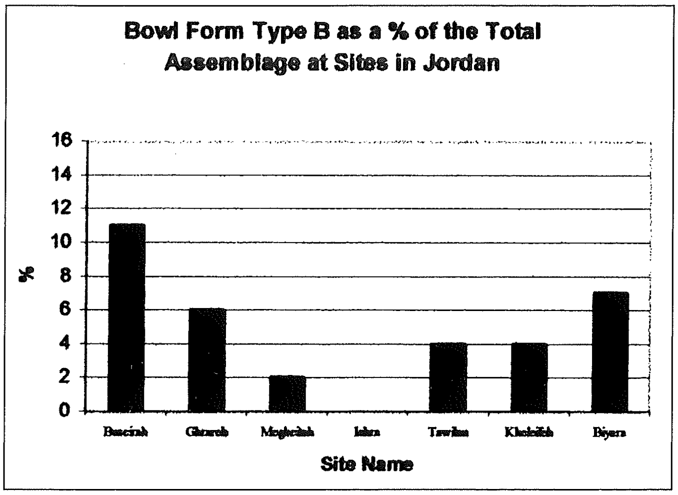
FIGS. 1 and 2 shows the relative proportions of Bowl Types A and B — two very common Iron Age bowl forms in Southern Jordan — at the 7 main sites excavated in southern Jordan. The graphs show that these bowls form a large part of the assemblage at Buṣayra, but that they are less common at smaller sites such as Ghrāra and Ṭuwaylān. FIGS. 3 and 4 shows the proportional occurrence of two other key bowl forms — Bowl Type D and J — which are much more common at smaller sites such as Khirbat al-Megheitah and Khirbat 'Ishra than they are



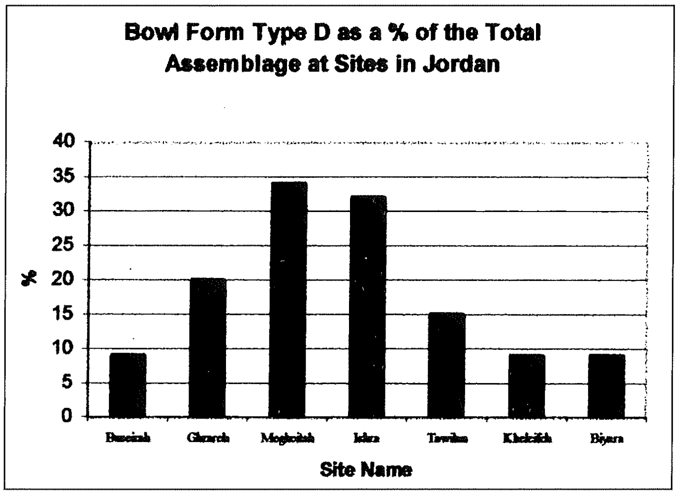
1. Bowl Form Type A as a % of the total assemblage at sites in southern Jordan.

at larger sites such as Buṣayra and Ṭuwaylān. Other bowl forms, such as Bowl Type R and Double Bowls, only occur at the site of Buṣayra, as shown by the graphs in FIGS. 5 and 6.

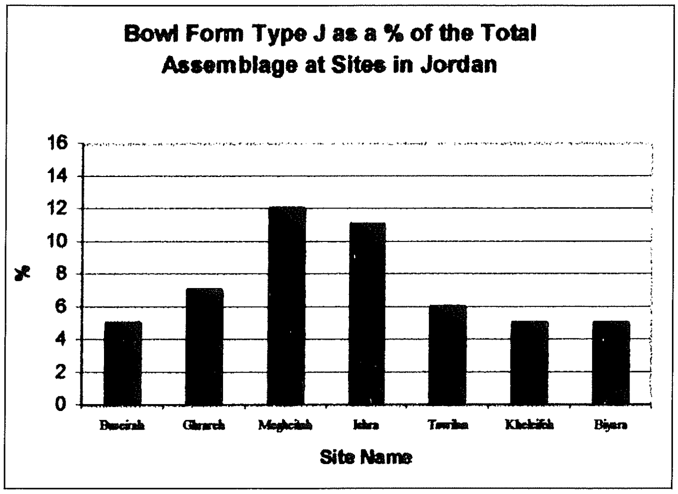
Turning now to jug forms, FIGS. 7 and 8 demonstrate that certain types are very common at Tall al-



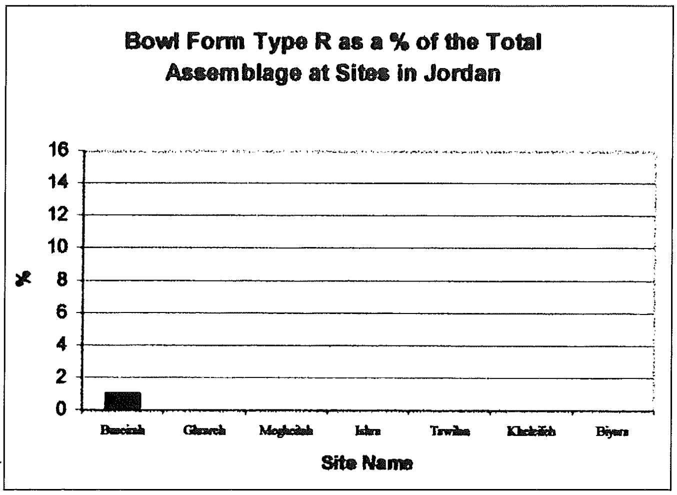
2. Bowl Form Type B as a % of the total assemblage at sites in southern Jordan.



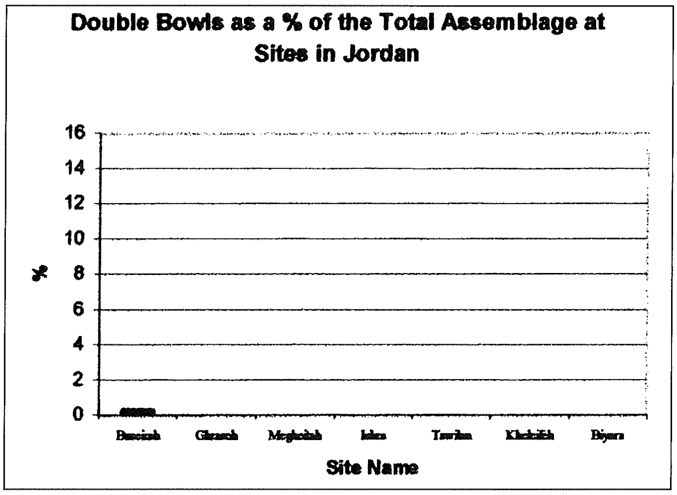
3. Bowl Form Type D as a % of the total assemblage at sites in southern Jordan.



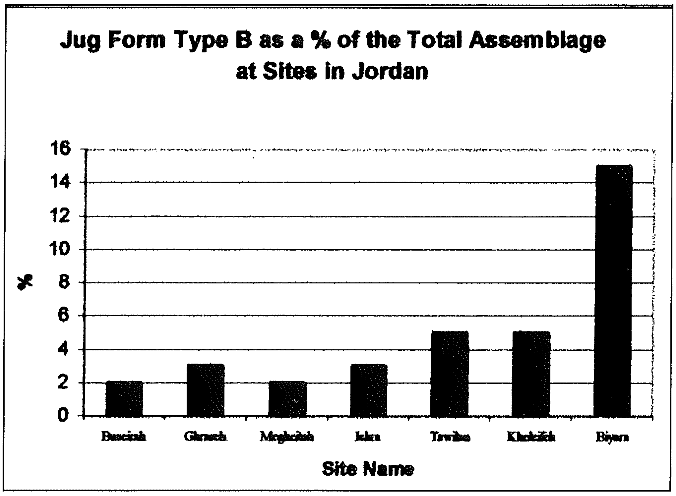
4. Bowl Form Type J as a % of the total assemblage at sites in southern Jordan.



5. Bowl Form Type R as a % of the total assemblage at sites in southern Jordan.



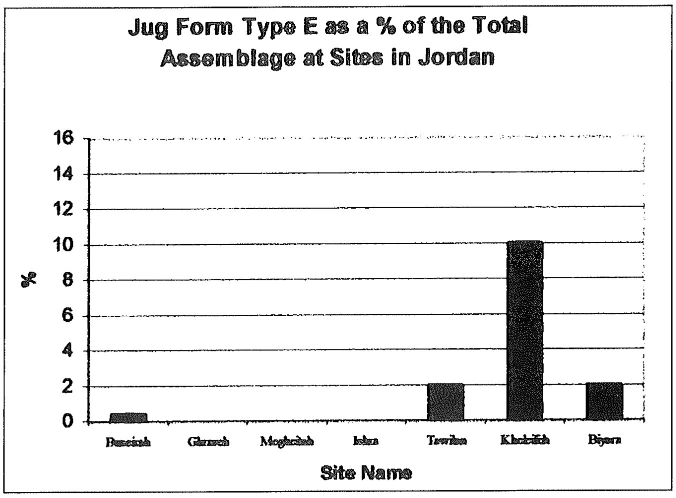
6. Double Bowls as a % of the total assemblage at sites in southern Jordan.



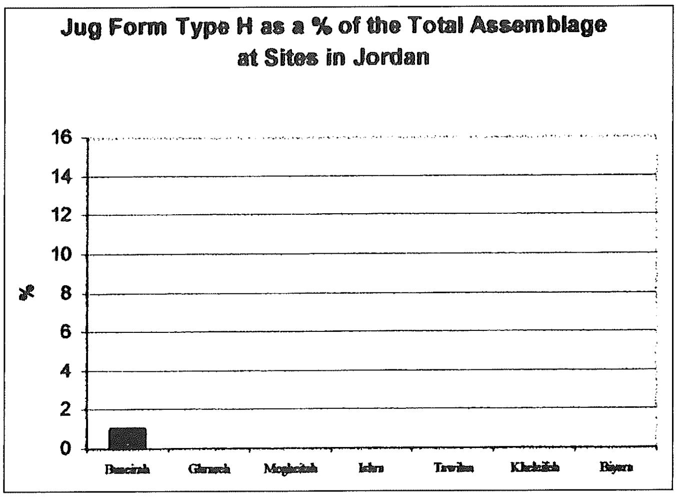
7. Jug Form Type B as a % of the total assemblage at sites in southern Jordan.

Khalīfa, whereas others occur in a high proportion only at Umm al-Biyāra, while others occur only at Buṣayra and nowhere else (FIG. 9). Cooking pot forms also occur in very distinct distributions as shown in FIGS. 10 and 11. Cooking Pot Type A forms the highest proportions at Ghrāra and Umm al-Biyāra, while Type B occurs more commonly at Khirbat al-Megheitah and Khirbat 'Ishra. Cooking Pot Types C and D occur only at Buṣayra and in very small proportions at only three other sites: Tall al-Khalīfa, Ghrāra, and Ṭuwaylān (FIGS. 12 and 13). In addition to vessel form, it is significant that the proportions of painted and denticulated pottery vary by site, as shown in FIG. 14.

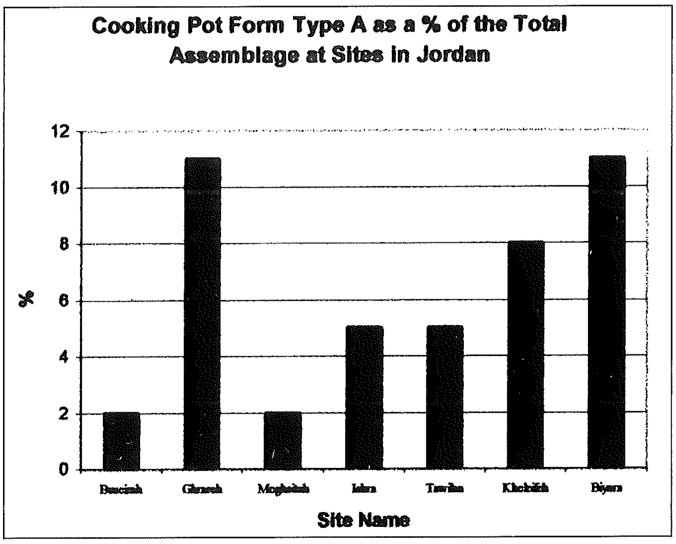
As well as the main sites discussed above, a number of so-called 'mountain-top' sites dated to the Iron Age have also been surveyed (Zeitler 1992; Lindner *et al.* 1996a; Lindner *et al.* 1996b). All of



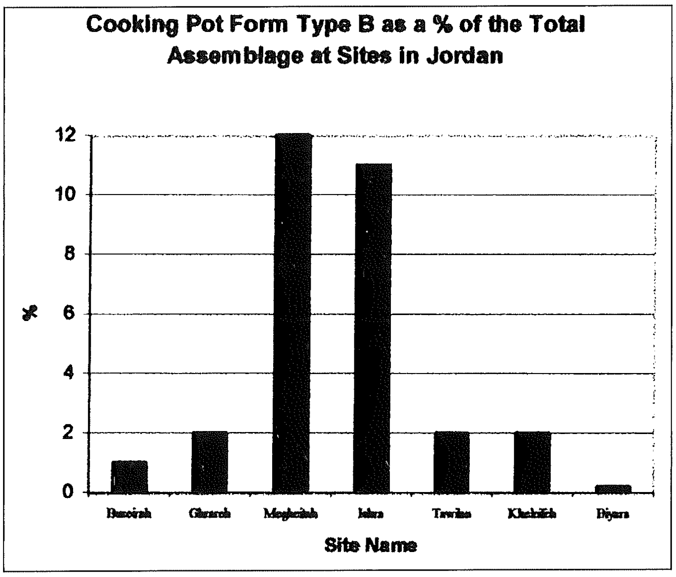
8. Jug Form Type E as a % of the total assemblage at sites in southern Jordan.



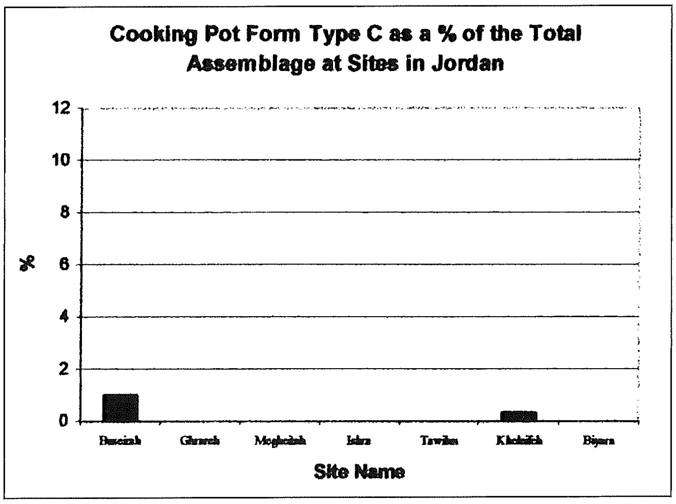
9. Jug Form Type H as a % of the total assemblage at sites in southern Jordan.



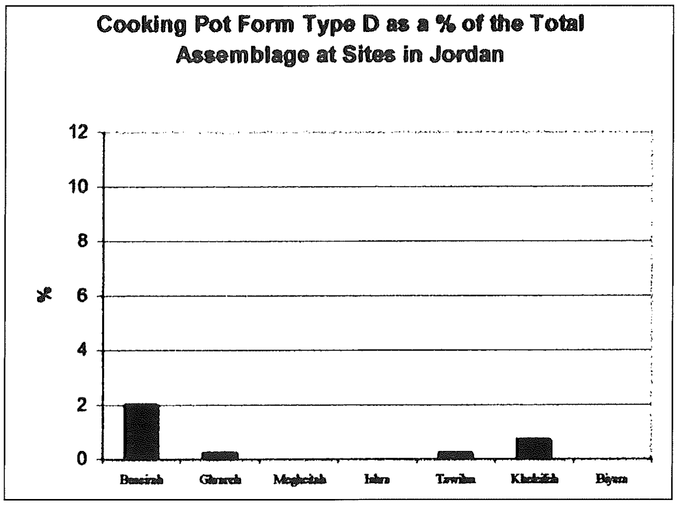
10. Cooking Pot Form Type A as a % of the total assemblage at sites in southern Jordan.



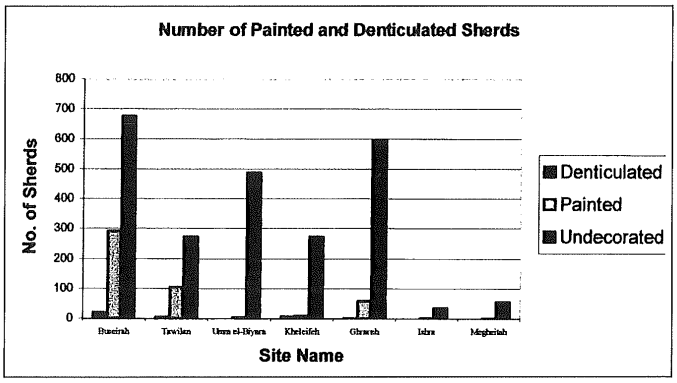
11. Cooking Pot Form Type B as a % of the total assemblage at sites in southern Jordan.



12. Cooking Pot Form Type C as a % of the total assemblage at sites in southern Jordan.



13. Cooking Pot Form Type D as a % of the total assemblage at sites in southern Jordan.



14. Number of painted, denticulated, and undecorated sherds at sites in southern Jordan.

these sites produced a very limited range of pottery types and only coarse wares were found (Whiting 2002: 220). None of the finer wares that are found at Buṣayra and Ṭuwaylān, for example, were found at these sites, and decorated pottery was extremely rare. This phenomenon has already been noted by a number of scholars (Zeitler 1992; Lindner *et al.* 1996a; Lindner *et al.* 1996b), but its significance has been little explored.

As the largest site, and because Oakeshott's classification was largely based on the Buṣayra ceramics, it is to be expected that all the pottery types in the formal classification of south Jordanian Iron Age II ceramics are represented to some degree at Buṣayra. This is, however, clearly not the case at all the other excavated and surveyed Iron Age sites in southern Jordan. Due to their small size, for example, Khirbat al Megheitah and Khirbat 'Ishra produced the least amount of types – and regarding cooking pot and jug forms, the most types are represented at Tall al-Khalīfa (Whiting 2002: 221). However, when considering jar forms, after Buṣayra, the most types are represented at Umm al-Biyāra (Whiting 2002: 221).

In addition to variation in vessel type, some broad vessel forms predominate at some sites and not others. Bowls, for example, clearly predominate at Buṣayra in comparison to the other sites, and jugs and jars clearly predominate at Umm al-Biyāra (Whiting 2002: 221). For smaller sites such as Khirbat 'Ishra, Khirbat al-Megheitah, ash-Shurabāt, and the mountain-top sites, coarse wares predominate and very little painted ware is found (Whiting 2002: 221).

This discussion has provided a basic presentation of what is a fairly large and complex body of data. Despite this, the information presented shows very clearly that there is immense diversity in late Iron Age ceramic distribution patterns in southern Jordan, and that it is much more complex than has been previously assumed. Despite the recent work of Bienkowski and van der Steen (2001), which has highlighted the regional variation of south Jordanian Iron Age ceramics, most studies still focus on the degree to which cultural traits are shared in these assemblages. This has had the effect of creating a number of 'diagnostic' types which uphold the ideal of a univariate block of culture-historical archaeology with which to equate ethnic groups, in this case the 'Edomites'. However, the comparison of site assemblages in southern Jordan clearly reveals substantial material culture variation. Current archaeological practices and interpretative models applied to the archaeology of southern Jordan thus clearly mask this variation and disregard the possibility of local and temporal variations in the meaning and active, contextual usage of material culture.

Having said this, as all of the relative quantities of these pottery types at each site are based on the quantification of non-representative assemblages that most likely constituted Bennet's type series from her excavations (Bienkowski pers. comm.), the quantitative differences have to be taken with caution. In addition, the variation in distribution may also be chronological. However, the fact that a number of smaller, potentially single-phase sites such as Umm al-Biyāra and Tall al-Khalīfa do not show a more limited range of for example jar and jug types, than much larger multi-phased sites such as Buṣayra, indicates that variation in the range of vessel forms does not seem to be linked to chronology *per se*. On present evidence however, this issue cannot be adequately explored, and it will require further examination when more detailed chronological information becomes available. In addition, site function may have influenced the composition of assemblages, but disregarding the obviously different function of Buṣayra versus the other sites, many of the other sites can be reasonably classed as small agricultural settlements. This highlights how the assemblages all differ notwithstanding their use at sites with potentially very similar functions.

In conclusion therefore, and despite these various issues, the straightforward presence/absence and proportional comparison of the various different types of vessels between sites is revealing. It shows us that the inhabitants of each site were selecting from the overall repertoire of available — or known — pottery types, and were not simply following a normative and rule-bound structure of life, as proposed by previous more culture-historically led interpretations of the late Iron Age pottery of southern Jordan.

By taking the site as a meaningful scale of study, it has been demonstrated that even when the same basic activities were undertaken — for example cooking, storage, eating, and preparing food — and the same basic equipment was used — such as cooking pots and storage jars — the actual ceramic types varied from site to site. Choice in cooking pot types, bowl forms, and jar types varied between sites where the same functional activities were pursued. While there are also significant similarities between the assemblages analysed in this study, the scale at which this study has been conducted has clearly demonstrated that choice in the use of equipment not structured by blind submission to normative rules, functional need, or typology.

The juxtaposition of site-specific variability with regional patterns has thus enabled the identification of hitherto unrecorded patterns of artefact variability that challenge the conventional view of the normative and rule-bound structure of the late Iron Age in the southern Levant. Rather than practising the same late Iron Age way of life from site to site, differentiated only by ethnicity, the data analysis presented in this study suggests that these people participated differentially in culture. It is not sufficient to class these findings as the idiosyncratic vagaries of individuals however. Rather, it is important to recognise these patterns of variability as traces of individual agents interacting with each other through and during their everyday material activities, such as the preparation and consumption of food.

The variation revealed by this study therefore suggests that, inasmuch as pottery is indicative of social practices, particular styles of pottery were integrated within local Iron Age social practices in a variety of ways, with sites and their inhabitants participating differently in the available material culture. This implies that we must think in terms not of a homogenous Iron Age 'culture' but of an Iron Age world that encompassed the coexistence of diverse communities and lifestyles, from the standpoint of which particular types of pottery could be drawn upon to greater or lesser degrees.

These communities may have been part of various overarching entities — as hinted at by the Nabonidus and Mesha' stela for example — but since there is not necessarily a direct relationship between material culture and ethnic and political institutions, using artefact variation as a simple indicator of wider political situations is questionable. Rather what we should envisage is a dynamically linked region populated by diverse communities all living within their own specific material and social conditions, perhaps under overarching entities of some form, but not ones that necessarily directly influenced the social practices at each site. The availability and use of material culture would therefore not necessarily have been governed by strict adherence to 'national or ethnic characteristics' or the presence of 'national borders'. Rather, contact between these different groups of people would have allowed contact with other lifeways, thus making ideas, objects, and practices available for appropriation.

Acknowledgements

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Great and Little Traditions: A Framework for Studying Cultural Interaction through the Ages in Jordan[1]

Abstract

The paper updates our current efforts to devise a more comprehensive theoretical framework for explaining the occurrence of long-term cycles of food system intensification and abatement at Ḥisbān in particular and throughout Transjordan and the Southern Levant in general. Building on previous research by Redfield (1955, 1960), von Grunebaum (1955), Marriott (1955), Bodley (2000) and Odner (2000), a series of 'great' and 'little traditions' are posited as a means to explain how and why cultures in different times and places are constructed, constituted and represented. Examples of great traditions include the Egyptian, Mesopotamian, Arabian, Canaanite, Greek/Hellenistic, Roman, Byzantine, Islamic and Modern Capitalist. Examples of little traditions include local-level water management, mixed agro-pastoralism, fluid shared commons, residential flexibility, hospitality, honor and tribalism. The paper also discusses ways to avoid essentialist thinking in connection with the line of research proposed here.

Introduction

Past efforts by the Mādabā Plains Project to devie a framework for studying long-term cultural interactions in Transjordan have centered on the food system concept and related notions such as intensification and abatement and sedentarization and nomadization (LaBianca 1990). While these concepts have been found to be quite useful as means to reconstruct long-term changes in the agricultural landscape and daily life routines of successive generations of occupants of the Mādabā Plains, they have proven insufficient in several important respects.

For example, a serious short-coming of analysis focused solely on reconstruction of food system cycles is that it tends to minimize attention to culture-historical contexts, thus leaving the impression that daily life in a rural village such as Ḥisbān during Iron II was very similar to that during Late Roman and Mamluk times. While to a certain extent, this was true — especially with regard to how people provided for their food — we can be quite certain that different languages were spoken, that the sorts of things that could be bought in local markets, and that the "news from abroad" would have been substantially different during each period.

Another problem with the food system perspective is that it does not go far enough in helping us understand why, over the centuries and millennia peaks and valleys occur in the intensity levels of the local food system. For example, periods when the system reaches peak levels in the Ḥisbān area are Early Bronze, Late Iron, Early Roman, Byzantine and Mamluk. Low points — valleys — occur during Middle and Late Bronze, Early Iron, Persian-Hellenistic, Late Roman, Abbasid, and Ottoman.

It is as a means to address such short-comings of the food systems approach that the search for a more comprehensive theoretical framework has

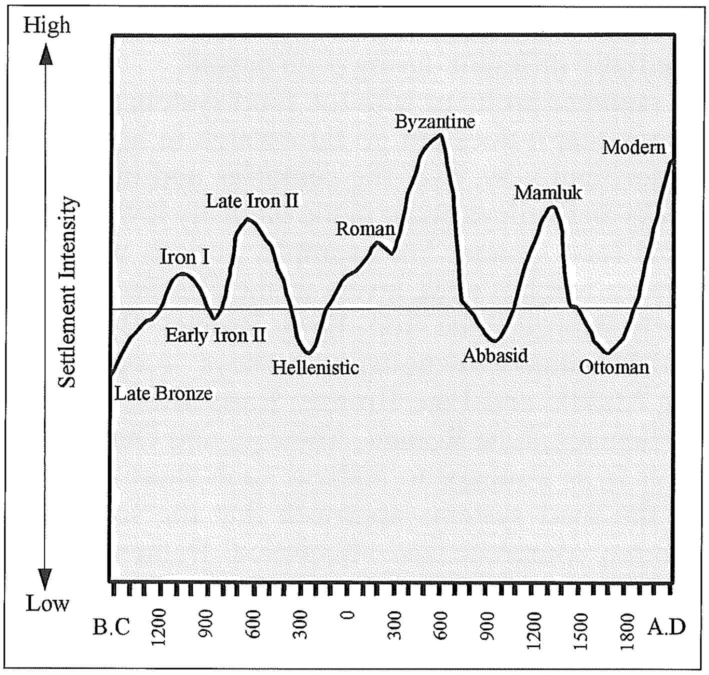
[1] The ideas developed in this paper were incubated during April and May 2004 while I was a guest researcher at the Centre for Development Studies at the University of Bergen in Bergen, Norway. I am especially grateful for comments and suggestions offered by colleagues at the University of Bergen, including Leif Manger, Nils Anfinset, Terje Oestigaard, and Ove Stoknes. Jordanian colleagues with whom I had the privilege of discussing the paper include Adeib Abu Shmeis and Sabah Abu Hudeib of the Department of Antiquities. Colleagues here in North America who have offered helpful suggestions include Bethany Walker, Bert deVries, Larry Herr, Bob Bates, Paul Ray and Randall Younker. A special thanks also to Fawwaz al-Khreyshah, Director General of the Department of Antiquities in Jordan, for the invitation to participate and present an earlier version of this paper to the 9th International Conference on the History and Archaeology of Jordan: "Cultural Interaction through the Ages". Petra, Jordan. May 24-28, 2004.

gotten underway. I am not abandoning the food systems approach — I am still convinced that it has a great deal to contribute to the process of making sense out of what is found in and on the ground — instead, what I have been looking for is a complementary framework that might somehow help make up for its short-comings, (FIG. 1).

In this paper I introduce the "structure of traditions" framework as a candidate for filling this need. I begin by providing a brief overview of this framework, including several reasons why I have chosen it. Next I introduce nine great traditions and seven little traditions that are crucial to explaining cultural interactions in Jordan through the ages. The paper addresses possible objections to this proposal, in particular the problem of essentialism.

The Structure of Traditions

Anthropological discussions of the concept of 'tradition' have been dominated by the 'structure of traditions' approach developed by Robert Redfield and his students (Redfield 1947, 1962; Marriott 1955). Essentially the approach involves studying the interactions between elite cultural traditions at the center of complex civilized societies and local level village communities (folk society). A key distinction is that between the 'lettered' traditions of a 'learned elite' and the 'unlettered' traditions of



1. Graph tracing long-term patterns of intensification and abatement in the food system of Ḥisbān. A short-coming of analysis focused solely on reconstruction of food system cycles is that it tends to minimize attention to culture-historical contexts.

'common folk'. The former represent a societies' 'great traditions' whereas the latter its 'little traditions'.

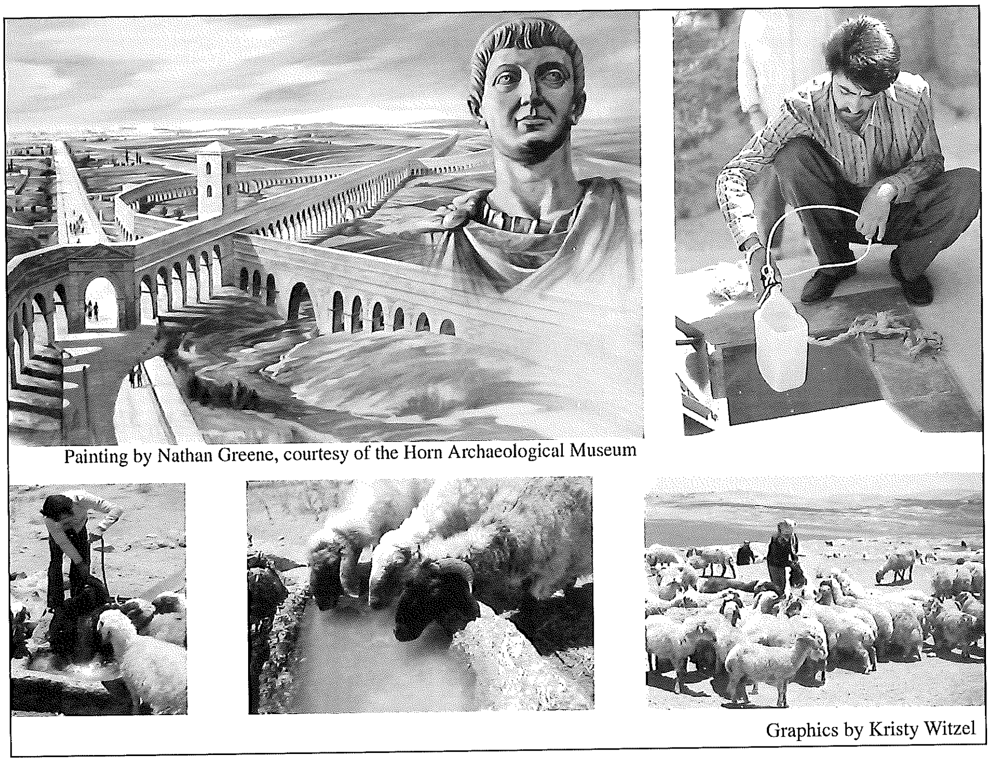
According to McKim Marriott (1955), a student of Redfield, a great tradition owes its existence to two processes. The primary process is *universalization*, by which Marriot meant "the carrying forward of the material which is already present in the little traditions in the villages to a body which "universalized" the knowledge into a great tradition. The second process is *parochialization* or the "downward spread" to the villages of the great tradition. Both *universalization* and *parochialization* are characterized by transformations, and there are gaps in communication which the communities fill at their own discretion" (Marriott 1955 as cited in Odner 2000: 34). Whereas little traditions can persist and change without reliance on the process of universalization, great traditions depend on a network of transmission centers in order to persist and change (FIG. 2).

Redfield's framework has been famously applied to the study of Middle Eastern society by Gustave von Grunebaum (1955). In *Unity and Variety in Muslim Civilization* he uses it to examine the interaction between *dar al-Islam*, the "genuine" great tradition, and local culture patterns (1955: 27-29). Even though this particular application has been widely criticized (Lukens-Bull 1999), the framework continues to be used and adapted by anthropologists as a means to study interactions between elite cultural traditions and the cultural patterns of commoners (Odner 2000; Bodley 2000).

There are several good reasons why Redfield's structure of traditions framework holds promise — indeed, why it is preferable when compared with competing frameworks--for the study of long-term cultural interactions in Jordan.

First is that it is especially suited to the study interactions of cultural entities at the level of civilizations, for this is what it was designed to do originally (Redfield 1962: 392-401). As Jordan is situated between and betwixt more than a dozen great civilizations — some pristine, others secondary — its proper study requires a framework that takes into full account the cultural influences exerted by multiple civilization level actors on its cultural history.

Second, to the extent that it is concerned with elite cultural traditions, it goes beyond the narrow focus on economic interactions that is the hallmark of more recent world systems approaches (LaBian-



Painting by Nathan Greene, courtesy of the Horn Archaeological Museum

Graphics by Kristy Witzel

2. Great and little traditions for managing water. The construction and maintenance of aqueducts requires labor and organization on a scale that only an elite ruling class can provide. Cisterns can be constructed and maintained at the household level without orchestration by an elite ruling class. Whereas great traditions involve universalized collective heritage and knowledge little traditions are based solely on localized indigenous heritage and knowledge.

ca and Scham 2005), thus providing archaeologists with a much wider range of options when it comes to what to focus on — from art, architecture and artisanry to ritual centers, temples and weapons.

Third, its concomitant focus on little traditions assures that the local level dimension of civilizations is examined right along with that of the elite dimension — a definite advantage when compared, for example, to the French *Annales* approach, which tends to overlook the local level in its quest to understand long-term environmental constraints and shorter-term economic and political events (Braudel 1992; Bintliff 1991; Levy 1995).

Fourth is its emphasis on the interaction between the local and the global through study of the processes whereby little traditions become great traditions — universalization--and the processes whereby great traditions trickle down and influence local level practices--parochialization. Critics who complain that the structure of tradition fails to examine the interactions between great and little traditions forget this important dynamic aspect of the framework (cf. Lukens-Bull 1999).

Finally, and very important, is the clarion call for cooperation between various specialists which this approach mandates. To adequately study the interaction between great and little traditions, archaeologists must team up with historians and epigraphers who can help establish linkages between distant epicenters of elite cultural traditions and local level cultural patterns. No single scholar can possibly do justice to all the sources that have to be studied to fully assess the influences and contributions of various great traditions on his-her particular archaeological site.

For the purposes of this study, we will define great traditions simply as *universalized collective heritage and knowledge*; and little traditions as *localized indigenous heritage and knowledge*. Defined thus, the concepts are sufficiently broad to accommodate research not only on the ideological aspects (literate vs. illiterate) of civilizations, but also on their material aspects (e.g. food systems).

The Geographical Context

As a background for understanding the role of great and little traditions in shaping oscillation over time in Jordan's settlement history and food system, four notable geographical characteristics of the Southern Levant must be reckoned with:

First is the region's geographic position astride an *intercontinental land bridge* linking together the continents of Africa, Europe and Asia. Having served since prehistoric times as a vital corridor of communication, migration, and trade, the Southern Levant has long been a coveted piece of real estate over which rival dynasties in Egypt, Mesopotamia, Anatolia, Greece, Rome and Western Europe have sought to exert control and domination.

Second is its *proximity to the Arabian steppe*

For multiple millennia, this steppe has served not only as the desert headquarters of long-distance caravan trade, but also as a wellspring of Bedouin culture and aspirations. Since earliest antiquity Bedouin tribes from the Arabian steppe have infiltrated the fertile highlands of both Transjordan and Cis-Jordan, replenishing its population while emboldening it in its resistance to foreign domination and control.

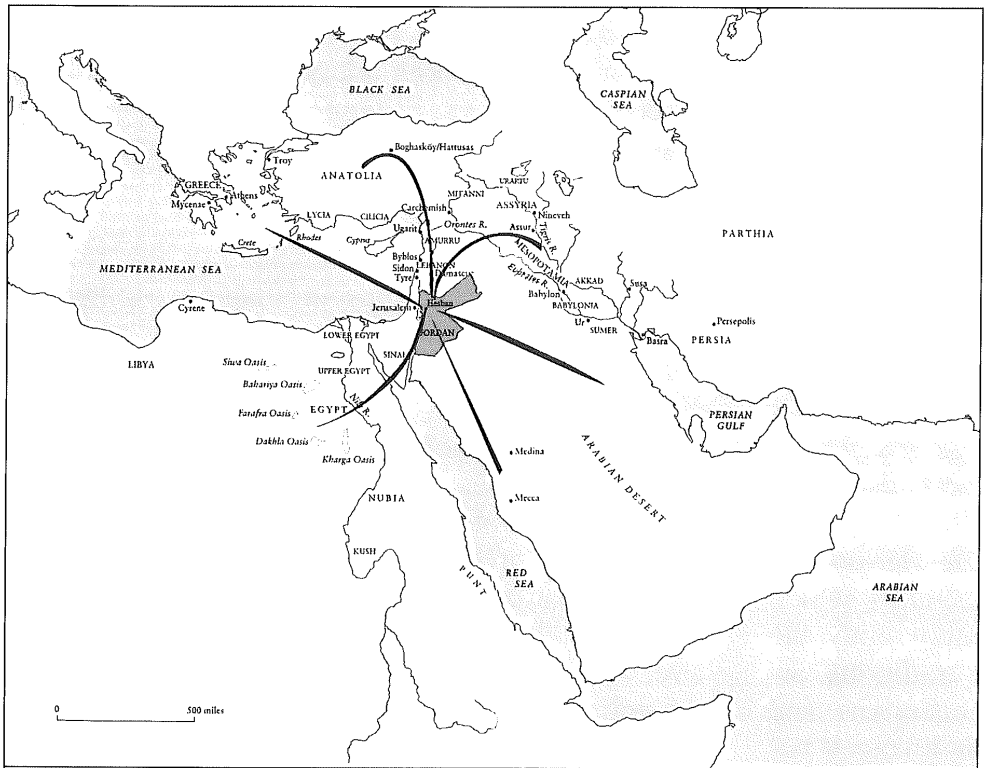
Third is the *Mediterranean Sea* that connects the Southern Levant to ports of call all around the Mediterranean and beyond. Coastal cities such as Tyre and Sidon, Ashkelon and Caesarea are examples of harbours through which trade goods could be channelled from inland cities and towns to distant ports of call and vice versa. At various points in time this same coastline has also served as a point of access to the region by seafaring invaders such as the Philistines, the Greeks, the Romans and the Crusaders (FIG. 3).

And fourth is its natural endowment of which availability of water is the single most important factor impacting human livelihoods. As a general rule, rainfall is most plentiful in highland regions, especially as one moves northward and westward across Transjordan and the Southern Levant. Sedentary agriculture is thus most sustainable in the well-watered highlands of both sides of the Rift Valley and along the slopes of river valleys and wadis that drain eastward and westward from these parallel highlands. In these drainages natural springs and man-made cisterns, dams and terraces make water available year-around in this otherwise semi-arid landscape. These four factors combine to make the Southern Levant cross-roads of civilizations and a point of often violent conjuncture of great and little traditions.

Great Traditions

As stated earlier, great traditions are the universalized collective heritage and knowledge that, through the processes of universalization and parochialization end up impacting how life is lived in particular localities and times. At this preliminary stage of inquiry into what these traditions are, at least nine can be isolated as having played a significant role in shaping changes over time in local food systems of Transjordan. These include the Egyptian, Mesopotamian, Arabian, Canaanite, Greek, Roman, Byzantine, Islamic, and Modern Capitalist great traditions, each of which could, of course, be further subdivided into lesser strands of influences and traditions.

We shall limit ourselves here to providing a brief overview of each of these nine great traditions, attempting in the process to identify core components that help distinguish each. Highlighted with respect to each tradition will be the geographical region in



Graphics by Kristy Witzel

3. The Southern Levant is a cross road of civilizations and a point of often violent conjuncture of great and little traditions. Jordan is a frontier region on the edge of the great Arabian desert.

which they originated; aspects of their modes of agricultural production that set them apart, and selected other features. The goal here is not at all to be exhaustive in describing each (after all, whole disciplines have evolved around the study of each great tradition), but rather to posit — as a basis for future research and validation--core components of each in so far as this might help us understand cultural interactions through the ages in Jordan.

The Egyptian Great Tradition developed in the Nile Basin in response to the annual gentle flooding of the Nile River (Butzer 1976). Hypothesized core components include: 1) production of wheat, barley, pulse and flax by village farmers in naturally irrigated flood basins located along both banks of the Nile, in the Fayyum Depression and in the Delta (Butzer 1976; Wetterstrom and Murry 2001); 2) centralized regulation of the agricultural calendar by a religious elite with the pharaoh at the top (Robins 1995: 1811-1812); 3) diversion of agricultural labour to public works such as pyramid construction during flooding season (Mendelssohn; 1974); 4) on-again off-again control of provinces or *nomes* by central governments (Eyre 1995: 186; Leprohon 1995: 273-287) and 5) reliance on hieroglyphics as a means to codify knowledge and practices essential to the maintenance of the tradition.[2]

Interactions between Egypt and the Southern Levant go back to at least the fourth millennium BC — to the Chalcolithic Period (van den Brink and Levy 2002). The development of writing during Old Kingdom times facilitated not only market exchange between the two regions, but also expansionary dynamics involving ideology and power (Algaze 1993). During Middle Kingdom times maritime relations between Lebanon and Egypt were established, and inland trade routes connecting the Southern Levant with Egypt were opened up (Manley 1996). During New Kingdom times Thutmose III, and later his son, Amernhotep II, invaded Palestine in order to further secure Egypt's commercial interests and authority in the region (Redford 1982). The invasion of the Sea People during Late New Kingdom times threatened to undo Egypt's strong hegemony over the Southern Levant. However, another military campaign, this one presided over by Shoshenk I, assured continued Egyptian authority over the vital trade routes with Palestine throughout the remainder of the Late New Kingdom (Manley 1996).

The Mesopotamian Great Tradition developed in Southern Mesopotamia in response to annual--often violent--late spring flooding of the Euphrates and especially the Tigris rivers (Adams 1965, 1981; Lamberg-Karlovsky and Sabloff 1995: 139-181; Wittfogel 1955). Hypothesized core elements include: 1) irrigation of cereal fields and pasturelands by means of networks of man-made canals transporting water from the main channels of these two river (Postgate 1990); 2) application of various social technologies--for example, priestly regulation of the agricultural calendar--as a means to ensure elite control of agricultural production (Eyre 1995); 3) protection and centralized control of agricultural villages and canals by means of city-states (Adams 1981) and 4) reliance on cuneiform script as a means to codify knowledge and practices essential to the maintenance of the tradition.[3]

The source of the Mesopotamian Great Tradition was Ancient Sumer (Kramer 1963; Woolley 1965). Crucial to the progress of this great tradition was the Sumerian language and script — cuneiform — which not only facilitated routine administrative activities of the Mesopotamian city-states, it also served as an important medium for dissemination of sacred temple literature, epic poetry, and royal decrees. Like its Egyptian counter part, the Sumerian Great Tradition shaped the elite cultural traditions of a succession of dynasties and empires in the Mesopotamian heartland and beyond, starting ca. 3500BC and ending ca. 500BC.

While interactions with the Southern Levant go back as far as the Old Babylonian Period, during the times of the Amorites (see Canaan below), it is especially during the Late Babylonian period that Mesopotamian influence reaches its peak — thanks in particular to the military campaigns of the Assyrian king Tiglath-Pileser III ca. 728BC (Routledge 2004). This Mesopotamian hegemony in the Southern Levant continues nearly unabated for ap-

2 Other components could no doubt be added to this list. For example, throughout much of Egyptian history it was the pharaoh who ultimately controlled the economy and political unity or disunity of Egypt as a state-level polity. As stated earlier, our project here is more to be suggestive than to be exhaustive.

3 Again, this is by no means intended as an exhaustive list, but as a point of departure on the road to a more comprehensive one. This applies to all the rest of the great traditions discussed below as well.

proximately two centuries, until ca. 539BC when the Achaemenid Persians took over control (Lipschits 2004).

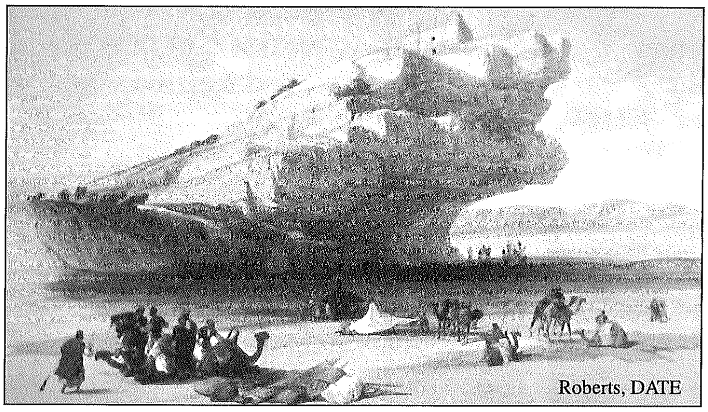
The Arabian Great Tradition developed in the desert oasis and arid steppe of the Arabian Peninsula (von Soden 1994: 23-24). Hypothesized core components include: 1) adaptation to arid desert conditions by means of migratory production of sheep and goats (Eph'al 1982: 12-17); 2) symbiotic, often predatory, interactions with agricultural populations along the Fertile Crescent; 3) reliance on kin-based or tribal social organization as a means to protect rangelands, watering places and households (Guillaume 1954: 2-5) and 4) reliance on a group of Semitic language and scripts, such as Thamudic, Safaitic and Old South Arabic, as a means to codify knowledge and practices essential to the maintenance of the tradition (FIG. 4), (Eph'al 1982; Zurayk 1949).

The Arabian Great Tradition is closely tied to the history of Semitic peoples in general. The Semites were among the earliest peoples of the Ancient Near East who can be identified from inscribed monuments and written tradition (Huehnergard 1995; Gragg 1997). The most enduring influence of the Arabian Great Tradition is in having bequeathed to the world the religion of Islam.

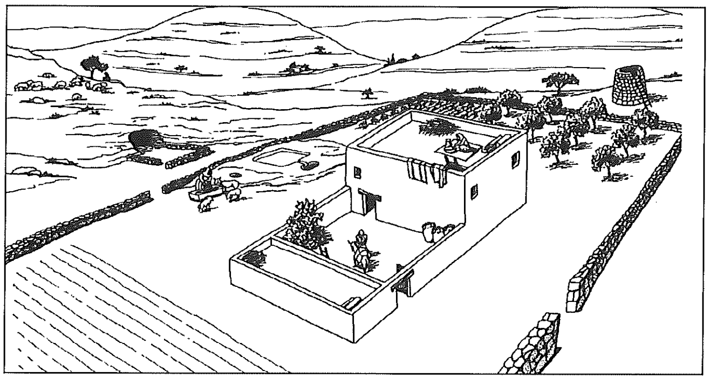
The Canaanite Great Tradition developed in response to the ecological conditions along the Eastern Mediterranean, in particular the fertile highlands of coastal and southern inland Syria (including Lebanon), Israel, Palestine and Jordan FIG. 5 (Tubb 1998: 13). Hypothesized core components include: 1) local-level collection of rainwater on fertile slopes by means of terracing, diversion dams and cisterns; 2) agriculture emphasizing dry-farming of cereals and terrace-based production of olives and grapes (Hopkins 1985); 3) significant capacity for sedentarization and nomadization as a means to manage risks and respond to new opportunities and threats (LaBianca 1997); reliance on extended family networks, a temple-based religious cult, and at times tribal kings, as a means to organize production and protect against enemies (LaBianca and Younker 1995; cf. Ahlstrom 1995: 587-631); and 4) reliance on a specific Northwest Semitic language and script (Amorite, Ammonite, Edomite, Hebrew, Moabite) as a means to codify knowledge and practices essential to the maintenance of the tradition (Gray 1964; Gragg 1997: 516-527).

A point of view shared by many biblical scholars is that the people we know in the Bible as Israelites were originally Canaanites (Mendenhall 1973; Lemche 1991; Tubb 1998). From an archaeological standpoint, however, a problem with the Canaanites, especially when compared with the Egyptians and the Mesopotamians, is that they are very difficult to identify from their material culture remains.

The Greek/Hellenistic Great Tradition[4] resembles to some degree that of the Canaanites. Hypothe-



4. Arab tribesmen camping in the desert. The Arabian Great Tradition developed in the desert oasis and arid steppe of the Arabian Peninsula. Its most enduring influence is in having bequeathed to the world the religion of Islam.

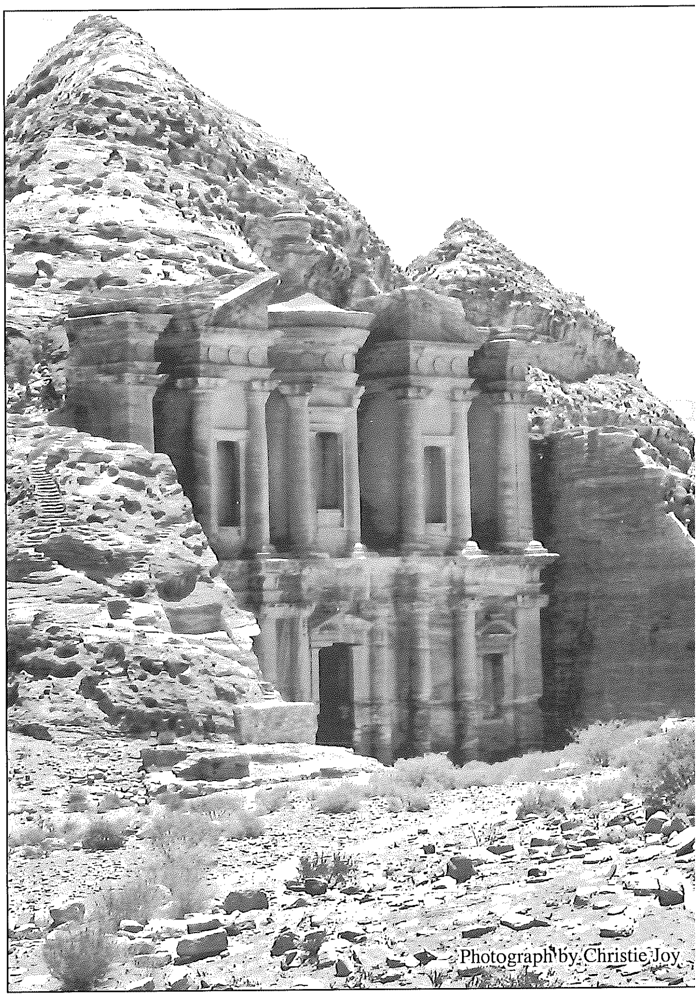


5. Ammonite farmstead excavated and reconstructed by the Mādabā Plains Project. The Canaanite Great Tradition developed in response to the ecological conditions along the Eastern Mediterranean, in particular the fertile highlands of coastal and southern inland Syria (including Lebanon), Israel, Palestine and Jordan.

[4] An argument could be made for calling this the Indo-European Great Tradition, which would include the Hittites, Hurrians, Greeks (Myceneans and Hellenistic), and, to a lesser extent, the Romans, culminating in the Byzantines. At this writing, I prefer to leave it as it is until a more compelling case can be made for broadening the designation.

sized core components include: 1) local-level collection of rainwater in fertile valleys and slopes by means of terracing, diversion dams and cisterns; 2) production of cereals by means of dry farming on open plains and orchards planted to olives, figs and grapes on terraced hillsides; 3) transhumant production of sheep and goats on mountain pastures and stubble fields in cultivated areas (Hughes 1975: 68-82); 4) reliance on extended family networks as a means to organize production and protect against droughts and enemies and 5) use of the Greek language and script as a means to codify knowledge and practices essential to the maintenance of the tradition (Gragg 1997: 516-527).

The influence of Greek/Hellenistic civilization on the Southern Levant increased rapidly in the wake of Alexander the Great's campaigns in the region. This influence has been preserved in archaeological remains of town planning, buildings, and dietary preferences (LaBianca 1990; Vyhmeister 1989; Tcherikover 1959). The textual basis for this tradition was the Greek language and theatre, along with its rich literary, philosophical and scientific corpus of learning (Aune 1997). Cities of the Southern Levant that show the influence of this Great Tradition include Philadelphia ('Ammān), Cesarea, Jerusalem, Jarash, Petra (FIG. 6) and many others (Mitchel 1992; Tcherikover 1959).



6. The Nabatean Arabs of Petra adopted Greek/Hellenisti traditions in their city planning and architecture.

The Roman Great Tradition[5]--although greatly indebted to the Greek/Hellenistic Great Tradition and in so many ways a continuation of it--can nevertheless be distinguished from this earlier tradition because of its heavy emphasis on maximization of agricultural production and yield. Hypothesized core components include 1) maximization of water supply through addition of aqueducts for channelling water from distant streams and springs (FIG. 7); waterwheels and pumps for raising water to nearby fields; large underground cisterns and reservoirs for storing water, and drainage systems for managing runoff (Hughes 1975); 2) maximization of land area available for agricultural production through removal of forests and draining of swamps (White 1970: 146-172); 3) maximization of yield through application of green manure, fertilizers, and rotation of crops (White 1970: 86-172); 4) maximiza-

7. Aqueduct supplying water to Cesarea. The Roman Grea Tradition-although greatly indebted to the Greek/Hellenis tic Great Tradition and in so many ways a continuatio of it--can nevertheless be distinguished from this earlie tradition because of its heavy emphasis on maximization

[5] In the version of this paper I presented at the ICHAJ conference in Petra, I lumped the Greek and Roman tradition into one — Greco-Roman Great Tradition. In researching the matter further, however, I have elected to keep the two separate — especially as there is such a significant difference between the two traditior when it comes the emphasis on maximization. I do acknowledg however, that in most other respects, the Roman Great Traditio is a continuation of the Greek/Hellenistic.

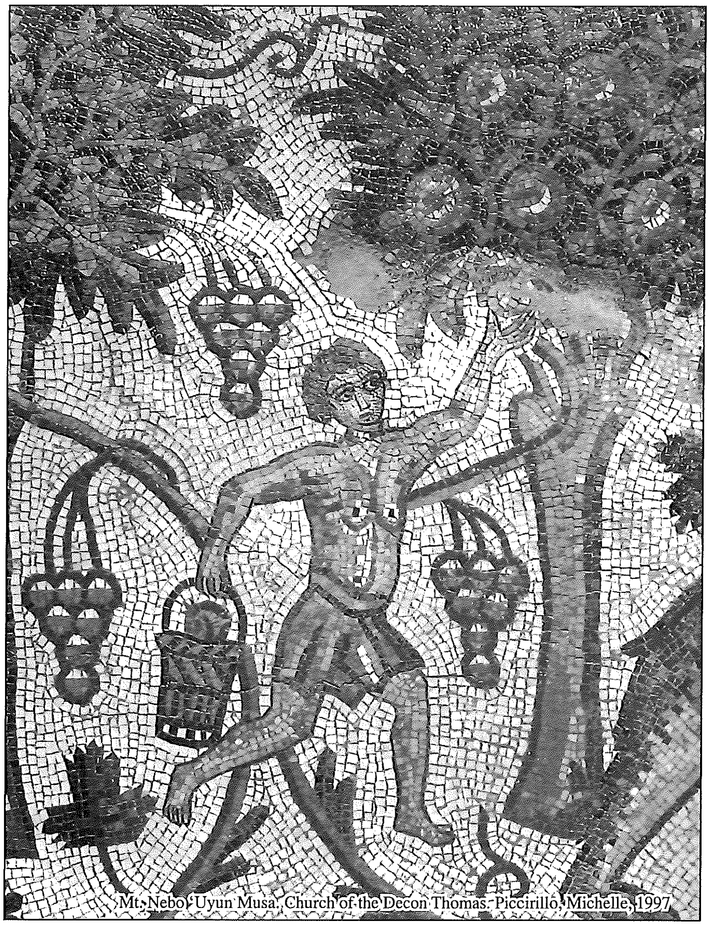
tion of crop and stock yields through breeding and improved husbandry practices (White 1970: 173-331); 5) maximization of farm labour through increased use of slaves and hired personnel (White 1970: 332-383) and 6) use of the Latin language and script as a means to codify knowledge and practices essential to the maintenance of the tradition.

These efforts to maximize food system outputs were intimately linked to the growth and spread of cities throughout the Roman world. Modelled to a great extent on urban designs developed by the Greeks, and linked by paved highways, cities became the political centres of the Roman economy, exerting a powerful influence on their agricultural hinterlands (Foss 2002). Mandatory architectural components included the *forum* with its subsidiary buildings; the *temple* devoted to the state religion and the emperor cult, the *curia* where city councils were held, and the *basilica* or courthouse. Larger cities also included an amphitheatre, temples built for various divinities; fountains, and triumphal arches.

To these changes in rural and urban landscapes introduced by the Romans must be added their devotion to law, order and discipline — their "unwavering adherence to the idea of a controlled life, subject not to this or that individual, but to a system embodying the principle of justice and fair dealing" (Hamilton 1993: 129-130). In the end, this ideal ended up favouring the settled farmer over the nomad; the strong over the weak and the landowner over the farm hand.

The Byzantine Great Tradition[6] continued to a significant extent the emphasis on maximization introduced by the Romans, but with modifications attributable in great measure to the rise of Byzantine Christianity, centered in Constantinople. Hypothesized core components include 1) continuation, and in certain locations, expansion of Roman system for maximizing water supply (Evenari, Shanan and Tadmor 1971; Patrich 1995: 483; Reifenberg 1955); 2) addition of monasteries and estate farms as centers of agricultural production and distribution (Foss 2002: 95); 3) intensification of cash crop production of olives and grapes (FIG. 8) (Foss 2002: 92); and 4) increased hierarchical organization of production due to increased concentration of political power in the hands of bishops at the expense of city endowments and private citizens (Foss 2002: 71) and 5) use of the Greek language and script as a means to codify knowledge and practices essential to the maintenance of the tradition. At the apex of this new world of Byzantine Christendom sat the emperor — head of both the church and the state — a polity referred to by some scholars as caesaropapism (Margoulias 1970: 1-16).

As in the case of the Roman great tradition, that of the Byzantines was essential to life in towns and cities. And every town, every city had its own church, or churches — often constructed of reused remains of destroyed Roman temples. Even the rural landscape took on a new character as monaster-



8. Mosaic from Mount Nebo depicting harvest scene. The Byzantine Great Tradition continued to a significant extent the emphasis on maximization introduced by the Romans, but with modifications attributable in great measure to the rise of Byzantine Christianity, centered in Constantinople.

[6] A case could probably be made for referring to this as being part of a broader Judeo-Christian Great Tradition — which would include Judaism and the two streams of Christianity — the eastern stream or Byzantine Christianity, and the Western stream, or Roman Catholicism. Again, I prefer to leave it as it is as most of the published sources I have come across so far treat the two streams as separate.

ies and shrines were inserted in the midst of olive groves and along highways and paths linking cities and towns (Foss 2002: 74).

The Islamic Great Tradition originated during the sixth century AD among caravaneers and desert tribesmen of the Saudi Arabian desert (Tritton 1951: 9-22). As stated earlier, its roots are to be found in the Arabian Great Tradition. From its beginnings in Mecca and Medina it spread rapidly to the great population centers of Late Antiquity — to Baghdad, Cairo, Damascus and Jerusalem — to become the dominant religion of the Arabs throughout all the lands of the Middle East and far beyond (Guillaume 1954: 78-87). Hypothesized core components include 1) irrigation agriculture in the great river basins of Egypt and Mesopotamia; 2) dry-farming of cereals in the mountainous regions of the Levant and Northern Syria; 3) pastoral nomadism in the deserts of Arabia and North Africa; 4) extensive inter-regional trade and exchange in foodstuffs and other goods facilitated by caravaneers and universal Islam; 5) a world view and elite culture anchored in the teachings of the Holy Qur'ān and the Prophet Muhammad (Guillaume 1954: 20-54) and 6) use of the Arabic language and script as a means to codify knowledge and practices essential to the maintenance of the tradition.

More than any other, the Islamic Great Tradition, which draws its inspiration from the Holy Qur'ān and the Arabic language, continues to shape the lives of people in the Southern Levant (Guillaume 1954: 155-199). Among its salient features is a global network of believers whose common core of shared religious attitudes, beliefs and practices have fostered and facilitated the development of networks of cooperation, trade and political domination which have surpassed any before them, and which continue to imbue Islam with vitality and power visa-vie the rest of the world. For over thirteen centuries, Islam has prevailed as a dominant force in the lives of both elites and commoners within its sphere — starting with the Umayyads, and continuing through the Abbasids, the Seljuks, the Ayyubids, the Mamluks, the Ottomans, and most recently, the Wahabis (Waldman 1987).

The Modern Capitalist Great Tradition. Born of the "great transformations" which took place in Europe during the 16th-18th centuries — including the Renaissance, Reformation, Enlightenment and the scientific and industrial revolutions — the Modern Capitalist Great Tradition has had enormous consequences for how food is produced, stored, distributed, prepared and consumed around the world (Braudel 1995; Wolf 1997). What sets this new tradition apart is its reliance on fossil fuels, fertilizers, mechanization, and international markets. Under this new system, food is produced by means of factory farming methods for the sake of profit (Bodley 2000: 308-309). As was the case with the Roman great tradition, the goal is maximization — but this time not only by means of application of technology, but also by expansion of demand through globalization.

Encounters between the Modern Capitalist Great Tradition and the Middle East began with Napoleon's invasion of Egypt, and has since continued unabated through the instrumentalities of colonialism, imperialism, trans-national corporate activity, multi-national political and economic organizations, factory farming, tourism, and commerce (Bodley 2000). Through these processes it has brought into existence a global food system that is rapidly rendering traditional farming and dietary practices obsolete. Its impact is ubiquitous throughout the world, not the least in the Southern Levant, where the many encounters between "The Lexus and the Olive Tree" (Friedman 2000) continue to challenge daily survival for many.

Little Traditions

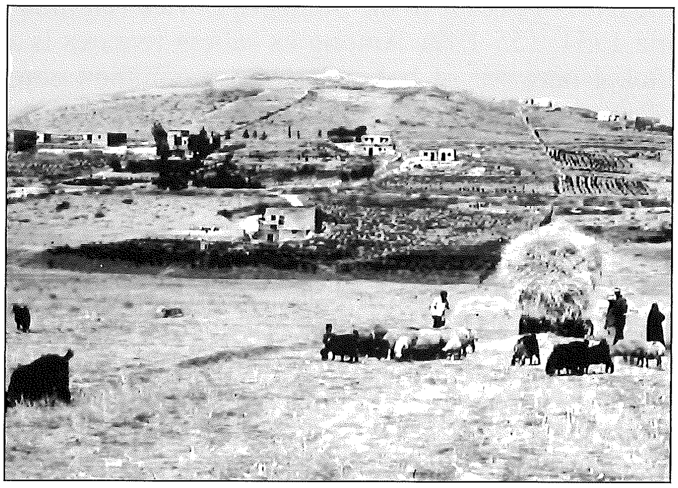
As was stated earlier, little traditions are localized indigenous heritage and knowledge. What sets little traditions apart from great traditions is their essentially localized and indigenous character. Thus, little traditions are under the domain and control of local actors who do not rely on the process of universalization and centers of transmission in order to persist or change. In this section I focus attention on seven such little traditions whose persistence is due largely to the perceptions of local actors that these are crucial practices for assuring food and livelihood security at the level of households and local communities. These practices and traditions have come to light as a result of archaeological and ethnographical research by the Mādabā Plains Project in Jordan.

Elsewhere (LaBianca 1997) I have referred to them as "indigenous hardiness structures" in order to emphasize their derivation among local residents (indigenous); their function in fortifying against hunger and famine (hardiness); and their persistence as cultural practices (structures). They include the following: local-level water management, mixed agro-pastoralism, fluid shared commons, residential flexibility, hospitality, honor and tribalism (see End Notes for examples of encounters with each of these little traditions in Tristram 1873).

Local-level water management[7] refers to the practice of relying on natural springs and man-made cisterns for water to meet household and farming needs. Knowing the location of natural springs, even those that flow only intermittently, is crucial for survival of some households, especially where access to other sources of water is minimal. Additional sources of water are the "family cistern" and the "agricultural cistern" (cf. Wåhlin 1997). Typically, these are pear shaped installations, hewn out of the soft bedrock, into which rainfall is directed during the rainy season via a settling basin and a small ground-level opening. Cisterns may vary in size from as small as 1 cubic meter up to 20 cubic meters. Many, if not most, were originally constructed by ancients, especially the Romans, although a few have more recent origins. Whether ancient or new, cisterns, along with the catchments that feed them, require regular maintenance. In the case of household cisterns, which are typically located adjacent or underneath dwellings, catchments consist of rooftops of houses, while agricultural cistern, which are typically located nearby cereal fields or orchards, have earthen catchments. Compared with large scale systems for collecting, transporting and storing water, such as dams, aqueducts, and reservoirs — which are difficult to construct, require a great deal of labour to maintain, and are vulnerable targets in times of conflict — natural springs and cisterns represent a comparably low-risk approach to water management.

Mixed agro-pastoralism[8] refers generally to the practice of combining crop cultivation with animal husbandry. Although a wide range of "mixes" are possible, the classic pattern in the Eastern Mediterranean is cereal production combined with sheep/goat production. The advantage of this practice is that after the fields have been harvested, the small stock can graze on the stubble while dropping fertilizing dung on the ground. Where conditions permit, this practice may be combined with production of legumes or the cultivation of olives and grapes on slopes and terraces. In some cases, pigs and poultry may also be added to the mix. Transhumance is also a common practice in the Southern Levant. It involves people moving with their mixed herds from lowland to highland regions on an annual basis in order to maximize productivity of both lands and herds. The bottom line is that the ordinary farmer "knows how" to do produce a range of different crops and animals. This, in turn, allows him to respond to different economic, political or environmental opportunities or threats by adjusting the mix in terms of emphasis: cereals, legumes, olives, grapes, other fruits, sheep, goats, pigs or poultry. In more recent times, wage labour has been added to this bundle of options for many local farmers (FIG. 9).

Fluid shared commons[9] are pastures and crop lands to which no one family or household has exclusive use rights; instead, in any one year, or over a period of several year, the land may be used by a range of different families representing one or more folk communities or tribes. Furthermore, over a given period of time, the territory of such shared commons may shift as individual families or communities adjust their production strategy to emphasize herding or agriculture; thus the boundaries of shared commons are typically fluid. Such



9. Harvest scene at Ḥisbān. Mixed agro-pastoralism refers generally to the practice of combining crop cultivation with animal husbandry.

[7] cf. Tristram 1873: 62, 115, 119.
[8] cf. Tristram 1873: 83, 271, 238.
[9] cf. Tristram 1865: 552.

fluid shared commons have certain advantages, and also certain disadvantages. An advantage is that it makes shifts in production emphasis easier in that it does not require purchase of new lands and/or bureaucratic hassle of any kind (although it may require negotiations with other locals using the same lands). Another advantage is that it gives producers a certain amount of flexibility in adjusting to differences from year to year in moisture conditions necessary for animal and/or crop production as homeland territories may be expanded to incorporate recently well-watered areas outside of last year's homeland territory. A disadvantage is that conflicts can also arise, and often do arise, as different producers attempt to exert control over disputed fields, pastures, and watering places.

Residential flexibility[10] allows families to shift the location of their production activities from houses, to caves or to tents. In some cases, a given household may split up, with some members moving into tents to be closer to their herds, and others staying behind in the house to look after the crops. In other cases, households may live in tents during the warm months of the year, and move into caves or houses during the colder months. Here again, the bottom line is that people "know how" to make themselves comfortable in houses, tents and caves, thus greatly increasing their strategic options for producing food under a mixed agro-pastoral regime and also for protecting crops, herds and the products of both (FIG. 10).

Hospitality[11]. The emphasis on hospitality for which the people of Jordan are deservedly well known has its roots in more than good manners. By means of this institution, individuals and households--sometime entire folk communities or tribes--accumulate generosity credits that can be cashed on a reciprocal basis when the need arises. Hospitality also facilitates the sharing of stories by traveling "story tellers" who hold forth before their hosts about matters of importance to preserving their honor, prestige and heritage. Visitors are also a good source of information about new opportunities and threats, thus providing news that benefits the conduct of livelihood activities by members of folk communities. Hospitality, therefore, played a crucial practical role in facilitating the transmission of information vital to group solidarity and survival.

Honour and Shame[12]. The institution of honour informs men and women in various statuses and roles of ideal qualities and practices in the conduct of their private and public lives as members of a particular folk community or group (Eickelman 1989: 250-253). The related institution of shame serves as a means of assuring compliance with such shared ideals and practices. Honor can be increased through acts of valour and courage, and also through association with individuals and groups perceived to be more prestigious (FIG. 11). Shame is the opposite side of the coin in that it in-

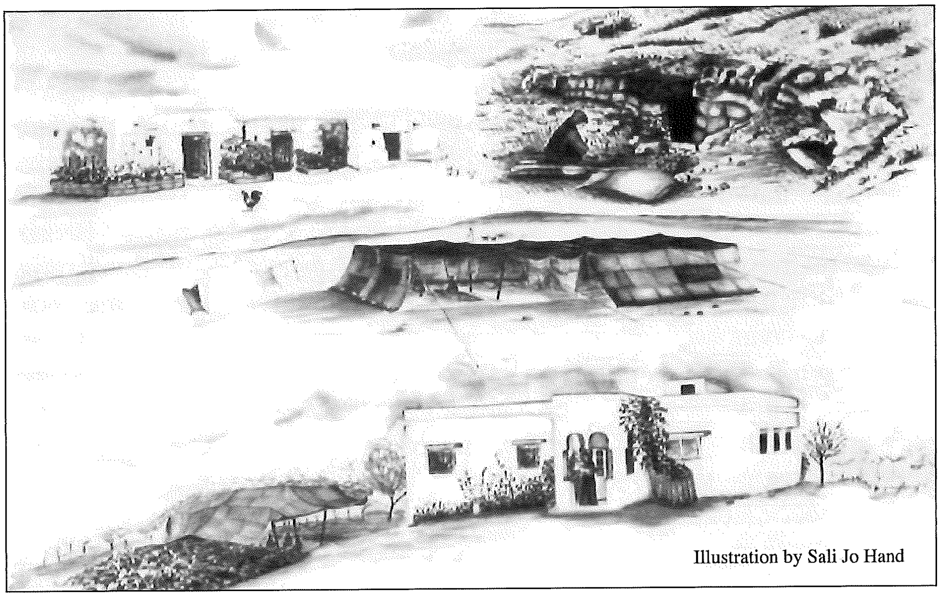


Illustration by Sali Jo Hand

10. Residential flexibility allows families to shift the location of their production activities from houses, to caves or to tents. In some cases, a given household may split up, with some members moving into tents to be closer to their herds, and others staying behind in the house to look after the crops.

[10] cf. Tristram 1873: 114m 121m 189.
[11] cf. Tristram 1873: 37, 178.
[12] cf. Tristram 1873: 100, 206.

11. Party of armed men performing their duty as kinsmen. The institution of honour informs men and women in various statuses and roles of ideal qualities and practices in the conduct of their private and public lives as members of a particular folk community or group.

creases or decreases in proportion to acts of honor undertaken or omitted. Both work in tandem as a powerful means of social control that can--and usually does-- operate outside of a codified system of civil and/or criminal law.

Tribalism[13] can be defined a flexible polity involving strong in-group loyalty based on variously fluid notions of common lineal descent. As I have discussed elsewhere (LaBianca 1993, 1997; Lancaster and Lancaster 1992), this type of polity provide tribal peoples with a highly flexible system of local level political organization by means of which small groups of kin have been able to adjust consistently and successfully to political and economic domination and change. Based as it is on the principle of claimed common lineal descent, it provides the enabling mechanism by means of which individual households and whole tribal sections have been able to shift back and forth between sedentary and nomadic ways of living.

Deeply embedded in the local food system, these indigenous hardiness structures represent "little traditions" that the local population has clung to over the centuries as a means to survival in a high-risk social, economic and natural environment. They have provided individuals, households and whole communities with a proven set of options for survival and resiliency in a region that has become legendary as a crossroads of commerce, contesting armies and civilizations.

Avoiding Essentialism

An issue which surely will arise in response to the line of research proposed here is the question of essentialism (Brown 1999; Eickelman 1989:258). Essentialism is "belief in the real, true essence of things, the invariable and fixed properties which define the 'whatness' of a given entity" (Cliff 1996). Applied to our project here, the concern is that in seeking to identify "core components" of various great and little traditions, we risk assuming homogeneity and constancy where in actuality heterogeneity and change is the reality. This is an important concern to which I would offer the following response:

First, the risk of essentialism applies to all fields of inquiry where the goal is to identify analytically distinctive features of objects or events. The important thing to keep in mind, however, is the reason why scientists devise classification schemes in the first place — usually in order to deepen understanding of properties and patterns in a particular class of objects or events. Thus, by distinguishing nine distinct great traditions and seven distinct little traditions, our goal is to deepen understanding of the "whatness" of each of these, and to discover patterning with regard to their interactions. We fully anticipate as this line of research progresses that we will become aware of weaknesses and limitations with respect both to the terminology (Semitic, Canaanite, Islamic) used and the posited properties of each category of tradition. This will no doubt lead to changes and enhancements with respect to both.

Second, consideration should also be given to what would happen if our project here — to construct a framework that would apply to all historical periods in Jordan--was abandoned as a means to avoid essentialism. What would happen is obvious, i.e. existing divisions of labour would continue along traditional lines of scholarship — Bronze Age archaeology, Iron Age archaeology, Roman archaeology, and so on. An advantage of thus continuing the status quo is that as scholars with in-depth knowledge of their fields keep digging deeper and deeper they are less inclined to settle for overly simplified characterizations of their particular period of expertise. The down side of this approach to avoiding essentialism is that it reinforces the tendency among such experts to ignore the ways in which "their period" has been shaped by traditions

[13] cf. Tristram 1873: 43, 237.

originating in much earlier periods. It is precisely in regards to this limitation that the structure of tradition framework is so valuable, for it sets up feedback loops between scholars working in different periods, thereby bringing to light streams of tradition that span multiple centuries and millennia.

Third, the best way to avoid essentialism, therefore, is to build feedback loops between scholars that assure continuing discourse about the "whatness" of various great and little traditions. To facilitate such discourse, a certain amount of simplifying is necessary — as for example the attempt in this paper to identify "core components" of great traditions — even if this risks suggesting constancy and unbroken ness about a given tradition that may not in fact exist. To the extent that this limitation is acknowledged by all, it avoids essentialism.

Conclusion

What I have attempted to do in this paper is to sketch the outlines of a more adequate theoretical framework for grasping the causes of cultural interactions through the ages in Transjordan. The categories I have posited as constituting various great traditions are well known by most scholars working in Jordan. The posited small traditions are common knowledge among the rural masses of the region, but not necessarily among scholars.

More research is needed 1) to expand and validate the salient features of each of the great and small traditions highlighted; 2) to delineate their influence and impact in terms of local food systems and 3) to understand their synergistic interactions in producing particular historical landscapes and societies throughout the region. To this end anthropological, archaeological and historical research must proceed hand in hand so that the full extent of regional variation and historical particularity that has existed in Jordan throughout the ages will come to light.

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Land Uses and their Effect on the Demography of Region: A Study of Three Different Areas in The South of Jordan; ash-Shawbak, Uthruḥ and Bīr Abū Danna

Introduction

Studies of land use reveal historical changes that concern both urban and rural provinces. Land use is regarded as a marker of life and of the changes that took place in the social, agricultural, economical and industrial spheres of a given province or region over time. Such studies result in deeper understanding of a given region and can assist in planning and reorganization. This study will present an analysis of documents and data pertaining to land use within a framework of the Osmanli period. The study will proceed from 1858 (the date of the application of Osmanli land law) until the end of 2002.

The regions of ash-Shawbak, Uthruḥ and Bīr Abū Danna have never been investigated, although the horizontal expansion land use in this region, and the accompanying [intensified use?] of certain applications, would suggest that studies will inevitably increase. Such studies are also expected to spotlight future developments related to surface and subsurface of water sources on the one hand, and population distribution on the other. The effect of immigration from these areas to urban towns can be vividly observed throughout the study. Further, it is possible to define and determine the impact of government policies as well as [environmental?] and social changes that determine land use in this region.

Regions of Study ash-Shawbak Province (Governorate of Ma'ān)

This is a region defined by classical agriculture and is inhabited by farmers. The region measures about 414km^2. The lands cover 6532.298 dunams. The lands which refer to the treasury of state are 72991.068 square dunams. These lands include about 100 springs, 52 wells and about 90 old ruins, some of which have become agricultural or urban villages inhabited by residential complexes. The number of villages has expanded from 3 villages and 1 farm during the Osmanli time to 14 urban population gatherings and 10s of productive farms nowadays.

Lands of Uthruḥ (part of the lands of Southern Semi-Desert)

This region is considered of great importance to Islamic history. These lands are inhabited by Bedouin people (A'sheer), the majority of which belong to Al-Jazi tribe. The privately owned portion of these lands amounts to about 313.502 dunams. State-owned land amount to 6674.383 dunams including 1 spring and about 20 wells.

Bīr Abū Danna

This region is settled by Bedouin who belong to al-Nu'aymat tribe. It is difficult to separate the area from the other villages of al-Nu'aymat (unless one refers to registers of lands). In fact it consists of 1 small village of al-Nu'aymat bedouin. It is inhabited by a small population and only contains 1 spring.

Approach

The aim of the study is to present recommendations for decision-makers and planners in Jordan. In order to properly conduct the study the following factors must be considered: geographical features of the region; environmental factors: location, shapes of land, climate, temperatures, rainfall, water sources, areas of lands used for different purposes; population levels: average family size, population structure, population complexes, other variables. The analysis should assess the value of land in terms of population and other agricultural, commercial, industrial, administrative, and tourist purposes.

There are, of course, human factors which affect the use of agricultural lands: e.g. the constructive0/urban expansion; the system of agricultural title deeds; agricultural human resources; agricultural services; marketing and transportation; agricultural output.

The analysis will take into account the following historical periods:

Time period	Events and reasons for study
1858-1916	Osmanli land law — the Great Arab revolution
1917-1951	The time of establishing the Emirate and Kingdom until the end of the period of the founder king Abdullah Bin – Al-Hussein
1952-1980	The climax of financial and economical situation
1981-1996	Different social, economical and political transformations in Jordan
1991-2002	Time of stability of these transformations and their vivid effects

Method and timetable

1) One year: A comprehensive review of literature relating to land use will be undertaken. Other similar studies have provided useful background to the present research. Certain studies have provided statistical models which can be applied here. Further, unpublished reports and data from the Ministries of Lands and legal proceedings from ʻAmmān, Maʻān and ash-Shawbak on the one hand, statistics and reports from the Ministries of Education, Agriculture, Remains and Tourism, Water and Irrigation, Health, Works and housing, Royal Geographic Center, Office of Statistics, and Directorate of Remains in Maʻān Governorate, documents of municipalities of ash-Shawbak, Uthruḥ, Basṭa, Records of trade and industry from ʻAmmān and Maʻān, and Ministry of Interior and the General security and al-Bādiya police records may also prove useful.
2) One year: Developing familiarity with the registers of lands at ash-Shawbak, Uthruḥ and Abū Danna during the Osmanli rule found at the Office of Lands and Areas (ʻAmmān) and others kept in the Legal Court of ʻAmmān that are concerned with the regions of study.
3) 8 months: Working with the registers of current lands of ash-Shawbak, Uthruḥ and Abū Danna. This will result in a diachronic study of the structure of land-use from title deeds and other records.
4) 8 months of fieldwork involving survey of the three regions to record: springs (and their effectiveness), wells and their usages and inhabited complexes with reference to title deeds and/or state-owned lands of these regions. This work will help determine the dates and stages of transformations in the region in respect of the agricultural, industrial and professional projects and their effect on the local community.
5) One year: Analysis and documentation of 2, 3 and 4 (above) in relation to current academic study and including maps, pictures and statistical data which illustrate the diachronic and analytic approach.

The total period of study is estimated to be about five years, although some stages may be shortened if other researchers direct their work together. The process of coordination may help to shorten the time of achieving the study.

Personnel

1) The study requires 1 main researcher (supervisor) to direct the project academically.
2) This study requires 1 full-time assistant to the supervisor who would collaborate with field-researchers and co-ordinate their work and form the link between the theoretical and practical sides of the study. Mr. Mahmmoud al-Jbarat is proposed for this position.
3) The study requires 10 full-time field researchers (6 males and 4 females), to work at the region of study. These would be preferably academically qualified inhabitants of the regions of study (and therefore would possess acquaintance with land registers individuals and local environments).
4) In addition 4 full-time specialist research assistants are required to study all the Osmanli registers available at the Office of Lands, area registers found in the legal court of ʻAmmān, and any other registers and/or documents outside the region of study.
5) For the purpose of follow-up, the **study** requires a stay of some researchers at the region of study. Three of them, at least should stay for no less

than half the period of time of study. Because of the distance between 'Ammān and the region of study and because there is no regular means of transport, it is suggested that means of transportation should be available.

6) Other costs of administration, translation, and equipment — 2 computers, references and sources.

The proposed budget is outlined below:

Item	Per annum	Total
Salaries: Main researcher (Supervisor)	JD 12,000	JD 60,000
Salaries: Full time Assistant	JD 8,400	JD 42,000
Salaries: 10 field workers	JD 30,000	JD 150,000
Salaries: 4 M.A. Student Assistants	JD 19,200	JD 96,000
Salaries: secretary (administrative assistant)	JD 2,400	JD 12.000
Salaries: Computer officer	JD 3,000	JD 15,000
Accommodation	JD 4,000	JD 20,000
Transportation	JD 2,500	JD 12,500
Equipment _ (computers)		JD 2,000
Equipment (reference material, incl. photocopying)		JD 7,000
Equipment (stationary)		JD 5,000
TOTAL COST	**JD 84,300**	**JD 421,500**

Enclosures

List (A): which includes names of writers and title of foreign studies and researches of land applications in different places of the world.

List (B): which includes Osmanli registers of lands, and the names of books and studies in Arabic.

Appendix 1

Osmanli Registers of lands:

a) Osmanli Registers of lands kept in the Office of Lands and Areas 'Ammān that pertain to the Province of Ma'ān during Osmanli legislation with the numbers:
1/3/1 (p. 89) referring to (1906).
1/3/2 (p. 98) referring to (1908-1910).
1/3/3 (p. 98) referring to (1910-1917).
1/3/2 (p. 296) referring to (1900-1910).

b) Osmanli Registers of lands kept in the Office of Lands and Areas, 'Ammān that pertain to lands of Karak and ash-Shawbak with the numbers:
2/3/1 (p. 389) referring to (1911-1922).
2/3/2 (p. 345) referring to (1919-1940).
3/3/3 (p. 392) referring to (1922-1925).
4/3/2 (p. 406) referring to (1925-1931).

c) Register of disbanded lands No. 4/1/4

d) Register of lands no. 3/2/4 (p. 393) written in Osmanli language that pertain to lands of Ma'ān and 'Aqaba during 1940-1953.

Appendix 2

a) Unpublished declarations and data of Ministries and Offices of Lands, Areas and Legal Courts in 'Ammān, Ma'ān and ash-Shawbak

b) The statistics and reports of Ministries of Education, Agriculture, Antiquities and Tourism, Water and Irrigation, Health, Works and Housing, Royal Geographic Centre, Office of Statistics, Directorate of Antiquities in Ma'ān, Basṭa, Rooms of Trade and Industry in 'Ammān and Ma'ān, and the registers of Ministry of Interior and the General security and al-Badiya Police.

الرقم	البيان
1	FAO. Guidelines for land – use planning. Rome: FAO, 1993.
2	LAND use mapping by local authorities in Britain: a report commissioned by the Department of the Environment. London: The Architectural 1978.
3	FAO Expert Consultation on land use planning Applications (Dec. 4-10, 1990: Rome).
4	IFAN/FAO Expert Consultation on prevention of land degradation (April 15, 1999: Rome). Prevention of land degradation, enhancement of carbon sequestration and conservation of biodiversity through land use change and sustainable land management with a focus on Latin America and the Caribbean proceedings. Rome: FAO, 1999.
5	UNESCO. The sahel: ecological approaches to land use Paris: Unisco, 1975.

الرقم	البيان
6	FOOD and Agricultural organization of the United Nations poplars and willows in wood production and land use. Rome: FAO, 1979.
7	POPLAR in forestry and land use. Rome: FAO, 1965, p. 511 (ill.) (FAO forestry and forest products studies; no. 12).
8	YEMEN. Range and Livestock Improvement project. Sheep herding patterns in relation to environmental conditions and land use in the Dhamar Montane plains (s. 1.) DHV Consulting Engineers, 1987.
9	SYMPOSIUM on the geography of the arid Zone (1962 Iraklion, Greece) land use in semi-arid Mediterranean climates. Unesco. Paris, 1964.
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11	BOUWMAN, A.F, Long-term scenarios of livestock – crop – land use interactions in developing countries/ by A. F. Bouwman Rome: FAO, 1997.
12	VINK, A. P. A. Landscape ecology and land use/ A. P. A. Vink: English translation edited by D. A. Davidson. London: Longman, 1983.
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21	SYMPOSIUM on Land Use Planning Techniques and policies (1981: Atlanta, Georgia). Land use planning techniques and policies: proceedings/ editorial Committee F. P. Miller *et al.*; managing editor David M. Kral. Madison: Soil Science Society of America, 1984.
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24	PEREIRA, Herbert Charles, 1913. Land use and water resources in temperate and tropical climates/ H.C. Pereira. London: Cambridge U. P., (1976).
25	FOTH, Henry D. Soil geography and land use/ Henry D. Foth, John W. Schafer. New York: John Wiley, 1980.
26	ZAGHA, Hisham D. Development and Application of a land use design model/ by Hisham D. Zagha. 1976.
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الرقم	البيان
28	O`CALLAGHAN, J.R. Land use: the interaction of economics, ecology and hydrology/ J.R. O`Callaghan. London: Chapman and Hall, 1996.
29	SILBERSTEIN, Jane. Land – use planning for sustainable development/ Jane Silberstein, Chris Maser. Boca Raton: Lewis pub., 2000.
30	BARTELLI, Lindo Joseph, 1917 Soil Surveys and Land Use Planning/ edited by L. J. Baratelli *et al.* Madison, WIS: Soil Science Society of America Society of Agronomy, 1966.
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33	CHISHOLM, Michael, 1931, Rural settlement and use: an essay in location/ Michael Chisholm. London: Hutchinson U.P., 1972.
34	ECONOMIC, activity and land use: the changing information base for local and regional studies/ edited by Michael J. Healey. New York: Longman, 1991.
35	SABA, Mona Yousef. The impact of land use on soil degradation for some selected soils in al-Muwwaqar area/ by Mona Yousef Saba: (supervised by) Awni Y. Taimeh. 2002.
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The Social-Cultural Impact of Trade Relations: The Case of The Nabataeans

Introduction

Trade was the backbone of the economy and power of the Nabataeans. The importance of trade for the Nabataeans cannot be overestimated, but we should not consider the Nabataeans as just traders. Various papers at this conference have emphasized aspects of the Nabataean economy, and these papers introduced new promising approaches in this field.

Concerning trade relations, we have a couple of sources. First: inscriptions from or about Nabataeans in the Mediterranean world (Wenning 1987: 22-23; Roche 1996). Some of them are found at well-known centres of international trade like Delos, Rhodes and Puteoli. None of the inscriptions provide a clear trade context from its contents but we know that Puteoli was the harbour of Rome for trade with the Near East. The second information is provided by Strabo, who reports what products were imported to Petra and what was locally produced (Hackl, Jenni and Schneider 2003: 615-617). Unfortunately, the source Strabo used, Athenodoros from Tarsus, was not well informed — a great part of his statements are wrong.

The trade activities, the presence of Nabataean and other Near Eastern traders in the international trade in the Hellenistic and Early Roman period and especially the trade goods offer a long list of questions. What can be said about the Nabataean trade is summarized by Graf and Sidebotham (2003). Therefore, I would like to focus on the impact and the effect of the trade on the Nabataeans. This is a very complex question and it needs some simplification to go along with. When asking for the chance or the danger caused by the impact of the trade it concerns particular economic, social, and political changes which allowed the Nabataean society to develop themselves into a higher standard and to become part of a system of Near Eastern powers. What is to be described is the effect of the profit the Nabataeans gained by their trade and are aspects of Nabataean society and history. Could wealth have been a factor which affected Nabataean identity and became a threat to Nabataean society or can wealth be seen as a great potential to strengthen Nabataean identity? How did the Nabataeans manage to overcome these problems in their greater world?

The Nabataeans gained a great knowledge of the trade routes, the areas, the people, and their cultures along these routes. We have to assume innumerable agreements and interactions. Nevertheless, I can see no direct influence caused by the trade relations of the Nabataeans. I do not understand Hellenization of the Nabataeans as an effect of trade relations with the Mediterranean world, but rather an embedded embodiment into of a greater development which we find all over the Near East. This development began as a process of sedentarization when the royal family and the Nabataean nobility decided to settle down at Petra around the middle of the second century BC and reached its full flowering in the period of Augustus (Schmid 2001a; Wenning 2003a). It is possible to follow the stages of the Hellenization of the Nabataeans and it is interesting that it resulted in a particularly Nabataean style and shaped culture.

The Early History of the Nabataeans

We know absolutely nothing about the origins of the Nabataeans. There is a possibility to connect the rise of the Nabataeans with the revolt of Euagoras of Salamis in 385/380BC who was supported by the Qedar, then the privileged Arabs in the incense trade. It seems that the Persians replaced the Qedar with the Nabataeans after the suppression of the revolt (Wenning forthcoming).

The description of the Nabataeans by the Greek historian Hieronymus of Kardia, recorded in the works of Diodorus Siculus, is still the source for ideas about the early period of the Nabataeans (Hackl, Jenni and Schneider 2003: 431-434, 439-453). Hieronymus refers to the situation of 311BC when Greek troops twice pillaged Petra, but failed to take their booty home. I agree with Fawzi Zayadine and others, who identify this Petra with Khirbat as-Sala further to the north (Zayadine 1999). Despite all problems in the report of Hieronymus and its interpretation four statements are essential to understand early Nabataean society:

1. The Nabataeans were a relatively small people of some 10.000, small in comparison with the large tribal league of the Qedar.
2. They were nomads, grazing camels and sheep. In technical terms they practiced an enclosed nomadism (Staubli 1991: 13-15).
3. They were tradesmen on the incense road on its upper part from Dedan to Gaza.
4. They became wealthy via the transport, protection and sale of trade goods, not only incense and spices, but many other goods.

The richness of the Nabataeans must have been become legendary in that period among other Arabs and the Greeks in the area. Already the Greek historian Arrian refers to the richness of the Arabs who defended Gaza together with the Persians when attacked by Alexander the Great. These Arabs are none other than Nabataeans. In 311BC the Nabataeans had established their part of the incense trade for some 60-70 years.

The effects of the trade privileges meant a great change for the Nabataeans. From an unknown small tribe they started to become the most important Arab power between Syria and South Arabia in the Hellenistic and early Roman periods. We are not informed about changes in the social levels, but may assume that it happened. Probably the highest *shaykh* of the tribe was called *malik*, king, as were the rulers of the Qedar and other tribes. The oldest evidence for a Nabataean king may date back to the third century BC (Milik 2003). The Nabataeans secured supremacy in the region. But there was no reason for the Nabataeans to give up their nomadic way of life. Although there could have been early villages of the Nabataeans in Midian (Wenning 1987: 107; Hackl, Jenni and Schneider 2003: 279, 437) this does not conflict with nomadism, as nomadism still allows dimorphic societies (Staubli 1991: 14-15).

In that period there seems to have been no great influence on the Nabataeans by the Hellenistic world and the wider region. The early contacts of the Nabataeans with the Mediterranean world had no effect on the tribe itself. In the third century BC Palestine was ruled by the Ptolemies. There was no more interest by them to develop the country and even less to deal with the desert fringes and the nomads there. The Zenon Papyri illustrate the situation very well (Hackl, Jenni and Schneider 2003: 363-367). It was only in the trade on the Red Sea that there was conflict between the Ptolemies and the Nabataeans (Hackl, Jenni and Schneider 2003: 355-356, 437-438), but it seems that the Ptolemies either could not obtain the upper hand or they could develop their ports on the Red Sea significantly for maritime trade.

The situation in Palestine changed under Seleucid rule. Antioch IV tried to strengthen Palestine via colonies of veterans and the support of Greek cities. This became the background for the Hellenization of the area. This Hellenization seems to have been stronger than previously assumed (Thiel 2002). The results of this development became clearer by the late second century BC. These developments did not affect the Nabataeans as long as they did not come into conflict over their trade activities and trade routes. The archaeological evidence at Petra and at the sites of the Petra-Gaza-road illustrates the growing stabilization of Nabataean trade and trading posts. Notably Rhodian amphorae appear at Petra, Moje Awad, Oboda and Elusa since 220BC (Wenning 1987: 200-201, 132, 160, 141).

Sedentarization

Petra, near Wādī Mūsā, called *Reqem* by the Nabataeans, was established as a place to store goods at least from the third century BC onwards on the basis of archaeological evidence. But there are no indications for a larger group of people living here in that period. The finds up to the middle of the second century BC indicate storage facilities rather than a settlement. In any case, the place was used by the Nabataeans for a much longer time once their tribal nobility decided to settle down at Petra, making it the seat of the tribe. That happened about the third quarter of the second century BC on the basis of indirect indications such as more prevalent material culture, literary sources, and the fact that there was a requirment for the production of objects not needed by the Nabataeans before, like their own coinage and pottery, all of which point to larger settled population. The place seems to be chosen so well that it remained the seat of the tribe and the centre of the Nabataeans until the end of the Nabataean kingdom in 106AD. I do not accept the hypothesis that the capital moved to Bosra under Rabbel II.

This new development could be called a dimorphic chiefdom (Staubli 1991: 15), if my reconstruction fits the evidence. It seems to be a normal process of nomadism that nomads are shaped by their environment and that a polity among the nomads, often the rich and influential group, otherwise called the nobility, tended to prefer a permanent stationing. Parts of the polity were still wandering nomads, other parts mostly stationed. The term 'semi nomads' seems not to describe the situation. The quality of living could have changed a bit, but the way of living did not change so quickly. Most Nabataeans still lived in tents. Petra remained for a long time a tent site. The excavations at az-Zanṭūr yielded fragments of painted wall plaster, dated by the excavators to the early first century BC, which indicate early buildings (Schmid 2001b: 432-433). Flavius Josephus mentioned the *basileia* of Aretas III at Petra (Hackl, Jenni and Schneider 2003: 479). Therefore, the impression of a great tent site down to the middle of the first century BC, as stated in the past (Stucky 1996: 14-17), might need to be corrected as more data become available via excavations like the French excavations at the Temenos of the Qaṣr al-Bint.

There is an inscription from Priene in Asia Minor dated after 129BC, probably the earliest Greek source referring to our Petra. Moschion of Priene was honoured for leading various delegations of that city to different courts and places. Concerning Alexandria and Petra it is said he went to these places *kata tēn chreian*, because of the special interests of his city. It is suggested that Priene or Moschion himself was interested in trade relations with the Nabataeans. The reason for the delegation to Petra could have been the new situation. Probably Moschion was interested to see the new court, and of course he wanted to learn if Petra would still admit the same conditions as before. There must have been a lot of such contacts between the Nabataeans and the Greek world (cf. the inscriptions from Tenos and Rheneia; Wenning 1987: 23). Having a permanent seat to meet the authorities of Nabataean trade made these contacts much easier than having market days at a few occasions, and possibly at different places. It is not known why the Nabataean king took residency at Petra, but such considerations may have contributed to his decision. Another reason may have been the expansion of the tribe, and especially growing wealth and political importance that encouraged the Nabataean nobility to display this wealth to other Arabs and the Greek world. The internal tribal factors which reflected status, like the increasing of herds or the accumulation of riches by individuals, were no longer sufficient for the Nabataeans as a great regional power. If this assumption is correct this meant a new conception of the Nabataeans and the first steps towards an integration into the Hellenistic world. Therefore, these changes were the second serious social-cultural impact of the incense trade.

Neither the Royal court itself nor the Hellenistic titles of the court administration were a new element because the position of a king was not a new concept. The tribal structure did not change but the first architectural elements appear: the new type of monumental family tombs with the famous rock-cut façades. These façades reflected the status of their owners. The many façades point to a greater group of rich Nabataeans, possibly even greater than the tribal nobility. At the beginning the façades are simple and equal in the decoration, indicating a kind of equality among the tribesmen, but later the owners tried to demonstrate their wealth by exaggeration of the decoration. The Crowstep tombs are believed to be the oldest façades. Their conception follows Eastern traditions, while the Step tombs are related to Hellenistic influence. That the Step tombs are about 50 years or even younger than the Crowstep tombs (Netzer 2003: 39-47) can be doubted. It cannot be excluded that both types are more or less contemporary and they could be dated to the end rather than to the middle of the second century. It is the period around 100BC which saw a great breakthrough of new developments: coins minted for the first time by the Nabataeans, pottery produced the first time by the Nabataeans, the oldest dated Nabataean inscription at Petra is from around these years and so on. The Aslah inscription of 96/95BC demonstrates that large rock-cut halls and triclinia can be dated into this period. The oldest tombs should not be placed too far from these developments.

How can the sudden need for such objects be explained? It can be assumed that after the nobility settled down at Petra other parts of the tribe followed and Petra became gradually more and more populated. The loyalty of the tribesmen to the polity-group was very strong and can explain why not only the nobility settled down but large groups related to the polity as well. The same argument explains why the Nabataean dynasty was so strong. A greater population seems to be indicated by olive plantations that were traced by the az-Zanṭūr team around this period (Karg 1996: 356-357; Schmid 2001b: 431-432). Petra was now the centre of the tribe, not only in tribal and political matters, but especially in religious ones (Wenning 2003b and 2004b). The area around the valley of Petra is full of meeting places of sections of the tribe, clans and others (Dalman 1908).

A closer look upon the oldest real Nabataean products shows that in the beginning the Nabataeans imitated Hellenistic prototypes. That can be demonstrated by the oldest coins, those attributed to Aretas II, and by the oldest Nabataean pottery. The Nabataeans had no native tradition for such products. The coins of Aretas II are widespread and support the assumption of the expansion of the Nabataeans at this period (Hackl, Jenni and Schneider 2003: 559). The coins seem to have been used primarily for internal purposes, as it was usual for local minted money and not in the overseas trade. The importance of pottery has been discussed by Stephan Schmid in various contributions (see especially Schmid 2001b).

Set-backs

In the late second and the early first centuries BC some dramatic set-backs struck the Nabataean trade activities. After the collapse of the Minaean Kingdom in South Arabia the rulers of Saba attacked or even blocked the overland incense road (Schippmann 1998: 50, 60-62). It is not known if the Nabataeans at that time shipped their goods through the Red Sea to the Nabataean port of Leuke Kome (as they did at least since the late first century BC) or if they had to accept an overland route via the Persian Gulf (Gherra). That could have been one of the reasons that the Nabataeans began to take possession of territories instead of securing only the caravan routes, but their expansion resulted in many conflicts with the Hasmonaeans, who were also expanding. The Hasmonaeans were able to occupy Nabataean territories east of the Jordan, bands around the shores of the Dead Sea and all of the northern Negev. By this the Nabataeans had lost the bitumen industry at the Dead Sea and important trade stations such as Elusa and the port of Gaza (97/96BC). They had to choose Rhinocoulura (El-Arish) as the new port at the end of the incense road. Whether Gaza became the main port again at a later period is debated (Johnson 1987). Although Aretas III could rule Damascus from 84 to 72BC as Seleucid king of *Koile Syria* he did not win back the occupied territories. No great Nabataean influence can be detected in southern Syria, nor does there seem to be any particular new Hellenistic influence upon Petra in this period. The Damascus affair remained a passing phase without any great effect.

The arrival of Pompey in the Near East changed the political structures completely. The Seleucid kingdom was transformed into the Roman *provincia Syria*, and Hasmonaeans and Nabataeans both became clients of Rome. On the other hand Rome created a balance of power in the East with these developments. Later Cleopatra VII tried to disturb this balance when Herod I and Malichus I fought each other. After the victory of Octavian over Marc Antony in the battle of Actium the status quo between the two kingdoms was confirmed, and was the basis for a long prosperous period in both kingdoms. But in 23, respectively 20BC Augustus gave the Southern Syria to Herod I. This affected Nabataean clans in the Auranitis and provided Herod with a degree of control of the trade routes.

The use of the monsoon winds in the second half of the first century B.C. allowed maritime trade directly from India and South Arabia to Egypt by the Red Sea. The eastern harbours of Egypt grew in importance. This meant a new competition for the Nabataeans but it caused no commercial decline and did not weaken the overland route. On the contrary, the demand for spices and aromatics had grown to the extent that all parties could make profits. Trade remained the main factor of the Nabataean economy until 106AD, when the Nabataean Kingdom was transformed into the Roman *provincia Arabia* (Fiema 2003: 39-43).

Important as these political events and changes were there are also no recognizable effects on the development of Nabataean material culture and the consolidation of the Nabataean society. Schmid reported that around the middle of the first century BC a strong innovation in the pottery production can be noticed (his phase 2 of the Nabataean pottery) and he suggested a first monumentalisation of the city (Schmid 2000: 157-159). That may or may not have been so, but there was a change in the conception of products. Instead of a simple imitation of Hellenistic prototypes, the Nabataean artists started to make their own, but had not yet achieved the typical 'Nabataean style'.

Petra, The *Metropolis*

The turning point towards a full Hellenization with Hellenistic forms and a particular Nabataean style seems to be the Khazna, which I have dated to the third quarter of the first century BC, or around 30BC, for a long time. I have since learned from the new excavations by Suleiman Farajat that we have to date the Khazna possibly a little bit later. There is no doubt about the strong Alexandrian style of this façade. Alexandrian influence in the last third of the first century BC can be find in some other monuments at Petra (Wenning 2003a: 162-163). The Khazna is followed by the Qaṣr al-Bint and other buildings in the centre of Petra. Under Obodas III and/or Aretas IV the city of Petra changed totally. Beside the well-known Qaṣr al-Bint there are still difficulties in describing how the centre looked in that period. The decoration of the buildings were now shaped in a particular Nabataean style, which owed much to Alexandrian influence, but was open for other influences as well.

It was the first time that the Nabataeans adopted temples, and it was the first time that deities are shown in Greek anthropomorphic prototypes in the decoration of these buildings. Usually the Nabataeans venerated their deities in betyls (Wenning 2001). It was not only the centre of Petra which had a new appearance, the whole atmosphere had changed. The report by Strabo demonstrates this (Hackl, Jenni and Schneider 2003: 604-606, 615-617), although there are many wrong statements in it. Strabo called Petra a *metropolis*, a real capital. There are two main factors as the background for this development, one is the *pax Augustiana*, the political stabilization of the Imperium Romanum and its cultural and religious development under the long reign of Augustus, the other is the impact of the Roman campaign against Saba under Aelius Gallus in 25/24BC (Hackl, Jenni and Schneider 2003: 606-615) The latter is important in the sense of the increase of trade possibilities. Saba was defeated and it seems the Nabataeans could control the overland incense road now from Najran at the border to South Arabia northwards. Strabo compared the traffic on the incense road with that of an army, which gives a hint of the extent of the Nabataean trade. The income from this trade must have increased to new unbelievable heights.

Petra became strongly hellenized in this period. Strabo reported about many foreigners at the Royal court. The newly build temenos with the temple cannot be understood without regard to what happened at other places in the Roman East: e.g. Palmyra, Baalbek, Gerasa, and Jerusalem in the same period (Freyberger 1998). It was a kind of contest to have the most splendid sanctuary: self-representation by prestige monuments and pride on the one hand, loyalty to Augustus and his ideas on the other. The Nabataeans were already part of this great community and had to act in the same way.

Change and Chance

But did the Nabataeans really follow the same path? It is interesting to note that there were no donations made by Nabataean kings known outside their realm (unlike Herod, who is known to have made many). At first glance the Qaṣr al-Bint seems to be like one of the temples of that period, but if one takes a closer look there are a lot of differences in comparison with Greek and Roman temples, even Graeco-Roman temples in the East. The masonry decoration of the walls and the stucco elements contradict Greek understanding of temple architecture. Inside the temple a *motab* probably with a betyl can be seen, an element which fits with the traditional veneration of the deity by the Nabataeans. The busts of 'Greek deities' in the metopes of the Doric frieze which decorated the building might reflect the benefits of the Nabataean deity who owned the temple but are not representations of this god. Beside the famous bust of Helios no other deities can be identified due to iconoclasm. However, it cannot be excluded, that the busts reflect a particular programme like those at other younger Nabataean temples, where such deities are embedded into the zodiac or the seven planets (Villeneuve and Al-Muheisen 2000: 1546-1554; McKenzie, Gibson and Reyes 2002: 59-63). These 'Greek deities' are not Greek deities and not venerated as Greek deities from which they took their face, but Nabataean deities or at least deities in contexts familiar to the Nabataeans (Wenning 1989). There are quite a lot of such busts at Petra belonging to various structures (Wenning 2004a). These sculptures should not be taken to assume the introduction of foreign deities and cults as it happens with Isis (Merklein and Wenning 1998 and 2001).

Taking this as another example — and there are many others — one may consider whether the socio-cultural impact of the trade was an opportunity or a threat to the Nabataeans? If I understand the situation of the Augustean period mainly as an impact of the incense trade it was a great chance for the Nabataeans, the third time. Praised by the foreigners and historians, and not overcome by the Romans, the Nabataean kingdom reached its full flowering. That concerns the political and economic level. In the social level the tribal organization still stands unchanged, as indicated by Strabo (Wenning 1997: 180-182). Despite the strong influences from the Greek and Roman world and from the East the Nabataeans managed to retain their identity and the essential issues in their tradition. This allowed the polity to accept such Hellenistic features as temples and statues by which the polity participated in the general cultural movement of the Near East. Therefore, the impact of trade and the wealth of the Nabataeans caused no danger for their identity. The danger which brought the Nabataean kingdom to an end was not a decline in trade, but other political constellations or even a revolt (Wenning 1993), and we are not informed about the circumstances which led Rome to occupy Nabataea in 106AD.

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Gabriella Di Rocco

Julian of Ascalon's Treatise and its Implications for Research and Conservation of Jordan's Archaeological Heritage*

1. Remarks on Julian of Ascalon's Treatise

Julian of Ascalon's treatise is of fundamental importance for the study of Middle Eastern urban population centres in Late Antiquity.[1]

The treatise is a building law manual compiled by Julian, an architect who lived in the sixth century AD in Ascalon, a coastal town about 20km north of Gaza.[2] It consists of a collection of norms and customs concerning private building. We can therefore see it as a guide for cooperation between good neighbours.

The oldest surviving version comes from a collection of urban legislation dating from the early 11th century (Koder 1988: 85-97). Here it is entitled 'Extract of norms and customs in use in Palestine, by Julian of Ascalon, architect'. The main reference is codex *Genauensis gr. 23*, dating from the mid 14th century, discovered at Chalcedon in 1636 and donated to the Geneva Library (Nicole 1893).

Our main source for the indirect tradition is the *Hexabiblos*, a law handbook in six volumes, compiled in 1345 at Thessalonica by the legal expert Constantine Harménopoulos (Pitsakis 1971). Julian of Ascalon's treatise appears here under title IV of Book II. This cannot be entirely attributed to Julian however, since the author of the *Hexabiblos* partially modified the original text so as to adapt it to his handbook, on occasion mixing passages by Julian with the work of other writers.[3]

Despite the rather difficult philological problems presented by the treatise, and its partial transmission, it is a fundamental source for knowledge of Middle Eastern Byzantine town planning.

The brief introduction (§ 1-2), where the author presents the aims of his study, is followed by the first part consisting of a long list of building norms (§ 3-51). This part consists of four sections, following the Hellenistic Greek scientific literature division into the four elements of fire, air, water and earth.

In the first section (§ 3-15: fire), the author lists the norms concerning distances between houses and the rules for protecting both buildings and their inhabitants from damage caused by fire, smoke and heat.

In the second section (§ 16-39: air), Julian deals with distances between the various dwellings in a town. He covers the problem of the opening up of doors and windows and the relationship between the storeys of a building. He underlines the importance of respect for the shared courtyard and other common areas. It is the former that plays the fundamental role of liason between the residents of the 'condominium'.

The third section (§ 40-46: water) refers to town

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[1] The edition used was that by Catherine Saliou: *Le traité d'urbanisme de Julien d'Ascalon. Droit et architecture en Palestine au VI^e^ siècle*, in *Travaux et Mémories du Centre de Recherche d'Histoire et Civilisation de Byzance*, Collège de France, De Boccard, Paris 1996.

[2] Detailed information on Julian of Ascalon is still not available. See Geiger 1992: 31-43. On Ascalon: Bagatti 1974: 227-264; Allen 1991.

[3] For the critical edition cf.: Saliou 1996.

water supply infrastructures: water supply canals, drains and possible damage caused to houses by improper organisation of water discharge.

In the fourth section (§ 47-51: earth), Julian examines earthworks, ditches, gardens, planted areas and the distances required between them and inhabited areas. With reference to gardens, Julian highlights the fact that necessary distances are essential to keep walls free from branches and roots and to avoid damaging the neighbourhood.

The second part of the treatise (§ 52-56), which is considerably shorter than the first, concerns *prospectus*, views over hills, landscape and protection of privacy.

A final chapter (§ 57) concludes the treatise.

Reading this handbook on building law shows how its author filtered features of Roman origin and also some elements of the enormous rabbinical literature on the subject. On the one hand there is a clear relationship with the great treatise on architecture: *De Architectura* by Marcus Vitruvius Pollio, written between 27 and 23BC[4]. Vitruvius' frequently mentioned doctrine of the four elements[5] is the basis of Julian's text structure[6]. Julian also makes specific reference to Roman legislation. In Chapter 56.2 he mentions a law of the Emperor Zeno, concerning private town buildings, included in the eighth book of Justinian's *Corpus Iuris Civilis*[7].

On the other hand, there are also clear links with Jewish literature, which included numerous Late Antique compilations of building norms and rules for cooperation with neighbours. One of these was the *Neziquim* treatise on damage from the Jerusalem Talmud, put together by the rabbis of Caesarea around the mid fourth century AD[8].

2. Julian of Ascalon's treatise and on site topographical evidence in Jordan

The aim of this study is to verify the validity of the treatise by directly applying its norms on site. Three sites were selected in the central and northern areas of the present day Kingdom of Jordan, the ancient Roman province of Arabia[9]: Umm al-Jimāl, Umm Qays and Umm ar-Raṣāṣ.

Umm al-Jimal: the first site studied, is in north-eastern Jordan. The ancient place name is still under discussion[10]. The town was situated 25km south of Bostra, in an area between two main roads: to the west the Via Traiana, to the east, the road from Bostra to the oasis of al-Azraq, a major caravan route in the direction of the Arabian peninsular[11].

It stood on a previous Nabataean settlement and, in the second century AD, when the region fell to Rome, its first circuit wall was built. A *castellum*, with exclusively military functions, dates from the fourth century AD, and, at the beginning of the fifth century the *dux* of the Roman province of Arabia, Pelagius, built a fortified barracks area, the *praetorium*, to replace the previous *castellum* which had been abandoned. In this period, and for the following two centuries, Umm al-Jimāl expanded considerably. During the sixth century AD, under the influence of the Ghassanid phylarchs, considerable building work took place, much of it still visible, including a large number of private houses[12].

It is to these houses that we turn in our search for confirmation of Julian's statements in his treatise. After carrying out a survey of the town, we selected a number of private buildings, which supplied proof of the importance and validity of the treatise under examination. These buildings are situated in one of the three districts making up the town of Umm al-Jimāl, the south eastern one. The houses, built of large blocks of local basalt stone, still have one, two or even three storeys, and mostly have large central courtyards, onto which the various apartments give[13].

The first case concerns two houses with a com-

4 Among the most recent editions are: Marco Vitruvio Pollione, *De Architectura*. L. Migotto (ed.), edizioni Studio Tesi 1990.

5 Vitr., *De Arch.*, I, 4, 5; II, 2, 1-2; VIII, Pref.

6 § 1-2.

7 *C.J.* VIII, 10, 12. In § 56.2 Julian wrote: "*Zeno's constitution says that if a neighbour has moved 100 feet away anyone who so desires is allowed to build*".
C.J. = *Corpus Juris Civilis*. Okko Behrends, Berthold Kupisch, Hermann Seiler (eds.), Heidelberg 1995.

8 Lieberman 1931, 1970/1971: 409-417; Blumberg 1970: 114-123; Bokser 1979: 139-256.

9 Birley 1971; Jones 1971; Gutwein 1981; Barnes 1982; Sartre 1982; Bowersock 1983; Graf 1988: 171-211; Walmsley 1996: 126-158.

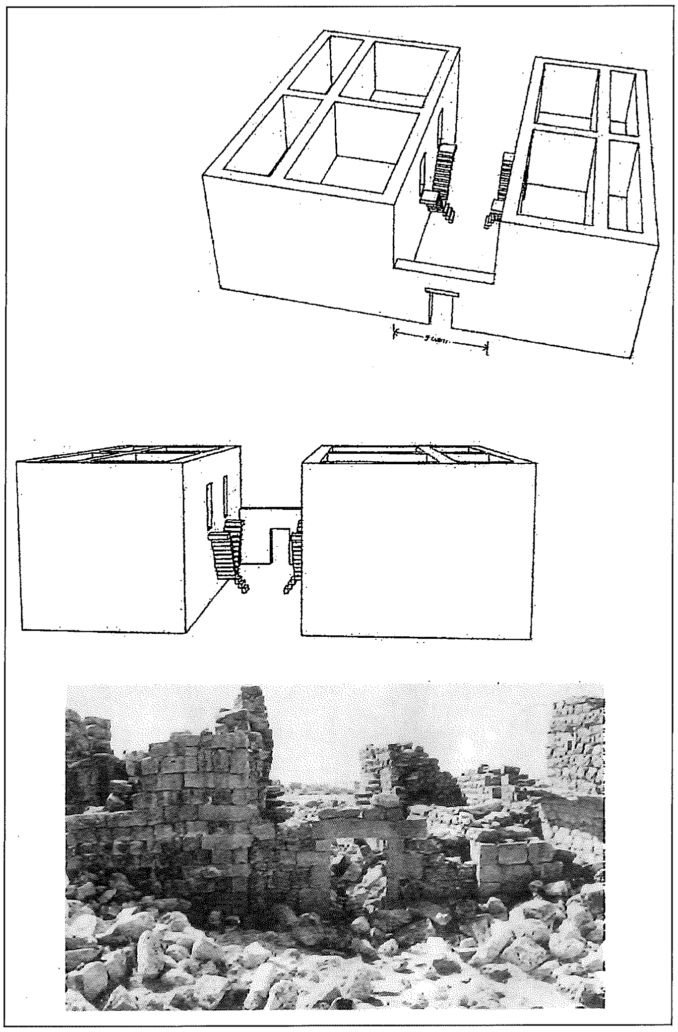
10 According to H.C. Butler (1913: 149-213) Umm al-Jimāl, from the Arabic 'the mother of camels', is Thanthia of the Tabula Peutingeriana. However it has been pointed out (Bauzou 1988: 292-300) that the distance between Thanthia and Bostra given by the Tabula does not correspond to the actual distance between Umm al-Jimāl and Bostra.

11 Poidebard 1934; Parker 1987; Bauzou 1988: 292-300; Kennedy, Riley 1990; Khouri (ed.) 2003.

12 Parker 1986; de Vries 1990, 1993: 433-460, 1995: 421-434, 1998; Concina 2003.

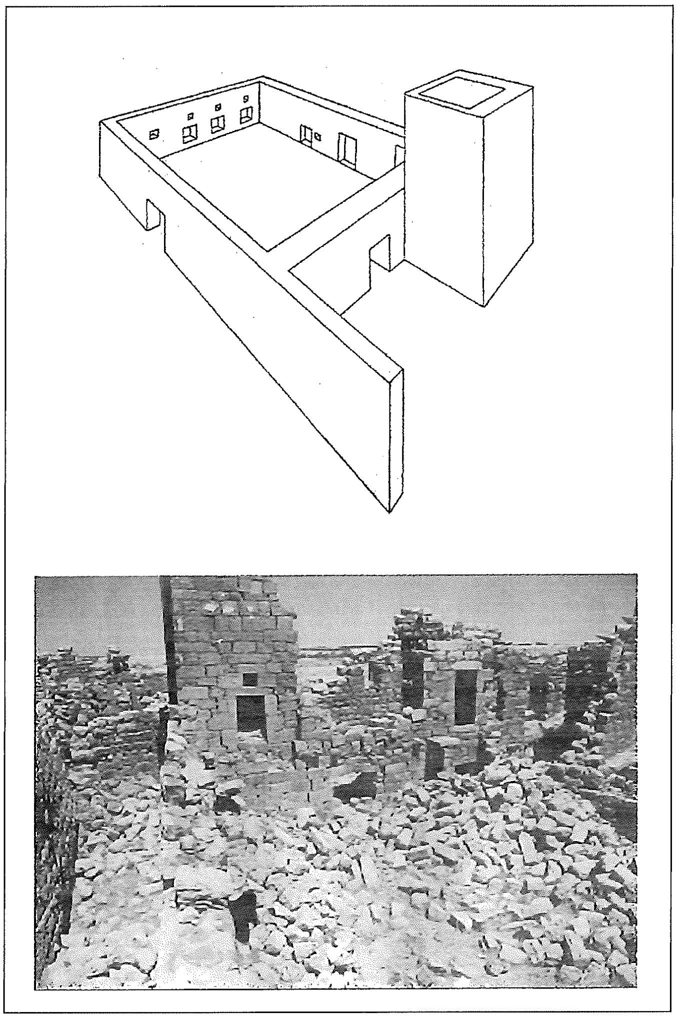
13 See the previous note.

mon courtyard (FIG. 1). The axonometric projections (one seen from the east, the other from the west) show the two buildings giving onto the courtyard. Julian of Ascalon refers explicitly to this type, which was common throughout the Middle East: "*In the case of a courtyard belonging to more than one owner, the wall of which has to be demolished and rebuilt on several levels (2, 3 or 4), all those living on the storeys above the foundations, starting from the first storey, must contribute to the common expenses required for the foundations, in proportion to the heights of the various storeys*"[14] . After the common entrance, two flights of stairs, one for each building, provided access to the upper floors. These staircases are still partially visible, together the large ledges holding up the ceiling beams and thresholds of the doors on the first floor.



1. Umm al-Jimāl. Area S/E — Houses with common courtyard.
Axonometric projection (above); photo (below).

The second case investigated at Umm al-Jimāl is that of a private building, not far from the previous houses, but larger in size and different in plan (FIG. 2). This complex, one of the many still visible on the site, consists of a large quadrangle (ca. 20m per side), onto which several rooms on several levels give. A smaller courtyard (12.40m per side) is adjacent to the larger one. The axonometric projection and photograph show a reconstruction (above) and its present day state (below). Here too our findings at Umm al-Jimāl correspond to a typical case described in Julian of Ascalon's treatise: "*In the case of an inner courtyard of a court with three sides, one of which shuts off the inner courtyard, if the court only occupies this side, there is no use of the inner courtyard and if this courtyard requires cleaning or other attention, dispensation from payment is granted, since the inner courtyard*



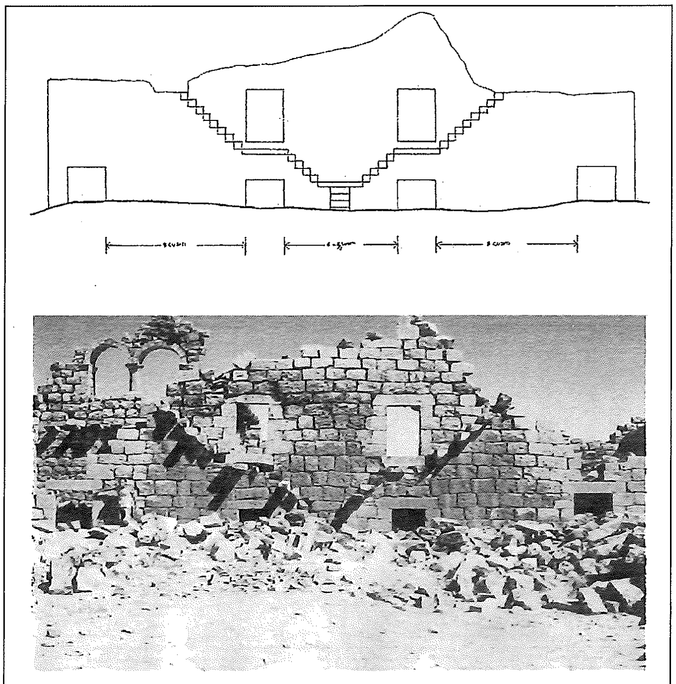
2. Umm al-Jimāl. Area S/E — Private building, small courtyard.

[14] In the second section, chapter 33.1.

is not used"[15] . FIG. 2 also clearly shows the lane on the outer side of the minor courtyard, along the western side, an example of a town road system with few main streets and, as in this case, a network of narrow, winding lanes. Substantial remains of the second and part of the third storey of the apartments looking onto the northern side of the courtyard are clearly visible.

Attention was subsequently devoted to the eastern side of the large courtyard of the same complex (FIG. 3): five entrances (four of which can be seen in the photograph), today partially covered by earth, led to apartments and a double flight of stairs, still *in situ*, to the upper levels, of which only the entrances survive. This was a large collective housing complex. Life in, what in the USA are called 'condominiums', was regulated by treatises like the one by Julian of Ascalon. Occupants were obliged to follow precise norms of neighbourly cooperation, since the families living there shared common areas and the same infrastructure. Figures 4 and 5 provide a general view of the minor courtyard of this large complex and a detail of the lane along the western side (FIGS. 4 and 5). FIG. 6 is an overall view of the large courtyard.

Umm Qays: The second site studied was Umm Qays, ancient Gadara, on the Golan Heights, near Lake Tiberias. The town was a stage on the caravan route from the East to the shores of the Mediterranean. It was founded in the fourth century BC. By Macedonian veterans, and in the following century



3. Umm al-Jimāl. Area S/E — Private building, eastern side of the large courtyard.
Prospect (above); photo (below).

4. Umm al-Jimāl. Area S/E — Private building, small courtyard, general view of the small courtyard.

5. Umm al-Jimāl. Area S/E — Private building, small courtyard, detail of the lane along the western side.

6. Umm al-Jimāl. Area S/E — Private building. General view of the large courtyard.

[15] In the second section, chapter 38.1.

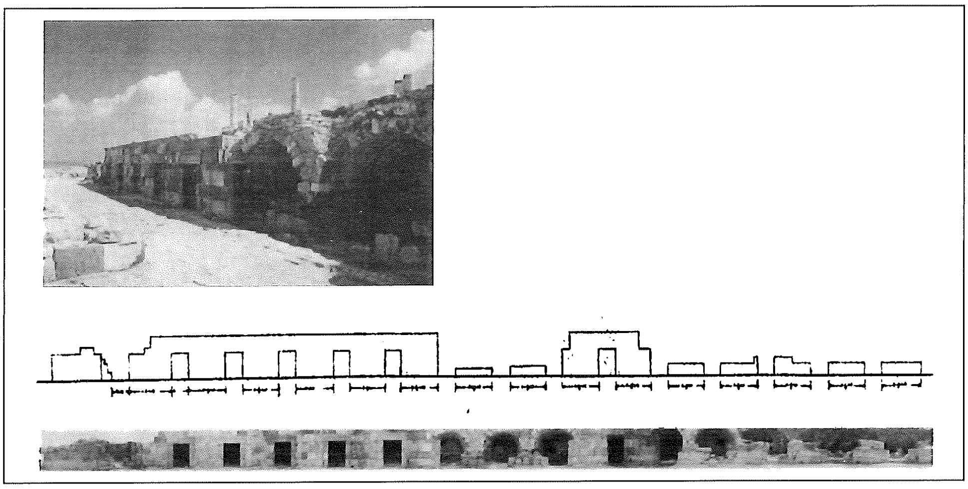
was occupied by a garrison from Ptolemaic Egypt, subsequently passing under the influence of the Seleucids of Syria. From the first century AD. It became part of the Decapolis, from then onwards remaining under Roman control, until it was conquered by the Islamic army in 636AD[16].

The Byzantine town kept the Roman plan, based on the two main road axes at right angles. The hub of the town was the imposing octagonal basilica, dating from the sixth century AD which was entered via a four sided portico looking over the *decumanus*. To the west of the basilica stood a series of one roomed structures with vaulted ceilings, opening onto the *cardo* [17]. These symmetrical, adjoining rooms were studied in our survey (FIG. 7).

Starting from the first room to the north, measurements were taken of the distances between the entrances, thus practically applying data supplied by Julian of Ascalon's treatise[18]. 10 feet or 6 2/3 cubits is the measurement most frequently used by Julian as the minimum distance to be observed between entrances[19]. Our measurements, on twelve occasions out of a total of fifteen, gave the figure of 3.12m[20]. In our view, this is of great interest for two main reasons: firstly because the widespread use of treatises on building norms like the one under examination is confirmed, and secondly because these treatises can be regarded as valuable sources, not only for archaeological research, but also for ensuring correct conservation procedures of ancient structures[21].

Umm ar-Raṣāṣ: The third and last site examined was Umm ar-Raṣāṣ, 30km to the south east of Ar-Mādabā, on the steppes stretching from Wādī al-Mūjib-Arnon to the south and Wādī al-Wāla-Hīdān to the north (Abel 1967; Bowersock 1983; Parker 1986). In the Roman and Byzantine periods the town reached its most splendid stage, as a frontier town open to the trading routes of the whole of the Middle East (Lagrange 1898: 168; Bujard, Haldimann 1988: 101-109). Umm ar-Raṣāṣ has been identified with the biblical site of Mefa'a (Joshua 13: 18, 21: 37; Jeremiah 48: 21). In the first half of the fourth century AD. Eusebius of Caesarea wrote of a Roman fortress at Mefa'a[22]. Excavations unearthed the remains of numerous religious buildings within the *castrum*, as well as houses. To the north of the fortress a large residential area developed in Late Antiquity[23].

It is here that we examined two buildings, almost entirely collapsed, but significant, nevertheless, for



7. Umm Qays. Roomed structures opening onto the *cardo*. Photo (above); prospect (below).

[16] Schumacher 1890; Wagner Lux *et al.* 2000: 425-431; Weber 1987: 531-534; ID. 1988: 349-352, 1989; Kuhnen 1990; Bol-Hoffmann-Weber 1990: 193-266; Weber 1991a: 123-134; ID. 1991b: 223-235.

[17] These rooms have recently been restored by archaeologists working at Umm Qays. The basalt blocks covering the vaulted structures have been put back into place.

[18] In Chapter 16 at the outset of the second section he wrote: "*anyone building on the ground floor must keep at a distance of 10 feet from his neighbour/s*".

[19] The measurement system used by Julian of Ascalon derived from the Roman-Philetaric one, in which a *cubit* equaled one and a half feet, the *bèma* equaled one and two thirds of a cubit and the *àkaina* six and two thirds of a cubit or ten feet: Hultsch 1882.

[20] Considering that a Byzantine foot equaled 31.2cm, 10 feet (or 6 2/3 *cubits*) equaled 3.12m.

[21] The application of data from treatises like this one allows one to avoid, or at least reduce mistaken conservation procedures on archaeological structures being restored.

[22] Piccirello, 'Attiyat 1986: 349-350. The identification of Umm ar-Raṣāṣ with Mefa'a was confirmed in 1986 thanks to the unearthing in the basilica of St. Stephen of a mosaic dating back to 785AD, where the name of the site can be read: Kastron Mefaa (Piccirello, 'Attiyat 1986: 347; Piccirello 1990: 527-541).

[23] Piccirello 1990: 527-541, 1990a: 463-466, 1992, 1992a: 366-369; Piccirello, 'Attiyat 1994.

our research (FIG. 8). Two adjacent entrance of two limestone dwellings can be seen clearly. Measurements of the distance between the two entrances were 3.40m or almost 11 feet, fully adhering to the data in Julian's treatise, where at least 10 feet is the norm. The same distance was found between two other entrances of adjacent buildings, this time inside the *castrum* at Umm ar-Raṣāṣ (FIG. 9). This is interesting since we are clearly above the limit imposed by the treatise: the distance to be adhered to could not be less than 10 feet.

Conclusions

From the theoretical analysis of Julian of Ascalon's treatise we turned to an on site survey, which demonstrated the concrete application of some of its norms. The confirmation from three Jordanian sites underlines the great importance of historical written sources like this treatise both in the archaeology and conservation[24]. Scientific research cannot do without such sources.

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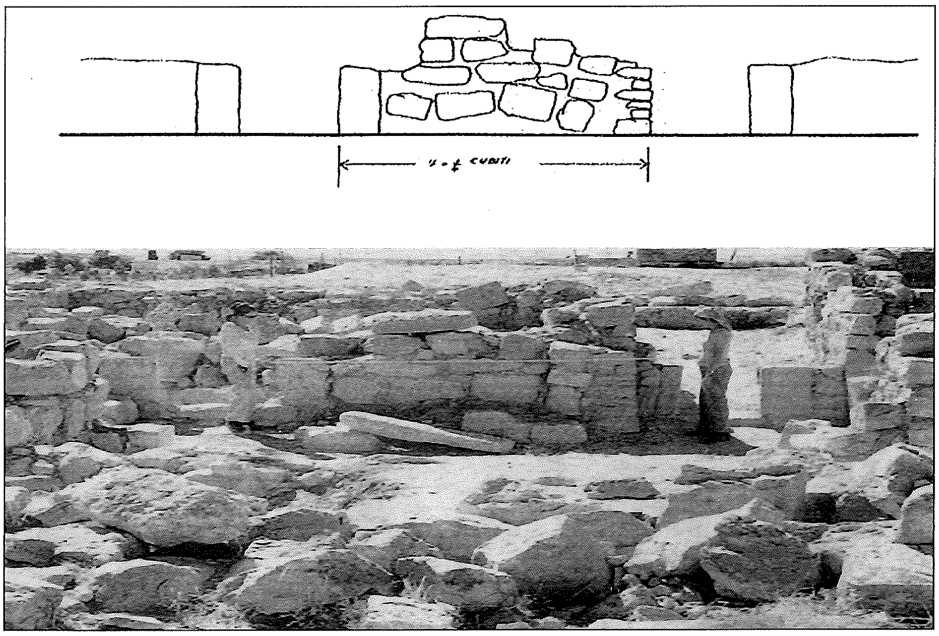
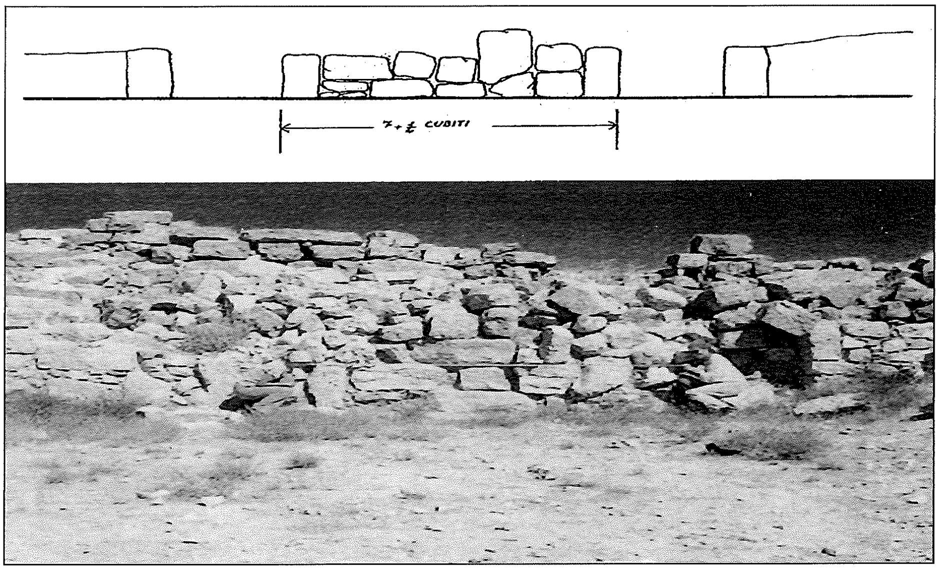


8. Umm ar-Raṣāṣ. Byzantine residential area to the north of the fortress — two adjacent entrances of two limestone dwellings. Prospect (above); photo (below).



9. Umm ar-Raṣāṣ. Residential area inside the fortress — two adjacent entrances of two limestone dwellings. Prospect (above); photo (below).

[24] Marino 1995; Infranca 1998, 2000; Khouri (ed.) 2003.

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Ueli Bellwald

The Hydraulic Infrastructure of Petra: A Model For Water Strategies in Arid Land

Introduction

The starting point for an overall study research investigating the hydraulic infrastructure of ancient Petra was the excavation and restoration project in the as-Sīq (Belwald *et al.* 2003), which provided the first clear and undeniable archaeological evidence for the construction, the functioning and dating of the system. Based on these results, the author began a survey of the entire Petra area in 1997 in order to document all the visible remains of other hydraulic systems. The evaluation of the recorded elements led to a preliminary model of Petra's hydraulic infrastructure in antiquity. Furthermore a first relative chronology could be established, showing how the entire system was developed over the centuries, how it declined and finally collapsed. For each single element of the system its function in the entire network and its technical and constructive characteristics could be determined.

The Water Supply in the Early Phases of the City Development

It was already well known from written sources[1] that at the beginning of their settlement in Petra the Nabataeans maintained their traditional Bedouin way of living in tents. The Swiss-Liechtenstein Excavations at az-Zanṭūr was able to show these ancient written sources to be correct when they discovered the battered dung layers of this tent occupation and even some of the holes from the posts supporting the tarpaulins (Stucky *et al.* 1996) How the water supply for this tent settlement functioned is still unknown. Again known from written sources[2] and now confirmed by various excavations[3]: at the beginning of the first century BC Petra began to develop as a stone built city. This still modest city got its water supply from cisterns collecting runoff water from the roofs and from the surrounding areas. One of these early cisterns was excavated by the team of Basel University below the mansion at az-Zanṭūr IV. It dates to the first half of the first century BC and was then built over by the foundations of a construction from the very beginning of the first century AD (Kolb 2001). In the middle of the first century BC the developing city underwent a strict urban planning and was completely remodeled as a Hellenistic capital. For this new Hellenistic urban centre a completely new water supply system had to be built, providing the growing population with spring water and feeding the city's outstanding monuments.

The First Spring Water Aqueduct

The excavations in the as-Sīq revealed sections of an underground gravity flow channel which followed the surface of the trampling path before the construction of the paved road. This channel was covered over its entire length and crossed wider faults on dams or even arched bridges (Bellwald 2003). In summer 2004 the joint excavation of Graf, Schmid and Bedal unearthed further sections of the same channel in the vicinity of the Temenos gate proving that this first aqueduct reached the city centre[4]. Due to the modern building activity

[1] Description of the military campaign of Antigonos Monophtalmos against the Nabataeans in 311BC, written by Hieronymos of Cardia and recorded by Diodorus Siculus (90-21BC) in Bibliotheca Historia XIX, 94-100.

[2] Description of the Nabataeans and Petra by Artemidor of Ephesos, recorded by Strabo (63BC – 24AD) in Geography XVI iv. 26.

[3] Parr, P.J., Excavations at Petra 1958-59, Palestine Exploration Quarterly 92, 1960; Stucky, R., 1996; Augé, C. and others, The Excavations of IFAPO in the Qasr al-Bint Area, Editions Recherches sur les Civilisations, forthcoming; Graf, D., Schmid, S., Bedal, L.A., The Hellenistic Petra Project, forthcoming.

[4] Hellenistic Petra Project, forthcoming.

in the town of Wādī Mūsā, no remains of this first channel have yet been discovered between Bāb as-Sīq area and the springs to the East of the city, thus the original feeder of the aqueduct cannot be determined. However, based on the wide cross section of the channel it must have been a spring with a great capacity, and therefore it was most probably 'Ayn Mūsā.

The sections of this first gravity flow channel excavated in the as-Sīq have shown that the first aqueduct must have been destroyed by a flash flood in the middle of the first century BC (Bellwald 2003). The constructive characteristics of the first spring water channel, as revealed by the excavated sections in the as-Sīq and near the Temenos Gate and by the still visible remains in the Bāb as-Sīq area, clearly show that this was built as a completely hidden, underground construction. Such buried aqueducts were common in the Greek motherland since the archaic period and were widely adopted in the Hellenistic cities in Asia Minor (Garbrecht 2001). The same model was adopted for the first aqueducts built in Rome, as may be shown by the Aqua Marcia[5].

The Khubtha North Aqueduct

The first spring water aqueduct which was obviously built for the developing Hellenistic urban centre was the Khubtha North aqueduct (FIG. 1). As the older underground channel it had a wide cross section and hence must have used the 'Ayn Mūsā spring. It immediately replaced the destroyed oldest channel in the as-Sīq and was the first aqueduct to be built as a completely visible structure above ground, with imposing arched bridges up to a span of more than 13m (FIG. 2). Contrary to older studies (Gunsam 1970) the Khubtha North channel was fully covered and had no deviation between the spring and the end reservoir besides the Palace tomb. A sequence of 3 water basins in front of the end reservoir assured the supply of spring water to the public. Before it reached Wādī Shi'ab Qays, the Khubtha North aqueduct supplied a huge storage basin in Ramla, providing the mills and the pottery work shops of the area with water (FIG. 1) ('Amr and Momani 1999). The arched bridges of the Khubtha North aqueduct collapsed in the earthquake of 363AD and were never rebuilt; hence the entire aqueduct went out-of-use after this date.

The as-Sīq Aqueduct

The first element of the spring water supply system in the as-Sīq to be built was the terracotta pipeline, installed in the third quarter of the first century BC (Bellwald 2003) (FIG. 3). It had its end reservoir at the eastern end of the colonnaded street, where a splendid Nymphaeum served as a public fountain (FIG. 1). In the Roman period, under the Severian emperors, the northern Nymphaeum was added. The terracotta pipeline in the as-Sīq was, due to its gradient, under pressure, but the pressure was not used to reach areas located on a higher level than the conduit of the pipe. In the second century AD a second branch was added to the original pipe, with its partition chamber below Khubtha fault 6 (FIG. 5). This secondary pipe did not make use of the high internal pressure, as may be proved by its conduit high up in the cliff of the outer as-Sīq. This later, additional branch supplied an area opposite the theatre which was located on a much higher level than the end reservoir of the original pipeline (FIG. 1). To reach it the new branch was built with a very flat gradient that required a conduit high up along the cliff of the outer as-Sīq. This type of construction is another proof that no use was made of internal pressure in the pipeline. During the third century AD there was a risk of damage from increased internal pressure caused by the lime built up inside the pipe. In order to prevent the entire conduit from being destroyed, the top of the pipe was opened, after which it further functioned only as a gravity flow channel (FIG. 3). In the earthquake of 363AD the pipe was finally destroyed and was not repaired again.

The second element of the water supply system in the as-Sīq was the gravity flow channel following its southern cliff (FIG. 4). It was built in the mid first century AD and originally only supplied the Khazna Plaza with drinking water (Bellwald 2003). Partially destroyed in the earthquake of 363AD, it was then repaired and extended into the city centre[6]. After the earthquake the repair was done in a rather sloppy manner and the channel was no longer covered. It seems that the channel in the as-Sīq still functioned during the late period of Petra's existence until the early eighth century AD. Both as-Sīq aqueducts used the water from 'Ayn Mūsā.

[5] Fahlbusch, H., 1981, Die Wasserversorgung des Antiken Rom, Mainz.

[6] Proved by a sounding in the outer Sīq, executed by the Department of Antiquities in 1998, but still unpublished.

1. The water supply system of Petra after its completion at the end of the first century AD:

Spring Water Aqueducts:

As-Sīq Aqueduct

Terracotta pipeline, 3rd quarter of the first century BC

Gravity flow channel, mid first century AD.

1a. End reservoir of the terracotta pipeline with public fountain.

1b. Branch added to the terracotta pipeline, second century AD, end reservoir opposite the theatre.

Khubtha North Aqueduct

Gravity flow channel, mid century BC

2a. Storage basin at Ramla for the supply of the mills and pottery kilns at az-Zurraba.

2b. Preserved arched aqueduct at Shi'ab Qays.

2c. Collapsed arched aqueduct at Wādī Zarnuq.

2d. End reservoir and public fountain to the North of the Palace tomb.

'Ayn Brāq Aqueduct

3a. Castellum Divisorum.

3b. End reservoir at az-Zanṭūr.

3c. End reservoir flanking the Paradeisos.

'Ayn Dibdba Aqueduct

4a. End reservoir opposite Qaṣr al-Bint

'Ayn Abū 'Ullayqa Aqueduct

Runoff Water Collection Systems:

A. Wādī Farasa East

B. Wādī Farasa West

C. Wādī an-Nimr

D. Jabal al-Mu'ayṣra East

E. Jabal al-Mu'ayṣra West

F. ath-Thughra

G. ad-Dayr Plateau

H. Qaṭṭār ad-Dayr

I. Wādī al-Maṭāḥa

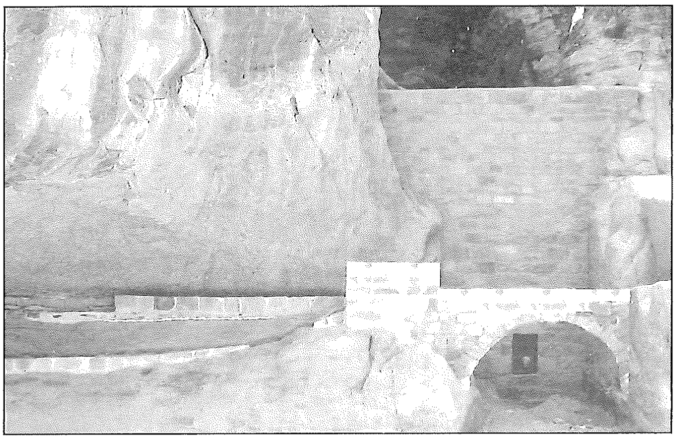
K. Mughur an-Naṣārā

Aerial Photo Royal Geographic Centre, Amman 2000. Display of water supply system U. Bellwald.

2. Khubtha North aqueduct, the arched bridge crossing Wādī Shi'ab Qays, built mid first century BC. The arch has a span of 7m.
Photo and computer-simulation U. Bellwald.

3. The water pipe of the as-Sīq aqueduct, built in the 3rd quarter of the first century BC.
Photo U. Bellwald.

4. The gravity flow channel of the as-Sīq aqueduct, built mid first century AD. The section shown includes a settling tank (top right).
Photo U. Bellwald.



5. The partition chamber at the lower end of the arched bridge crossing Khubtha Fault 6, added to the aqueduct during the second century AD.
Photo and computer-simulation of the original aspect U. Bellwald.

The 'Ayn Brāq Aqueduct

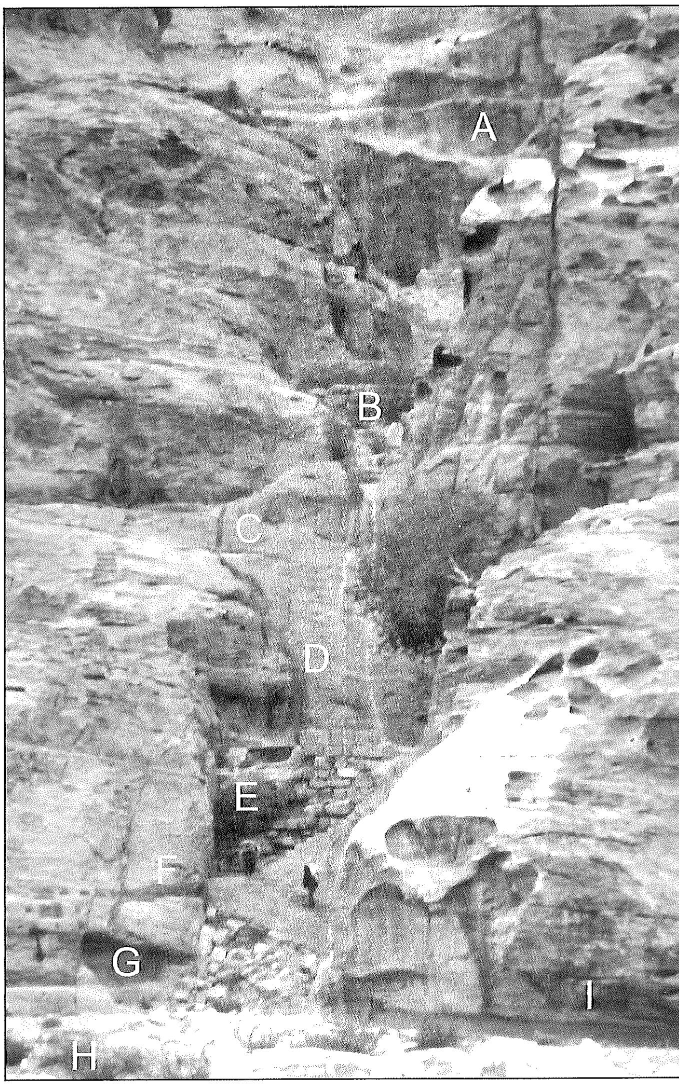
The 'Ayn Brāq aqueduct provided the Southwestern quarter of the city with drinking water (FIG.

1). It was a double aqueduct, consisting of a terracotta pipeline and a gravity flow channel. Due to the steep and rocky areas between the spring and the city the conduits of the pipe and the channel are not parallel at all; mostly they have their own individual line. To prevent the pipeline from being destroyed by internal pressure due to extreme gradients, decompression tanks were built below steep stretches.

The ʿAyn Brāq aqueduct has two end reservoirs, one on top of az-Zanṭūr hill, and the other flanking the pool complex beside the Great Temple (FIG. 1). The partition chamber is located between the cliff of Jabal al-Madhbaḥ and az-Zanṭūr (FIG. 6). As there is a difference in level of about 16m between the aqueduct's entry into the city area and the end reservoir on top of az-Zanṭūr the pipeline had to

6. ʿAyn Brāq aqueduct, partition chamber about 100m below the descent into the city area. The right branch leads up to the public reservoirs on top of az-Zanṭūr, the left one down to the reservoirs flanking the Paradeisos.
Photo U. Bellwald.

use its internal pressure to transport the water. Co trary to earlier studies (Lindner and Hübl 1997) t ʿAyn Brāq aqueduct had no forks for the supply the suburban areas in the plain of al-Qanṭara and Wādī Farasa, all hydraulic installations there we based on runoff water collection (FIG. 7). The ʿA Brāq aqueduct developed the model of the as-S pipeline to perfection; it is characterized by ou



7. The terraces above and below the lion fountain in Wā Farasa East:
A. ʿAyn Brāq Aqueduct with no deviation to the lower te races.
B. Dam for the water supply of the lion fountain.
C. Supply channel of the lion fountain.
D. Lion fountain.
E. Dam of the pool in front of the lion fountain.
F. Overflow channel from the pool in front of the lion fou tain to the lower pool.
G. Fountain supplying the lower pool.
H. Lower pool.
I. Overflow channel from the lower pool to the cistern belo the great staircase, leading to the terrace of the garden t clinium.
Photo U. Bellwald.

standing constructions, mostly built in beautiful embossed ashlar blocks. Its arched bridges outside the city must have been of such impressing appearance that their ruins still survive in the name of the area: Al-Qanṭara means arch! Based on its construction, the aqueduct may be dated to the end of the first century BC, dating which is confirmed by the results of the excavations at the pool complex beside the Great Temple (Bedal 2004). As the Swiss-Liechtenstein excavation at az-Zanṭūr IV has proved, the mansion situated on a promontory at the southern slope of the hill had direct water supply from the end reservoir on the hilltop (Kolb 2002). Therefore, just as at Pergamon, Priene, Ephesos and Pompeii, at least the most important private houses of the city had direct drinking water supply. As with most of the other aqueducts, the 'Ayn Brāq conduit was destroyed by the earthquake of 363AD and never rebuilt.

The 'Ayn Abū 'Ullayqa Aqueduct

The 'Ayn Abū 'Ullayqa aqueduct connects the spring in the lower Wādī Turkmāniyya with the sacred area of Petra, the Temenos of Qaṣr al-Bint (FIG. 1). Unfortunately the section in the city area itself has been completely washed away by flash-floods. The 'Ayn Abū 'Ullayqa aqueduct follows the model of the 'Ayn Brāq aqueduct: it consists of a terracotta pipeline and a gravity flow channel and shows exactly the same type of construction with beautiful embossed ashlar blocks and evidently dates to the same period, i. e. towards the end of the first century BC. Due to the low gradient between the spring and the end of the city basin, the channel and the pipeline of the 'Ayn Abū 'Ullayqa aqueduct follow parallel conduits. No statements may be made in regard to the destruction of this aqueduct.

The 'Ayn Dibdba Aqueduct

The 'Ayn Dibdba aqueduct brings the water from the spring above the actual village of the Amarin Bedouins into the city basin. It supplied the north-western quarter of the city with drinking water (FIG. 1). With a terracotta pipeline, a gravity flow channel and decompression basins below steep slopes, the 'Ayn Dibdba aqueduct technically follows the model of the 'Ayn Brāq aqueduct. In its construction however it differs remarkably from the outstanding 'Ayn Brāq aqueduct, its built sections consisting of masonry from collected broken stones. From its end reservoirs only the one opposite Qaṣr al-Bint is known for the moment, but evidently there must have been prior ones below the northern ridge of the city area (FIG. 1). It must be supposed that the 'Ayn Dibdba aqueduct was the last of the five spring water aqueducts to be built; it may be dated to the late first century AD. As with most of the other aqueducts, it was destroyed by the 363AD earthquake, and was not rebuilt.

The Later Water Supply of the City Basin

As most of the splendid aqueducts of Hellenistic Petra were destroyed in the earthquake of 363AD and not rebuilt, other water systems had to be installed for assuring the supply of the population. From the aqueducts only the gravity flow channel in the as-Sīq was repaired and prolonged into the city centre. A section of this new branch of the channel has been excavated in front of a tomb in the outer as-Sīq[7] . This section of the channel is clearly related to the Byzantine level of the paved street, which was several meters above the Nabataean pavement. This channel was no more covered, therefore inside a thick layer of lime and leaves and small branches built up, slowly reducing its capacity (Bellwald 2003). For additional water supply, the tremendously reduced population of the declining city returned to runoff water collection systems, as may be shown by the cistern in the courtyard in front of the Petra Church (Fiema 2001).

In Conclusion

At its final stage, the spring water supply system of Petra covered the entire area of the city basin, bringing spring water from the east, south and North into the city. The location of the end reservoirs shows that all four quarters of the city had their own aqueduct (FIG. 1). Normally public fountains provided the inhabitants of Petra with drinking water, but as may be proved by the mansion at az-Zanṭūr, at least some of the houses were directly connected with the public reservoirs. This research has clearly shown that all spring water aqueducts were entirely closed and did not collect runoff water along the cliffs, as has been suggested before (Gunsam 1970; Lindner 1997) (FIG. 7). Furthermore all 5 aque-

[7] Executed by the Department of Antiquities in 1998, but still unpublished.

ducts had no deviations into areas outside the city basin. The only hydraulic installations supplied by one of the spring water aqueducts outside the city basin discovered to-date are the four drinking basins excavated in the as-Sīq (Bellwald 2003).

The Flash Flood Prevention System

The excavations in the as-Sīq revealed a highly sophisticated flash flood prevention system, consisting of a series of dams and stilling basins built to protect the hydraulic constructions from being destroyed by the winter water masses (Bellwald 2003). The survey has shown that the other four aqueducts were protected by similar constructions. Furthermore the survey proved that all wadis and faults leading into the city area were included in the flash flood prevention system. At each outlet of such wadis and faults retention dams were built in order to control the outflow of water (FIG. 8). The most spectacular remains of such dams are located at the outlet of Wādī Umm Ṣayḥūn into Wādī al-Maṭāḥa, at the outlet of Wādī al-Jarra into Khazna Plaza[8] (FIG. 9) and in Wādī Farasa East (FIG. 8). Ruins of dams on Khubtha hill, on the plain of al-Qanṭara, al-Madrass and al-Jilf bear witness that part of the water from winter rainfalls was already retained on the natural terraces high above the city area (FIG. 8).

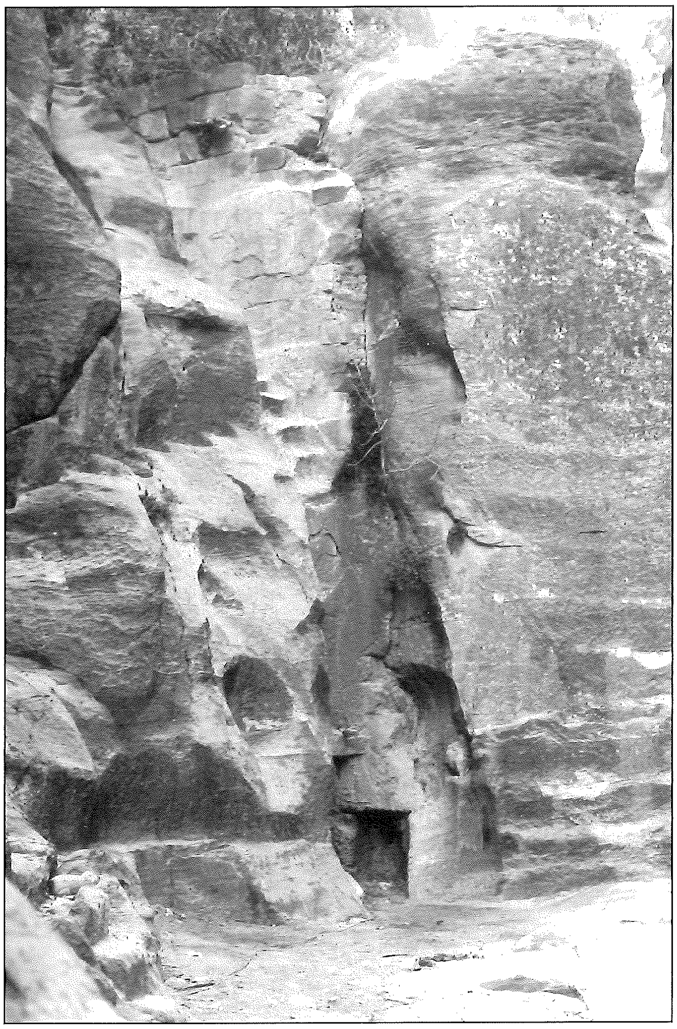
The Runoff Water Collection Systems

Areas around the city, which were not constantly inhabited, were not supplied by the spring water aqueducts, but had their local, independent and individual runoff water collection systems. All these various systems have some common characteristics: channels at the bottom of cliffs which collect the runoff water and direct it into collection basins. The function of these basins was to tame the tormented water and let silt settle down. In a sequence of following settling tanks the still dirty water was further cleaned and filtered. The end station was a fully covered cistern with an internal staircase for maintenance and an opening for drawing water (FIG. 10). This opening was normally covered by a metal lid, cautiously embedded into the covering slabs. Most of these cisterns were carved into the bedrock and their covering slabs were supported by segmental arches. The complete exclusion of daylight prevented the water in the cisterns from being polluted by bacteria and algae. In special locations diversion dams had to be built on top of the system in order to dam the water up to the level of the channels leading to the collection basin. The most spectacular of these was built in outer Wādī Farasa West (FIG. 1).

8. The Flash Flood Prevention System:
A. Retention basin, diversion dam and bridge in front of the as-Sīq entrance.
B. Diversion tunnel from Wādī Mūsā into Sīq al-Mudhlim.
C. Retention Dam in Sīq al-Mudhlim.
D. Retention dams in Wādī Maṭāḥa.
E. Retention walls and dam in Wādī Umm Ṣayḥūn.
F. Retention dams on top of Jabal al-Khubtha.
G. Retention dams on the natural, intermediate terraces of Wādī al-Madrass and Wādī al-Jilf.
H. Retention dams on the natural, intermediate terraces of Wādī al-Qanṭara.
I. Retention dams at the outlet of Wādī al-Jarra into Khazna Plaza.
K. Retention dam in Wādī Maḥfūr.
L. Retention dam in outer Wādī Farasa East.
Aerial Photo Royal Geographic Centre, Amman 2000. Display of flas flood prevention system U. Bellwald.

The runoff water supply systems generally provided necropolis and sacred areas with water. However, new excavations in Wādī Farasa East have shown that some of the areas close to the city were

[8] Wādī al-Jarra enters Khazna Plaza in two arms. Whereas the dam at the bottom of the wider arm collapsed in the earthquake of 363AD, the two superimposed dams of the narrower arm are completely preserved.

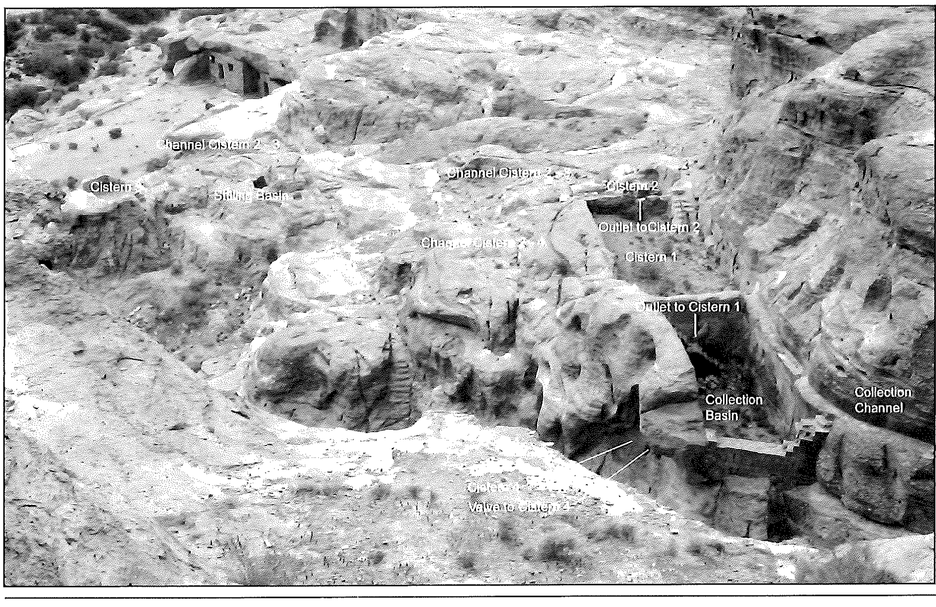


9. Fully preserved retention dam at the outlet of the narrower, eastern branch of Wādī al-Jarra into Khazna Plaza. The niche at the bottom of the dam contains the valve which assured a continuous outflow of water.
Photo U. Bellwald.

inhabited too (Schmid and Studer 2003). In addition the International Wādī Farasa Project has uncovered archaeological evidence for a precise dating of the runoff water collection system into the beginning of the first century AD (FIG. 7). Another such a suburb existed most probably at ath-Thughra, a location close to the necropolis of the snake monument (FIG. 1). Other runoff water supply systems were built along the caravan routes, providing men and animals with water. Such systems are located along the routes into Wādī Ṣabrā and the one bypassing Jabal Hārūn, leading to the Negev[9] (FIG. 1). At least one runoff water collection system is known at the outlet of Sīq al-Ba'ja, which was built for the irrigation of fields, allowing a certain agricultural production on the higher banks flanking the wadi bed (Bienert *et al.* 2000).

The Nabataean's Contribution to the Development of Hydraulic Systems and Constructions

The precise dating results of the excavations in the as-Sīq have clearly shown that the terracotta pipes with which the aqueduct was built are the oldest ones found to be manufactured on the potter's wheel (Bellwald 2003). It is obvious, therefore, that the Nabataeans, very sophisticated potters, adopted the technology which they had developed for the production of fine ware bowls for producing industrial terracotta ware such as water pipes. The pipes excavated in the as-Sīq, manufactured on the wheel, are not longer than a yard and have a ribbed/rippled inner surface which is due to the movements of the potter's fingers. This ribbed/rippled inner structure,



10. General view onto one of the runoff water collection systems at the eastern slope of eastern Jabal al-Mu'ayṣra, showing a perfect model for such a system.
Photo and display of runoff water collection system U. Bellwald.

[9] Lindner, M. and others, 2004, Beyond Petra, 30 Years of Fascination and Research, Rahden.

first only a consequence of the production on the wheel was then detected to be of great influence for a better flow of water, as it led air bubbles in the water to the top of the pipes. The pipes produced on the wheel were much thinner than the pipes produced from flat tiles around a cylindrical mould and therefore of tremendously reduced weight, a fact that increased their applicability. Due to the very thin walls of the pipes the Nabataeans seemed to be the first ever to have their pipelines completely embedded in lime mortar.

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Qaṣr al-Ḥallābāt: Continuity and Change from the Roman-Byzantine to the Umayyad Period

Introduction

The complex of al-Ḥallābāt is located 60km northeast of ʻAmmān, and 12km to the east of the *Via Nova Trajana*. It includes the Qaṣr itself, and other buildings and structures: a Mosque, the nearby baths at Ḥammām as-Sarāḥ, and a series of auxiliary dwelling buildings and hydraulic infrastructures. It has been the subject of different studies since the turn of the 20th century when was firstly described by Butler.

The aim of this paper is to review, on the basis of the most recent (and still ongoing) research linked to the excavation and restoration works at al-Ḥallābāt, the new hypothesis on the dating and nature of the physical transformation and the change of use of the site and its related structures*. The aim is thus two fold: Firstly, to study the transformation of a Roman-Byzantine military structure into a civil (representative) one, in relation to the border it was intended originally to defend (the *Limes Arabicus*) [and its disappearance], in an attempt to clarify when this transformation actually occurred; Secondly, to solve the problem of the precise architectural phases of the Qaṣr, on the basis of a stratigraphic analysis of the building itself, in an attempt to establish a reliable relative sequence of the building activities and the related "different buildings". These related structures have succeeded and superseded each other, and are the result of successive demolitions, ruins, transformations and refurbishments, due both to natural and anthropic causes. This architectural sequence is essential for any attempt to interpret the change of use of the structure throughout its history.

The Excavation and Restoration Project of Qaṣr al-Ḥallābāt complex started in 2002 under the technical and scientific direction of the author. This project is funded by the Spanish Agency for International Co-operation, and it is carried out in collaboration with the Jordanian Department of Antiquities, the Ministry of Tourism, and the Spanish Embassy. It has, as well, the financial and logistic support of the Spanish Institute for Historical Heritage (IPHE Ministry of Culture) within the Grant Program for Archaeological Research in Foreign Countries.

This paper will discuss the preliminary results of the research conducted during the excavation and restoration of the monument. We will present the instruments, the process of analysis and the proposed hypothesis, that might have important repercussions for the interpretation of the transition from the Byzantine to Umayyad periods. The transformation of military structures from the Limes Arábicus into agricultural states and protocol reception halls (in an earlier period than expected), and the relationship between people and nature, and the exploitation and control of territory, from Late Antiquity into the Early Medieval period, are the basis of the presentation.

Previous Research and Related Hypothesis

Many different interpretations and studies have been carried out on al-Ḥallābāt, since the very first study by Butler who produced the first plan of the Qaṣr. The most recent ones were the result of the survey by David Kennedy in 1978 and the partial excavation by the Department of Antiquities, carried out from 1979 throughout 1985, under the direction of Ghazi Bisheh, who identified the latest

* This paper is a revised, enlarged version of the one to be published in the proceedings of the Islamic Fortification Conference held in Aleppo in 2003. Although the main conclusions remain unchanged, it has been updated according to the new data and the subsequent review of the hypothetical sequence of activities, from the ongoing research process.

period of use of the complex as Umayyad.

From the first surveys it was clear to all researchers that the building of the Qaṣr (as well as most of the complex) was the result of a series of interventions and transformations of an original structure (most probably Roman, although an earlier Nabatean origin for the settlement cannot be completely ruled out). This is evident to any observer of the wall sections of the Qaṣr that abut each other, and the various building techniques and materials employed in the different elements and sections of the main structure (FIGS. 1 and 2).

The Inscriptions and the Debate about the Dating

The unusually large amount of epigraphic material (including two inscriptions dating construction activities) found in the site has determined[1] and (mis)guided much the discussion regarding the dating of the different phases of the structure and the complex as a whole. This is due to attempts to link the dating of these inscriptions to the architectural phases, without a neutral assessment of the problems of provenance.

The problem regarding their origin is mainly related to the reuse of basalt blocks in a certain phase of refurbishment of the Qaṣr. Many of these blocks bear inscriptions from an imperial edict (see below) from a previously destroyed structure. The fact that this inscription (due to its importance) seems very unlikely to derive from such a small and politically irrelevant site, together with the unusual number and location of the other two dated inscriptions, casts a shadow of doubt on the actual origin of all them[2] . They are not, consequently, reliable enough to be taken into account for absolute dating purposes without considerations and reservations[3] .

Among the more relevant inscriptions that have determined the discussion (and the related current ideas) are:

A- A Latin inscription on a lintel stone retrieved in the court near to the northern wall, just outside room 10, making reference to the construction of a *Castellum Novum* in 213AD (It had been lost but was recently rediscovered at the RJAF Base at Mārkā).
The term. *novum* refers to the construction of a fort where another one would have previously existed. Butler suggests that the inscription could refer to the enlargement of the innermost and older structure (that would be the "old" one). This interpretation is accepted by Kennedy and Bisheh. Alternatively, it could be understood as the complete reconstruction of the innermost structure itself (which would have replaced a previous one destroyed *a fundamentis*).

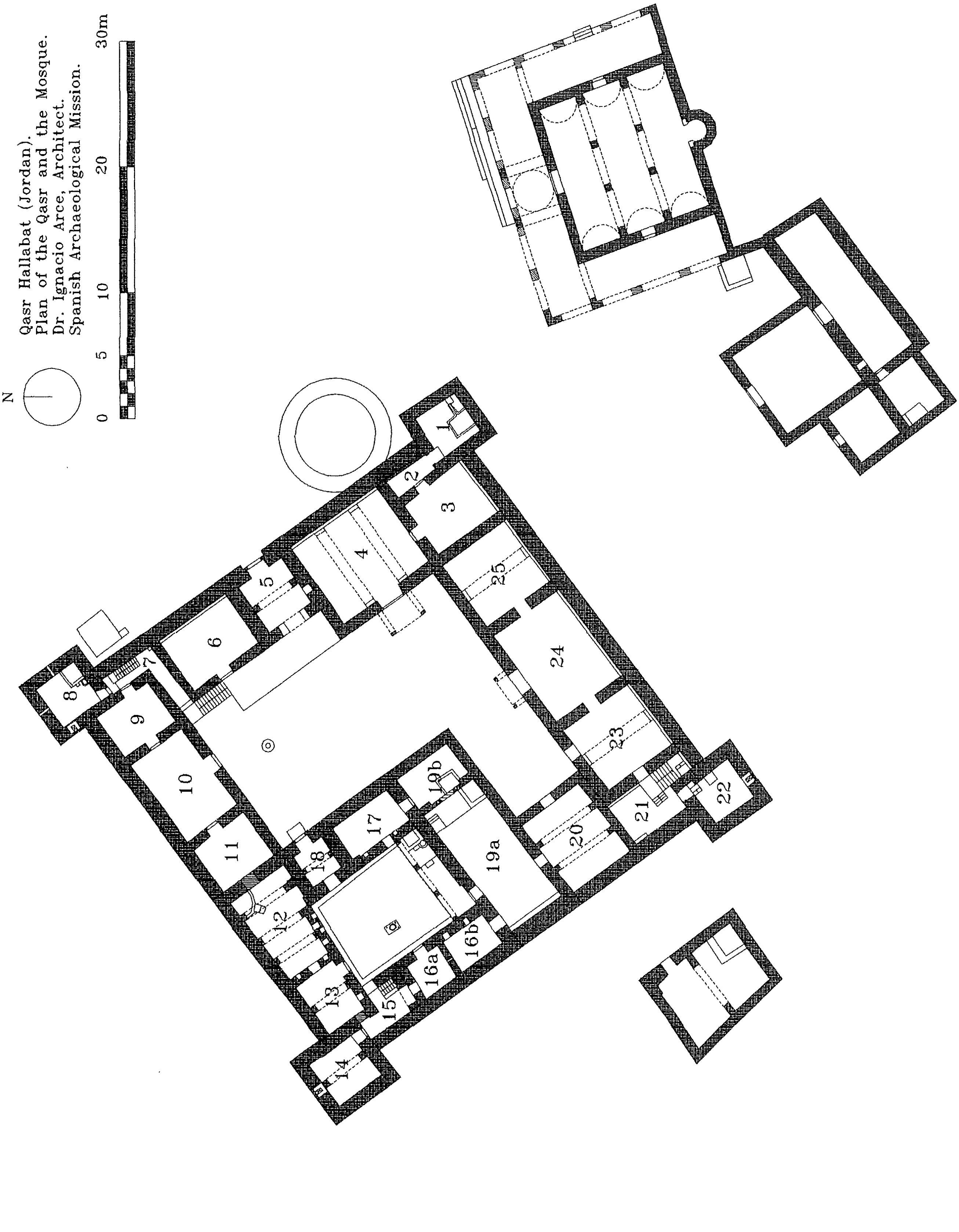
B- A Greek inscription from the reign of Justinian (dated 529AD) mentioning the restoration of the fort (*kastra*) under the rule of Flavius Anastasius, Consul and Dux (from a lintel stone reused on the north wall of the main courtyard - *see* Crawford's 1928 photograph in Kennedy 2004).
In Butler's opinion (followed in some respects by Kennedy), the reconstruction mentioned in the 2nd dated inscription would have involved the northern and southern "barracks" built inside the Qaṣr, mainly with basalt.

C- Over 100 fragments of an Imperial edict of Anastasius (491-518AD) employed in the refurbishment of the interior of the Qaṣr. Fragments of the same edict have been found at Buṣra, Ṣalkhad, Umm al-Jimāl and Imtān. The presence of copies of this edict in the first three [more important] locations is less surprising, than at al-Ḥallābāt (Kennedy). The remoteness and modest entity of the fort of al-Ḥallābāt has raised suspicion that these basalt stones may not have come from a previous structure built at al-Ḥallābāt itself

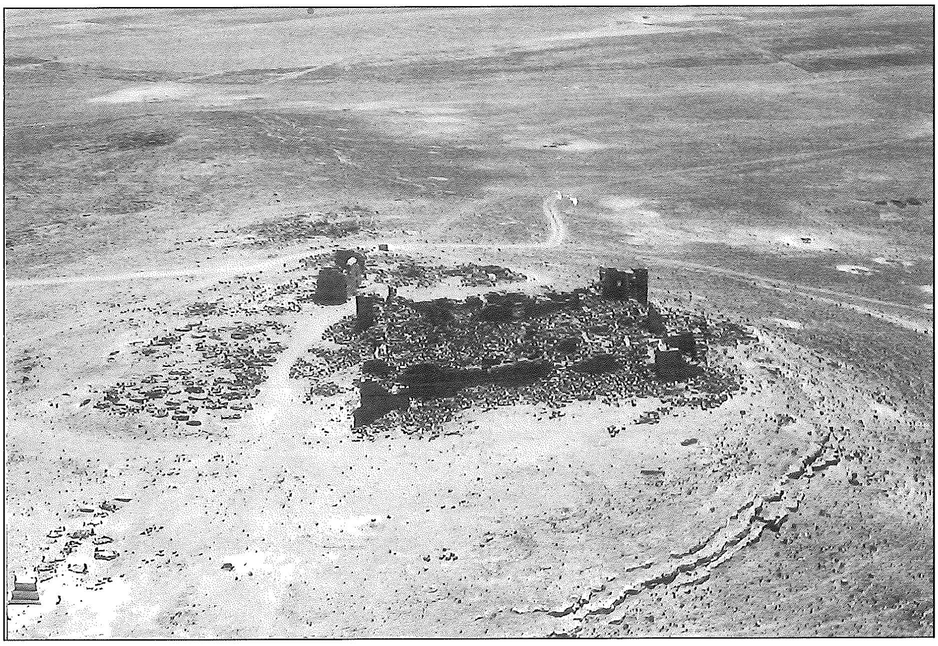
[1] This issue has determined so deeply the research that, according to the published reports, the 1979 excavations by the Department of Antiquities were carried out "with the express purpose of uncovering as many of the Greek inscriptions scattered throughout the castle as possible" (Bisheh 1980: 69).

[2] All these inscriptions were carved in basalt blocks, and were built into the masonry work that makes massive use of this material. They were placed amidst plain blocks in an casual way: The two most important ones, that bear the (re)construction dates, seem to have been placed in the same wall, one close to each other, not in a conspicuous position like on top of a lintel door, as their alleged importance would suggest. It must be taken into account that due to the hardness of this stone, once carved it does not suffer much damage or weathering, even when retrieved from a collapse. This means that it can be reused and transported far away without the risk of eventual damage to the surfaces and arises of the pieces. Finally it must be pointed out that there is no basalt stone quarry in the vicinity, meanwhile the site of al-Ḥallābāt is itself home for one of the quarries of best renowned limestone for its quality and easy carving.

[3] Nonetheless, it can not be completely ruled out that the other dated inscriptions were actually intended for the new constructions (re)built at al-Ḥallābāt. However the fact remains that the odd location of these inscriptions argues against this: instead of being placed on top of a gateway or another prominent position, they were placed amidst other ones with (apparently) no regard to its alleged importance. A campaign of sampling and petrographic analysis has been foreseen as well, to compare the basalt stone from these inscriptions with those found at Umm al-Jimāl, Bosra, Ṣalkhad, etc., and their related quarries.



1. Qaṣr al-Ḥallābāt. Plan of the Qaṣr and the Mosque.



2. Aerial view before the intervention.

(dismantled and recycled) but from somewhere else (perhaps corresponding to the location of the other two inscriptions as they were built in all together in the same period). The questions of when and where these stones were brought from remains unanswered. The only certainty is the *post quem* dating for the structures built with these stones, fixed by the date of the edict itself (the turn of the fifth-sixth centuries AD).

These basalt blocks were reused in the massive refurbishment of the northern and southern internal partitions of the Qaṣr[4] . The fact that these ashlars were placed with complete disregard for their original orientation and plastered over afterwards, led Ghazi Bisheh to date this phase to the Umayyad period partly on the basis (accepted by Parker and many others) that "it is difficult to believe that this edict would have been treated in such cavalier fashion a mere decade after Anastasius death in 518AD. This is much more likely to have occurred in the Umayyad era, more than one hundred years later and under a new regime" (Parker 1986: 32).

In my opinion this interpretation is biased by the devotion and respect usually paid by scholars to inscriptions, which overlooks the practical and pragmatic view of a builder in need of cheap supplies. The latter, in the presence of the elements of a collapsed structure, would see not a venerable relic or an official document, but just pre-cut, ready-to-use, and consequently cheap (or even free) building material[5] . If we imagine this happening in the aftermath of an earthquake, which unites the need to clear the rubble in large areas with the need for a cheap and ready supply of building material for rebuilding other structures, a more realistic and reliable picture emerges.

If we take into account that in 551AD the most violent earthquake that had occured in the region in all Antiquity struck, we could date the structures using these basalt stones after the *post quem* provided by the Anastasius edict, and after the 551AD quake, but before the Umayyad period.

Previous Hypothesis of Building Activities Sequences

The phases of use (actually there are slight variations of a single phase) of the complex proposed to date, rely mainly on these inscriptions despite the degree of uncertainty involved. The reconstruction, according to the interpretations proposed by Bisheh, Kennedy, Gregory and Butler (all closely related to the dated inscriptions and with slight differences),

4 Bisheh found one of these basalt ashlars reused in one of the sluices of the agricultural hydraulic system, and used this fact to date it to the same period.

5 Even nowadays this seems to be still a common practice: Dr. Ghazi Bisheh kindly prevented me from the risk of a possible misinterpretation, pointing out that most of the stones used in the restoration of Ḥammām as-Sarāḥ, carried out by the Department of Antiquities in the 80's, were brought from the site of Qaṣr al-Ḥallābāt.

would identify just three phases:

1- The small innermost enclosure 17.5 m square, located comprised in the W. corner of the present building.
According to the mentioned Authors this would be the "old fort" inferred from the mention to a "new" one by the 213AD inscription[6] . On this basis, they date this structure to the second century AD, and relate its construction to that of the *Via Nova Trajana* in 111-117AD. Accordingly, this structure would be a watch-fort from the *Limes Arabicus* to provide an in-depth protection of it.
2- The extension embracing the previous structure, creating an enclosure 38 m square. This would correspond, in their opinion, to the *"Castellum novum"* mentioned in the 213AD inscription[7] .
3- The reconstruction involving the reuse of basalt stones in the internal divisions (and the northern wall).

This phase (that Butler and Kennedy interpret implicitly as Byzantine and corresponding to the 529AD restoration), is on the contrary dated by Bisheh to the Umayyad period on the basis of the "evidence of the pottery sherds[8] and the carved stucco found" (Bisheh 1980: 70), and on the above mentioned assumption that the reuse of stones bearing a Byzantine imperial edict in such an inconsiderate way, could not have occurred in Byzantine period.

According to Bisheh (an opinion accepted apparently also by Parker), this basalt masonry stonework would be thus coeval to the Umayyad mosque and to the bath at Ḥammām as-Sarāḥ (built both in limestone without a single basalt block), and to the fine decoration of carved stucco, glass mosaics and mural paintings found in the Qaṣr.

Kennedy links the extension of the original fort of the 2nd phase with the construction of the internal basalt-built partition walls, and assumes that the third phase involved the raising of the walls in height, the addition of a second storey to the existing room and the insertion of three-storied towers in the corners (Kennedy 2000: 92).

Evidences Versus Preconceived Interpretations Towards an Stratigraphic and Constructive Analysis of the Material Evidences[9]

As we have seen, in all the aforementioned hypothesis, the inscriptions have guided the interpretation of the material evidences, in an attempt to accommodate the latter in the light of the former, giving as a result unreliable and, in some cases, contradictory conclusions. The problem of these sequences is that they rely on a preconceived idea provided by the dates of the inscriptions that has biased the recording and analysis of the material evidences. This confusion in the process of data gathering, confuses the data recording with interpretation and creates a preconceived idea of the chronological sequence and tends (even unconsciously) to neglect certain pieces of information in favour of other ones on the basis of their fit within that preconceived idea.

More recently some of the authors of these proposed sequences have recognised the fact that these inscribed stones are most probably derived fromsomewhere other than al-Ḥallābāt. This prevents us from using them for directly dating the different phases of the building. Gregory has pointed out the difficulty of linking these inscriptions with identifiable phases; meanwhile Bisheh, in his latest

[6] Kennedy mentions the presence of an inscribed basalt *tabula ansata* in this first phase that could be purely decorative or it may once have had a painted inscription (2004: 100)

[7] Kennedy and Gregory suggest that the "new fort" was built without towers, and that they would have been added in the following phase, involving the massive use of basalt (dated according to them, by the 529AD inscription), or even later. This can be ruled out as the same building techniques are used in both the wall and the towers (they are even bonded in some points).
On the contrary, Bisheh accepts Butler's opinion that the towers were built in the Severan expansion, together with the rest of the perimeter walls, meanwhile he dates the basalt-built internal reconstruction to the Umayyad period (he notices that these structures abut the South perimeter wall, but does not realise that they are bonded to the northern one). However, Bisheh fails to identify the restoration mentioned in the 529AD inscription with any specific structure in the palace. He just mentions that some works were carried out, just before being abandoned and falling into disuse during the first half of the seventh century AD, perhaps as a result of the Persian invasion (Bisheh 1980: 70). Again, he fails to give any evidence that would support the hypothesis of the abandonment.

[8] The "pottery evidence" mentioned by Bisheh, makes reference to the absence of any Roman-Byzantine pottery inside the Qaṣr reported in his excavations. Meanwhile the fact that Umayyad stucco was applied to the basalt, does not necessarily indicate that they are coeval.

[9] In the previous interpretations the stratigraphic secuence of the building activities has not been studied in depth, nor systematically, despite the clear evidence. Some of the previous hypotheses include some attempts of basic stratigraphic interpretation, although not systematic, nor following thoroughly the principles of this discipline, firmly developed in the last decades in Italy and Spain.

publication, recognises "that the dated inscriptions can no longer be used for dating the structural phases of the castle" (Bisheh 1993). In spite of this, no alternative hypothesis for the actual sequence of transformation and use has been put forward as yet, nor has there been a thorough review of all previous interpretations.

Accordingly, the approach adopted in our research has been based strictly on the neutral recording and evaluation of the material evidences (using stratigraphic and construction analysis), without taking into account the absolute dating provided by the inscriptions, and avoiding any preconceived ideas, relying only upon the relative temporal sequence elicited from the sequence of building activities identifiable on the building itself.

As a result, the first stratigraphic assessment of the uncovered walls provided a much more complex sequence than those proposed to date. This led to a detailed stratigraphic analysis of the whole complex (still ongoing), of which just a preliminary summary of the process, and some related conclusions, will be presented here.

The first and most relevant conclusions came from the detailed observation of the corner towers and some stretches of the perimeter wall. In these areas, the stratigraphic analysis indicates that they were built at least twice following the same plan (with many other later minor repairs), using each of them very different building techniques. As a result, we can conclude that there were two successive *quadriburgiums* (a Roman fortress with corner towers) following the same plan and both embracing the allegedly oldest structure, comprised in the NW corner of the new one. This was just the first of a series of remarkable evidences that will significantly change ideas about the site, and approaches to further research.

Relative Sequence of the Built Structures

This study of the stratigraphic relationships and the related building techniques and materials used has resulted in the following preliminary[10] sequence of building activities and phases:

1- The oldest standing structure (the core building 17.5 m square in plan — FIGS. 1, 3a,b,c and 4) was built with an irregular masonry consisting of big blocks of roughly-hewn limestone. The pointing of the joints consists of a very characteristic vermiculated line of protruding lime mortar that prevents the earth placed in the core of the wall (intended as a filling) from being percolated by rainfall. Basalt ashlar masonry was used only in the jambs and the lintel of the main entrance (the more regular limestone ashlars found in this main, East, façade facing the courtyard may indicate a later refurbishment). Originally it seems to have been composed of only the external perimeter and the access corridor (FIG. 3a). Traces of the original walls can be seen in the West façade (FIGS. 9 and 15), meanwhile its original North? wall survives entirely in the northern side (FIGS. 8 and 14). Also visible is the original fabric from the Southern and Eeastern façades inside the main enclosure (FIG. 4).

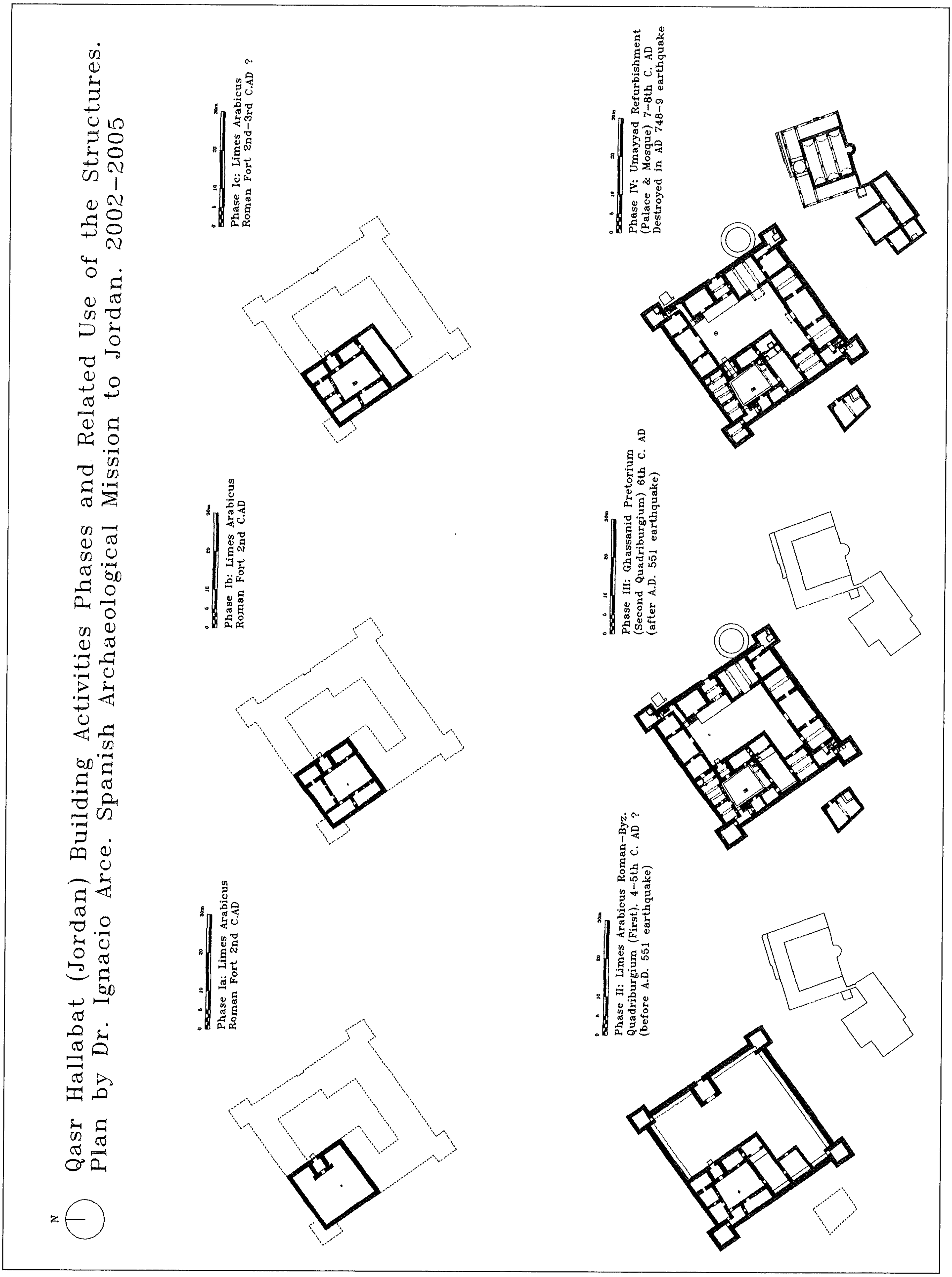
2- Immediately afterwards the building was internally divided by means of partition walls that define several rooms articulated around a central court with a cistern, placed in three of its four sides (FIG. 3b). Originally it seems that there were two rooms in its SW side and three in its NE (the entrance corridor and two others flanking it). While in the NW side there was one room placed in between the two main bays that gave access to the N corner room (all the other rooms had direct access from the court). No room was placed in the SE side of the court. Apparently no diaphragm arches were used to cover the rooms in this first phase, probably because of their reduced span.

3- This structure was subsequently enlarged in its south-eastern side with the addition of a room (n.19) 5 m wide, that runs from the W to the E façades (FIGS. 3c and 4). It was connected to the court of the fort by means of a door opened in the S corner of the court.

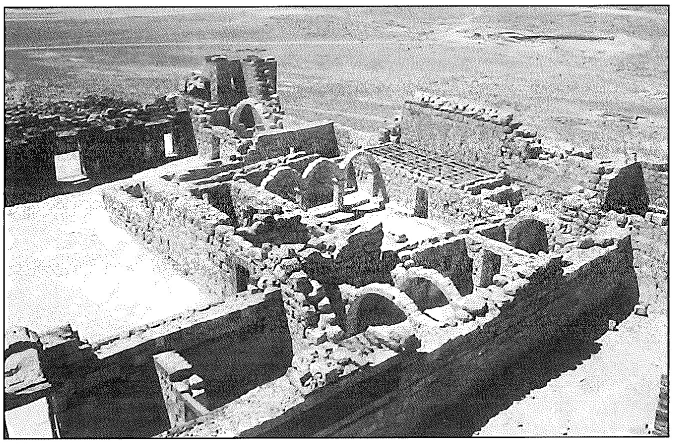
4- The first *quadriburgium* (FIGS. 3d, 5, 12 and 14) was built embracing the oldest fort, and its construction included also the corner towers[11] , (the W tower was embedded in the oldest fort).

[10] This is not the detailed and complete sequence of activities (the scope of this paper does not allow detailed description) but just a summary of the most relevant and significant phases.

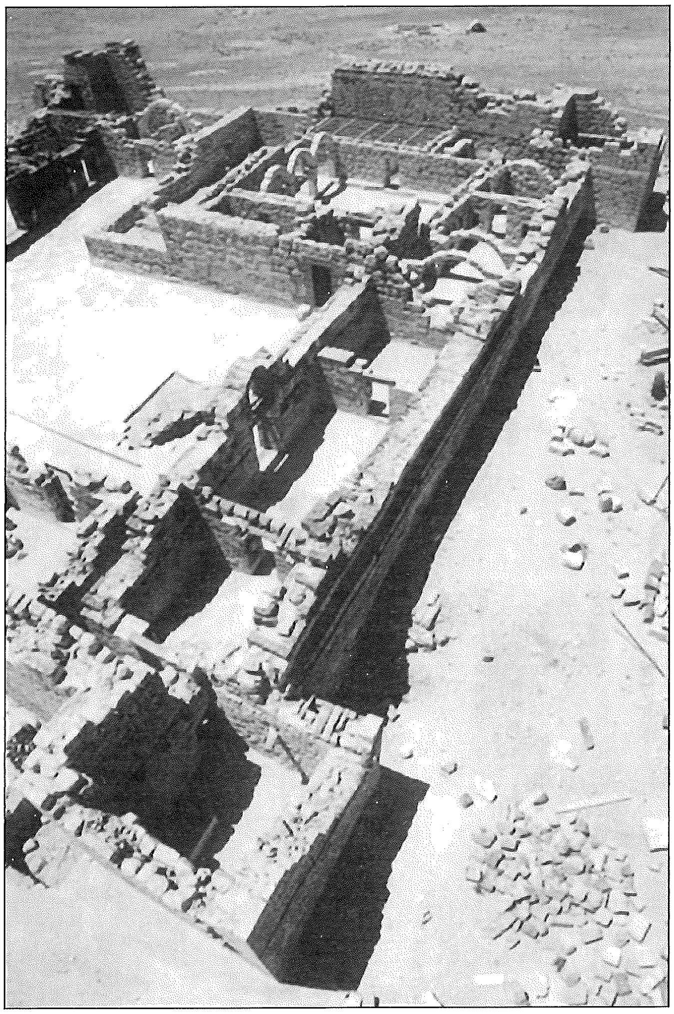
[11] It must be pointed out that usually in a defensive structure, towers and walls are not built linked, even in coeval construction, to prevent the collapse of complete stretches of a defensive wall, in case a tower would be demolished. This would explain this apparently not coeval construction due to the joint in between both structures.



3. Building activities phases.

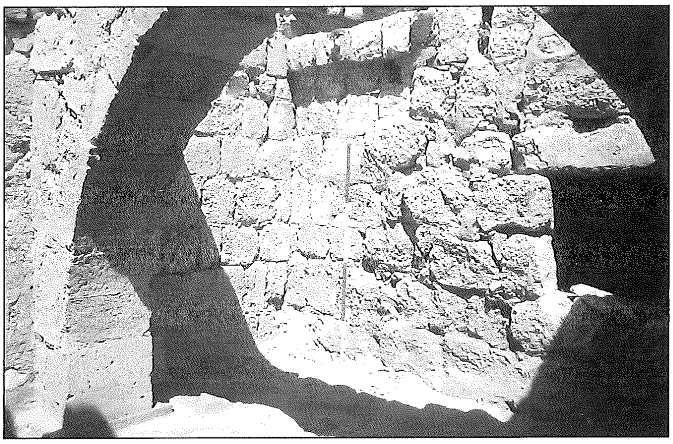


4. Aerial view of the innermost and older fort. Notice the way the old stretches of the original wall are lumped up and comprised in the new structures.



5. Aerial view from the North. Note the *quadriburgium* embracing the older fort.

6. Tower 22. Detail showing the rusticated corner ashlars from the first *quadriburgium* tower comprised in the second *quadriburgium* one.

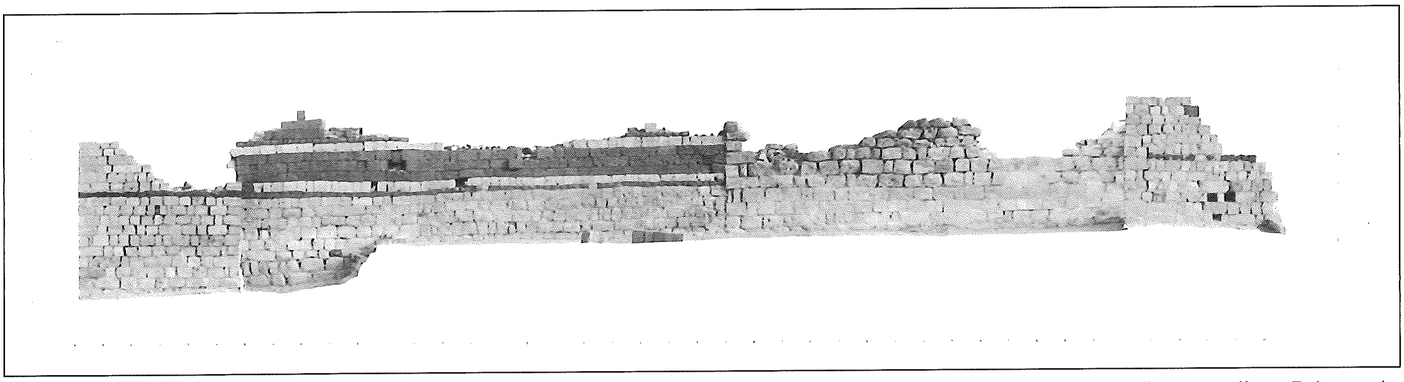


7. Tower 14. Detail showing the reconstruction of the tower of the first *quadriburgium,* notice the different masonry technique and materials used to recreate the same tower in plan.

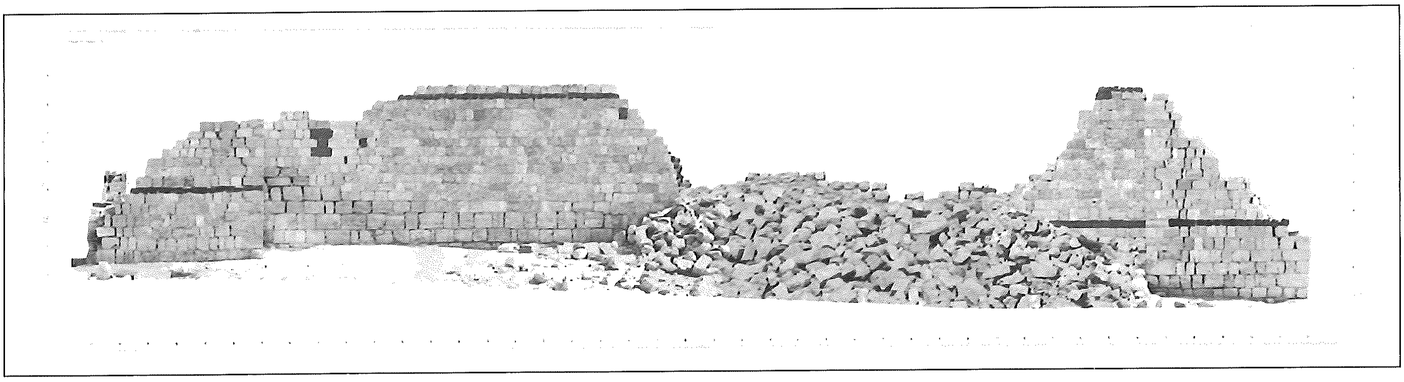
Remains of these first towers can be seen in the present ones (FIGS. 6 and 7). The main remains of this first *quadriburgium* are the existing South wall (FIG. 9), and some stretches of the East one (FIG. 11). In the West wall, just a few traces can be identified in the southern end of its internal face, meanwhile in the North wall, just one or two courses of the pre-existing structure survive and serve as a foundation for the new one.

The building technique of this second phase is similar to the first one. It consists of roughly hewn-cut blocks of limestone (somehow rougher than the former ones), with better squared blocks in the corners, roughly dressed (with a *anathyrosis* — FIG. 6 — similar to the masonry work of Qaṣr Bshīr). No basalt blocks were used in this phase. The pointing technique is also the same vermiculated one found in the oldest and innermost structure (this may be due to the continuity of the same technique, or to a re-pointing of all the joints of the building when this second phase was built).

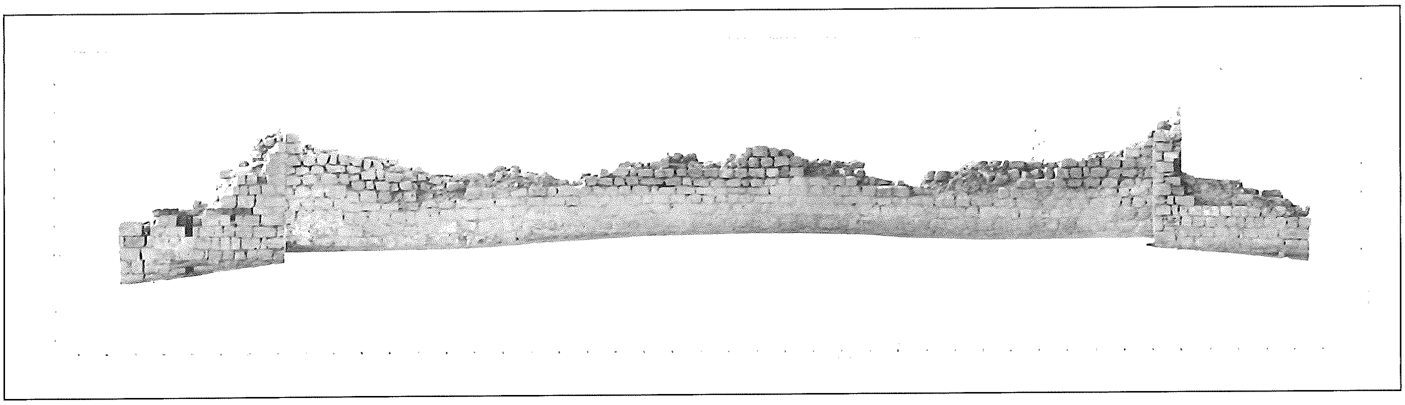
The internal section of the wall has a continuous recess, only a few cm deep, that runs the length of the internal perimeter of the wall, at a height of



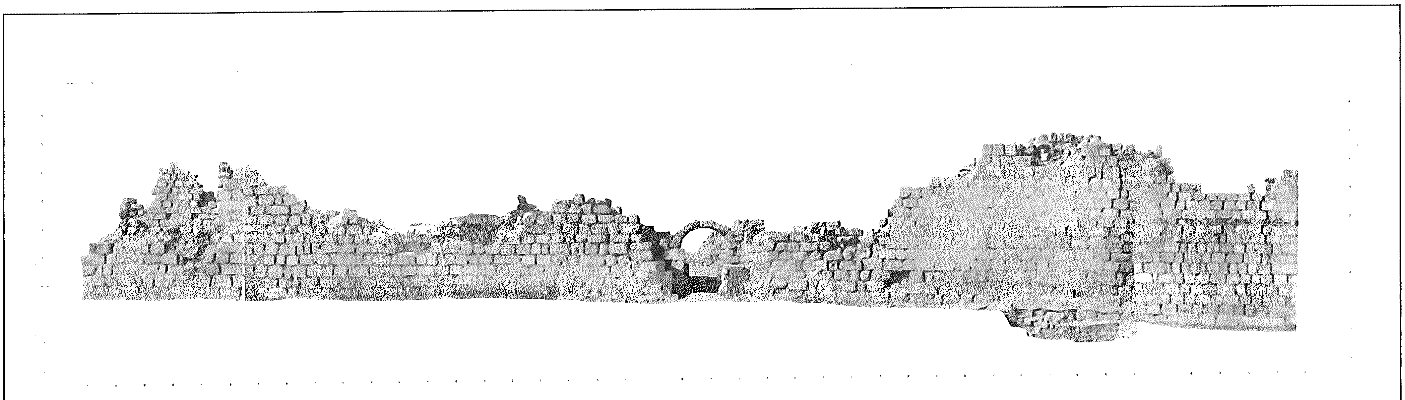
8. North wall elevation. Rectified ortophotographic photomosaic recording (Photographic and tachymetric recording: I.Arce, A. Mariotti and L. Tarducci; Rectification processing and image edition: A. Sbardellati).



9. West wall elevation. Rectified ortophotographic photomosaic recording.



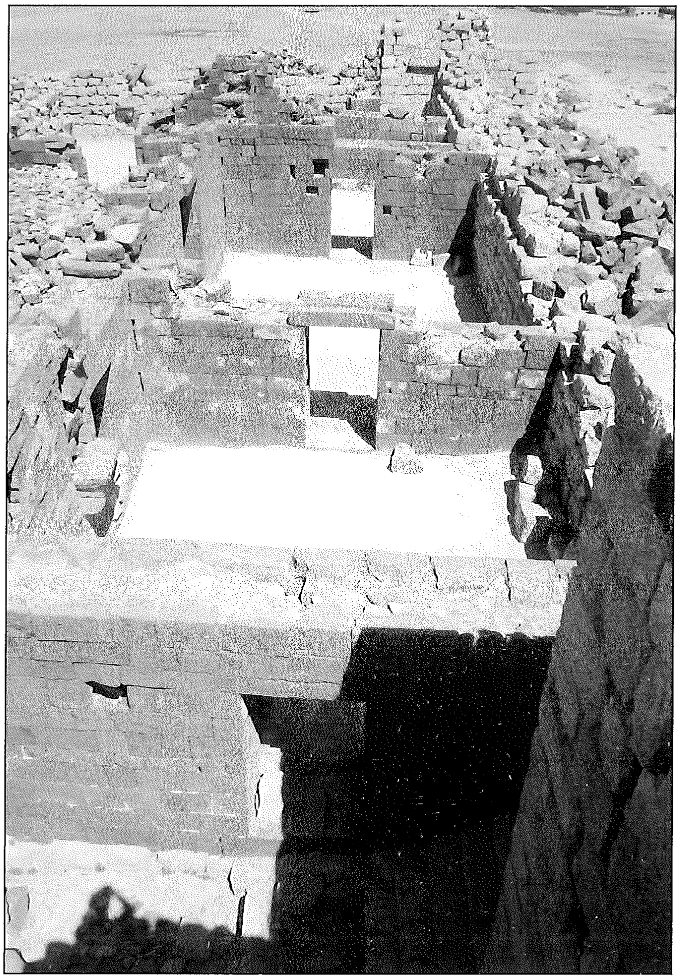
10. South wall elevation. Rectified ortophotographic photomosaic recording.



11. East wall elevation. Rectified ortophotographic photomosaic recording.

circa 2 m from the floor. This would have served to place a timber scaffold that would have rested on the perimeter wall, providing an elevated sentry walkway. This recess can be found in all the surviving sections of this wall (FIG. 12). This suggests that this first *quadriburgium* had no stone partition walls (nor rooms) built against the perimeter wall, but just a timber walkway. The only structures built in this phase, internally to the perimetral wall, are the entrance gateway, and the structure corresponding to room 20 (built abutting the first enlargement of the oldest core fort — FIGS. 1 and 3d —). These use a building technique similar to the one of the first *quadriburgium*.

5- The second *quadriburgium* (FIG. 3e) was rebuilt following exactly the perimeter and plan of the previous one, after a mayor destruction (most probably an earthquake), but it included new internal partitions that will be described later (6). It was built with a finer masonry work of medium size limestone ashlars laid in regular courses (FIGS. 8 and 9). These blocks have just the exposed face dressed, with the rest of the block left with very irregular finishing. At certain heights (the top of the perimeter walls and at mid-height in the towers), is placed a course of basalt headers that bond both faces of the wall. In the towers these are actually placed in correspondence with the upper floor level and the external corner of this course is finished with a flat slab of the same height as the course. The mortar used consists of lime mixed with a huge amount of crushed volcanic stone and pottery. This addition provides the mortar with hydraulic characteristics and thus a longer-lasting and better resistance to weathering. The mortar was used (as in the previous cases) just in the external faces of the wall, meanwhile the core was filled with earth and rubble, and basalt chipping used to wedge the limestone blocks.



12. Basalt built internal divisions (from the 2nd *quadriburgium* phase) abutting on the South section of the perimetral wall (entirely remaining from the 1st *quadriburgium*). Notice the continuous recess in this South section of the wall from the 1st *quadriburgium* for the timber sentry walkway.

In this phase the perimeter West wall was almost completely rebuilt (including the stretch corresponding to the oldest roman fort), embedding in its thickness the remains of the previous walls (FIG. 9). The traces of these pre-existing structures can be found externally in the contact area of the W tower and the W wall, and internally at both ends of the wall (FIGS. 15, 9 and 4). The eastern stretch of the North wall was almost completely rebuilt, again leaning against the N. wall of the oldest fort. The upper part of this northern wall was almost exclusively built with basalt. The South wall (FIG. 10) was not rebuilt in this phase (because still standing), meanwhile in the East wall (FIG. 11) only minor modifications took place, the most significant one being the breach in the middle of the wall (in correspondence with the gateway) to insert a new, slightly recessed door, built with basalt jambs and probably also with a lintel and a relieving arch of the same material (the reconstruction of the N section of this E wall belong to a later phase).

The present configuration of the corner towers would correspond to this period as well, although they comprise (lumped together) remains of the previous ones (FIGS. 6, 7 and 15). In some corner stones of the S tower incised crosses to attract the divine protection can be traced (these are not reused lintels, but plain ashlars with irregular shaped crossed merely scratched). This helps to date them as pre-Islamic.

Apart from the E one, all the towers are provided with a latrine in the upper floor. The latrines are built in a recess within the thickness of the wall, with a vertical shaft and an outlet at the external floor level. The latrines are placed in the areas downwind of the fort, near the ridge and the sloping surroundings (ideal for dumping), and far away from the main access way. This is probably the reason why the E tower, closer to that access way, was not provided with a latrine. This tower is also the only one without a staircase leading to its upper floor. The lower floors were intended to store food, and the windows that pierce for instance the walls of the N tower are not arrow-slits, but were intended for ventilation.

This refurbishment of the towers implies a certain loss of their defensive value, correspondent and coherent with the aulic and representative character of the rooms created inside this second *quadriburgium* (see below).

6- Another major building activity, that we have conclude to be coeval with the second *quadriburgium* (see below), corresponds to the internal partition walls and rooms (FIG. 3e), built mainly with basalt blocks, in the area between the external perimeter of the oldest roman fort and the internal one of this second *quadriburgium.* This phase can be dated by means of *the post-quem* provided by the inscribed stones with the Anastasius edict used in its construction, after 518AD (most probably after the 551AD earthquake).

The predominant building technique consisted of basalt stone ashlars (clearly reused) of which only the main face is dressed, the arises of its perimeter being cut with great precision, leaving the rest of the block rough-hewn. They are arranged in series of horizontal courses of stretchers along both faces of the wall. Each certain number of stretchers' courses (from five to six), it is placed a course of headers that bond both faces of the wall. Clearly this is exactly the same building technique as the second *quadriburgium,* using basalt as the sole, or main, building material (not only for the headers but also for the stretchers). The joints are tightened by a fine lime mortar pointing, being the core of the wall filled with basalt chipping and argilleous earth. This same technique can be found at Qaṣr Burqu' (but only in the Byzantine tower, not in the supposedly Umayyad enclosure that surrounds it).

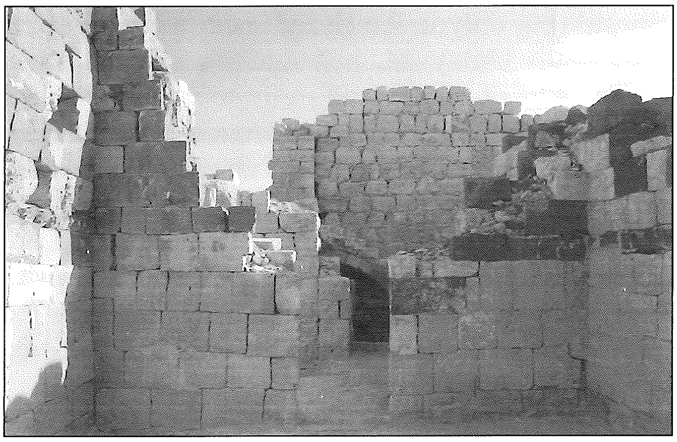
The sort of doors used in these walls (the ones that give access from the court to rooms 10 and 24) are fitted with a thin lintel and an extremely raised relieving arch (FIGS. 14 and 26). This feature is typical of the Byzantine basalt architecture of the Ḥawrān (similar samples can be found in Busra, Qanawāt, etc.) but are not used afterwards in the Umayyad period. Something similar could be said regarding the accurately cut basalt masonry employed in its construction. The Umayyads borrowed all kind of building techniques and architectural elements from both Roman-Byzantine and Parto-Sassanian traditions, with the purpose of achieving quick and efficient results (see Arce 2001, 2003, 2004, *in press*). Probably for this reason they abandoned almost totally the basalt masonry techniques, using it only where there was no other choice (even in these cases they used a much simpler building technique — as in the mentioned perimeter structures of Qaṣr Burqu' — or they used it for building a base for a mud brick superstructure as in the case of Jabal Says structures).

Still, two different areas with slightly different techniques can be distinguished in this phase:

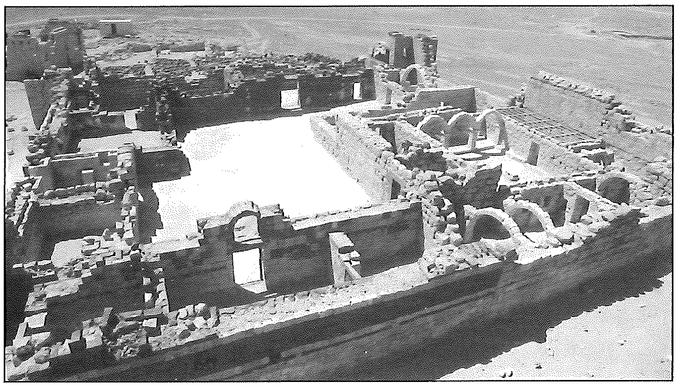
6a- The structures built in the southern area (FIGS. 12 and 14) abut the pre-existing limestone South wall from the first *quadriburgium*, and are almost entirely built with basalt (according to the above described technique). Remarkably some stretches of the first courses of these walls are of well-dressed limestone ashlars. The basalt corbels embedded in the internal face of the southern wall (to support diaphragm arches) are, of course, coeval.

6b- The structures built in the northern area (FIGS. 13 and 14 are built with limestone ashlars mixed with basalt following the same building technique of the second *quadriburgium* (except in the wall that separates the rooms from the court). They abut the oldest and innermost core structure (the first fort), but are bonded with the North perimeter wall of the second *quadriburgium* This means that these partition walls and the N. Wall (belonging to the second *quadriburgium*) are coeval[12] .

[12] The uppermost section of this stretch of the northern wall is built entirely with basalt stones as in the other coeval southern sections of the second *quadriburgium* internal partition walls. This upper section abuts the E. tower, meanwhile in the lower section the E. tower abuts the external wall. All these facts, indicate different stratigraphic units corresponding to different, but coeval, building activities (due probably to an irregular influx of basalt stones to the worksite).



13. Basalt built internal divisions (from the 2nd *quadriburgium* phase) built together, interlocked with the North perimetral wall and the wall that faces the main court demonstrating that all of them belong to the same building activity, i.e.: are coeval.



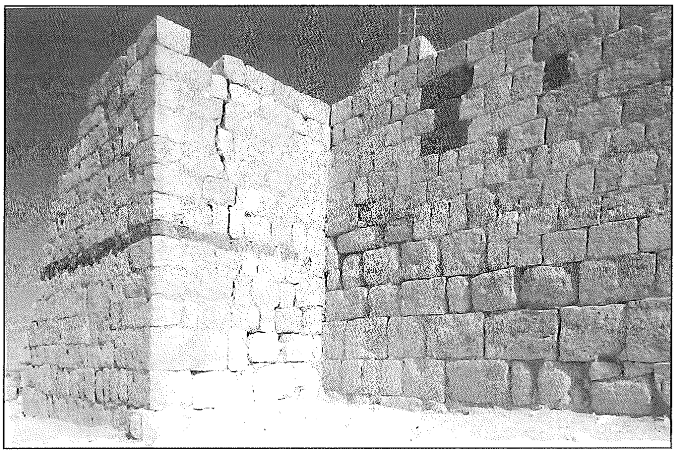
14. Aerial view from the Northeast. Notice the basalt masonry work from the northern (mixed with limestone) and southern (entirely in basalt) sections of the internal partitions, coeval to the 2nd *quadriburgium* walls (in the foreground). Notice as well the typical door with raised relieving arch typical from the sixth century AD basalt architecture from the Ḥawrān.

The wall that divides the main court from these rooms is remarkable: the internal face is built with courses of limestone stretchers, with one upper course of headers in basalt, meanwhile the side facing the court is built mainly with basalt (although includes, scattered, a few number of limestone blocks). This makes clear the (decorative) aim behind the decision to built with basalt at least the faces of the walls facing the court.

There are certain decorative finishings (apparently related to this phase) that cover the walls of the court corresponding to this phase. Among them can be mentioned:

Firstly, a series of plain decorative elements built with plaster (pilasters, friezes and door frames) that adorn the basalt walls facing the court. Some of these elements still survive in the southern wall of the court, meanwhile traces of a frieze with a profile of a series of rounded elements can be traced in the corner to the south of the courtyard entrance. In the northern wall the rough surface finishing to facilitate the adhesion of the plaster-made pilasters can be seen. This decorative pattern (and the plaster composition) are very different from the ones applied latter in Umayyad period, indicating that in this phase these walls facing the court (not the internal ones) were intended to be left unplastered (apart from the mentioned moldures). The composition of the plaster is exactly the same as that of the mortar of the second *quadriburgium* (limestone with huge amounts of crushed volcanic tufo — and eventually some fragments of *cocciopesto* — that provides the mortar with a better quality and a better performance against weathering decay). As a result, no traces of the Umayyad carved stucco panels are still in place (Bisheh reports finding just one small fragment still attached, on the wall), several traces of this earlier decoration can be found still *in situ*. In some places, this earlier plaster decoration seems to have been removed to apply the Umayyad carved stucco panels and the frames that decorated the walls and doors of the court, the surface scratches being left to provide a grip to the applied mortar (this is noticeable on the stretches of wall flanking the door of room 10).

Secondly, the fragments of marble slabs lining the walls and some traces of mosaic pavements found in room 24. Both elements seem to be earlier than the latest (Umayyad) mosaics found in the same room. This earlier dating can be elicited firstly, from the different techniques used and secondly, from the stratigraphic relationship between both mosaics,



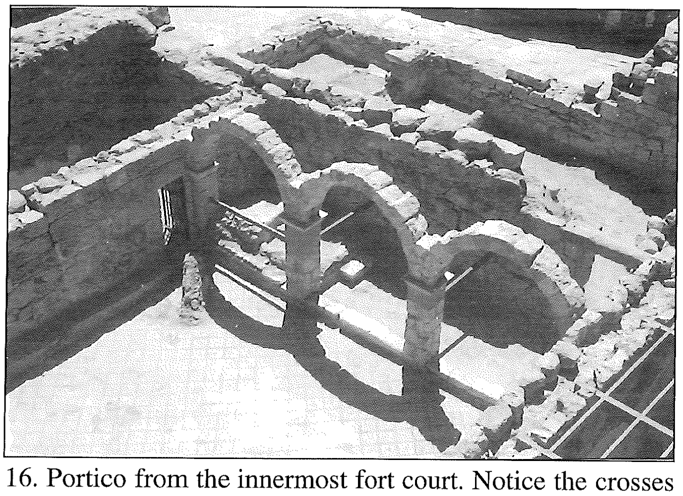
15. Encounter of the perimetral West wall with tower 14 (W). Notice the traces of the innermost and oldest Roman fort and the 1st *quadriburgium* tower comprised respectively in the 2nd *quadriburgium* West wall and tower.

and between the mosaic floors and the marble lining of the walls. The first mosaic pavement is made of stone *tesserae* and it was built against the mortar that supports the marble slabs (underneath them) meanwhile the second mosaic (the Umayyad one) is made of glass *tesserae* and abuts directly against the marble slabs (at a slightly higher level, than the previous one).

The plan of these rooms, together with this rich decoration, shows that the character of these rooms was clearly related to protocol activities as they look and were decorated as audience halls. This, together with the loss of military character of the newly rebuilt walls and towers, indicates a drastic change in the use of the building that can be also traced in the refurbishment carried out in other parts of the building.

7- A different and very singular series of building activities (most probably coeval to this "second *quadriburgium*") are those related to the refurbishment of the court of the innermost (oldest) structure.

They consist mainly in the construction of a three arched portico in its southern side. The arches of this portico are built of finely cut limestone blocks. The dressing of the voussoirs and the springers is particularly accurate (the structure has been recently rebuilt using the original pieces found *in situ*, see FIG. 16). They bear crosses in their keystones and directly abut the fabric of the first fort (entire sections of the original pointing behind the remains



16. Portico from the innermost fort court. Notice the crosses carved on the arches key stones and the central protruding one carved away in Umayyad period. On the left can be seen the wine press basins from Ghassanid period.

of the extreme pillars of the portico are preserved intact). The stratigraphic evidence would lead, at first, to place this intervention chronologically after the first fort, (consequently coeval or later than the first *quadriburgium)*, meanwhile the fine building technique employed recalls the one used in the walls of the second *quadriburgium*[13] . Beside this, it must be pointed out that the ceiling of the portico was built by means of basalt beams that were covered with plaster and mural paintings. Finally, the fact that the key stones of the three arches bear crosses, dates this intervention to the fifth century AD and before the Islamic period. It could be argued that the crosses may have been carved later, but the fact that the central one was protruding (it was carved away in Islamic period because of this, while the other ones were just concealed under a coat of plaster) indicates that, at least the central cross was carved at the same time the key stone was cut, and not later.

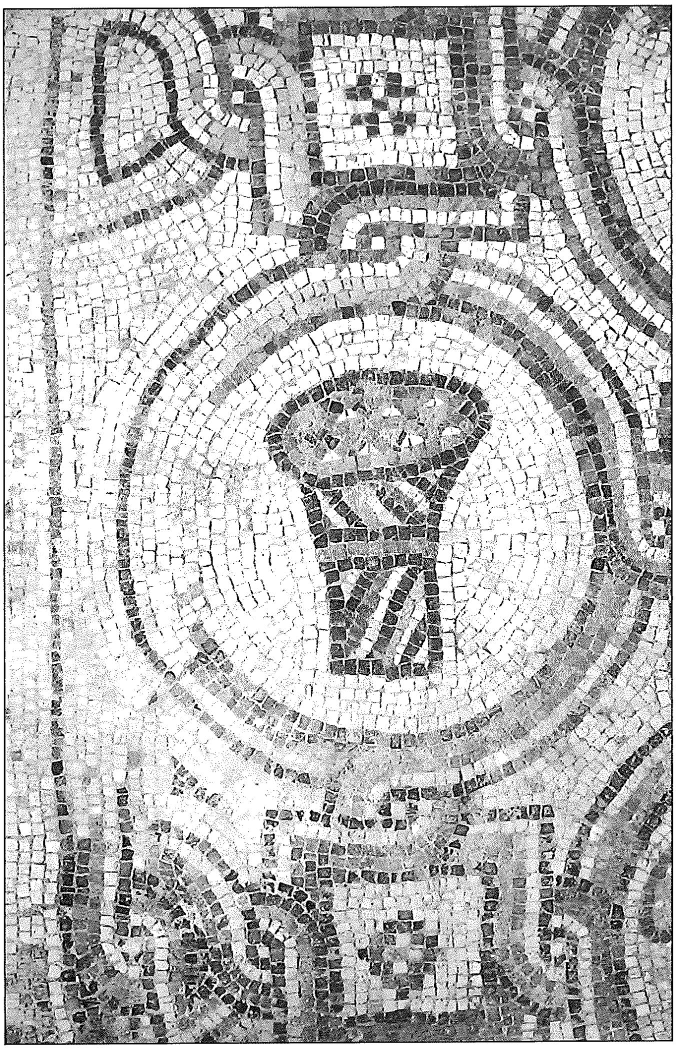
Closely related to the portico (built immediately afterwards) were the wine press basins in its SE corner, and the mosaic pavements that cover the court and the portico floors (this second one abuts against the wine press). The pattern of the mosaic from the court is a simple grid of squares placed at 45 degrees without any further decoration. The one placed under the portico has two different panels: The first consists of a series of interlaced circles with baskets, birds, and a kalix with a fish, meanwhile the second is conformed by a cross-like pattern achieved by the combination of interlaced circumferences (FIG. 17). The pattern's display indicates that the mosaic was laid at the same time or later than the wine press basins, as the first reflects the latter. Apparently it seems that the three elements (portico, basins and mosaics) were built simultaneously in a short period of time. It is important to mention traces of wall paintings (covered by a new plane layer of plaster) on the south wall of the portico (representing, among other features, a soldier) as well as traces of a cross on the ceiling basalt beams.

After a preliminary assessment, the technique of the mosaics and some of the decorative patterns seem to correspond to a Late Byzantine — Early Umayyad period[14] , although some patterns appear here for the very first time. A very relevant detail

13 In a previous moment, room 17 (originally wide open to the court) was closed up and provided with a door opened to it

14 Similar motifs and techniques can be traced in the apse of the Church at al-Fudayn/ al-Mafraq, the lower Church at Quwaysima (rebuilt in 717AD), and in the northern aisle of St. Stephan Church at Umm ar-Raṣāṣ.

17. Mosaic from the inner court portico. Notice that the patterns are adapted to the space left by the wine press basins, demonstrating that the former are adapted to the latter (and thus coeval or later).

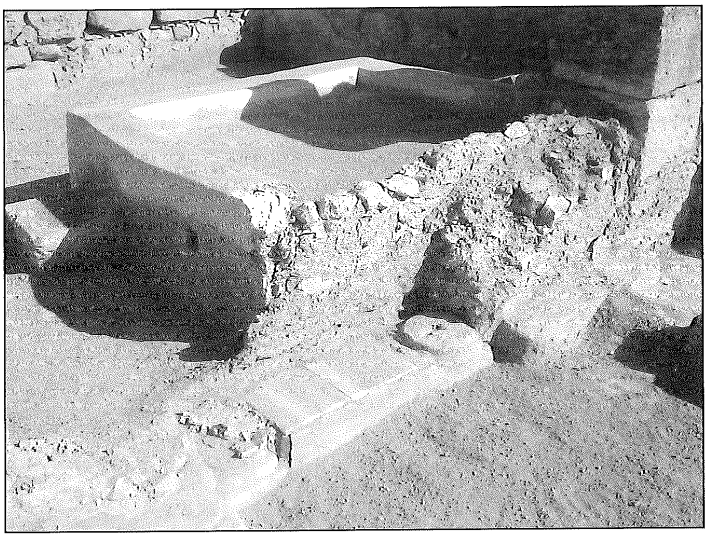


18. Mosaic from the inner court portico. Detail showing an old restoration. This proves that this mosaic is pre-Umayyad (as the restoration was carried out in the latest phase — Umayyad — of occupation and use of the building).

is that these mosaics present in different points an old restoration (FIG. 18), indicating that they would not belong to the last refurbishment of the building (in the Umayyad period), but to an earlier one, being restored afterwards in that last phase of use of the building. As we will point out later, these features are relevant, as they would suggest the transformation of the fort (and the site itself) into a civic and representative use (a palatine structure with an associated farmstead, or similar) already in pre-Islamic period.

8- The transformations of room 19 deserve special attention. In its eastern end a small section of the room, just 3m deep, was divided from the rest of the room by means of a diaphragm arch and a slight change of the floor level (it defines a raised platform that starts 1m ahead of the arch). This arch was built with roughly cut masonry voussoirs, springing from low piers with projecting springers, and indicates a functional distinction of this area of the room. It is still not clear if this arch and the raised floor are coeval to the addition of the room to the innermost fort, or if they were added when the first *quadriburgium* was built embracing it.

Later, the spatial division and importance of this section of the room was further enhanced by means of two small marble columns placed within the span of the arch and the construction of a thin wall in the lateral spaces between the columns and the arch piers (FIG. 19). Traces of a painted red skirting stripe decorated the base of this wall (similar to the one found in the first layer of the main court). The access threshold to this chamber was further enriched with two small marble slabs



19. Room 19. Detail of the marble colonnettes and the marble threshold that separates the two sections of the room divided by the diaphragm arch that spanned over that threshold across the room. Notice the Umayyad wall blocking at once the opening and the wine press basins built against it on both sides of the wall.

placed between the columns. There were also traces of a mosaic that once covered all the floor of room 19. This floor was removed thoroughly (only a few traces from the edges near the walls have survived), so that during the Umayyad period both sections of this room were deprived of its luxury decoration and used as service and store-rooms (as with most of the rooms of this innermost and older structure). The traces of this mosaic resemble the traces of the oldest one found in room 24 (see above).

Some hypothesis can be put forward regarding the use and function of this room before the Umayyad period, depending also on the exact date of these structures. Firstly it could have been used as a *principia* for the first *quadriburgium* (assuming that the arch and the raised floor are coeval to that phase). It could have been used in later period as an audience hall, or even as a Chapel. The raised and arched area of the *presbiterium* (its orientation towards East) would sustain this hypothesis, although the spatial "screen" — very reduced in span – created by these columns and walls does not fully fit a typical Christian ritual space.

Later, in the last period of use (Umayyad), the arch and this ritual access were blocked up completely dividing at once both spaces. Two wine presses were built abutting each side of the new partition wall (as part of the same building activity).

9- Finally we will deal with the architectural refurbishment that actually belongs to the Umayyad period in the rest of the building. Unfortunately, apart from the mosaic floors and the carved stucco decoration, only a series of fragments of architectural elements (finely carved in limestone and corresponding to the Umayyad period) have been retrieved from the rubble of the collapse in room n. 6 (belonging to the upper floor), confirming that the masonry using basalt ashlars is predates to the Umayyad period. These fragments correspond to the decoration of a representative room and include elements from pilasters (with their own very singular and characteristic moldures in bases and capitals), cornices, and semicircular arches (FIG. 20). This upper floor is reached by the elegant flight of steps placed in the NE corner of the main court (together with the corner towers and rooms 16a and b, would be the only areas with a second floor)[15] .

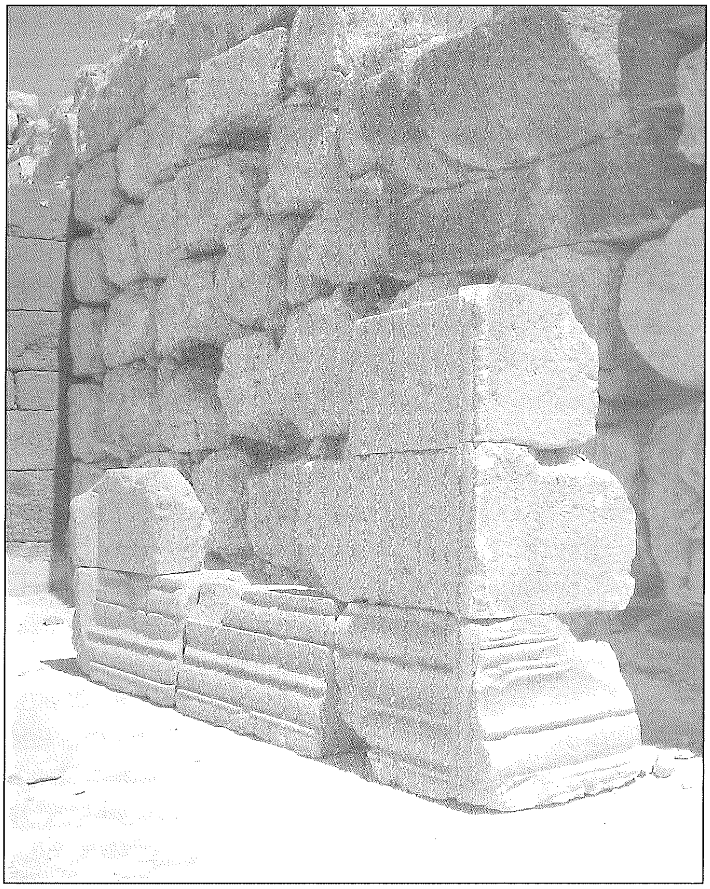
The moldures of these arches, friezes, and pilasters are typically Umayyad. They try to imitate classical moldures, but lack the knowledge of classical orders and proportions, presenting encounter and angle solutions not well solved, and in some cases quite *naïve*. The carving technique, the material used, as well as the decorative patterns, recall the ones used in the nearby Mosque and at Ḥammām as-Sarāḥ indicating that these (and not the ones built with basalt), would be the architectural interventions from the refurbishment carried out in Umayyad period. Particularly remarkable is the fact that all the faces of the blocks are dressed, something that does not occur in the previous phases[16] . The same moldure profiles are found at Khirbat al-Mafjar (flanking the bath porch entrance).

Other remarkable elements that belong to this same phase are:

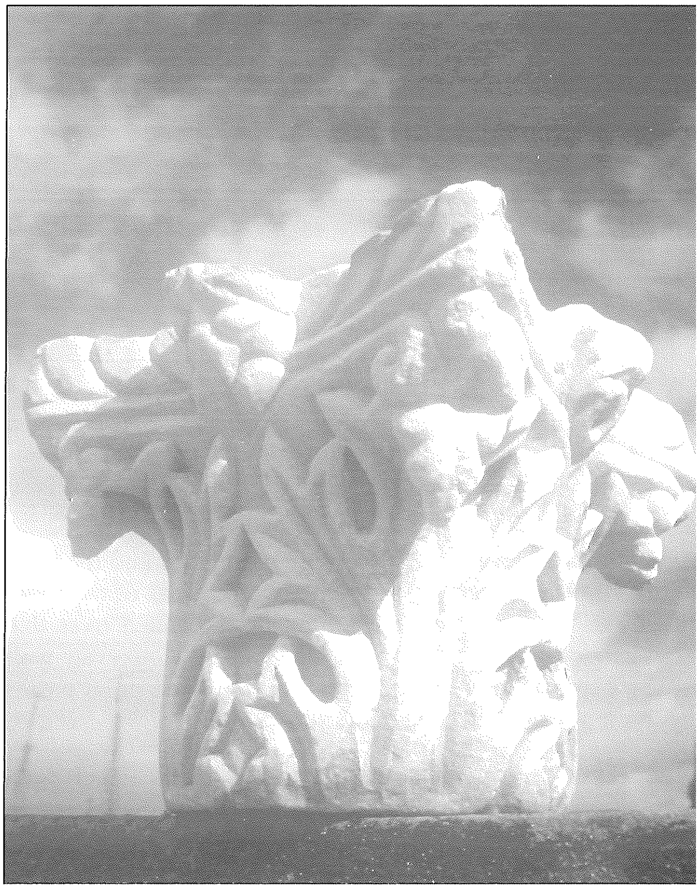
Firstly, the canopy built in the entrance to room

[15] If we assume that this second floor of room 6 (even the lower floor), and the staircase that led to it (built all of them with finely carved limestone), are part of this latest Umayyad refurbishment, then the pavement of flagstones from the main court would also be from this period, because it is built against the staircase structure. The possibility remains that the stairs and the pavement are from an earlier period than the refurbishment in the upper floor (i.e. coeval — or immediately post-dating — the internal partition walls in basalt stone).

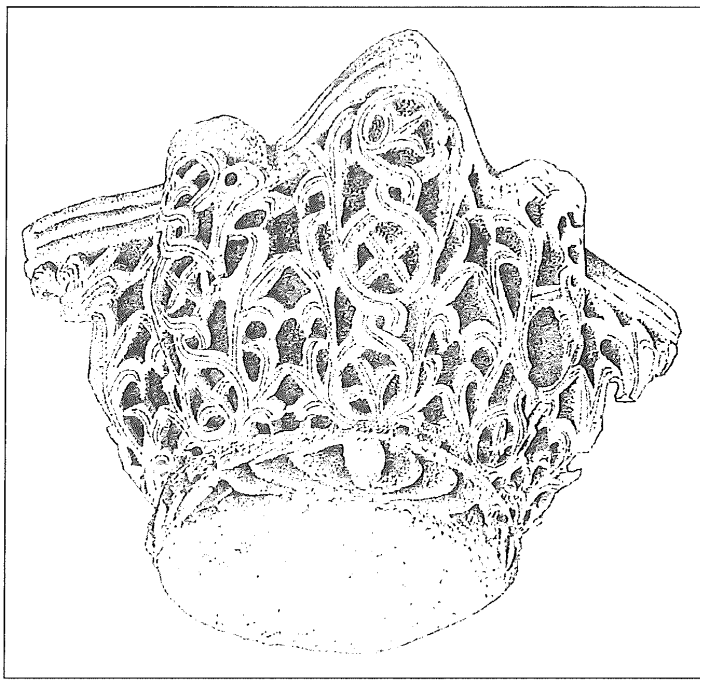
[16] Linked to these interventions, is the mending and reconstruction of the upper section of the northern stretch of the East wall (to the right of the entrance). This hypothesis is based on stratigraphic evidence, as well as on the building technique, the sort of stone and, especially, the kind of mortar used (close to the one used in the mosque).



20. Umayyad architectural elements from the Qaṣr (pilasters, arches and cornices). Compare them with the ones from the bath porch at Khirbat al-Mafjar.



21. Umayyad (?) marble capital from the canopy placed at the entrance from the court to audience room nº 24 .



22. Reused Byzantine basketry capital from the main court of the Qaṣr.

24. It must have been similar to the ones from the Dome of the Rock was built on top of two basalt beams embedded in the wall in two cavities achieved by means of removing two basalt ashlars. These beams rested on a pair of columns topped with fine marble capitals, one of which was found collapsed *in situ,* together with its corresponding beam and the related stucco decoration (typical Umayyad), still attached (FIG. 21). On top of the two beams a short stretch of a barrel vault was built leaning against the wall, cutting the existing basalt-built window/relieving arch (indicating that it belong to a later architectural phase), some traces of the mortar following the profile of the vault are still visible on the wall. Apparently, the *intrados* of the vault and/or the tympanum, were covered with glass mosaic, as a big amount of glass *tesserae* was found in this place. A second marble capital was found in the courtyard (FIG. 22). This is a Byzantine fretwork "basketry" type, reused, probably from the second canopy, that probably existed in front of the entrance to room 4, of which just some traces of mortar from the columns or pillars are left on the flagstones of the court pavement.

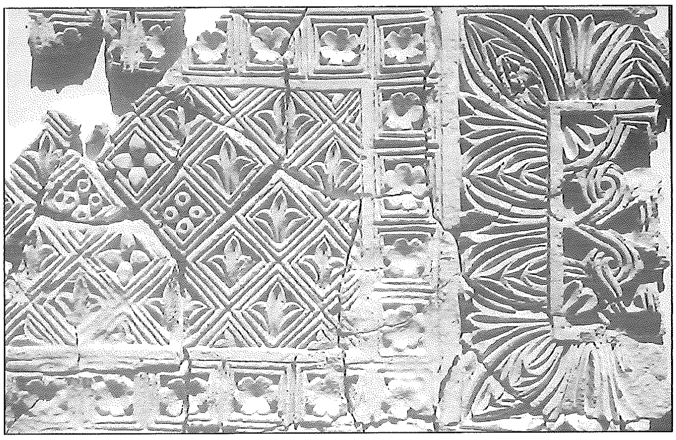
Secondly, the richly decorated kerbstone intended for the mouth of the cistern of the courtyard (it was found broken into pieces inside it). It is carved in a single block of limestone, and has a delicate architectural decoration consisting in a series of niches resting on attached colonnettes. The niches alternate the classical motif of a shell within the semicircular tympanum, with another kind of mixtilinear arch with a Sassanian decoration of chevrons and teardrops (FIG. 23). This has been recently restored, regaining its original shape and beauty.

Finally, the stepped crenellations and the ones with floral decoration (clear antecedents of those from the Cordoba mosque), and the related pierced trapezoidal pierced limestone blocks from the uppermost part of the building.

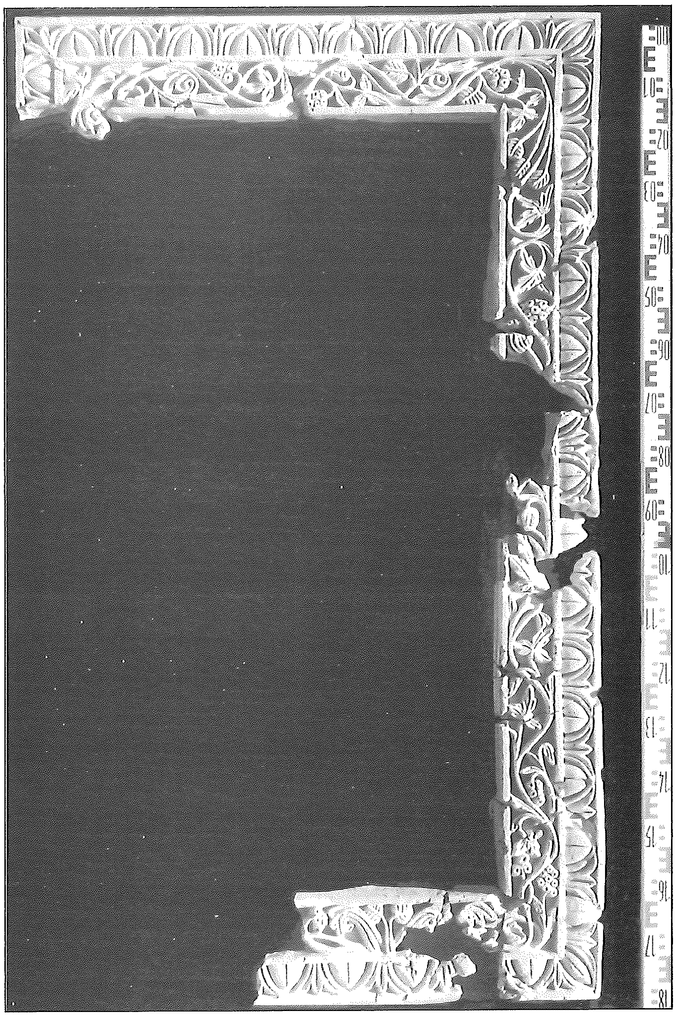
10- The decorative lining refurbishment from Umayyad period. This consisted mainly of mosaic pavements, mural paintings and stucco panels. Unfortunately, a detailed study of these elements goes beyond the limits of this article:

- *Stucco panels and window grills*. The carved stucco is very similar (although a little bit rougher in quality) to the one from Mafjar and Qaṣr al-Ḥayr al-Gharbī. It was applied to the frames of doors and windows facing the main court, and in a continuous frieze running just alongside the walls of that same court built in limestone (FIG. 24). The frieze is divided in panels that are articulated by means of colonnettes with Corinthian capitals. The panels were topped with a cornice of tongues and trefoils, meanwhile a lower cornice of ove and darts and another with beads and pearls run underneath them. It was placed on top of a continuous dado of mural painting imitating marble, 1m from the floor level itself. The windows and doors were provided with spectacular carved stucco frames (FIG. 25).
- *Mural Paintings*. Two successive layers of mural paintings have been detected in the lower section of the court wall, just under

23. Umayyad kerb from the main court cistern (retrieved from the rubble of the cistern itself).



24. Umayyad carved stucco panel from the west wall of the main court.



25. Umayyad carved stucco door frame from the entrance to room n°20 from the main court.

the stucco panel frieze (the second layer leans clearly against the stucco panels, proving its Umayyad origin). The lower one is heavily weathered due to exposure while the Umayyad one still keeps its bright, crisp colours. The earlier layer could correspond to traces of an Umayyad paint layer as well, repainted on a regular basis. This hypothesis would make sense as this painted dado was clearly intended as a sacrificial layer at the base of the wall (to be replaced regularly when damaged), meanwhile the more precious stucco panels were placed at a higher and safer level. Alternatively this weathered layer would belong to an earlier period. Actually its red skirting band at the base of the wall resembles the one found on the "screen wall" placed between the colonnettes and the arch that separates the E end of room 19 from the rest of the room (this earlier wall was concealed and embedded by the blocking wall of Umayyad period, see above). Figurative elements have also been identified in the internal rooms (in room 10, see Bisheh 1993) geometrical patterns, or imitating marble slabs (as in room 6 or the main court itself).

- *Mosaic floors*. At least three different qualities have been identified. For a detailed study see Bisheh (1993).

The distribution pattern of the panels and the other applied decoration helps to interpret the use of the building in this latest phase. The decorative effort was concentrated in the representative rooms, corresponding to the rooms of the 2nd *quadriburgium* extension (confirming that during the Umayyad period the character of audience and reception halls were kept as they were first built), while the rooms from the innermost and oldest structure were devoted to stores and kitchens.

Interpretation: A Ghassanid *Palatium* Preceding the Umayyad One? An Hypothesis Based on Material Evidences

From the analysis of the material evidences gathered, we can elicit that during the first phases of the Qaṣr (Ia, b, c and II), it had a clear military purpose, as part of the defensive system of the *Limes Arabicus*. The third phase (the 2nd *quadriburgium*) involves a refurbishment that includes three distinctive features indicating a clear change of use: Firstly, the lack of defensive character of this new perimeter wall; Secondly, the construction *intramuros* of a series of reception rooms with a clear representative function; Thirdly, the refurbishment of the internal court in the oldest fort including the mentioned portico bearing crosses (as well as the wine press and the floor mosaics).

Finally, the verification of the existence of a later building phase with a clear and distinctive Umayyad character, very different from the previous one in material, building techniques and decorative features (limestone masonry finely carved with elaborated architectural mouldings), that dates them without doubt to the Umayyad period reinforcing the hypothesis that the 3rd phase (the 2nd *quadriburgium*, and the coeval basalt-built structures) dates to the pre-Umayyad period (but after the Anastasius reign and the 551AD earthquake).

It is striking that this second *quadriburgium* has almost no military value but a clear representative one. Something similar could be said about the refurbishment of the innermost court, with the construction of the portico, the wine press basin and the mosaics. If we assume that these interventions are pre-Umayyad, it means that in the "late Byzantine" period (i.e. the latest stage before the Muslim conquest) this place was already transformed into a representative-palatial structure with luxury decoration (marble lining and mosaic floors) displayed in rooms intended for reception and with associated agricultural activities. On the basis of these evidences, several hypothesis could be presented, of which the most convincing would be the refurbishment of the site by the Ghassanid Phylarchs in the sixth century AD. The hypothesis of a monastic settlement[17] does not fit with this representative character and the luxury display of reception halls, its decoration, and the absence of a proper Church inside the premises (or *extramuros*).

[17] Kennedy makes reference to an 'uncorroborated report many years ago, but by a general reliable witness that "sometime in the seventh century al-Ḥallābāt became a monastic establishment and an inscription recording this fact in now built into the main gate of the Arab Legion in az-Zarqā' (quoted in Kennedy 1982: 40, n°5) (Kennedy 2004). Room 19 could eventually be interpreted as a "Chapel", although this does not fit with the ritual purposes and needs of a monastic congregation (beside the luxury display and representative -aulic- character of the building in that period, already mentioned).

The change of use that can be elicited from this change in architectural character can be traced in other buildings in the region also around the sixth century AD, although with different final uses, like Umm al-Jimāl (de Vries 1998) and Umm ar-Raṣāṣ, where the construction of churches within the *castrum* enclosure in the sixth century AD would mark an adaptation of the pre-existing fortress for civilian purposes (Bujard 1995).

We must take into account two important facts regarding the military context of the period: Firstly, that from the forth to the sixth centuries AD security was entrusted to Tribal *Foederati* (successively from the Tandukh, Salih and Ghassan tribes), with an increasing delegation of functions reaching an almost full control of the border by the Ghassanids, in a final arrangement fixed by Justinian in 529-30AD. These troops had a mobile character (specially the Ghassanid army), not relying on garrisons and forts. On the contrary, it is well known how keen the Ghassanid Phylarchs were on having reception and throne halls (being that of Al-Mundhir at Resafa the most famous one). Secondly, that after the peace with Persia, agreed in 532AD, many troops at the region were discharged and, seemingly, imperial maintenance of fortifications stopped (Parker 1987: 82 and De Vries 1998: Ch.14). Both facts would reinforce the hypothesis that a refurbishment of the fort in a "*late Byzantine*" /Ghassanid period (sixth century AD) would not have had a necessarily military character, something that fits with the material evidence found in the monument.

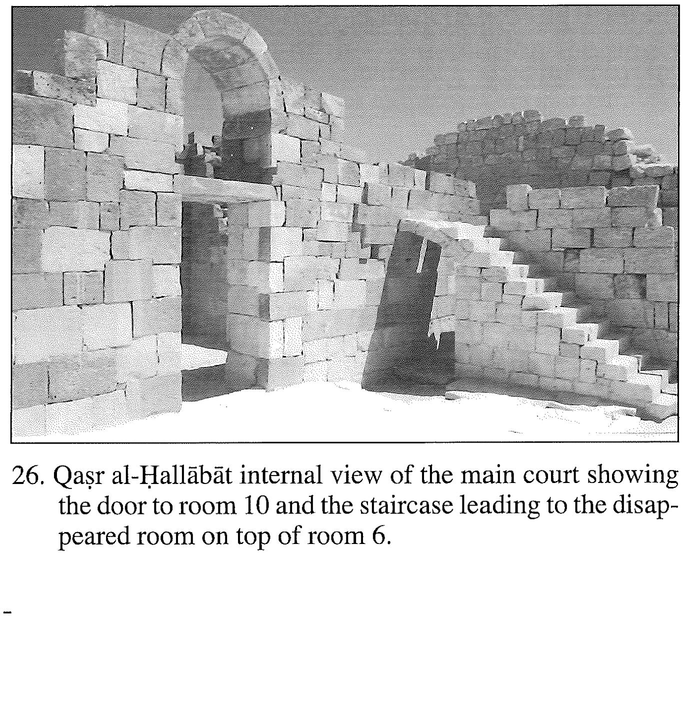
Finally, under the Umayyad rule this representative/civic character would be enhanced with the construction of the mosque and the baths, and the luxurious refurbishment of the reception areas of the Qaṣr, meanwhile a more functional intervention can be noticed in the rest of the existing ones. These changes could actually be linked to the elite's production and the role of gift exchange as reinforcement of social institutions within the clientelar policy of the Umayyad period, especially in the Bādiya area.

The question of the date of the construction/refurbishment of the hydraulic and agricultural settlement remains open. Accordingly, it would be necessary to review also the dating of these structures (including the dwellings), as they could have originated in Roman times, as the *vicus* of the fort (taking advantage of the available water), which afterwards expanded to a small settlement in the Byzantine and Umayyad periods.

Conclusions and Further Research

The reliability of the sequence achieved (based not upon any confusion or *a priori* assumptions regarding textual data) offers a sound foundation to conduct further research and comparative analysis. This will provide relevant information, not only about this structure, but many others in the region. As a consequence of this, the final results will pose clear and irrefutable chronological sequence that, although lacking in absolute dates (supported by inscriptions), are sound in terms of their relative sequence through the Roman to Umayyad periods. This will allow us to make use of these results as a real stratigraphic sequence of building techniques, priceless in dating many other structures of the area.

This sequence of building techniques can allow us to attempt some inferred absolute dating by means of typological confrontation with buildings reliably dated. This is the case of Qaṣr Bshīr with a dating inscription placed still *in situ* as part of a uniform, and apparently singular building activity (309AD). Its building technique (limestone medium size masonry with rusticated corner ashlars) is, as we have seen, very similar to the remains of the first *quadriburgium* at al-Ḥallābāt. Accordingly, this would lead to infer an indirect absolute dating of the first *quadriburgium* at al-Ḥallābāt as coeval to Qaṣr Bshīr. In a similar way, we can now affirm (on the basis of this typologic confrontation of building techniques) that the tower at Qaṣr Burquʻ (dated at present to the third century AD) should be



26. Qaṣr al-Ḥallābāt internal view of the main court showing the door to room 10 and the staircase leading to the disappeared room on top of room 6.

instead dated in the sixth century AD (Justinean or Ghassanid period).

The next step will be to develop this line of research based on actual material evidences, deepening and extending the stratigraphic analysis and the study of building techniques of historic structures to the surrounding area monuments, in an attempt to establish sound, interrelated sequences of building activities, techniques, and phases of use.

Besides, the research now begun on the Umayyad mosque at al-Ḥallābāt promises remarkable results which will be dealt with in another paper in the near future.

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Al-Ḥumayma and the Abbasid Family

Al-Ḥumayma's claim to historical fame came in the first half of the eighth century AD, when the Abbasid family chose to live there as they organized their successful overthrow of the Umayyad caliphate in 749-750. This article has the objective of documenting the history of the Abbasid family's presence in Al-Ḥumayma. It seeks to examine when and why they came to Al-Ḥumayma and present the activities of the three generations of Abbasid family members who lived there (see also al-Hamarnah 2002).

This article does not attempt to examine the larger framework of the Abbasid revolution (see most recently Agha 2003 and Sharon 1990, 1983; Lassner 1986; Nagel 1972, among others). Rather it attempts to document the people and events of the Abbasid revolution only in so far as the site of Al-Ḥumayma was involved. The historical information about Al-Ḥumayma utilized in this article derives from three Arabic texts in particular: the anonymous tenth-century Akhbār ad-Dawlah al-'Abbāsiyyah (1971; see Daniel 1982), al-Balādhurī's ninth-century Ansāb al-Ashrāf (part 3: 1978) and aṭ-Ṭabarī's tenth-century history (1879-1901).

The Abbasid Family Before their Arrival in Al-Ḥumayma

The Abbasids were descendants of al-'Abbās, one of the Prophet Muḥammad's uncles, and his son, 'Abd Allāh bin al-'Abbās. 'Abdullāh spent the last years of his life in aṭ-Ṭā'if, where he died in 687-688 during the civil war between the Umayyads and the rival caliph 'Abdullāh bin az-Zubayr. At the time of his death, 'Abdullāh directed his children to go to Syria and pay allegiance to the Umayyad caliph 'Abd al-Malik. Later Abbasid tradition credits 'Abdullāh bin al-'Abbās with a vision that the first Abbasid caliph would come from the ash-Sharā district of southern Jordan, in which Al-Ḥumayma is located (Akhbār 1971: 131; al-Balādhurī 1978: 53-55).

However, it seems that rather than leaving for Syria as soon as he died, 'Abdullāh's descendants continued to live in aṭ-Ṭā'if, under the patronage of Muḥammad bin al-Ḥanafiyya, the third historically important son of 'Alī bin Abū Ṭālib (by the Ḥanafite woman, rather than Fāṭima, the Prophet Muḥammad's daughter) and head of the 'Alī family after the death of al-Ḥusayn at Karbulā' in 680.

Muḥammad bin al-Ḥanafiyya was a close lifelong friend of 'Abdullāh bin al-'Abbās and they lived together in the same places for much of their lives. Both were on generally good relations with the Umayyads and did not support the rival caliph, 'Abdullāh bin az-Zubayr (aṭ-Ṭabarī II: 693; Dixon 1971: 57-58). Because of 'Abdullāh bin az-Zubayr's presence in Mecca, Muḥammad bin al-Ḥanafiyya and 'Abdullāh bin al-'Abbās found their position there intolerable, so they moved to aṭ-Ṭā'if (al-Balādhurī 1978: 53). Although 'Abdullāh bin al-'Abbās died in 687-688, soon after their move, Muḥammad bin al-Ḥanafiyya continued to live in aṭ-Ṭā'if until his death some time around 700-705.

In 685, Mukhtār led a rebellion in al-Kūfa against the Umayyads to avenge the death of al-Ḥusayn in 680, but he also claimed to be acting on behalf of Muḥammad bin al-Ḥanafiyya, whom he proclaimed to be the divinely guided *Mahdī*. Even though the Umayyads defeated Mukhtār's rebellion in 687, Muḥammad bin al-Ḥanafiyya, who had not taken an active part in the events, survived, and a core of supporters continued to maintain a skeletal revolutionary organization in al-Kūfa on his behalf. Otherwise, both Muḥammad bin al-Ḥanafiyya and 'Abdullāh bin al-'Abbās were for the most part able to avoid taking sides during the fighting between the Umayyads and 'Abdullāh bin az-Zubayr (Dixon 1971: 25-81; Abū Sha'r 1983).

In the view of his supporters, Muḥammad bin al-Ḥanafiyya, as a son of 'Alī bin Abū Ṭālib, possessed charismatic spiritual authority and esoteric knowledge, which he passed on to his son 'Abdullāh Abū Hāshim. During his later years, Muḥammad bin al-Ḥanafiyya was recognized as the head of 'Alī's family, but after his death around 700-705 the next generation of the family split into different branches. After Muḥammad bin al-Ḥanafiyya's death, 'Abdullāh Abū Hāshim was the senior member of the family, but only the small group of survivors of Mukhtār's rebellion transferred their loyalty to him and maintained their dormant revolutionary structure in al-Kūfa on his behalf, while others looked to 'Alī bin al-Ḥusayn (Zayn al-'Ābidīn) and Zayd bin Ḥasan for the leadership of the family (Sharon 1983: 122). 'Abdullāh Abū Hāshim found himself more closely tied with the Abbasid family than with his 'Alid relatives. 'Abdullāh Abū Hāshim quarreled with his 'Alid relatives in Medina, and as a result, when he came on the pilgrimage in 710, the caliph al-Walīd, had him arrested and taken to prison in Damascus (Akhbār 1971: 173-175; Sharon 1983: 121, 128-130).

The members of the Abbasid family did not have the same sort of close relations with al-Ḥasan's and al-Ḥusayn's branches of 'Alī's family that they enjoyed with Muḥammad bin al-Ḥanafiyya's branch. So after Muḥammad bin al-Ḥanafiyya died around 700-705, the Abbasids no longer had a patron, such as he had been, and they decided to move to Syria under the leadership of 'Alī, whom 'Abdullāh bin al-'Abbās seems to have selected to succeed him as the new head of the Abbasid family.

'Alī bin 'Abdullāh and the First Generation at Al-Ḥumayma

'Alī and at least a few other members of the Abbasid family would have arrived in Syria by 705, if not earlier, because the Umayyad caliph 'Abd al-Malik (reigned 685-705) welcomed them and offered to let them settle wherever they wished (Akhbār 1971: 131, 154). The Abbasids first arrived at Udhru', the settlement just east of Petra, where the arbitration between Mu'āwiyah and 'Alī after the Battle of Ṣiffīn had taken place in 657 and where al-Ḥasan bin 'Alī had pledged his allegiance to Mu'āwiyah in 661 (aṭ-Ṭabarī II: 8, 198). In the Abbasid period, Udhru' was the capital of the ash-Sharā district of the *Jund* of Dimashq and was inhabited by clients of the Banī Hāshim (al-Ya'qūbī 1892: 326).

The Abbasids did not reside in Udhruḥ for long. Instead, after a search 'Alī decided to buy al-Ḥumayma, a remote village to the south in the ash-Sharā district. The word the Arabic sources normally use to identify Al-Ḥumayma is *qarya* (village) (al-Balādhurī 1978: 121; Akhbār 1971: 108), where the *manzil* (residence) of the Abbasids was (Yāqūt al-Ḥamawī 1866-1873: II:342-343). The sources do not use the term *ḍay'a* (estate). Al-Ḥumayma is located in a desert region, and the land values of such bleak desert property would never have been high, even when the site was occupied and had functioning water collection facilities. The historical sources do not state who the previous owner of the site was — whether the local residents and their tribal shaykhs or perhaps an aristocratic landowner — nor what the implications of the Abbasid's purchase were for the residents there at the time.

In the early Islamic period, Al-Ḥumayma is described as located near the pilgrimage route from Syria to Mecca, so many travelers were constantly passing through (Akhbār 1971: 142). But Al-Ḥumayma was not an historically important site at the time. It is unattested after the early sixth century until the members of the Abbasid family came to live there; it is not mentioned in the accounts of the Islamic conquest of the 630s.

When they first arrived at Al-Ḥumayma, 'Alī and the other Abbasids seem to not have yet developed any pretensions to rule. They were on generally friendly terms with the Umayyads. Their choice of Al-Ḥumayma would have been made without any thought as to how well it would serve their descendants once they began plotting their revolution.

Once he purchased Al-Ḥumayma, 'Alī bin 'Abdullāh built a *qaṣr* with a garden (Akhbār 1971: 154; al-Bakrī 1945-1951: 130; Sharon 1983: 121). 'Alī (or Muḥammad, his son [aṭ-Ṭabarī II: 1592]) is said to have had 500 olive trees and to have performed two *rak'ahs* at each one every day. He prostrated himself so much that he eventually developed calluses on his forehead and so acquired the nickname "the possessor of the calluses" (al-Balādhurī 1978: 75; Akhbār 1971: 144-145). Any such trees would have needed constant care to survive in the desert environment of Al-Ḥumayma.

But 'Alī at first did not live in Al-Ḥumayma permanently. Instead he lived at the Umayyad court in Damascus as an intimate of the caliph 'Abd al-

Malik (Akhbār 1971: 146; al-Balādhurī 1978: 74; Lassner 1986: 50-52; Sharon 1983: 123). Whether other members of the family stayed in Al-Ḥumayma and managed the property or also lived in Damascus is not specifically attested. But 'Alī lost the favor of 'Abd al-Malik, and after 'Abd al-Malik died in 705 his son al-Walīd, the new caliph, banished him from his presence (Akhbār 1971: 138-139; al-Balādhurī 1978: 76; Lassner 1986: 41-43).

Whether at that point 'Alī came to live permanently in Al-Ḥumayma is complicated by the incident of the murder of Salīṭ. Salīṭ claimed to be a son of 'Abdullāh bin 'Abbās from a slave girl, and so claimed the right of inheritance as a member of 'Abdullāh's family. 'Alī rejected Salīṭ's pretensions, but the case was brought to the attention of al-Walīd. Al-Walīd was prepared to rule in favor of Salīṭ, when he disappeared. Given the obvious motive that 'Alī had for foul play, an investigation was launched and Salīṭ's murdered body was found. Where the murder took place and whether 'Alī was personally involved are variously reported in the sources (al-Balādhurī 1978: 77-79; Akhbār 1971: 149-150; Yāqūt: II:634; Lassner 1986 44-46; Sharon 1983: 123).

According to al-Balādhurī (1978: 77-79), the incident occurred when 'Alī was in Damascus. Even though 'Alī denied any involvement, al-Walīd had him beaten and then banished first to Dahlak, an island in the Red Sea and a standard place of banishment, and then to al-Ḥijr in the Ḥijāz. Only later, after the death of al-Walīd in 715 did the new caliph Sulaymān bin 'Abd al-Malik bring 'Alī back to Damascus and allow him to settle in Al-Ḥumayma.

Al-Walīd's banishment of 'Alī makes it possible that the Abbasids did not settle in Al-Ḥumayma during the time of 'Abd al-Malik, but only in connection with 'Alī's banishment. The family could have settled in Al-Ḥumayma in order to be closer to him in al-Ḥijr, but such an idea can remain only speculation.

In any event, 'Alī returned to favor after al-Walīd died and once again he is attested in Damascus at the court of Sulaymān bin 'Abd al-Malik. In one recorded incident he told of his need for 30,000 dirhams to pay off a debt (Akhbār 1971: 139-140). That shows that the Abbasids had no great sources of income; the agricultural potential of Al-Ḥumayma was slight. Thus while the Abbasids were aristocrats, they were not particularly wealthy ones. The Abbasids were on good terms with the Umayyad caliphs Sulaymān (715-717, 'Umar bin 'Abd al-'Azīz (717-720), and Hishām (724-743), but their relations with Yazπd II (720-724) are not documented. Other members of the family are attested at Damascus on occasion and they often took part in the summer military raids against the Byzantines (Akhbār 1971: 141, 173-174; Nagel 1972: 128).

Other references, however, place 'Alī at Al-Ḥumayma. He was noted for his hospitality, which he extended to every traveler who passed by Al-Ḥumayma on his way between Syria and the Ḥijāz, including alms if requested (al-Balādhurī 1978: 72-73, 75; Akhbār 1971: 145; Sharon 1983: 160; Lassner 1986: 47, 48). One incident presumably took place after 'Alī's return from his banishment when a member of the Banū Makhzūm tribe met 'Alī, with his sons and clients, at the mosque in Al-Ḥumayma. 'Alī rejoiced at having a guest and asked for information about the Umayyad court (Akhbār 1971: 150-151). That could suggest that guests were few and far between, and 'Alī was no longer up to date about affairs in Damascus.

'Alī fathered some twenty-odd children, most of whom died while he was still alive (Akhbār 1971: 147-148; al-Balādhurī 1978: 72; Khuraysat 1987: 59). Some at least were born before the Abbasid family moved to Al-Ḥumayma. A number of 'Alī's sons in the Umayyad period are attested at various places throughout the caliphate, indicating that the family members did not spend all their time in Al-Ḥumayma. For some of the other sons, little is known beyond their names (al-Balādhurī 1978: 71-72, 80-114).

'Alī passed on the leadership of the family to Sulaymān, his fourth son, not Muḥammad, his eldest son, to whom he passed on his esoteric knowledge (Nagel 1972: 42). 'Alī died in Al-Ḥumayma around 735-736 at the age of 78 or 80 (al-Balādhurī 1978: 79-80; aṭ-Ṭabarī II:1592). By the time of 'Alī's death, Muḥammad had already begun to organize the revolution.

Muḥammad bin 'Alī and the Second Generation at Al-Ḥumayma

Muḥammad bin 'Alī was the instigator of the Abbasid revolution, which got off the ground when 'Abdullāh Abū Hāshim, the son of Muḥammad bin al-Ḥanafiyya, at the time of his death about 716-717, transferred the charismatic spiritual authority that he had received from his father to Muḥammad bin 'Alī.

As noted earlier, the Umayyad caliph al-Walīd brought 'Abdullāh Abū Hāshim to Damascus in 710 and imprisoned him there, but 'Alī bin al-Ḥusayn bin 'Alī interceded on Abū Hāshim's behalf, and he was soon released. Abū Hāshim became a member of the Umayyad court for a time, but eventually al-Walīd banished him from the court (Akhbār 1971: 173-177). He continued to reside in Damascus, and from time to time he met Muḥammad bin 'Alī, who along with his brothers and sons were not affected by the banishment of 'Alī to Dahlak and al-Ḥijr and took part in the summer military raids against the Byzantines and defended the coastal cities. Over the years Abū Hāshim and Muḥammad formed the same sort of close personal relationship that 'Abdullāh bin al-'Abbās and Muḥammad bin al-Ḥanafiyya had developed (Akhbār 1971: 173). Abū Hāshim, the older of the two, had no surviving male children and came to regard Muḥammad as his heir and successor to the support of the small group of survivors of Mukhtār's rebellion in al-Kūfa.

'Alī seems to have disapproved of 'Abdullāh Abū Hāshim, but none the less around the end of al-Walīd's reign or during the reign of Sulaymān, Abū Hāshim decided to move to Al-Ḥumayma, and arrange for the transfer of the loyalty of his followers to Muḥammad (Akhbār 1971: 183-184). Abū Hāshim, who seems to have been over 60 years old, became ill in Al-Ḥumayma and died, perhaps in 716-717. There are a number of different versions of Abū Hāshim's death and testament to Muḥammad (Moscati 1952; Nagel 1972: 14-18, 45-63; Sharon 1983: 130-140).

Most probably, 'Abdullāh Abū Hāshim had been resident at Al-Ḥumayma for some time and died a natural death after a lingering illness, but according to an account that is too dramatic to be believable, Abū Hāshim was murdered by Umayyad agents (Sulaymān bin 'Abd al-Malik was caliph at the time). They poisoned him with some adulterated milk that he drank while on his way to Al-Ḥumayma with Muḥammad from a trip to the court in Damascus (perhaps implying that Abū Hāshim had already been living in Al-Ḥumayma). The poison was slow-acting, so he managed to stay alive just long enough to be brought to Al-Ḥumayma and transfer his charismatic authority to Muḥammad (al-Balādhurī 1978: 80; Akhbār 1971: 183-184). Accompanying Abū Hāshim and Muḥammad from Damascus on that fatal journey to Al-Ḥumayma were a number of Abū Hāshim's Kufan supporters (Akhbār 1971: 182-183, al-Balādhurī 1978: 114).

But 'Abdullāh Abū Hāshim faced difficulties in getting his followers to accept the transfer of his authority to someone like the Abbasid Muḥammad bin 'Alī who was not a direct descendent of the Prophet Muḥammad through Fāṭimah and 'Alī bin Abū Ṭālib, and it was only the influence of Salamah bin Bujayr, the son of one of Mukhtār's main supporters, that convinced them to acknowledge the transfer to Muḥammad and pledge their support to him (Akhbār 1971: 173, 188-191; Sharon 1983 134-135).

The elaborate Abbasid traditions about Abū Hāshim's transfer of his esoteric knowledge to Muḥammad record a legend of a yellow scroll of prophesies about the Abbasid revolution in the possession of Muḥammad bin al-Ḥanafiyya, which passed to Abū Hāshim and from him to Muḥammad, and finally from Muḥammad to his son, Ibrāhīm the *Imām*. As the story goes, when the Umayyad caliph Marwān arrested Ibrāhīm (see below), the other Abbasids buried the parchment in a chest under olive trees in the ash-Sharā region. Those olive trees were the only ones in the ash-Sharā. After the success of the revolution, the Abbasids dug up all of the olive trees in the ash-Sharā, even digging until they hit water, but they were unable to find the chest (Akhbār 1971: 184-185; Sharon 1983: 139-140, 1990: 80-82).

With the transfer of authority from Abū Hāshim to Muḥammad, the Abbasids inherited his skeletal revolutionary organization in al-Kūfa and Khurāsān. The Abbasids were to stress their rights to the caliphate on the basis of this transfer, and only once their revolution succeeded did they change and emphasize their descent from al-'Abbās, the uncle of the Prophet Muḥammad.

After Abū Hāshim's transfer was completed, Salamah bin Bujayr informed Muḥammad about the leaders of the organization in al-Kūfa, who were not present: 14 names are listed (Akhbār 1971: 191-192; Sharon 1983: 135-137). In 718-719 Muḥammad sent some agents to al-Kūfa, while Ibrāhīm bin Salamah stayed on in Al-Ḥumayma to act as a link between Muḥammad and the revolutionaries in al-Kūfa and to identify the other leaders whom he knew personally, but whom Muḥammad had not met (aṭ-Ṭabarī II:1358; Akhbār 1971: 192).

Muḥammad kept the center in al-Kūfa small and underground, and disassociated from activity on behalf of any descendant of 'Alī bin Abū Ṭālib. Strict secrecy was maintained, and only a few were aware of the identity of their leader. They only knew that they were supporting "the chosen one from the family of the Prophet" without knowing precisely who that person was (Akhbār 1971: 194). Many must have assumed that the "chosen one from the family of the Prophet" was a descendant of 'Alī bin Abū Ṭālib and Fāṭimah, among whom there were a number of plausible candidates, such as 'Abdullāh bin al-Ḥasan and his two sons Muḥammad the Pure Soul and Ibrāhīm, both of whom were to revolt against the Abbasids in 762, and Ja'far aṣ-Ṣādiq.

Contact between the Kufans and Al-Ḥumayma was kept to a minimum. Muḥammad went to Mecca and Medina for one or two months each year at the time of the annual pilgrimage, and those few revolutionaries who knew the identity of their *Imām* would meet him there, not in Al-Ḥumayma (al-Balādhurī 1978: 86, 119). His revolutionary supporters would report on events in Khurāsān and hand over the large sums of money they collected on his behalf (aṭ-Ṭabarī II:1726-1727, 1769, 1869, 1916, 1953, 1962).

Muḥammad also inherited an embryonic revolutionary movement in Khurāsān. The organization there on behalf of Abū Hāshim was begun by Bukayr bin Māhān (al-Hamarneh 2001), who in 716-717 went on the pilgrimage to Mecca and returned to al-Kūfa. After he had spent a year or so there, the death of one of the revolutionary leaders made it necessary for the Kufans to get in contact with Muḥammad in Al-Ḥumayma, and Bukayr was chosen for the assignment. He first traveled to Damascus and passed himself off as an itinerant spice dealer. After spending some time selling spices in the villages south of Damascus, he moved on to Al-Ḥumayma, where Ibrāhīm bin Salamah recognized him and introduced him to Muḥammad. Muḥammad recognized Bukayr from the list he had, as well as by the special way in which Bukayr greeted him. Bukayr told Muḥammad that he was not completely satisfied with the arrangements to maintain secrecy in Al-Ḥumayma. Bukayr recommended that Muḥammad move to a separate residence (*manzil*) of his own where he could communicate with his revolutionary followers without the knowledge of even other members of the family. Muḥammad acted on this suggestion and took up residence in a settlement called Kudād some two miles away (Akhbār 1971: 195-197).

The place name Kudād is unknown today, and no ruins can be identified with it in the vicinity of Al-Ḥumayma. Musil makes the improbable identification of Kudād, under the variant spellings of Kdhūr or Krār, with the modern village of Muraygha (his al-Mrejjera), some 28km to the northeast up on the plateau, where Glueck reports a large but exclusively Nabataean period site (Musil 1926: 37, 61; Glueck 1934-1935: 64). Only one other resident of al-Kudād is attested (al-Balādhurī 1978: 83): Abū Ma'n al-Kudādī, who told a story about a group of insolent Umayyads who passed through Al-Ḥumayma once and insulted Muḥammad. Rather than take offense, Muḥammad chose to be forebearing.

Muḥammad later traveled to Damascus to take part in a summer raid against the Byzantines with Bukayr as a member of his sizable entourage. Muḥammad was accompanied by some of his brothers, three clients and Ibrāhīm bin Salamah. Bukayr and Muḥammad also established an intermediary link in Damascus between al-Kūfa and Al-Ḥumayma (Akhbār 1971: 197). Muḥammad and his son Mūsā took part in a military campaign against the Byzantines, in the course of which Mūsā died (al-Balādhurī 1978: 84).

In 718-719 Muḥammad sent some agents to Khurāsān to recruit supporters (aṭ-Ṭabarī II:1358; Nagel 1972: 126-129). Muḥammad established further contacts with Khurāsān, by sending Abū 'Ikrimah Ziyād bin Dirham there around 722-723 (Akhbār 1971: 203-204; Sharon 1983: 156-157). Muḥammad later sent other agents, including Bukayr bin Māhān to Khurāsān and to al-Kūfa (al-Balādhurī 1978: 116-117). Whether these individuals, and others like them, were at Al-Ḥumayma, al-Kūfa, or elsewhere when they were sent on their missions is normally not explicitly stated.

The deviant propagandistic work of Khidāsh, one of Muḥammad's agents, in Khurāsān provoked a crisis for the Abbasids, and after Khidāsh was executed in 736 the revolutionaries in Khurāsān selected Sulaymān bin Kathīr as their head to enter into contact with Muḥammad during the pilgrimage to Mecca. He and Qaḥtaba had not previously met their Imām. They went to Medina and were told that the Imām was in Syria and then went there and finally met Muḥammad. They asked him to send someone with them to Khurāsān, and Muḥammad sent Ziyād bin Dirham (al-Balādhurī 1978: 116; Sharon 1983: 173-174). Muḥammad also sent Bukayr to Khurāsān in 738 as well as one of his clients (Sharon 1983: 158). However, satisfactory arrangements with the revolutionaries in Khurāsān were not fully worked out until after Muḥammad died in August 743 and his son Ibrāhīm succeeded him.

Some members of the Umayyad government also supported Muḥammad in secret. Khālid bin 'Abdullāh al-Qaṣrī, Hishām's governor of Iraq, gave financial support to Muḥammad and once sent 3000 dinars (al-Balādhurī 1978: 81-82; Nagel 1972: 126-129). On one of Muḥammad's trips to the caliph Hishām, Hishām told him that the governor of the Al-Ḥumayma district had informed him that over the years the previous governors had illegally given the Abbasids 100,000 dinars worth of tax money. Hishām demanded the money back and imprisoned Muḥammad until 'Īsā bin Ibrāhīm Abū Mūsā, the head of the Kufan revolutionaries, and Abū Muslim, his apprentice, were able to raise the money. Muḥammad then returned to Al-Ḥumayma (al-Balādhurī 1978: 84-85). Muḥammad and his brothers came a second time to Hishām when he was in ar-Ruṣāfa. Hishām refused to give them some money with which to pay debts, so they returned to Al-Ḥumayma (al-Balādhurī 1978: 86-87). Such incidents demonstrate again that the Abbasids were not particularly wealthy.

Muḥammad's first wife was Rayṭah bint 'Ubaydallāh, a noble woman from the Banū al-Ḥārith tribe, and former wife of 'Abdullāh the son of the caliph 'Abd al-Malik. He married her when 'Umar bin 'Abd al-'Azīz was the caliph (717-720), after Abū Hāshim's transfer of his authority. Muḥammad left Al-Ḥumayma for one year to spend the summer elsewhere and he married her in Qinasrīn, in northern Syria (Akhbār 1971: 201, 234; al-Balādhurī 1978: 82).

Muḥammad had a number of children (al-Balādhurī 1978: 114-290), who presumably were born and raised in Al-Ḥumayma. They included Ibrāhīm the Imām, born in 701-702, 'Abdullāh Abū al-'Abbās as-saffāḥ, who became the first Abbasid caliph — a group of people from Khurāsān came to Muḥammad shortly after the birth of Abū al-'Abbās in Al-Ḥumayma around the early 720s (al-Balādhurī 1978: 81-82; aṭ-Ṭabarī III:88) — and 'Abdullāh Abū Ja'far al-Manṣūr, who became the second Abbasid caliph, born around 709-713 — Abū Ja'far told of a vision about the Ka'bah in Mecca he had while in Al-Ḥumayma (al-Balādhurī 1978: 198). Muḥammad's children are often attested in places other than Al-Ḥumayma, again indicating that the members of the Abbasid family spent only a portion of their time in Al-Ḥumayma.

One story told of Muḥammad parallels the story about 'Alī mentioned earlier. Muḥammad had 500 trees in Al-Ḥumayma and every day he would pray two *rak'ah(s)* below each one. Muḥammad died around 742-743 around the age of 70, shortly before the death of the Umayyad caliph al-Walīd (al-Balādhurī 1978: 80, 97). Muḥammad appointed his son Ibrāhīm as the next Imām.

Ibrāhīm and the Third Generation at Al-Ḥumayma

Between the death of Khidāsh and the death of Muḥammad, Zayd bin 'Alī bin al-Ḥusayn revolted in 740 (Nagel 1972: 132-135). Supporters of the Abbasids avoided any involvement in Zayd's revolt, which the Umayyads quickly crushed. They executed him, and three years later in 743 they murdered his son Yaḥyā, whose mother was a daughter of 'Abdullāh Abū Hāshim. 'Abdullāh bin Mu'āwiyah's revolt also collapsed in 746-747 (Sharon 1983: 127-142; Nagel 1972; 147-150). Several members of the Abbasid family joined 'Abdullāh: 'Abdullāh bin 'Alī, 'Īsā bin 'Alī, and Abū Ja'far al-Manṣūr bin Muḥammad (aṭ-Ṭabarī II:1977).

Muḥammad had earlier sent Abū Ja'far al-Manṣūr to al-Baṣrā to visit the religious scholars there and to propagandize (al-Balādhurī 1978: 114). He served 'Abdullāh bin Mu'āwiyah for a time as the governor of Idhaj in Khuzistān. On his way from Idhaj to al-Baṣrā Abū Ja'far al-Manṣūr was captured by the Umayyads, but after his escape from prison he returned to Al-Ḥumayma (al-Balādhurī 1978: 183). The failure of the revolts of Zayd bin 'Alī and 'Abdullāh bin Mu'āwiyah eliminated potential rivals of the Abbasids and created a vacuum in 'Alī's family, and Ibrāhīm, the new Abbasid Imām, had new opportunities to channel the frustrated hopes of supporters of 'Alī's family to his own advantage.

When Muḥammad died, Bukayr bin Māhān spent several days in Al-Ḥumayma with Ibrāhīm and then went to al-Kūfa and the east (Akhbār 1971: 240). When the leaders were in al-Kūfa they learned of the death of Hishām, the Umayyad caliph, in 743.

Ibrāhīm continued Muḥammad's policy of going on the pilgrimage to Mecca each year and meeting his supporters there, rather than in Al-Ḥumayma.

The pilgrimages of 743 and 744 were particularly important (Akhbār 1971: 241, 255-256; Lassner 1986: 75-97; Sharon 1983: 210-211). The meeting between Ibrāhīm and some agents in 743 was provoked by the death of Muḥammad shortly before, as well as the execution of Yaḥyā bin Zayd in 743. After the pilgrimage of 743 Bukayr bin Māhān and Abū Salama returned with Ibrāhīm to Al-Ḥumayma, and early in 743-744 they returned to al-Kūfa, where Bukayr met the young Abū Muslim, who soon became a major figure in the revolution. Abū Muslim was in the employ of Abū Mūsā, a saddlemaker with a prosperous trade that allowed the two of them to travel extensively without attracting attention.

In 744 Ibrāhīm sent Bukayr bin Māhān to Khurāsān, and the revolutionaries sent large sums of money and gifts to Ibrāhīm via him. Before Bukayr bin Māhān died in 744-745 he wrote to Ibrāhīm that he had selected Abū Salamah Ḥafā bin Sulaymān to be his successor in al-Kūfa. Ibrāhīm wrote to Abū Salamah confirming him in his new position and to the people in Khurāsān informing them of his appointment. Abū Salamah then went to Khurāsān (aṭ-Ṭabarī II:1869; al-Balādhurī 1978: 118-119). The revolutionaries there gave Abū Salamah the contributions that they had collected and a fifth of their wealth to pass on to Ibrāhīm (aṭ-Ṭabarī II:1917; Sharon 1983: 182).

In 745, three Abbasid agents went on the pilgrimage to Mecca, and there they met Ibrāhīm and presented Abū Muslim to him. They also brought 20,000 dinars and 200,000 dirhams, along with much musk, garments, and other items (aṭ-Ṭabarī II:1916; al-Balādhurī 1978: 118-119; Akhbār 1971: 241). Little of that money, or other donations, need have found its way to Al-Ḥumayma, even temporarily.

Ibrāhīm soon realized the need to establish a direct link with Khurāsān and so he sent his client Abū Muslim there in 745-746, while Abū Salamah remained the head in al-Kūfa. The Khurāsānī revolutionaries did not accept Abū Muslim initially. The people who did not accept him went to Mecca and met Ibrāhīm, who instructed them to obey Abū Muslim (aṭ-Ṭabarī II:1937, 1960).

In 746-747, after Abū Salama had written to Ibrāhīm to send someone for Khurāsān, and Ibrāhīm had sent Abū Muslim, Ibrāhīm wrote to Abū Muslim to come and report to him. Abū Muslim set out on the journey in the company of some seventy Abbasid agents on the pretense of performing the pilgrimage. Abū Muslim had only traveled part way when a letter from Ibrāhīm arrived, telling him to return to Khurāsān and openly proclaim the revolt, and to send on Qaḥtabah bin Shabīb in his place with the money and other things that they were bringing to give to Ibrāhīm. Abū Muslim had collected 360,000 dirhams and used part of it to buy silks, and melted the rest down into small ingots of gold and silver that they hid in the linings of their cloaks; the group loaded up 21 pack mules with their goods. Qaḥtabah returned to Khurāsān in 747-748 (aṭ-Ṭabarī II:1949-1953, 1962-1964, 2000).

A messenger from Abū Muslim to Ibrāhīm, who was on his way back to Abū Muslim with Ibrāhīm's reply, fell into the hands of the Umayyad caliph Marwān. Marwān wrote to al-Walīd bin Mu'āwiyah bin 'Abd al-Malik, the governor of Damascus, ordering him to write to the administrator of the al-Balqå' district to go to the *biyår* (cisterns rather than wells, of which there are none at the site) at Al-Ḥumayma (aṭ-Ṭabarī), or Kudād and Al-Ḥumayma (al-Balādhurī) and seize Ibrāhīm, bind him, and send him with a mounted escort to Marwān. The administrator caught Ibrāhīm and sent him to al-Walīd, who brought him to Marwān, who imprisoned him in Ḥarrān in 747 (Akhbār 1971: 392, 399-400; aṭ-Ṭabarī II:1974-1975, III:25-27; al-Balādhurī 1978: 121; Blankinship 1988). The departure of Ibrāhīm caused anxiety among the Abbasids living in Al-Ḥumayma, because the revolutionary apparatus was linked solely to him.

According to 'Uthmān bin 'Urwah bin Muḥammad bin Muḥammad bin 'Ammār bin Yāsir, a supporter of the Abbasids who was with Abū Ja'far al-Manṣūr and his two sons at Al-Ḥumayma when Ibrāhīm was arrested, the Umayyad agents seized the door of the mosque at the time of the dawn prayer. They arrested Ibrāhīm after he was identified to them, but when they brought him to Marwān, he realized that Ibrāhīm was not the person he wanted to have arrested. Marwān sent his agents back to Al-Ḥumayma to look for Abū al-'Abbās, but the Abbasids had already left for 'Iraq (aṭ-Ṭabarī III:25). The reference to the mosque implies a substantial structure. The Abbasids held their meetings and conversations and ate most of their meals in this mosque (Akhbār 1971: 195).

According to another version, a single Umayyad messenger came to Al-Ḥumayma and mistakenly arrested Ibrāhīm, rather than Abū al-'Abbās. A number of the leading Abbasids, including Ibrāhīm's brother Abū al-'Abbās, 'Abdullāh bin 'Alī, 'Īsā bin 'Alī, and 'Īsā bin Mūsā, and their clients set out with Ibrāhīm, who had a concubine with him. The Abbasids made plans to kill the Umayyad when they reached the fork in the road leading either to northern 'Iraq/Syria (al-Jazīrah) or southern 'Iraq and then to go to 'Iraq, but Ibrāhīm dissuaded them from it (Akhbār 1971: 399-401; al-Balādhurī 1978: 121; aṭ-Ṭabarī III:26). Such a version hardly describes the journey of a prisoner under arrest and supports the idea that Ibrāhīm left Al-Ḥumayma voluntarily. Ibrāhīm's companions reached Damascus with him, but they then returned to Al-Ḥumayma, while Ibrāhīm continued on to Ḥarrān (Akhbār 1971: 400-401). Just what fork in the road to either Syria or southern 'Iraq is meant is not apparent; there is no obvious candidate north of Al-Ḥumayma on the way to Damascus. One possibility could be Dawmat al-Jandal, south of Al-Ḥumayma in the northern Arabian peninsula, in which case the incident would be a garbled version of the Abbasids' later move from Al-Ḥumayma to al-Kūfa (see below).

Ibrāhīm died in prison in Ḥarrān in August-September 749, perhaps from the plague, if not deliberately murdered (aṭ-Ṭabarī III:42-44; al-Balādhurī 1978: 121-122). He was around 48 years old. Ibrāhīm was noted for his generosity. He married Zaynab bint Sulaymān, and their children were presumably born and raised in Al-Ḥumayma (al-Balādhurī 1978: 124-125, 127-128).

Abū al-'Abbas and the Move to al-Kūfa

Following Ibrāhīm's arrest and death, Abū al-'Abbās was chosen as the new Imām (Sharon 1990: 234-242). Abū Ja'far was not chosen to succeed Ibrāhīm, even though he was older than Abū al-'Abbās, who was in his early 30s.

According to other versions of Ibrāhīm's arrest, he advised his family to go to al-Kūfa with his brother Abū al-'Abbās. Sābiq, one of Ibrāhīm's clients who had stayed with him in Ḥarrān until his death, returned to Al-Ḥumayma with Ibrāhīm's instructions. Al-Kūfa had just fallen into the hands of the advancing Abbasid army in August 749, and no member of the Abbasid family was living there. A dozen people, including several of his prominent uncles, were living in Al-Ḥumayma at the time and left for al-Kūfa. They and their families and clients arrived in al-Kūfa in mid-September to mid-October 749 (aṭ-Ṭabarī III:27; Akhbār 409-410).

According to another version, the group of Abbasids traveled to al-Kūfa via Dawmat al-Jandal, where they met Dā'ūd bin 'Alī, an uncle of Abū al-'Abbās, and his son Mūsā, who had been on their own way to Al-Ḥumayma. In this version, 'Īsā bin Mūsā said that fourteen men left their homes and their families to stake their claim to rule, but only five individuals are listed (aṭ-Ṭabarī III:33-34). According to further report Abū al-'Abbās came to al-Kūfa first, and his family came later (al-Balādhurī 1978: 128,178).

Some of those relatives, in particular 'Abdullāh bin 'Alī and 'Īsā bin Mūsā, were seemingly better leaders than Abū al-'Abbās and Abū Ja'far. But because they were not children of Muḥammad bin 'Alī, as was Abū al-'Abbās, they could not lay claim to Abū Hāshim's transferred charismatic authority and esoteric knowledge.

After their arrival in al-Kūfa, the Abbasids stayed in hiding for forty days before Abū al-'Abbās was publicly proclaimed caliph. Those attested there include some additional family members to those recorded as having come from Al-Ḥumayma (al-Balādhurī 1978: 143, 178).

Abū al-'Abbās married Umm Salma in Filasṭīn (Palestine) and some of their children would have been born and raised in Al-Ḥumayma (al-Balādhurī 1978: 161, 179-180). Abū Ja'far married Umm Mūsā bint Manṣūr (al-Balādhurī 1978: 275). His son and future caliph al-Mahdī might have been born in Al-Ḥumayma, if not in Idhaj in Iran, when Abū Ja'far was there at the time of 'Abdullāh bin Mu'āwiyah around 743-745 (aṭ-Ṭabarī III:527).

The Archaeological Excavations at Al-Ḥumayma

The historical sources provide information about the people who lived in Al-Ḥumayma, but they say little about the site itself. The excavations directed by John Oleson since the 1980s (see the periodic preliminary reports in *ADAJ*) have revealed significant changes to the site in the early eighth century, characterized by much new building construction. This is clearest in the excavation areas B100 and F102, where clusters of houses were built above the Byzantine churches there, as well as in F103, where the Abbasid family *qaṣr* was located. While the F103 *qaṣr* can be linked with the Abbasids, whether the other building activity was connected in some way with the arrival of the Abbasids or was independent of their presence remains a question for speculation. The move to Al-Ḥumayma by the Abbasids would have meant a jump in the size of the site's population and provided enhanced economic opportunities for earlier inhabitants and might have attracted others to move to the settlement.

It is the F103 structure, excavated by Rebecca Foote, which is of most interest, because of its identification as the Abbasid family residence. A few remarks are appropriate here. The F103 building is located at the southeast edge of the site. It is rectangular (61 x 50m) with rooms centered around a courtyard. It is large enough to accommodate the members of the extended Abbasid family — the sons of 'Abdullāh bin al-'Abbās, their wives and children — along with their servants and attendants. One passage in the Akhbār *ad-Dawla* al-'Abbāsiyyah (1971: 195-196) describes such a building. When Bukayr bin Māhān first visited Muḥammad bin 'Alī he entered a wide-open space or courtyard (*raḥbah*). In the open space was located the residence (*manzil*) of Muḥammad bin 'Alī and around the open space were placed the residences (*manāzil*) of his brothers, his son, and their clients. In the open space there was also a mosque where the Abbasids had their meetings, discussions and most of their meals, and a residence (*bayt*) for guests.

A small roughly square mosque is located just to the southeast of the *qaṣr* and can be dated to the Umayyad period. It is one of the smallest known mosques in Bilād ash-Shām in the early Islamic period and could hardly fit more than a few dozen worshippers, or roughly the adult male Abbasids and their clients. Its location to the southeast of the *qaṣr* is at the furthest point from the rest of the village settlement and so not convenient to anyone other than the Abbasid family members. No other mosque has been identified at Al-Ḥumayma. Perhaps few other Muslims were at Al-Ḥumayma when the Abbasid family lived there.

The locals today claim that the cemetery of the Abbasids is located in an open area several hundred meters north of the *qaṣr*, south of the Roman fort. But there are no obvious traces of graves there, and the area has not been investigated.

Given the Islamic credentials of the Abbasids an important issue to examine is the status of the Christians at Al-Ḥumayma when the Abbasids were there (Schick 1995). In B100 and F102, the Umayyad houses built over the Byzantine period churches so completely destroyed the churches below that it is not possible to be sure whether they were still in use up to the time that the houses were built, or had already been abandoned by the early to mid-eighth century. In B100, pottery from below an upper late-phase church pavement, however, suggests that the church was renovated in the late seventh century, while the F102 church was constructed in the later part of the seventh century, based on the pottery found in a probe below the church pavement. The C101 lower church was certainly no longer in use as late as the eighth century. The church building remained structurally intact, although its church furnishings — altar, pulpit, marble chancel screen panels, and lamps — were dismantled and extensively robbed out, and the building was reused for some limited domestic occupation in the Umayyad period. A tight stratified corpus of pottery from the mid-seventh century found in one room adjoining the church provides the date for the abandonment of the church ('Amr and Schick 2001). Thus none of the churches can have remained in use while the Abbasids were there. There is no evidence to indicate that the churches were converted into mosques; that was definitely not the case in the built-over B100 and F103 churches. None of the literary references to the Abbasids hint at the continued presence of Christians, or for that matter to anyone other than the Abbasid family being at Al-Ḥumayma.

Al-Ḥumayma After the Abbasid Revolution

The site continued to be occupied after the Abbasids left. Although it is difficult to reach firm conclusions about the extent and nature of the Abbasid period occupation, in comparison with the early Roman-Byzantine and Umayyad periods, it does appear, nonetheless, that although the Abbasid period occupation may have been reduced from the earlier periods, it was still substantial and consisted of more than handfuls of seasonal nomads. Al-Ya'qūbī (1892: 114; Le Strange 1890: 455-456) and Yāqūt al-Ḥamawī (1867:2:342-343) among other geographers, record Al-Ḥumayma in their list of place names but such attestations reflect more the former importance of the Abbasid family's presence there, rather than the contemporary significance of the site.

It is noteworthy that after the success of their revolution, the Abbasids forgot about the site. They certainly did not invest any funds to aggrandize the site with monumental architecture; they built no shrine over the grave of Abū Hāshim, for example. Statements by later authors, such as al-Harawī (died 611/1215), about Al-Ḥumayma as "a village (*qaryah*) in which is the grave of Muḥammad bin 'Alī bin 'Abdullāh bin al-'Abbās, the father of the Imām al-Manṣūr, may God be pleased with them" (1953: 17, 1957: 44) need not imply an active shrine at Muḥammad's grave site. The architectural remains reflect a level of investment that the residents could have managed with their own limited resources. The F103 palatial structure continued to be occupied, although remodeled. There are some traces at Al-Ḥumayma of continual occupation up to the present, but the site eventually dwindled into insignificance. Al-Ḥumayma played no role during the Crusades.

Conclusions

Without the literary sources, one would never suspect that momentous events ever took place at Al-Ḥumayma. One could conclude from the F103 structure only that there was at least one wealthy aristocratic Muslim family living there in the Umayyad period, but not that they were the ones who overthrew the Umayyad Caliphate. After all, the political activities of secretive conspirators like the Abbasids do not manifest themselves in mundane aspects of material culture recoverable by excavation. The archaeological excavations have helped to show that the Abbasids had access to some money to build their *qaṣr*, but not on the scale of the Umayyad rulers, who clearly spent much greater funds for such building projects as Khirbat al-Mafjar. The standard of their *qaṣr* was on a par with that of the anonymous residents of, for example, the qaṣr at Umm al-Walīd. As a whole, Al-Ḥumayma was never more than a small settlement, whose inhabitants were able to gain a modest living from its desert environment and its location on a major travel route. The site was inhabited before the arrival of the Abbasids, and survived their departure; the Abbasid family members were extraordinarily large fish in a very small pond, but they were not the only fish in that pond. Al-Ḥumayma had little to offer the secretive Abbasid revolutionaries other than the virtue of its modest nature and isolated but accessible location.

But the Abbasids clearly did not spend all of their time in such an out-of-the-way place. Most of their revolutionary activity was carried out elsewhere especially during the pilgrimage to Mecca, and the various members of the family frequently traveled to Damascus and elsewhere in the caliphate. Had the Abbasids chosen to live somewhere else, they would still have overthrown the Umayyads.

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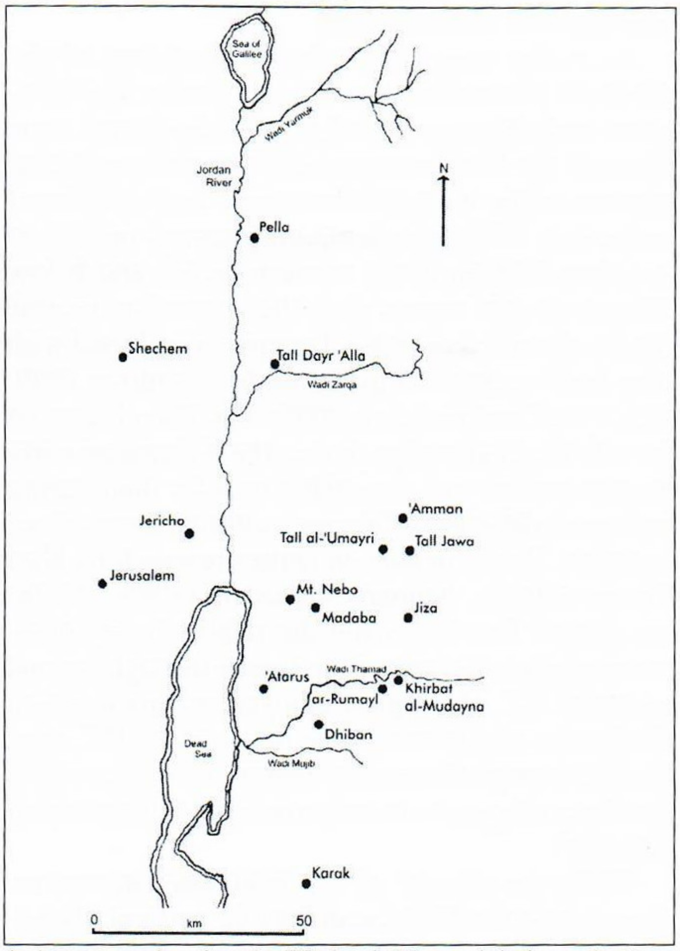
Nabataean Water Management Systems in the Wādī ath-Thamad

Introduction

The Wādī ath-Thamad is a major river system that begins east of the Desert Highway, southeast of Zīzyā[1] and south of Tall Burayk, and extends southwest for more than 50km before it flows into the mouth of the Wādī al-Mūjib. Along its trajectory between its source and Khirbat Iskandar, where it is known as the Wādī al-Wāla/Wādī al-Hīdān, the Thamad is fed by a series of secondary wadis, which flow into it from both the north and south. This river system provides water for modern agriculture and pastoralism over an extensive area, while the Wādī ath-Thamad itself forms the northern perimeter of the Dhībān plateau (FIG. 1).

The Wādī ath-Thamad Regional Survey[2] area covers approximately 110km2 centered on a Northeast-Southwest oriented graben and its surrounding drainage area. The catchment is bounded by the land to the east of the late Roman fortress of az-Zūna, the upland area south of the Wādī Shābik, the area to the west of the Iron Age site of ar-Rumayl and the Nabataean fortress known as Qaṣr az-Za'farān, and by Rujm al-Ḥīrī and West 'Urayniba on the north. The region naturally falls into three general topographic zones. To the north of the Thamad Graben is a narrow upland plain running east-west between the towns of West 'Urayniba and Za-



1. Area map showing the Wādī ath-Thamad drainage basin.

[1] Zīzyā is the name given to the modern town by local folk, although the site of the large reservoir was known to Tristram (1874:182-185) from the *Notitia Dignitatem* as "Ziza", one of the stations of the Equites Dalmatici Illyriciani Ziza. In JADIS (1994:2.158), the reservoir is included in the listing for Jizeh/Jīza (2412.003), with a reference to Tristram, while the listing for Zīzya (2413.005) refers only to a Middle Paleolithic wadi terrace.

[2] The Regional Survey is a component of the larger Wādī ath-Thamad Project, directed by Dr. P. M. Michèle Daviau of Wilfrid Laurier University, Canada. Complementing the excavations at Khirbat al-Mudayna, the survey of the Wādī ath-Thamad drainage basin aims to situate al-Mudayna in its landscape, sto clarify the relationship between the settlements (Iron Age, Nabataean) at al-Mudayna with outlying sites and features, to elucidate regional socio-economic systems, and to isolate paleo-environmental factors affecting settlement and land use. Conversely, it seeks to understand the impact of settlement and agricultural activity on the ancient environment.
The first two seasons of the regional survey were directed by J. Andrew Dearman (1996; 1997),
Austin Presbyterian Seminary, Austin, Texas, USA. Christopher M. Foley (1998, 1999, 2001), University of Saskatchewan, Canada, has directed the survey in subsequent seasons. The 2003 season was devoted to a study of the Iron Age cisterns and caves at at-Rumayl (Site WT-18).

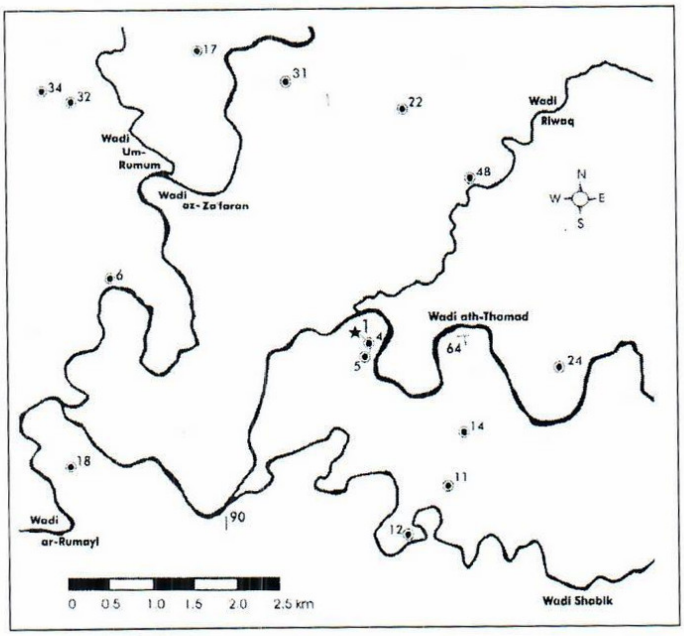
ynab. This relatively flat region gives way to the undulating terrain along the northern edge of the graben, which descends sharply as one proceeds southward into the bottom lands of the Wadis ath-Thamad, Za'farān and Shābik. These wadis, which run through the floor of the graben, are separated by limestone outcrops of the Eocene Umm Rijam Chert Limestone (Al-Hunjul 1995), resulting in areas of steep slopes and alluvial flood plains. The wadis are fed by smaller wadis, such as the ar-Ruwāq, and by numerous gullies descending from higher terrain to the north, the south, and to a lesser extent, the east. The third zone is another upland area south of Wādī Shābik.

As is the case today, the environment of the Wādī ath-Thamad catchment area during the Nabataean-early Roman Period was a transitional zone between the Mediterranean climate and vegetation regimes to the west and the steppe land and desert to the east. With a contemporary annual rainfall of less than 300mm in the western sector, and below 200mm as one moves east, the vegetation regime can be classified as Irano-Turanian, combined with "dry-bed" vegetation in the wadis (Cordova 1999: 183, 191; Cordova *et al.* 2005: 30). The climate of the ath-Thamad region during the Nabataean-early Roman period was somewhat moister than during both preceding and following cultural phases of occupation. Based in part on earlier research by Karl Butzer (1955), Numan Shehadeh (1985: 27-28) has argued that following the relatively dry environmental conditions of the fourth through second centuries BC, the region enjoyed an amelioration of climatic conditions in the first century BC, continuing through the second century AD, after which the climate began to revert to drier conditions about 180 AD[3].

While the climate of the Wādī ath-Thamad region during the Nabataean Period, particularly between the first century BC and the second century AD, was comparatively moist, with greater rainfall than today, it is unlikely that the flora regime was substantially different than that of today. Nevertheless, the increased moisture between 63 BC and AD 324 allowed a degree of agricultural expansion (Cordova 1999; Glueck 1970; LaBianca 1990) previously unknown. The fact that there is evidence for increased erosion during this same period may reflect periods of heavy rain, and/or the impact of increased agricultural activity due to a rise in population and extension of settlement into marginal areas[4]. Recent investigations of the archaeological and geomorphic records confirm that populations with appropriate technology were exploiting the more unstable, marginal agricultural lands to the east of the Mādabā Plateau.

Agricultural Settlements

A number of major agricultural sites, dating to the late Hellenistic-early Roman period, are located within the ath-Thamad Graben (Sites WT-1, WT-6, WT-12, WT-14; FIG. 2). The distribution of these settlements within the ath-Thamad survey area forms a consistent pattern; each site was located on the perimeter of a broad valley bottom, which was surrounded by a gentle meander of the wadi often associated with a ford. In some instances, these small communities were built up against the base of the escarpments, which edge the wadis running through the depression, or on outcrops of harder limestone formations within the graben itself. Their



2. The Wādī ath-Thamad Drainage Basin.

3 According to Shehadeh (1985:27-28), the moist period ended by the 3rd century, with a climate regime of low rainfall continuing until the end of the 6th century. This climate pattern of a rainy period followed by a dry period corresponds to a comparatively warm, wet climate phase posited for the Mediterranean region between 200 BC and AD 400, with between 200 and 300mm rain per year (Green 1986: 81ff.).

4 Although he did not have the Wādī ath-Thamad region in mind, Glueck (1965: 361) was convinced that the Nabataeans engaged in intensive dry farming to support settlements along their trade routes.

geographical location facilitated the exploitation of the water's flow for irrigation, a technology which can still be seen today where the local people pump water from the wadis into subsidiary pools located at the level of their fields. Bowersock (1983: 64) dates an increased investment in agriculture on the part of the Nabataeans to the reign of Aretas IV (8 BCBAD 40). This shift in economic priorities was associated with expanded sedentarization and the refinement of irrigation techniques, especially for Nabataean settlements around Petra itself and in the Negev. Our discovery of a series of sites along Wādī ath-Thamad, Wādī az-Za'farān and Wādī Shābik now argues for comparable expansion both in the implantation of Nabataean settlements and in water management facilities in the area southeast of Mādabā. From west to east, these sites include Toga (WT-6), north of ar-Rumayl; Nabataean al-Mudayna (WT-1; JADIS 2311.014)[5]; al-Wathir (WT-14); and no-name site WT-12. Both Toga and Site WT-12 consist of a line of buildings located on a terrace flanking the wadi and overlooking the valley bottom. By contrast, al-Wathir flanks a small stream, not immediately related to agricultural land, and al-Mudayna is located on the valley bottom itself and extends perpendicular to the wadi bed.

3. The southernmost dam at al-Wathir (WT-14).

4. Rock-cut channel and cistern at al-Wathir (WT-14).

Water Management Systems

Each of the Nabataean settlements in the Wādī ath-Thamad drainage basin was associated with a variety of installations to control and conserve water. One such water management system was located between the Wādī ath-Thamad and Wādī Shābik at al-Wathir (WT-14). Across the bed of a subsidiary stream or gully, flanked by two elongated hills, are three dams constructed of stones and packed earth; the largest dam (WT-14/D-1) at the south end measures 37.80m in width, 3.70m thick, and 1.30m in height (FIG. 3). No date can be assigned to the initial construction of this dam, since it appears to have been repaired in recent times. However, potsherds of *terra sigillata* and Nabataean painted vessels were scattered in front of a group of caves and cisterns that line the terrace flanking the gully. Above this dam to the west is a round hill with a carved bedrock channel running completely around it (FIG. 4). This channel carries runoff water into a large cistern (WT-14/C-1). Several other cisterns are visible further up hill, overlooking the ravine with its three dams.

A similar pattern, consisting of three dams across a secondary rivulet, is seen at Site WT-48. Here the stream bed runs down to the cliff above Wādī ar-Riwāq, which flows southwest to join the Wādī ath-Thamad at Khirbat al-Mudayna. Pottery from the middle dam can be dated to the Roman and Byzantine periods[6]. However, the presence of a Thamudic inscription (WT-48/TT-5) pounded into the bedrock at the lip of the wadi suggests that these

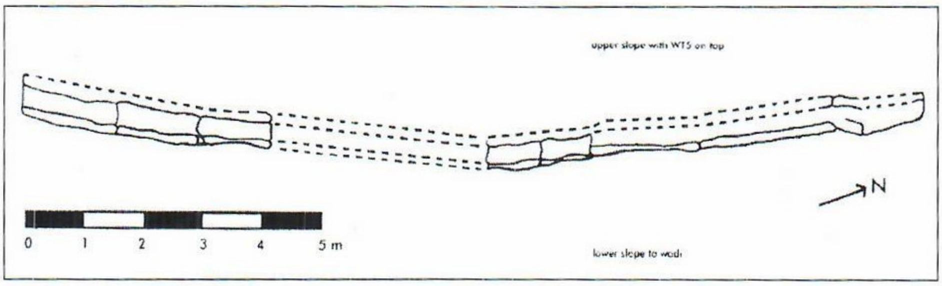
[5] Among six sites with the same name, al-Mudayna on the Thamad is the northernmost of these sites (Miller 1989). JADIS is the Jordan Archaeological Database and Information System.

[6] Oleson (1992: 270) mentions "sets of wadi barriers" and "stone piles", which are in themselves undatable, but can be assigned a date on the basis of their relationship to the Nabataean settlement and to the aqueduct.

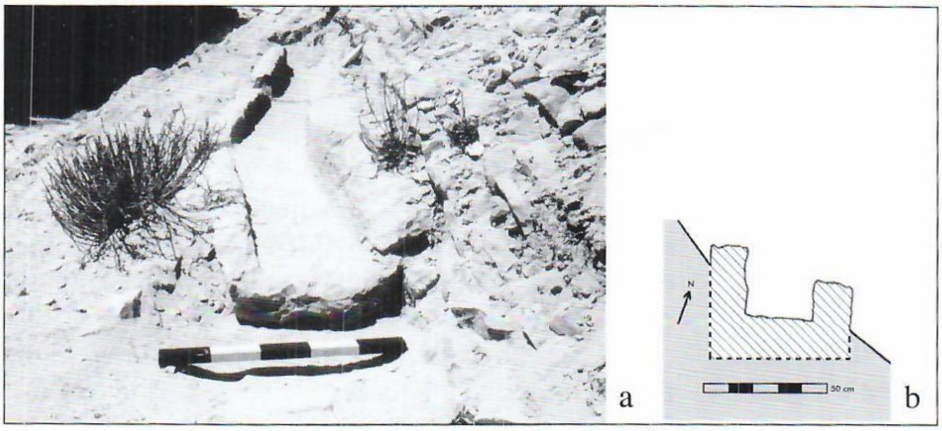
dams were already in use in the Nabataean period[7]. A similar pattern appears at Toga, where a series of small dams were built across an erosion channel, which cut through the escarpment to the northwest of the settlement. Comparable step dams to reduce erosion or to control and collect rain water can be seen in Wādī Abū Saq'a near Petra (Dentzer and Zayadine 1992: 236, Fig. 2) and in Petra itself in the Wādī al-Mudhlim (Akasheh 2002: 221).

The most complex assemblage of water installations is located at the Nabataean town site located at the foot of Iron Age Khirbat al-Mudayna (WT-1). Beginning to the southeast of the Nabataean town is an elaborate water collection system on the side of a hill (WT-5)[8], which forms the southern perimeter of the valley bottom. This system consists of a stone-carved channel (WT-47; FIG. 5) located on the eastern slope of the hill that was designed to collect runoff water, and divert the water before it ran into the Wādī ath-Thamad. The channel (FIG. 6a, b) was elaborately constructed; first a horizontal bed with vertical sides was cut into bedrock[9], and stone-cut blocks were installed. Chisel marks and diagonal Nabataean stone-dressing marks are visible on these blocks, which measure 0.60m in width with a central channel ca. 0.27-0.30m wide (FIG. 7). Each block was 1.25-2.25m in length, and the seams between the blocks were plastered (FIG. 5). The total preserved length of this water channel is ca. 18.40m. This would have been a very efficient system, since the east face of the hill is primarily exposed bedrock with little soil to absorb the runoff.

The blocks which form the al-Mudayna channel are somewhat larger than those documented at Nabataean sites in the south, where they measure approximately 0.90m long, with a channel 0.12m wide and 0.15m deep (Oleson 1995: 714). Such



5. Stone-lined water channel at Site WT-47.

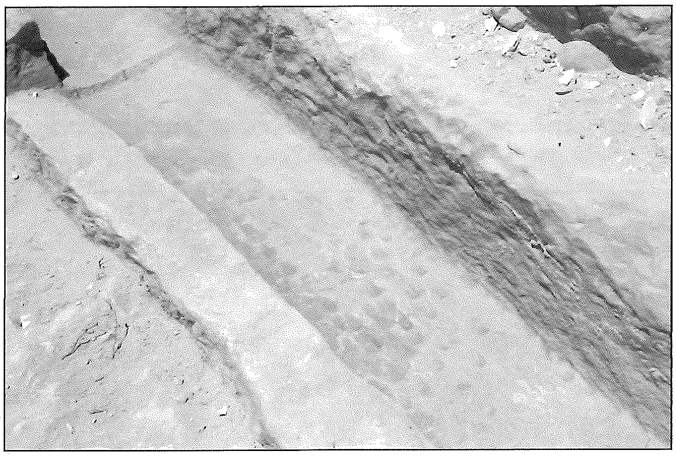


6a, b. Section of stone-lined Channel WT-47.

[7] To date, 13 Thamudic inscriptions have been located; 5 on building stones in Building 800 at al-Mudayna, 3 at West 'Urayniba, 2 at Tomb Site WT-61, and others on bedrock or on stones located at various sites in the survey area (Graf and Zettler 2004; M. C. A. MacDonald, in preparation). Additional epigraphic evidence can be seen in the area of the Queen Alia Airport where a Thamudic text was discovered in a cemetery (Röllig 1987). At southern sites such as al-Ḥumayma, water works are also dated on the basis of inscriptions carved on the rock in their immediate area (Oleson 1992: 270).

[8] Site WT-5 (PGE: 236550, PGN 110725) is a structure located on the rounded hill, which lies at the south end of the valley bottom, east of Khirbat al-Mudayna and inside the loop of the wadi. The wall lines consist of a single course, 1-2 rows thick, formed of medium size boulders, and enclose a rectilinear structure, 16.70 x 12.90m in size. Little debris or stone tumble survives from the superstructure of this building, if that is what the wall lines represent. Although architectural features are meagre, 208 sherds were collected, dating to the Iron Age and the early Roman-Nabataean period. The ceramic sherds include first century AD painted Nabataean fine ware.

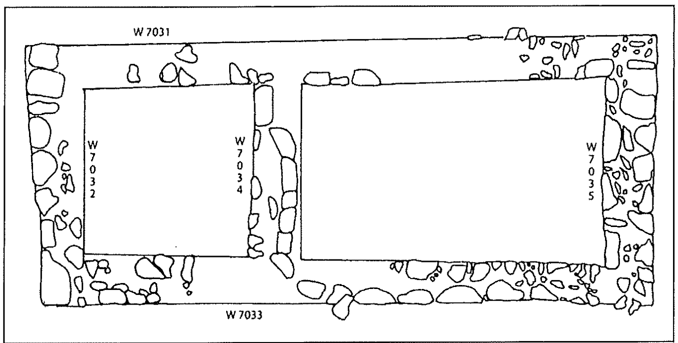
[9] Browning's photograph (1989: Fig. 55) of a section of the water channel along the wall of the Siq at Petra is a good example of this type of stone-carved channel. However, in this channel, there was a pressurized ceramic pipe, sections of which are still preserved (personal observation, 2004; see also Bellwald 2004).



7. Tool marks on the interior of the water channel (WT-47).

conduits have been found in Petra (Bedal 2002: 228)[10], in 'Ayn ash-Shallāla in Wādī Ramm, and at al-Ḥumayma (Oleson 1995: Figs. 9, 10), where the conduit was capped because it functioned as a ground level aqueduct.

At al-Mudayna, the channel served as both a catchment devise and as an aqueduct, carrying water around the side of the hill (WT-5). This channel was part of a complex system of water management installations and cisterns located along the south-eastern perimeter of the valley bottom. A second series of installations is located at the base of the north side of the same hill, where rain water flowed into a series of small settling tanks (WT-4. Feature A=B730; FIG. 8), which are associated with a water control wall (W7025=WT-4)[11]. Examples of water redistribution tanks are preserved in the garden terrace at Petra (Bedal 2002: 228) as well as at al-Ḥumayma (Oleson 1995), where a ground-level conduit carried water to a settling tank before continuing on to the major reservoir (Building 700).



8. Water collection tanks (B730) at the foot of the hill (WT-5) east of Khirbat al-Mudayna.

Although Wall 7025 appears to be a single wall, it may have functioned to control water in much the same way as ground-level aqueducts known at other contemporary sites in the southern Levant. Ground level aqueducts at Mampsis[12] and at Jericho were constructed with two parallel walls of boulder-and-chink construction, each 2-3 rows thick, comparable to the single wall (W7025) at al-Mudayna. Located north of the Wādī Qilt, the Jericho aqueduct irrigated a farming area of 4.0 ha located north of the Hasmonean palaces at Tulūl Abū al-'Alayiq (Netzer 1993: 690). A covered aqueduct in the Petra region at Qaṣr Umm Rattām was also built of boulder-and-chink construction (Dentzer and Zayadine 1992: Fig. 6), indicating a common tradition in the late Hellenistic-early Roman period. In contrast, dressed stones were used to form the flanking walls of the water channel at al-Amti in the Bayḍā region of Petra, where large gardens were irrigated in a broad valley bottom (Bikai 2004).

At al-Mudayna, the water control wall (W7025) forms the perimeter of the agricultural field in the valley bottom and directs water toward Building 700 (FIG. 9; Daviau 2000: 286)[13], an unroofed reservoir[14] measuring ca. 11.00 x

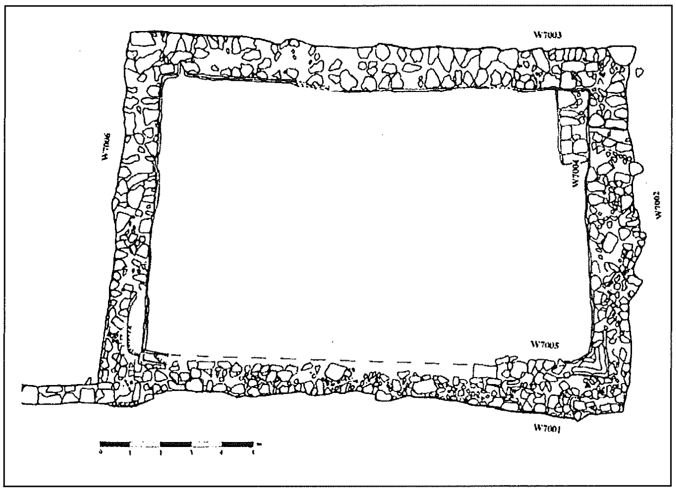
[10] Upper, right-hand photograph.

[11] Excavation in Building 720 during the 2004 field season uncovered a structure measuring *ca.* 4.50 x 10.50m and consisting of two units. The final interpretation of function must await completion of excavation in 2005.

[12] The width of the aqueduct channel at Mampsis measures 0.25cm wide (Negev 1988: 186; Photo 199-201), comparable to the width of the stone-carved conduit at al-Mudayna. However, the Mampsis channel was similar to other ground level aqueducts in that it was formed of two rows of stones, not of large stone blocks.

[13] Excavation during the 1997-1999 seasons revealed that the reservoir had two periods of use; at some point in its history, B700 was spanned by 10 opposing arches and had a stone roof. Interpreting the precise construction history of Building 700 is still problematic, in part because so few reservoirs are described in detail. It is possible that the reservoir continued to be used for water conservation after it was roofed (Daviau *et al.* 2000: Fig. 4), and only at a later time, when the spaces between the arch piers were filled with low connecting walls, was the building converted to a domestic or storage facility. However, the fact that the arch piers and their connecting walls were not plastered may indicate that the reservoir was converted in the second use phase into a storehouse or domestic structure, because the piers could not survive if surrounded by water. Further evidence for this second use phase was uncovered in 1996 and 2001, when repairs to the plaster floor and the presence of two ovens, one directly on the floor (L22:16) and a second oven (L33:27) inside a protected cooking area, were exposed. In addition, the presence of ceramic vessels, cooking pots, and a mould-made lamp (Daviau *et al.* 2000: Fig. 7:1-5, 8) clearly indicate a change of function in Building 700.

[14] A large open reservoir, as well as a smaller stone-roofed reservoir, is preserved at Umm al-Jimål (de Vries 1998: Figs. 46, 67). Several examples of roofed reservoirs were also documented at Mampsis (Negev 1988: Photos 192-198) and at Petra (Bellwald 2004).



9. Reservoir 700 at Khirbat al-Mudayna.

10. Floor make-up of Reservoir 700.

16.50m in size[15]. Cut into the virgin soil on the northeast slope of the mound, the reservoir walls were deeply footed below the level of the floor. Superimposed layers of flat-topped boulders and cobblestones packed with impermeable mortar/cement (L13:24)[16] were laid as the foundation for the floor (FIG. 10). The floor itself and the walls were coated with 4-5 layers of fine plaster and a cement curb of plaster and small pebbles filled the angle between the walls and the floor, as well as the vertical corners[17].

The south wall was cut into the slope of a large Iron Age dump composed of ashy soil filled with pottery sherds, animal bones and *ṭābūn* fragments. The porosity of this dump would have facilitated the gentle runoff of water into the reservoir. Built into the south wall is a stone-cut channel that directed water around the south and east sides[18]. A plastered drain through the east wall may be related to the ground level wall, W7025, coming from the southeast[19]. While these features are related to filling the reservoir, a plastered drain in the north wall may have served as an overflow drain to irrigate the agricultural valley bottom to the northeast.

Although the water management systems described above are modest in scale, when compared to the dam north of West 'Urayniba (Bisheh 1986: 9), the reservoir at Zīzyā (Jīza), and the large birkah (95.00 x 104.00m) at Mādabā (Piccirillo and Denton 1996: 25). Nevertheless, they served to enhance the available ground water necessary for successful agriculture at the rural Nabataean villages in ath-Thamad graben.

Roads

Connections between these sites are also a factor in their location. In each case, there is a place where the wadi can easily be forded, usually at the opening to the valley bottom. In the case of Toga (WT-6), one opening is at the opposite end of the valley from the settlement, while a second access point is located to the west, on a saddle that connects Toga to agricultural land north of ar-Rumayl (Glueck 1970: Fig. 84). At al-Mudayna, there is a gentle ford immediately north of the settlement and a second ford less than 1.0km to the west.

Another feature which served to link the sites in the Wādī ath-Thamad region is a network of local roads running predominantly east-west and still recognizable in a number of road fragments. At this stage in our investigation, these local roads have

[15] This reservoir is small in comparison to the one at Musayṭiba (Museitbeh, JADIS 2409.001), southeast of Umm ar-Raṣāṣ; this well-preserved reservoir measures 12.00 x 27.00 x 9.00m deep (Glueck 1934: Fig. 17). It is interesting that Glueck thought the reservoir dated to the Byzantine period, based on a comparable reservoir at Umm ar-Raṣāṣ, even though the adjoining fortress (or platform) was littered with Nabataean pottery and *terra sigillata*. When Tristram (1874: 149) saw this site in January 1873, it was located in a rich agricultural and pastoral zone, which is still the case today (personal observation, August 2003).

[16] The development of Nabataean cement is discussed by Gibson, http://nabataea.net/cement.html.

[17] The same feature (a plaster curb) is preserved in the reservoir (Building VII) at Mampsis (Negev 1988: Photo 195). However, in the vertical corners, a triangular cobblestone and mortar packing, coated with plaster, was installed (Negev 1988:184-185).

[18] Additional conduit blocks were recovered in Building 800, a large house located to the north of the reservoir (Daviau *et al.* 2000: 279). Both blocks were carved in a U-shape, comparable in size to the drain blocks built into the walls of Reservoir 700; when found, they were in secondary deposition and are evidence for the abandonment of the settlement at al-Mudayna.

[19] Comparable channels are seen entering a settling tank and in the east wall of a roofed reservoir (10.00 x 23.00m in size) in an agricultural area south of Bayḍā (al-Muheisen 1992: 216; Fig. 3).

not been linked to the major caravan routes that probably ran along the western and eastern reaches of our survey area[20]. One fragment of road (WT-75) is located on the east side of the flood plain at Khirbat al-Mudayna. In comparison with modern tracks, this road is lined with a stone curb.

A more substantial road fragment (Site WT-64), identified in the bottom land to the east of Wādī ath-Thamad and east of Khirbat al-Mudayna, is composed of two roads intersecting at approximately a 120-degree angle. The first road (Feature A) runs east-west for 126.07m, parallel to the wadi, and has a width of 3.25-3.65m. The most probable course for the westwards extension of this fragment would be to cross the wadi at the point where the wadi embankments become narrow. The road would then run along the alluvial bottomland on the north side of the wadi in the direction of al-Mudayna, and would cross the ford to the south side at al-Mudayna itself.

Intersecting with the east-west road to form a wide cobbled area, a branch of the road (Feature B; FIG. 11) runs southeast and crosses the alluvial terrace heading in the direction of an upland region separating Wādī Shābik from Wādī ath-Thamad. At it north end, the roadbed was built into reddish alluvial sediment, but disappears to the south under grayish colluvium. The exposed roadway is punctuated with Bedouin burials, which opportunistically utilize the stones forming the road to provide security for the deceased. These burials occur only in the road itself. After the point at which the roadway is subsumed by the colluvial deposit, the burials continue in a straight line, along the course of the road and thereby indicate its continuing trajectory.

11. Road (WT-64; Feature B) running southeast.

Conclusion

The discovery of a number of strategically placed farming settlements, each supplied with elaborate and extensive water management facilities, fills a gap in our knowledge concerning the organization and exploitation of farmland north of the Wādī al-Mūjib by the Nabataeans. The rich agricultural resources of this region, still evident today, were utilized by a settled and literate community, which extended from Mādabā in the west to Zīzya/Jīza in the east, linking the two principal trade routes north to Philadelphia. Excavation and survey in the Wādī ath-Thamad region shows clearly that Nabataean construction methods were in use, including diagonal stone dressing, plastered reservoirs with cement curbs, carved stone conduits, and stepped dams. The ceramic material indicates that the local inhabitants made use of Nabataean painted pottery and lamps, probably imported from Petra itself[21]. These obvious links to the centre of Nabataean culture leave no doubt that the Wādī ath-Thamad basin was an integral part of the Nabataean kingdom.

In this paper, we have reviewed the archaeological evidence for full-scale development of northern Moab by the Nabataeans, who established towns and farming settlements, built dams, aqueducts, reservoirs, cisterns, and local roads in the Wādī ath-

20 Negev was able to date the extensive road system between Petra and sites in the Negev on the basis of his excavation at Oboda, showing its importance prior to Roman control. In his judgment, after Roman and Palmyrene reorganization of the trading patterns, Nabataean settlements in the Negev were dependent primarily on agriculture (Negev 1966: 97).

21 Personal communication, Y. Gerber.

Thamad graben. Like the towns in the Negev (Negev 1976: 131), this implantation of settlements in northern Moab was the work of Nabataeans knowledgeable in stone architecture, engineering, climate and water conservation. Based on the ceramic repertoire from Khirbat al-Mudayna and from the survey sites, the Nabataeans appear to have exploited this area of northern Moab during the first and early second century. Further excavation and survey may help to clarify the character of the relationship of these agricultural villages to each another and to the urban centres at Mādabā and Dhībān[22].

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[22] The position of al-Lāhūn on the north bank of the Wādī al-Mūjib (Homès-Fredericq 1997: 80-89), due south of Khirbat al-Mudayna, suggests another strategically located Nabataean site on the Dhībān plateau.

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The Gaza-Damascus Roads in the Medieval Periods

Summary
Throughout it's long history the port of Gaza, in southern Palestine, was a thriving emporium and a strategic Crossroad between Egypt, Arabia and Syria despite the fact that it was wide open on the Mediterranean and active in maritime trade, thanks to it's two harbours 1. the Maioumas (Tida', al-Idrīsī 1154AD) and 2. Anthedon (Balakhia). However, the land routes were busy with international commerce with Palestine, Egypt and Transjordan. There was the coastal route of Joppa (Yafa) — Ptolemais ('Akka) and from there to Tyre, Sidon and Berythe in Phoenicia, this was an active route. Moreover, the inland roads (see FIG. 1) to Jerusalem, Nablus, Ṣafad, Baysān and Damascus were of special concern for trading with Syria and Mesopotamia. Another track to Bayt Jibrin/ Eleutheropolis, al-Khalil/ Hebron, al-Karak descended to the Dead sea and through Ghawr aṣ-Ṣāfī proceeded to al-Karak and continued on to Mādabā, Ḥisbān and 'Ammān. From there it could pass through al-Dayr/ Burj al-Abyaḍ, al-Badiyya, then on to 'Ajlūn and Irbid. It entered Syria by Ṭafas, al-Juwayn, Ṣanamayn and al-Kiswa before it reached Damascus (Demombynes 1923: 242-44).

Taking the road from Gaza one met with that segment of the road coming from Bayt Jibrin and descended to Engedi and crossed the Dead Sea, when the water was low, or the route turned around the southern tip of the sea towards Ghawr aṣ-Ṣāfī and climbed to al-Karak through Kathrabba, Madinat ar-Rās and 'Ayy (FIG. 2). This section of the track was recently surveyed and its stations were identified with more precision on the Madaba Mosaic Map (below).

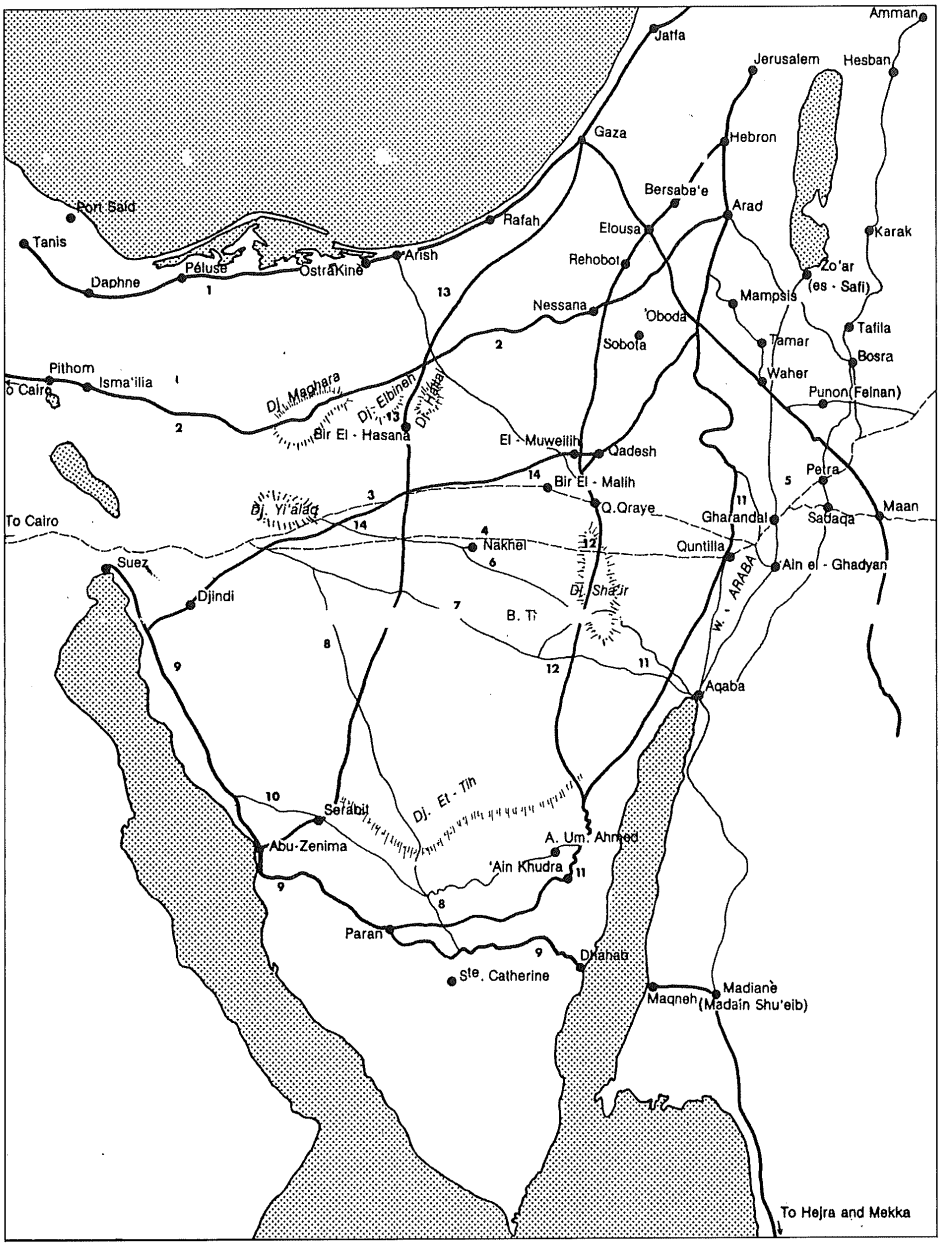
Gaza in the Recent Research

After the independence of Gaza in May 1994, there arose a revival of interest in the city and its environs: A long-term project of excavation was started by the Ecole Biblique et Archéologique Française of Jerusalem (Humbert, Abu Hassuneh 1999). Another study was launched by Clarke *et al.*: "to examine the evidence for settlement in the Gaza region during the second Millennium BC and to assess the region's wider external contacts, specifically, with Egypt and the Mediterranaean world" (2004: 31ff.). In addition a well documented monograph by Butt 1995 offers a useful synthesis on the history and archaeology of the Gaza Strip. These studies would gain more light from the ancient Arab chroniclers, or from the modern research studies: of the more significant ones are aṭ-Ṭabarī (915AD), Iṣtakhrī (951AD), al-'Umarī (1340AD) and adh-Dhāhirī (1425AD).

The modern publications of Abu Bakr (1994) and 'Atallah (1986) supply reliable information on the city and its environs in the Islamic periods up to recent times. The volume of W. Popper on the Mamluk roads was not available; instead, it was possible to consult Godefroy-Demombynes work: Syria in the Mamluk Period (1923). As one would expect, several studies dealt with al-'Ilāf agreement of Quraysh in Arabic, especially Daradkeh (1984) and Saḥāb (1992) (see below).

The Road System Between Gaza and Egypt

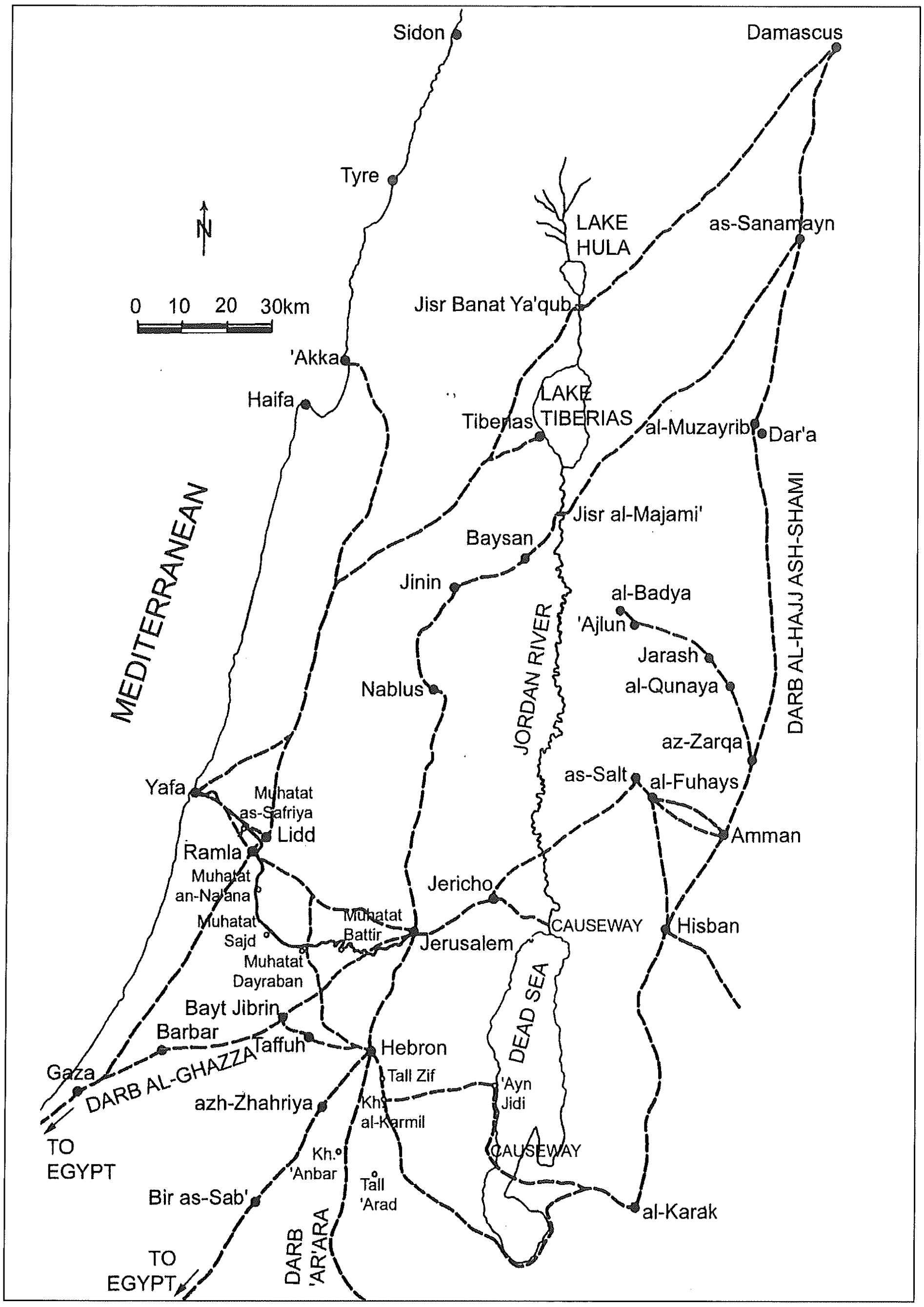
Since Gaza and its districts were in close economic and cultural contact with Egypt and Sinai, this study will describe the network of tracks with this country. The earliest caravan road is known today as "Darb al-Gazza" which connected the city with the coastal roads of Rafaḥ (Raphia), al-'Arish (Rhinocolura) and al-Farama/Pelusium. From there the travelers reached Tanis in the Eastern Delta, (see FIG. 1). This road was reported by Strabo (*Geog.*



1. Darb al-Ghazza, the Earliest Road between Eygpt and Gaza.

16. 2. 30) and was then called the '*Via Maris*': the same route taken by past Egyptian armies penetrating into Palestine. The first recorded campaign was that of Tothmosis III in 1468BC, who defeated a coalition of the Prince of Qadesh at Megiddo (de Vaux-1971: 93; Kafafi 2005: 55). In actuality, the first contacts between Egypt and Palestine date back to a so-called colonial period, in the first half of the fourth Millennium BC. The motive for these contacts was, according to Miroschedji, "the rise of complex societies in need of raw material, or prestigious objects which they could purchase from nearby countries" (Giroud 2000: 28-29). The first exchange of material was made via caravans of donkeys which carried aromatics from Arabia, mainly myrrh and frankincense, in addition to nard, cinnamon and precious stones from India (Giroud 2000: 42-44). However, of more concern to the Egyptians were the copper mines in the "Araba valley' of Jordan (Hauptmann, Weisgerber, 1987: 419-437; Levy *et al.* 2001: 159-187). Other rich copper mines were exploited in Timna', in the Negueb, north of Ayla ('Aqaba), Pratico 1993; Rothenburg 1972, 1988. Of special concern to the Pharaohs was the bitumen of the Dead Sea, because of its use in the mummification process (Diodorous, XIX, 99).

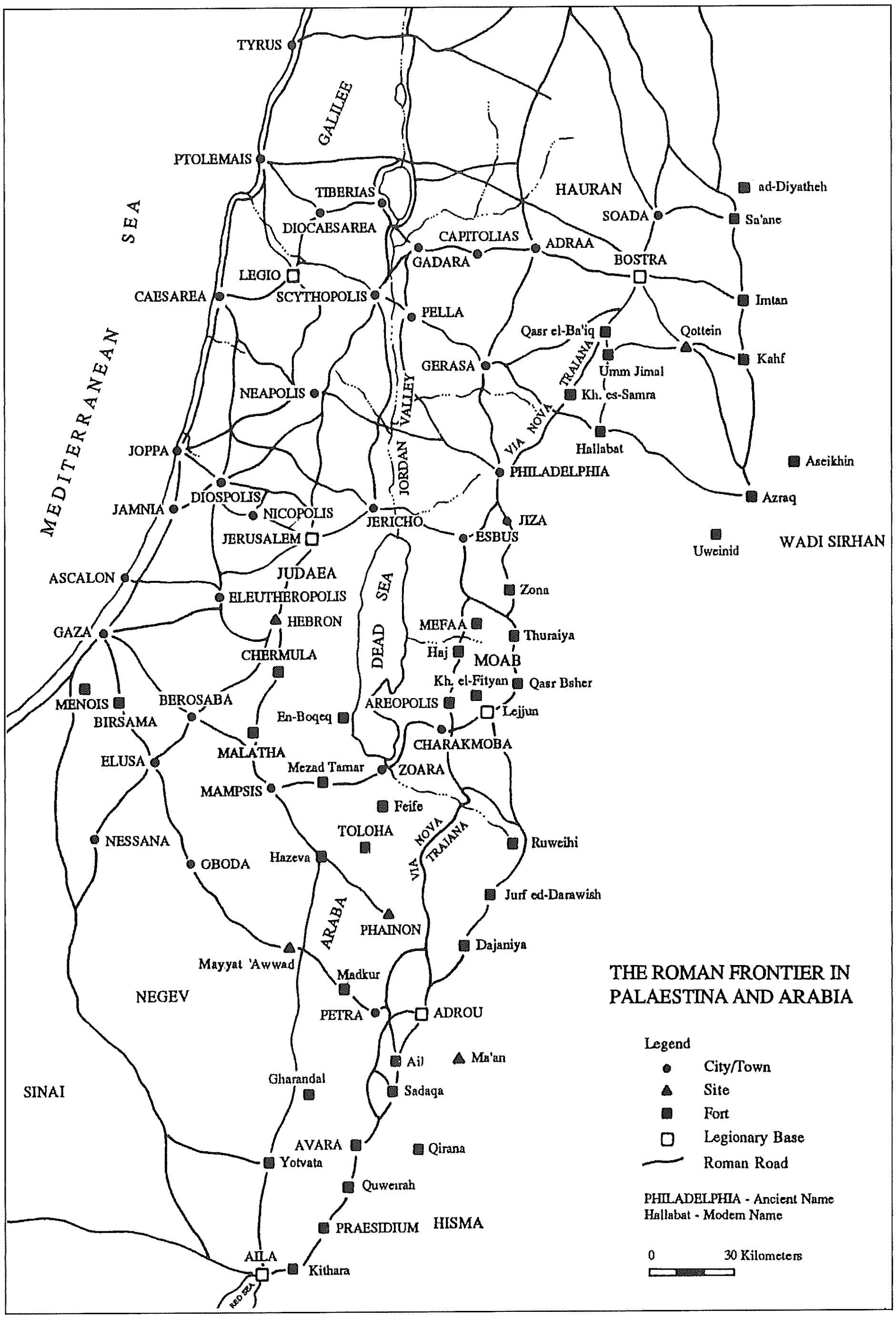
To reach Gaza, the caravan could proceed from the 'Araba Valley to Kuntillat, Gharandal and from there to 'Oboda, Elusa and Gaza (FIG. 3). In his 'Roman 'Aqaba Project' Parker (1998: 388-89) drew attention to the large amount of imported jars



2. The Roads from Gaza to al-Karak and Damascus.

from Gaza and Egypt through Wādī 'Araba. Another road may have started from Petra, Bīr Madhkūr in the 'Araba Valley and penetrate into the desert by Mayyat 'Awwad (Moa of the Madaba Mosaic Map?) (see FIG. 3).

In the summer of 1998, a caravan expedition was organized with the intention of training tourist guides by following the " Incense Road" from Petra to Gaza. The writer was lucky to have been able to participate in this expedition which reached Gaza in four days under the leadership of A. Goren (2000: 105-115). The first station in the desert was Mayyat 'Awwad, possibly Moa of the Madaba mosaic map. A fort at this station controlled a caravanserai close to a hidden cistern in a depression. The next stations were Wādī 'Omer and Qasra: at the latter we halted where a fort was built at the summit of a hill. After this station the caravan crossed the deep valley of Neqarot where another fort controlled the track. It included several rooms around a central courtyard; the water supply came from a cistern concealed in a little valley. This hidden water reservoir was part of the Nabataean long Traffic policy. After the ascent of Palm Grove of Ma'ale Deqalim, the road traversed the ancient volcano site of Makhtesh Ramon, an impressive valley of



3. The road System from Aila-'Aqaba to Gaza through Wādī 'Araba and the Negueb, after Parker "Limes XIX, Suppyling the Roman Army on the Arabian Frontier" (Parker 2005: 415-420).

40km in length and 10km in width. This natural geological fault was formed at the same period as the rift valley of the Jordan River and the Dead Sea. The 400m climb along a winding track, protected with a retaining wall, was exhausting for our camels. At the summit a small fort offered a much welcomed rest and the hidden cistern nearby supplied cool water to the caravaneers.

The next station was the famous city of 'Obodat ('Avdat), so named after the Nabataean King 'Obodat I, the God, who died in this desert after his victory over the Seleucid King Antiochus XII in 85BC. A substantial military camp by this famous station was built by the Nabataeans and re-used during the Roman-Byzantine periods. Churches were built here, as was a large reception hall. The churches date from the fourth to the sixth century AD and were built over Nabataean temples and monuments (Negev 1986: 40-43).

Thereafter the caravan stopped at Khalasa/Elusa at the outer limit of the desert and the cultivated land. A good amount of Nabataean pottery was reported at the ruins of this city and the earliest Nabataean inscription was found there (Negev 1986). A festival was celebrated to the goddess al-'Uzza as late as the Byzantine period (Starcky 1966: col. 1003).

To the north of Khalasa, the Wādī Besor was rich in abundant water springs. We crossed it on a bridge that was the last refreshing halt before Gaza. The city is built on a hill 4km from the sand dunes and the sea, and is surrounded by opulent groves of citrus, vine and fig trees. The oranges of Gaza are famous all over the world, but more famous are the two ports of Maioumas and Anthedon.

When Alexander the Great captured Gaza after a long siege in 331BC, he conveyed to Leonidas, his tutor, 500 talents of frankincense and 100 of myrrh to allow him to be lavish with the gods when performing a sacrifice in the temple (Plutarch, *Vita Alexander,* 25: 6). This is, indeed, good testimony that the port of Gaza was the terminal of Arabian aromatics in the fourth century BC.

Heading from Egypt or Petra, the caravaneers crossed the Wādī al-Ghazza, an ancient riverbed, where several archaeological sites have been investigated: the earlier excavations were conducted by Flinders Petrie in 1926-27, at Tall Jemmeh, about 10km south of Gaza (Petrie). This site was identified with Yurza of the 'Amarna texts (1900-1550) and was occupied by the Philistines, and later by the Assyrians (Aharoni 1956; Mazar 1952). The next important mound was Tall al-'Ajjul, 6km south-east of Gaza. The cemeteries in this site were exceptionally rich in gold jewellery from the time of the campaign of Ahmose against the city; it was identified with Sharuhen of the Egyptian Annals (Kempinski 1993: 52-53). Tall as-Sakan, 5km south of Gaza on the way between Egypt and Palestine, was recognized in 1998, following modern building operations. A rich archaeological material was recovered at the site and dated to the Early Bronze period, 3300-2350BC (Miroschedji and Sadeq 2000: 101). In the 3 soundings A-C, the archaeological occupation included two phases:

1) An Egyptian phase consisting of levels A9-A6, about 2.5m thick and dating to the pre-dynastic period (fourth-third millennium BC), corresponding to the EBI in Palestine.
2) A Canaanite phase, levels 5-1, about 6m thick.

The most distinctive features were the fortifications in A8, which consisted of 3 successive walls dating from the pre-dynastic period, the oldest fortifications of mud- brick in both Egypt and Palestine (Miroschedji and Sadeq 2001: 34-35). As expected, the ceramic finds in these levels were 90-95% of Egyptian origin, the rest being of a local Canaanite fabric. The finds included mainly holemouth jars usually dated to the end of the EBI (3200-3000BC).

The Issue of 'Ilāf Quraysh

It was noted above that Gaza was the terminal of the aromatics trade, at least in the Fourth century BC when Alexander the Great captured the city. The Nabataeans, who took over this lucrative trade from the Minaeans, most probably in the second century BC, transported the spices to the port of Gaza and were in conflict with the Hasmonean Prince Alexander Jannaeus who occupied the city around 100BC. The Gazaeans asked for Aretas II's help, but the latter was unable to secure them although he did eventually recover the city. The Nabataeans continued to act as middlemen for the trade of spices from south Arabia or from the Arabian-Persian Gulf until late in the Byzantine period. According to the Petra papayri, a citizen of Petra, Theodoros son of Obodianos, had some heritage in Gaza. He traveled to the city in 593 (see Lehtinen in Frösen *et al.* 2003: 9-10). In his account of the battle of Tabuk, al-Waqidi reports that the Nabataeans supplied al-Medineh/Yathreb with white flour and oil (*zayt*) (see Lehtinen in Frösen *et al.* 2003: 9-10) (Waqidi, Maghazi 3: 989 after Hamarneh 1990: 428).

On the rise of Islam, "news of Syria used to reach the city of Medina every day because of the great number of Nabataeans who arrived there" (Waqidi in Hamarneh 1990). Crone is skeptical about the tradition of the long distance Meccan trade and the Quraysh caravans "According to one exegete, it was on the rise of Islam that the international trade of the Meccans came to an end" (1987: 111). Furthermore she estimated that: "the stories on the beginning and end of the Meccan trade are legends told in explanation of the Quran, not of the past" (1987: 114)[1].

[1] A judicious review of this volume was published by Serjeant R.B. in JAOS, 111, 1990 and by Heck, G.W., "Arabia Without Spices: An Alternate Hypothesis" in JAOS, 123.3 (2003): 547-575. In his review, Serjeant stated that Crone's "novel theories to be sure, but founded upon misinterpretation, misunderstanding of sources, even at times incorrect translations of Arabic" *op.cit.*: 472. The article of Heck is well balanced and asserts that perfumes from Yemen were traded to Makkah and that grains were imported from Syria in the sixth-seventh century AD (*op.cit.* 572-73).

The 'Ilāf Quraysh, in fact, was the commercial agreement which was settled, according to Muslim tradition, by Hashim bin 'Abd Manāf, the ancestor of Prophet Muḥammad, for the safe passage of Arabian caravans in Syria. This took place at the beginning of the sixth century AD (Ya'qubi, I, 242; Daradkeh 1988: 102). According to Daradkeh, the date of Hashim can be deduced from the fact that he was contemporaneous with al-Ḥarith bin 'Amr al-Kindi, a leader of Dumat al-Jandal (Adumatu). probably met with a governor of Syria — not with the emperor himself. He was known for his generosity: he used to slaughter a sheep everyday and invite the people around him to eat. According to Ya'qubi, he was reported to Caesar who sent him a messenger and was pleased with his well-mannered speeches. Hashim said: "O king, I belong to a people who are the traders of Arabs; write for them a permission granting them a safe passage for them and their caravans". Caesar granted him his wish and Hashim left. Each time he passed in a camp of Arabs in Syria, Hashim took the 'Ilāf from their dignitaries to secure safe passage for the caravans in their dominions (Ya'qubi, I: 243). Crone considers this tradition to be a legend of the Arab story-tellers on the grounds that the Meccan trade "used to be purely local" (1987: 109). However, it is a fact that the Nabataean and the Palmyrene caravans conveyed foodstuffs to Mecca and Medina, as noted above around the advent of Islam. Furthermore, a few historical facts cannot be denied: the Muslim raid in the year 2 of al-Hijra on a caravan of Quraysh is acknowledged by Crone who analyzed the four battles of Badr (1987: 226-230). That there were contradictions among the story-tellers about the exact month of the encounter does not negate their historicity. The Arab chroniclers, such as Istakhri and Ibn Ḥawqal, reported that the tomb of Hashim bin 'Abd Manāf is in Gaza "and here Omar ibn al-Khattab in al-Jahilyyeh (pre-Islamic period) grew rich for this place was a great market for the people of al-Ḥijaz" (Istakhri, quoted by Le Strange 1965: 442).

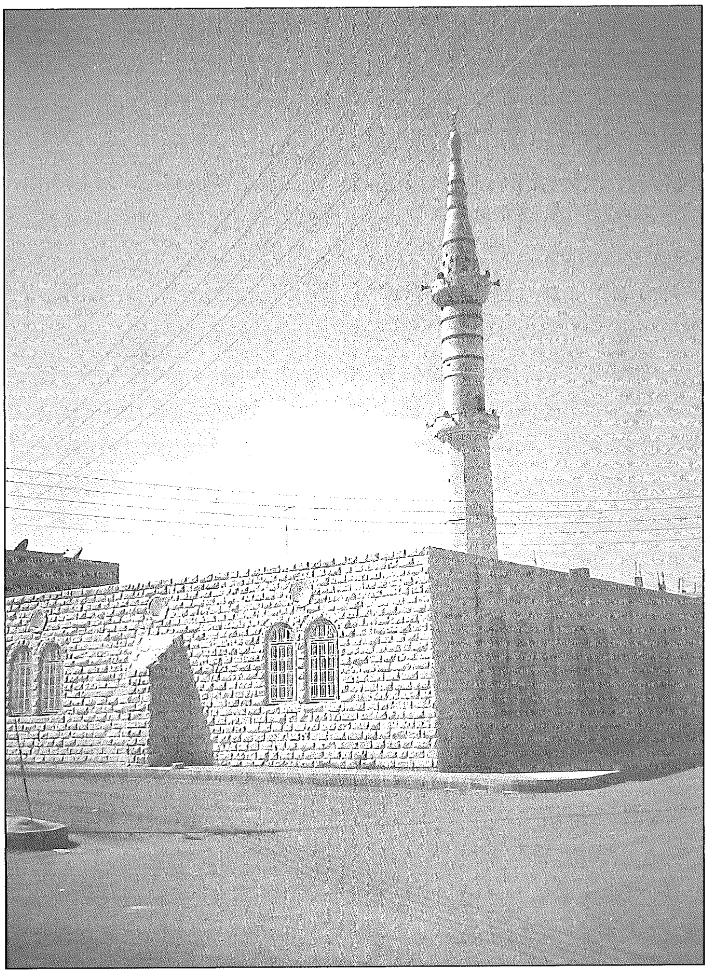
In another recollection by aṭ-Ṭabari, II, 2002, 128, Abu Sufian b. Ḥarb reported that he traveled with some traders of Quraysh to Syria and reached Gaza "in the year Heraclius campaigned against the Persians who occupied his land, drove them out and retrieved from them the greatest Cross", then went on foot from Ḥums to pray in Jerusalem" (aṭ-Ṭabari, 2002: 129). This was in 628, when Heraclius triumphed over the Persian armies. The mention of the victory of Heraclius by aṭ-Ṭabari was an obvious pretext to introduce Heraclius who inquired about the Prophet Muḥammad (aṭ-Ṭabari, 2002: 129).

However, when Hashim b. 'Abd Manāf's 'Ilāf agreement is considered, a reliable historical event must be mentioned: Surat Quraysh 106 follws Surat al-Fīl 105 which refers to the expedition of Abraha of Abyssinia against Mecca in 750AD, the year of the birth of the Prophet Muhammad. Both Surat(s) are considered to have been one unit (Shahid 1981: 429-436), therefore the 'Ilāf agreement must have preceeded 750AD. This would accord with Hashim's trade treaty initiative in the early sixth century AD. The tradition reported by aṭ-Ṭabari (aṭ-Ṭabari I, 2002: 504) that the three brothers of Hashim concluded the 'Ilāf agreement with the Negus of Abyssinia, with the Kisra's of Iran and a third agreement with the Kings of Ḥimyar in Yemen, could be a mere legend engendered by Hashem's trading activities. Nevertheless, it cannot be denied that the Ḥijazi traders reached Syria, Palestine and southern Arabia. Like the Nabataeans, they traveled to Yemen in the winter season to catch? the Indian ships which arrived at the port of Qana thanks to the monsoon winds, carrying pepper, cinnamon, precious stones, together with the silk of China. In this season, the harvesting of frankincense and myrrh took place in Ḥaḍramawt, in Dhufar and in the Somali lands and was brought to Shabwa in Yemen to be transported to Petra, Gaza and Damascus. In the summertime the Meccans arrived in Ḥawran after harvest to buy grain and sell spices or clothes from Yemen.

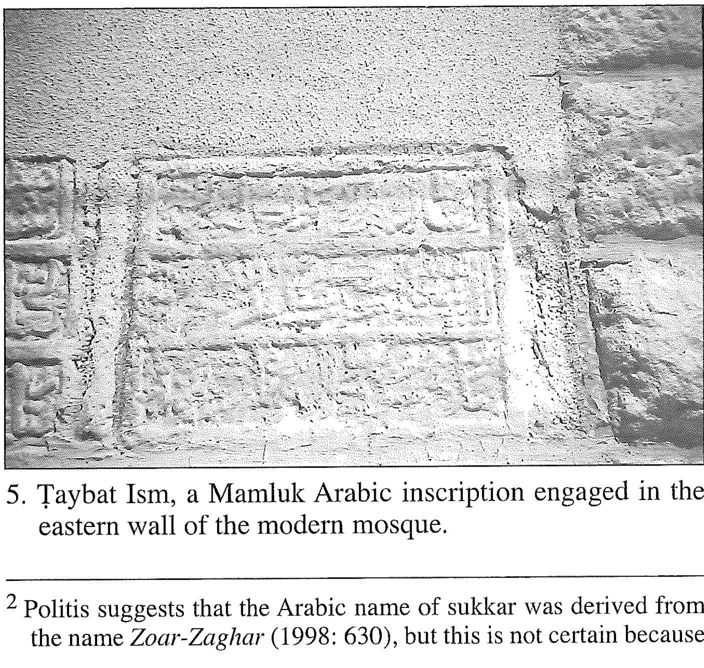
The Northern Road System: Gaza-Damascus

Starting from Gaza, the road passed by the village of Brayr and by Bayt-Jibrin/Eleutheropolis to meet with the route from al-Khalil/Hebron, and from there proceeded to Jerusalem, Nablus and Jenin. Al-'Umari notes the existence of a magnificent Khān: "of beautiful construction, very serviceable, no other caravanserai on this road is more elegant or stronger or valuable or better decorated" (1988: 248).

From this halt, the road descended to Zere'in, ancient Jizreel. A new post was built at 'Ayn Jalut, where the Mamluks defeated the Mongols in 1260AD. From Baysan the caravan passed on to Jisr al-Majami' and onward to Ṭaybat Ism, modern Ṭaybat Bani 'Alwān, and onward to Irbid. In 1340AD al-'Umari, who was appointed to the post of Scribe in Damascus, recommended this station to be shifted from Ṭaybat Ism to the nearby village of Zaḥar. This was functional advice, since the road to the Jordan valley (Waqas) is short, 7km, compared with the road from Ṭaybat Ism, which is a tortuous 10km up and down a rigid slope (al-'Umari 1988: 248). At this modern village (Ṭaybat Ism), ancient ruins are visible among the houses and the re-built mosque still has, in its eastern wall, a fragmentary Mamluk inscription — unfortunately much erased (FIGS. 4, 5).



4. Ṭaybat Ism, the modern Mosque from south-east.



5. Ṭaybat Ism, a Mamluk Arabic inscription engaged in the eastern wall of the modern mosque.

A direct, but longer, track could have departed from ar-Ramla, a city built by Sulayman bin 'Abd al-Malik in 90H/ 708AD. It would proceed north to Nazaret, Tiberias and cross the Jordan River at Jisr Banāt Ya'qub from there to Damascus (*see* Abu-Bakr 1994: fig. 7).

The Southern Tracks By Karak

The first haltstop from Gaza on this track route was Mulaqis (or Umm Laqis), then Bayt Jibrin onward to al-Khalil/Hebron, (Khirbat al-Karmel); from whence it descended to 'En Gedi. At the Dead Sea it was possible to cross the 'Causeway of the Lisan' if the water was low, or to turn around the southern tip of the sea to Ghawr aṣ-Ṣāfī (Zoar or Zaghar). In Medieval times this settlement was a major center for the production of sugar cane at the mills of Ṭawāḥīn as-Sukkar[2]. It was also a centre for indigo.

At the request of Lot, Yahwa agreed to save this "little town" from destruction when he annihilated both Sodom and Ghomora (Genesis 19: 23-29). Lot and his two daughters were allowed to take refuge in a cave in the hills, perhaps that excavated and identified by Politis (1997: 341-350). Politis identified ancient Zoar at Khirbat ash-Shaykh 'Īsā (1998: 627-633). The sites of this area are represented on the Madaba mosaic map: the Church of Saint Lot is depicted above Zoar. Aia and Tharais are located to the left (Alliata and Piccirillo 1999: 61). The first site was identified with 'Ayy, south of Karak, (Canova, 1854: LX1V, following Eusibius' Onomasticon 10, 12). According to Miller (1991: 163-166), the ruins of Muḥayy on the junction of the *Via Nova* to the desert are better candidates to the site of Aia. However this site, well-known for its remarkable Byzantine structures and cemeteries, is far from the route from Zoar to Karak.

Tharais is more difficult to locate: Alt (1937) placed it at Khirbat at-Tara'īn, southwest of Karak, but according to Canova, (1954: LX1V) there are

[2] Politis suggests that the Arabic name of sukkar was derived from the name *Zoar-Zaghar* (1998: 630), but this is not certain because the village has this name in the Old Testament (Genesis 19: 20).

no Byzantine remains on this site. Germer-Durand (1895) identified it with Dhāt Rās on the northern edge of Wādī al-Ḥasā. Several Nabataean to Byzantine monuments are known in this village. Students of Mu'tah University found a mosaic floor, damaged by vandals that did not belong to a church (H. Mahasneh *pers. comm.*).[3] In 1979 S. Mittmann explored the road from Zoar to Karak (FIG. 2). By careful surveying of the area he successfully identified the site of Lu'ith in the Nabataean inscription of Mādabā, dated to the 46th year of Aretas IV — equivalent to 37AD. The inscription was an epitaph of two persons named 'Ytybl/Aytibel, a grandfather and grandson buried in Madaba; the grandson was the military commander at Luḥitu and 'Abrata. Mittmann identified the camp of Luḥitu with Kathrabba, southwest of Karak (Mittmann 1982: 175-180). He located a 5.70m wide Roman road and noted: "nowhere in Palestine has a Roman road been so well preserved (1982: 178). A Nabataean military camp was discovered in the vicinity of Kathrabba. A Nabataean horned basalt capital, together with a column drum and base, found in a courtyard of the east border of the terrace are good evidence of Nabataean occupation (Mittmann 1982: 180). Mittmann noted that the "road was apparently unpaved", but the rock-bed was exposed and smoothed "under the thin layer of earth" (Ben-David 2003: 179). Recently, however, C. Ben-David (2003: pl. 11) photographed a long segment of the road from Kathrabba to the Dead Sea. Ben-David identifies Tharais of the Madaba mosaic map with the ruins of Madinat al-Ras, overlooking the Roman road to Ghawr aṣ-Ṣāfī (Zoar) (Ben-David 2003: 255-56). This site includes a group of buildings "some built of dressed stones, with a large water cistern" (Ben-David 2003: 255). Young 'Aytybel was the commander (*strategos*) of both Luḥitu and 'Abrata. 'Abrata means a ford' or causeway. It was not identified by Mittmann and probably corresponds to the Lisan passage on the Dead Sea (see FIG. 2).

From Karak to Ḥisbān

This route follows the King's Highway via Rabba/Areopolison to Qaṣr ar-Rabba/Bayt Karm and traverses the Wādī al-Mūjib/Arnon, a dreadful and dangerous canyon according to Eusibius: "*horribilem* et *pericolosum*" (Onomasticon, 11, 15). This arduous road was first paved by King Mesha' of Moab, according to line 26 on his famous stele (Lemaire 1986: 121). It was re-paved under Trajan by the governor of the Provincia Arabia, between 111-114AD, and was protected by forts and military camps. A large camp overlooks the southern rim of the valley. On the same southern slope a small station was reported by Miller (1979: 84). The segment between Aila and Mādabā was terminated in 111-112AD. A segment of the east-west paved street was exposed in the Madaba Archaeological Park. It is laid with large flagstones and was coated in the Byzantine/Umayyad periods with beaten earth (Bikai 1996: 29-30). On both sides of the street several churches were excavated, the latest being the church of Virgin Mary 667AD (Piccrillo 1998: 41-66). The circular nave of the church was partly built over the Hall of Hippolytus and Phaedra mosaic. This type of mythological mosaic was a common expression of the Byzantine elites, known in Greek as the "*Paideia*".

Two roads led to Ḥisbān in the Roman/Byzantine period: the *Via Nova Triana* and the Jordan Valley Road to Livias/Tall ar-Rāma, Jericho and Jerusalem. This was the route taken by the Christian Pilgrim Eegeria at the end of the fourth century AD (Alliata 1999: 121-124). After Livias, it climbs to Wādī Ḥisbān and halts at the large camp of Khirbat al-Maḥaṭṭa (Ibach 1994: 65-79). Near that site, a substantial segment of the paved road, about half a kilometer, was rediscovered by a team of the Andrews University; its width averaged 4.90 to 5.80m (Ibach 1994: 70). It was well known that Ḥisbān was the administrative center of the Balqā' in the Ayyubid-Mamluk periods and the residence of the governor.[4] Contacts with Karak via the *Via Nova,* and with Gaza via the Jordan Valley Road were continuous in the Medieval period.

From Ḥisbān to Burj al-Abyaḍ, al-Badiyya and 'Ajlūn

In his exploration of the as-Salṭ region, de Vaux (1967: 147-149) identified the ruins of ad-Dayr (on the track from 'Ammān to al-Fuḥayṣ and as-Salṭ), with the Mamluk station of Burj al-Abyaḍ. This rounded tower, which was constructed with roughly dressed huge blocks, is about 10m in diameter

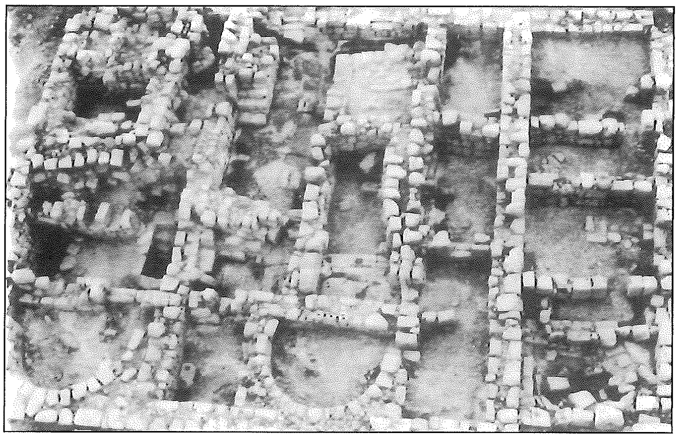
[3] The late Tayseer 'Attiyyat reported this floor in the local newspapers.

[4] The governor's administrative headquarters was excavated and a complete bath complex was exposed (De Vries 1986: 223-235).

6. Burj al-Abyaḍ/ ad-Dayr from the east.

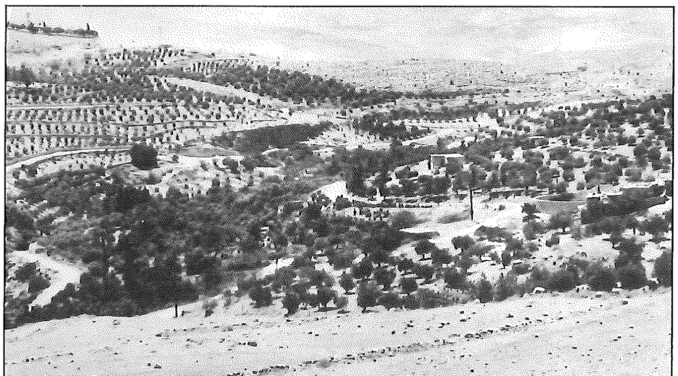
7. Burj al-Abyaḍ/ ad-Dayr from inside, notice the apse looking west.

(FIGS. 6, 7). The tower was excavated by Sa'ad al-Hadidi and Yazid 'Aliyyan (2002: 50-51). From the main gate one moves into a circular space divided in two — in the eastern half an apse for a church was added (FIG. 7). A wine press was carved in an open rock surface to the north. Several heaps of Iron slag can be observed around the tower and prove that weapons were produced in this station. The Iron ore was imported, most probably from Maghārat al-Warda in the 'Ajlūn hills. To reach the mine the road passed via al-Fuḥayṣ, al-Yazīdiyya, az-Za'tari, then to Maghārat al-Warda. From this Iron mine, the track passed via al-Badiyya at 15km from the modern road to 'Ajlūn/'Anjara. The ruins opposite the village of Ballāṣ, cover an area of 150 by 50m (Mittman 1970: 84, 'el-Bediye'). At the northern entrance of the site a rectangular structure might have been a control post. The archaeological remains include 3 churches, side by side (FIG. 8), and a mosque (Shamayleh 2002: 24-33). The 3 churches were paved with coloured mosaic tiles, and were re-used in the Islamic period as dwellings with the addition of inner walls. A cave, which is accessible from the nave of one churches, functioned as a wine press, dating to the late Roman and early Byzantine periods. (Shamayleh 2002: 29-30). A tower on the eastern hill was built with huge dressed blocks of 1.75 by 1m, and arranged in the header-stretcher technique, a building system well known in the Hellenistic and Roman periods (Shamayleh 2002: 17). This station was formed a stopping point between Burj al-Abyaḍ, 'Ajlūn, the Jordan Valley, by way of Wādī Rājil and from there to Jericho, Jerusalem and Gaza.



8. Al-Badiyya three churches, looking east, after (al-Muheisen 2002).

In his description of the road system Khalil adh-Dhāhirī, 1425AD, recorded the following stations from Ḥisbān to Damascus: al-Burj al-Abyaḍ, al-Baradiyya, and al-Qunayya. Al-Baradiyya was not identified by de Vaux (1967: 149). It might be a corruption of al-Badiyya. As for al-Qunayya, de Vaux confused it with another site, although it is a major station with abundant springs and a water mill (FIGS. 9, 10); it lies between Zarqā'-Sukhna and the Jarash crossroad at exactly 23km from al-Qunayya. This was, in fact, a detour on the direct



9. Al-Qunayya village (general view).

10. Al-Qunayya water mill.

road to Damascus, but it was a good station because of the springs and the rich pasture land. The modern village on the eastern hill preserves some Ottoman old houses.

General Conclusions

The network of roads between Gaza, Egypt Arabia and Syria was complex and confusing when looked at without the help of maps. In this short contribution it is possible to present 3 maps. Nevertheless, the writer was fortunate to have been able to experience most of these routes, either by caravans or by car, except for those in the northern part of Palestine near Tiberias and Nazareth. To summarise: this road system highlights the crucial position of Gaza, on the crossroad of several civilizations. The communication line with Egypt was the most vital and natural for the Gaza strip since the Pharoahs. For Arabia, the Petra-Gaza road was the best outlet. However, this caravan road was disturbed by the Thamudic tribes during the Mid-first century AD (Graf, after Negev 1978: 6). This argument is based on a misreading of the name "'Aya' in a Nabataean inscription of the Sinai (*cf.* Zayadine 2000: 78). On the other hand, "'Ilāf Quraysh" can be considered historical and real because Surat Quraysh 106 and al-Fīl 105 are one unit and refer to a historical event, the expedition of Abraha in 570AD. Furthermore, Gaza is known today as "Ghazzat Hāshim" in memory of the ancestor of the Prophet Muhammad who died in this city. When the Muslims fought their earlier battles against the Byzantine troops in 634AD at Datin or Tadoune, near Gaza (Hitti 1982: 148; Sadeq 2000: 78), they occupied the city peacefully in 637AD, as a testimony of the high esteem Muslims had for it. This non-violent conquest of Gaza is in striking contrast with the cruel and destructive siege of Alexander the Great of 331BC.

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Observations on the Byzantine Church at Jabal Hārūn near Petra, Jordan

The Finnish Jabal Hārūn Project (FJHP) is an interdisciplinary investigation of Jabal an-Nabī Hārūn (the mountain of the Prophet Aaron), ca. 5km SW of Petra in southern Jordan[1]. Launched in 1997 with Prof. Jaakko Frösén as its director, the FJHP is sponsored by the Academy of Finland and the University of Helsinki. The Mountain of Aaron is particularly important in the social and religious history of the Near East. According to the Jewish, Christian and Muslim traditions, the mountain is considered to be the place of burial of Moses' brother Aaron. The peak of the mountain is occupied by the 14th century Muslim shrine (*weli*) with a sarcophagus believed to contain Aaron's remains. However, it is the extensive, ruined architectural complex located at ca 1270m asl, on a plateau of the mountain, ca 70m below and ca 150m to the west of the peak, which is the focus of the FJHP investigations. Byzantine historical sources related to Jabal Hārūn, while pointing to the sanctity of the mountain, are generally scarce. Several accounts concerning the monastic presence there are preserved from the Crusader period, but the information provided by the Petra Papyri, discovered in 1993, is the most relevant here. Papyrus Petra inv. 6 (Papyrus Petra Daniel C. and Nancy E. Gamber) dated to June 15, AD 573, mentions "the House of our Lord the Saint High-Priest Aaron" outside of the city of Petra (Frösén and Fiema 1994: 1-3).

The combination of this information with the religious tradition associated with Jabal Hārūn, and the results of the early exploration in the area, strongly suggested that the architectural remains on the high plateau, which were otherwise recognized as remains of a monastic complex (Peterman and Schick 1996), could indeed be identified as the Monastery of Saint Aaron. However, the ultimate confirmation of this hypothesis came through the archaeological excavations of the ruined complex. During the past six fieldwork seasons (1998-2003), a large basilican church and a chapel, and some auxiliary structures and rooms were exposed (FIG. 1). The research on the data and finds provided by the fieldwork indicates that the complex, in addition to its monastic function, had most probably also served as a pilgrimage center dedicated to the veneration of St. Aaron. This monastic-pilgrimage center appears to have existed between the later 5th and the 8th century AD, if not later[2].

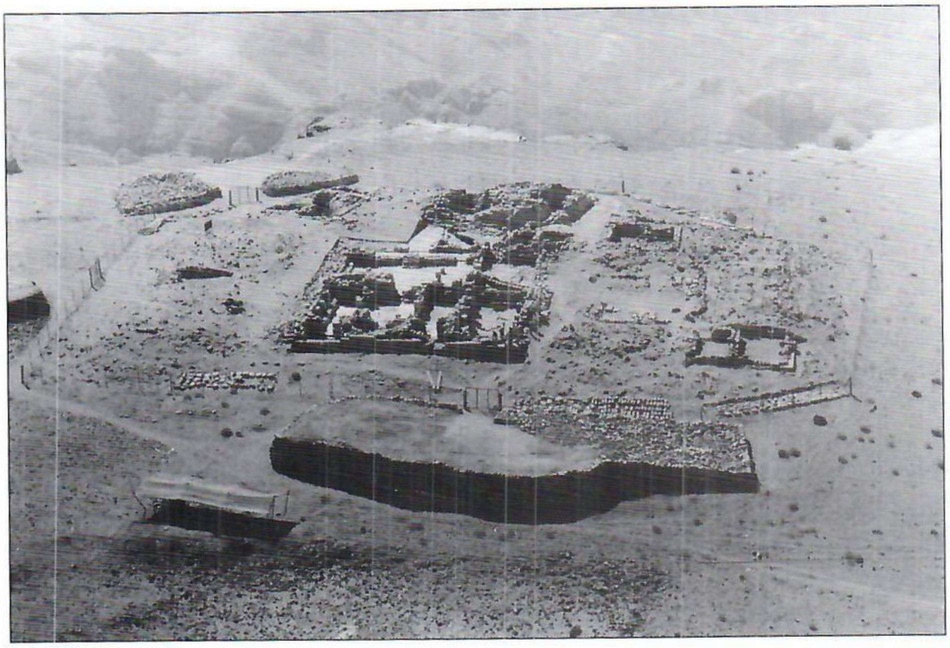
Analysis

The site, which measures ca 62m N-S x 48m E-W, is an irregular quadrangle the extent of which is marked by the back walls of the structures. The central location is occupied by the church and a chapel that face an irregular court with a rock-cut cistern on the western side, and series of rooms surrounding a courtyard on the northern side. This northern part of the complex most probably served as a pilgrims' hostel. The southern side of the complex consists of, as yet unexcavated, rooms and spaces which seem to have flanked the main entrance to the monastery. The western side of the monastery is occupied by the large multi-roomed structure which seems to date to the Nabataean-Roman periods, and which was apparently later incorporated into the monastery.

The relative chronology of particular structures

1 The research on the subject of this article has been carried out within the framework of the Research Center "Ancient and Medieval Greek Documents, Archives and Libraries" at the University of Helsinki, which is part of the "Centres of Excellence in Research" program of the Academy of Finland.

2 For the results, see the yearly reports: J. Frösén *et al.* 1998, 1999, 2000, 2001a, 2001b, 2002 and 2003. Other major publications include Frösén and Fiema 2002, and Fiema 2003.



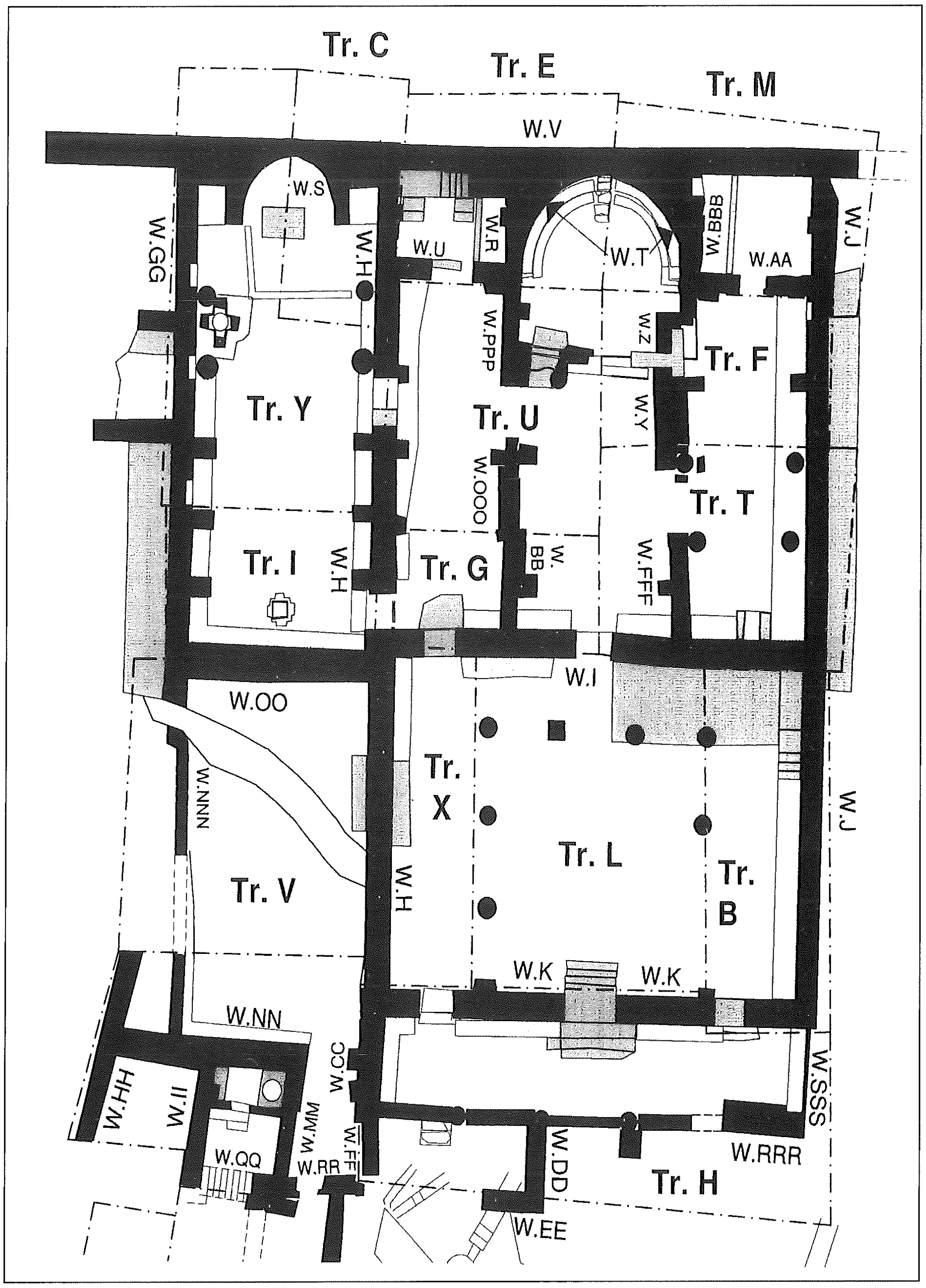
1. The view of the monastic site from the summit of Jabal Hārūn, looking west (photo by M. Mustonen).

at the site is well established, and significant chronological indicators (ceramics, lamps, and glass) were found in well-stratified deposits. However, the overall chronological sequence is currently available only for the church and the chapel which form one, relatively self-contained unit (FIG. 2). Altogether 14 phases of occupation interspersed with destruction episodes have been recognized in the history of the church and the chapel. However, to simplify the presentation, only the four major phases are described here. It is clear that a better understanding of the history and phases of the existence of the Jabal Hārūn church will largely depend on the architectural, decorative and structural parallels. As such, whenever appropriate, comparison is made here with the Byzantine church of the Virgin Mary at Petra, excavated by the American Center of Oriental Research in 1992-97 (Fiema *et al.* 2001). That church seems to be the closest parallel to the monastic church at Jabal Hārūn.

Phase I (later 5th-early 6th centuries AD)

The early church was a tripartite, monoapsidal basilica, internally measuring ca. 22.6m (max.) x 13.6m, with seven columns in each of the two rows. Compared with the size of the Petra church, dated to the later 5th century AD, which is internally ca. 23.21m. long and ca. 15.35m. wide, the Jabal Hārūn church is of similar dimensions. Therefore, the ratio of the inner length to inner width, being 3 : 2 for the Petra church, is also comparable for the Jabal Hārūn church. This length to width ratio is typical of earlier churches in Palestine (4th-5th century), characterized by long and narrow aisles (Crowfoot 1941: 54, 61; Smith and Day 1989: 84). The later 5th century date for the Jabal Hārūn church is also supported by the ceramic material, not later than the mid-5th century, recovered from the inner fill of the main walls of the church. The apse, ca. 5.2m long at the chord, was flanked by two pastophoria, similar to those of the Petra church in its early phase (IV). The marble floor was laid throughout the church (FIG. 3). The early, marble-clad, rectangular bema was fully contained within the nave, as in the Petra church. The apse had a two-tiered synthronon installation that shows affinities with the five-tiered synthronon of the Petra church. The clearly preserved remains of the bishop's throne in the Jabal Hārūn church were accessed by the steps centrally superimposed on the synthronon tiers. However, while the Jabal Hārūn synthronon is clearly an original installation, and not added later, as in the Petra church, the throne appears to have been added later (*infra*). The one-to-three tier synthronon types are generally better attested before the 6th century - an observation which also supports the 5th century date for the Jabal Hārūn church.

Apparently, the chapel was built at the same time as the early church, and they shared a wall between them. The eastern end featured an apse flanked on both sides by high cupboards or cabinets with three shelves each. The extant appearance of this area of the chapel seems to be associated with the succeeding phases. Only the remains of the marble floor and



2. The plan of the church and the chapel at Jabal Hārūn (by K. Koistinen and V. Putkonen).

fragments of wall plaster still attached to the lower parts of the apse's wall, all found in the sounding in the apse, can be safely associated with the early phase. In the western part of the chapel, a cruciform baptismal font with the masonry-built upper part was installed. The font belongs to the cruciform type which was usually masonry-built and generally earlier in date than the monolithic fonts (Ben-Pechat 1989: 173-4; 1990: 510; Piccirillo 1985a: 355). A close parallel is the large, canopied cruciform font in the baptistery of the Petra church, dated to the later 5th century AD. Cruciform fonts were popular in southern Palestine and especially in the Negev, e.g., in the East Church at Mampsis, the North Church at Oboda/'Avdat, and the North and South Churches at Sobata/Shivta; the first two were masonry-built (Ben-Pechat 1989, note 10; Rosenthal-Heginbottom 1982: 174-200).

Phase II (later 6th century AD)

A disaster, probably of a seismic nature, ended the Phase I occupation in the entire complex. The church was restored but also subdivided by a wall into the eastern and the western parts. The former, internally ca. 13m (max.) long, retained its ecclesiastical function but most of the columns were removed. Only two columns were retained (representing each initial row of columns in Phase I).

3. The marble pavement in the church (photo by J. Vihonen).

These were now carrying long (ca. 4.5m) E-W arches supporting the roof of the reduced-in-length church. Although the bema must have lost most of its marble furnishing, it seems that its form was largely retained. Inside the apse, a *thronos* was inserted in the middle of the synthronon.

The western part of the original church, ca. 9m long, was turned into an open court (atrium) with two original E-W rows of columns supplemented by the eastern row running N-S. As no evidence for a western row of columns has been detected, the atrium must have had two porticoes located opposite each other, and probably one on the eastern side. Presumably, the old marble floor was initially in use. But later, that floor was partially removed and replaced by the new (extant) floor which consisted of irregular sandstone slabs supplemented by broken marble pieces. This floor, laid out ca. 0.2-0.25m above the level of the marble floor, is markedly sloping westward to facilitate the channeling of rainwater out of the atrium, and toward the cistern. Also in this phase, a formal narthex was erected - an enclosed porch with a portico of four columns in the front - which now preceded the atrium. The mosaic floor in the porch featured an almost symmetrical arrangement of designs on both sides of the central door to the atrium, including armed humans hunting wild animals. Such scenes are common in the mosaics of the 6th century, e.g., the mosaics at the Hippolytus Hall (Piccirillo 1993: 23-24, 58-59; 6th century), or at the Old Diakonikon-Baptistery in the Memorial of Moses on Mt. Nebo (Piccirillo 1993: 135, 146; AD 530). The central medallion of the Jabal Hārūn mosaic - a complex geometric design of interlacing squares and ribbons - is strikingly similar to the central panel of the narthex mosaic in the church at Gharandal, tentatively dated to the 6th century (Ricklefs 1997: 501-3). However, except for the bordering chevron pattern, the geometric design in the center, and the occasional fragments of human or animal bodies, the designs are not preserved since the mosaic was heavily altered by later, iconoclastic activities.

Some changes also occurred in the chapel. The original western wall of the chapel seems to have suffered a destruction. A new wall was constructed further east, reducing the length of the chapel by ca. 3m. It seems that the baptismal font was still functional during this phase. A new marble floor was laid out in the apse and in the area of a new transversal bema located in front of it. The altar table was probably still a portable, or so-called "four-legged" installation.

Phase III (7th century AD?)

The following major phase of existence also seems to have followed a disaster. Resulting changes were major; in the church they included the functional replacement of the columns (although still retaining them *in situ*) as structural supports by free-standing pillars supporting E-W arches. Simultaneously, N-S arches, supported by the pilasters, spanned the spaces of the nave and side aisles. The bema itself was raised and laterally enclosed by two "counter-like" low walls, somewhat similar to those in the Petra church in Phase V, or in the sanctuary of the monastic church at Dayr 'Ayn 'Abāṭa (Fiema 2001: 57-8; Politis 1993: 507, Fig. 6). On the left (northern) side of the bema, a stepped and plastered structure was constructed, fully integrated with the wall enclosing the bema. This structure must have supported the ambo.

During the same phase, the early baptismal font in the western part of the chapel was abandoned and backfilled. A new, also cruciform and masonry-built font was erected at the left (northern) side of the bema (FIG. 4). The font is well preserved and it also includes an integrated container between two of the arms of the cross. On the bema, a large altar

4. The cruciform baptismal font uncovered in the chapel in 2003 (photo by M. Mustonen).

masonry base or pedestal was erected (FIG. 5). The structure is hollow inside, with a small compartment with the opening towards the apse. The marble fragment of an inscription, which reads ΑΡΩΝ, was found in front of the pedestal. The fragment could have belonged to an edge of an altar table placed on top of the pedestal. The small compartment inside the masonry pedestal might have served as a depository of reliquaries which would be easily accessible and available for display on various occasions. Although in this particular case, the reliquary would not be located in a shaft or fosse under the structure of the altar on the bema, as for example at Umm ar Raṣāṣ (Alliata 1994: 312-14; Michel 1994: 117, 119, note 15), but rather under the altar table, such cases are also known (Michel 1998: 394). The appearance of the fixed altar (as opposed to portable or four-legged installations) in Phase III is also consistent with the chronological observations. The fixed altars appear relatively late, i.e., after the 6th century and generally later (Duval 1994: 170, 203).

Phase IV (8th century AD and later?)

The changes related to this phase might have originated in response to another destruction. It is also possible, however, that these were simple but solid measures to further reinforce the structure of the church against potential earthquakes. Accordingly, the spaces between the free-standing pillars were walled up and pilasters built (or rebuilt) against these pillars and against the main northern and

5. The interior of the chapel. The masonry pedestal for an altar is in the center back (photo by M. Mustonen).

southern walls of the church. In the southern aisle, two columns were used instead of the pilasters. Secondary walls built directly on the pavements of the northern pastophorion and in the area in front of the narthex may belong to this or later phases. Notably, such barriers and partitions are well known from other Palestinian churches in the Umayyad period, and dated to the mid-7th-mid-8th centuries AD For example, to such belong the Church of St. Mary at Riḥāb and the Upper Church at Quwaysma (Piccirillo 1984: 338) or the Church of St John the Baptist (#95) at Khirbat as-Samrā' (Humbert and Desreumaux 1990: 261).

Probably during that period (or earlier), the damage had been inflicted upon the mosaic floor. The iconoclasts had removed not only almost all tesserae forming faces but also main parts of human and animal bodies, and replaced them with plain large-size tesserae, in the manner of a careful obliteration rather than a wanton destruction. This damage relates to the images of animals and ordinary people, in opposition to the 8th century Byzantine iconoclasm that specifically targeted sacred images. This kind of deliberate damage, which nevertheless preserves the mosaic in its entirety, is generally dated to the 8th century (late Umayyad-early Abbasid period), and is known from other churches in Jordan and Palestine as well as from the Jewish synagogues in the region (Piccirillo 1993: 42). Particularly notable and deliberate, but not complete damage, can be observed at the Church of the Lions in Umm ar-Raṣāṣ (Piccirillo 1993: 221). The evidence of careful mosaic obliteration, as at Jabal Hārūn, should indicate that in the 8th century the church would have been still functioning in an ecclesiastical capacity.

Later Phases

Possibly, some parts of the entire structure still retained their ecclesiastical function during the later phases of the complex's existence. But the structural integrity of the building is not fully supported as the apse's semidome seems to have collapsed by then, if not earlier. The evidence of the collection of marble fragments, glass and stone tesserae, and glass sherds is noteworthy. Dumps or collection points of such material have been found in the south pastophorion, in the ruined apse of the church, in the cupboards in the chapel, in various places in the atrium, and in other places in the excavated parts of the complex. Some spaces within the church and the atrium were temporarily or casually occupied during later periods, a fact exemplified by ashy spots, fireplaces and the abundance of bones (primarily fish) in strata above the original marble floor. Finally, substantial stone tumbles, either reflecting natural decay and deterioration of structural parts or subsequent seismic-related destructions, definitely terminated the occupation in the church area.

Comparative Observations

On the basis of his work in central Jordan, M. Piccirillo has distinguished two main periods of ecclesiastical building activities. In the 5th - beginning of the 6th century, the construction concentrated on fulfilling the practical liturgical purposes. In the second half of the 6th century, new luxurious building projects and the beautification of older churches seem to have taken place (Piccirillo 1985b: 261). Chronologically, these two periods would roughly correspond to Phases IV-VI at the Petra church, and Phases I and II of the monastic church at Jabal Hārūn.

The comparisons between the Petra church and the Jabal Hārūn church are not only based on purely chronological distinction, superficial observations, and the geographical proximity of both places. There are some striking similarities between both churches which do not seem to be accidental. The dimensions of both churches, the manner of construction and initial decoration are largely comparable, which may imply the involvement of the same team of architects and builders. Perhaps this hypothesis may also explain the initial monoapsidal form of both churches and the cruciform baptismal fonts. Even in the later phases of existence (Phases VII, IX of the Petra church and later phases at Jabal Hārūn), when the ecclesiastical function of both edifices was considerably reduced or poorly attested, certain cultural phenomena are equally attested. These include the construction of simple, partitioning walls, or the evidence for collection of still useful material (mosaic tesserae, glass).

There, however, the comparisons end and some substantial differences occur in the history of both churches. The most important seems to be the overall function. While the Church of the Virgin Mary at Petra might have been a metropolitan church of *Palaestina Tertia*, the church at Jabal Hārūn must have retained its monastic-pilgrimage function until the end of its active existence. The difference in the time-span of the ecclesiastical existence is also considerable. The Petra church may not have survived long beyond the end of the 6th century due to the disastrous fire and the subsequent ecclesiastical abandonment. As such, the early 8th century iconoclasm did not leave its destructive mark on the superb floor mosaics of that church. On the other hand, the Jabal Hārūn church appears to have continued long after the end of the 6th century, albeit in a gradually reduced and seemingly impoverished form.

Important in comparative terms is the transition between Phases IV and V of the Petra church and Phases I and II of the church at Jabal Hārūn, which probably may be assigned to the early through later 6th century AD. There is no evidence for a destruction of the early church (Phase IV) at Petra. Reflecting on the two periods distinguished by M. Piccirillo (*supra*), the Church of the Virgin Mary indeed experienced a considerable spatial expansion, architectural re-definition, and it benefited from a sumptuous, although often careless and somewhat haphazard redecoration program. On the other hand, the Church of St. Aaron experienced a destruction at the end of Phase I. While the function of the church and the chapel was possibly somewhat redefined, the reconstruction resulted in a substantial contraction of the church's size (and of the chapel) and only a modest, pragmatic redecoration, primarily exemplified by the mosaic floor in the narthex.

At any rate, both churches experienced substantial remodelling at the beginning of Phases V (Petra church) and II and III (Jabal Hārūn church), whether or not prompted by a prior destruction. But the Petra church was transformed into a triapsidal church while the Jabal Hārūn church retained its original form. The transformation from mono- to triapsidal form, i.e., the installation of apses in places formerly occupied by the pastophoria, is generally dated to the early through mid-6th century. On the basis of the examples from the Negev, that change is said to have been linked to the re-emphasis on the cult of Martyrs and Saints (Margalit 1990), and the associated liturgical changes (such as the introduction of the rite of the Great Procession and Prothesis) which affected the overall architectural arrangements and the location of the reliquaries (Negev 1989; Margalit 1989; Duval 1994; Tsafrir 1988: 47-49). An alternative view concentrates on the variations in the organization of the sanctuaries and in the deposition of the relics in triapsidal churches, and the resulting difficulty in associating an architectural form—mono-or triapsidal—with particulars of the specific cult and liturgical requirements (Rosenthal-Heginbottom 1982: 223-30, 233). It is certainly necessary, however, to distinguish between churches that were initially monoapsidal and underwent the transformation, and the new tripasidal churches which feature substantially changed, square-like proportions (wider but shorter) and which first appear in the later 6th century.

In this context, it is worthwhile to review the changes in the form and function of the Jabal Hārūn church and the chapel in Phase II, followed by further structural changes (support system) in Phase III. Wall I divides the original church into the western part (atrium) and the eastern part, the latter being a wide but shorter church proper. Initially, it was thought that this reduction in size, associated with the non-transformation into the triapsidal form, was specifically related to the lack of proper financing for the total rebuilding of the church, i.e., the execution of some kind of inexpensive reconstruction design. This argument is still at least partially tenable. After all, the Phase II church at Jabal Hārūn is not only smaller in size but also seemingly deprived of much of its marble furninshing. Destroyed or damaged marble chancel screens and posts were apparently not replaced, while their broken fragments were used as a fill in Wall I, or as replacements in the damaged marble floor. Overall, the Phase II church does not impress with wealthy furnishing and decoration, as does the Petra church in Phase V. However, the appearance of the Jabal Hārūn church in Phase II, somewhat simplified and depleted of costly marble decoration, should not entirely relate to a substantial impoverishment of the monastic community.

Attention should again be directed to the re-emphasis on the cult of Saints and Martyrs, evidenced in the 6th century. The installation of the new bema in front of the apse of the chapel at Jabal Hārūn in Phase II, and the construction of a large masonry-built altar pedestal in Phase III, seem to indicate a redefinition of the function of the chapel. Perhaps that redefinition remained in relation to a church or a chapel on the summit of Jabal Hārūn, recorded by Wiegand at the beginning of the 20th century (Wiegand 1920: 136-45), but no longer surviving (FIG. 6). It is not possible to establish its construction

6. Broken marble furnishing located near the summit of Jabal Hārūn; probably originating from a church explored by Wiegand (photo by M. Mustonen).

date. However, equally nothing prevents that upper church from being considered coexistent with the early monastery. If the upper church originally housed important relics, such as Aaron's, its possible damage or destruction at the end of Phase I or Phase II could have caused the translation of the relics down to the rebuilt chapel of the monastery. The substantial altar pedestal, empty inside, would best accommodate relics. As such, the chapel, at least in Phase III (if not earlier), would have become a memorial chapel. Notably, the construction of the new baptismal font in Phase III indicates that the baptismal function and practices there were not abandoned altogether. Rather, by their proximity to the bema and the altar, they seem to become even more liturgically interrelated.

Therefore, such changes would have made it unnecessary to transform the Jabal Hārūn church into a triapsidal edifice. The cult at Jabal Hārūn was overwhelmingly oriented around Aaron. If his relics were now housed in a chapel, which was an integral part of the ecclesiastical building of the monastery, that made the church a memorial edifice as well, without a compelling need to display or venerate any other holy relics in there. The potential presence of other relics in the ecclesiatical complex at Jabal Hārūn cannot be totally excluded either but there would have been no liturgical need to transform the church's pastophoria into side apses to accommodate such relics. Thus the northern pastophorion had retained its original function also in Phase II (and later), probably as a sacristy.

However, some less understood changes occurred in the southern pastophorion. An enigmatic installation there, which appears as an underground crypt or storage, should date to Phase II, but its function is unclear. Notably, during the 2000 season, small fragments of monochrome (red on white) painted plaster with Greek writing were found adjacent to the walls in this room. The Greek letters revealed a fragment of Psalm 91 (no. 90 in the Septuagint)[3]. The text may allegorically refer to the famous plague of the Justinianic period, which began in AD 541–2, and affected large areas of the Near East and Europe. Although there are no extant sources indicating the occurrence of the plague in Petra, it is possible that during that time someone quoted the psalm, writing it as a prayer on the wall inside the church, perhaps seeking a measure of comfort in its pronouncements. On the other hand, a less dramatic explanation would relate the text to the new function of the pastophorion, perhaps that of a funerary chapel for the inhabitants of the monastery. In such case, the installation in the southern

[3] Psalm 91: 4–7
"He will cover you with his feathers, and under his wings you will find refuge; his faithfulness will be your shield and rampart.
You will not fear the terror of night, nor the arrow that flies by day, nor the pestilence that stalks in the darkness, nor the plague that destroys at midday. A thousand may fall at your side, ten thousand at your right hand, but it will not come near you". For detailed description see J. Frösén 2002 in Frösén and Fiema 2002.

pastophorion may, perhaps, be interpreted as an ossuary.

Finally, returning to the partitioning of the church at the beginning of Phase II, this change does not need to be viewed as a reduction of the church in size, resulting solely from its destruction and the subsequent lack of funds for a proper reconstruction. In fact, by this partitioning, the church complex received a well-defined atrium that would better serve the needs of the pilgrims than the poorly defined Phase I courtyard located around the central cistern. Furthermore, the shorter, yet wide, church would better fulfill the architectural design related to the newly introduced rites of the Great Procession and Prothesis. In its form, the Jabal Hārūn church of Phase II much resembled new basilican churches built in the later 6th century, which, while featuring 3 apses, were also characterized by more square-like proportions.

The interpretive observations offered above necessarily remain preliminary hypotheses, and will probably remain so even after the end of the fieldwork. Nevertheless they offer some new insights into the history of the Jabal Hārūn church, while integrating this structure into a larger framework of the ecclesiastical architecture of the Byzantine East.

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Late Bronze Age Settlement Patterns North of the az-Zarqā' River

Introduction

In 2000 John Strange published an article discussing the Late Bronze Age in Northern Jordan in the light of the finds at Tall al-Fukhār. In this publication he contends that the northern part of Jordan was densely inhabited with people during the Late Bronze Ages. At the same time, he agrees with Nelson Glueck that the southern part of Jordan was only inhabited by nomads (Strange 2000: 476). Since Strange published his valuable article , more excavations have been conducted in the northern part of Jordan, especially in the vicinity of Irbid, e.g. Ya'amūn, Tall Juḥfiyya and Tall Zar'a in the Wādī al-'Arab. Moreover, several surveys and soundings have been recently conducted in the area of al-Mafraq producing Late Bronze Age sites such as Riḥāb (Husan 2002). In additon, new information from the area overlooking the eastern side of the Jordan Valley has been derived from the sites of Tall Abū al-Kharaz (Fischer 1999, 1997, 1996, 1995, 1994, 1993, in press) and Ṭabaqat Faḥl (Pella) (Bourke 1997). More tomb sites such as Qafqafā (Tall Jubayra) (Harahsheh: PC) and Saḥim (Fischer 1997) have been found in the north of Jordan and have to be added to the LB site list.

The writer's MA thesis (Kafafi 1977) discussed the Late Bronze Age Pottery from Jordan. Most of the LB materials included in this thesis were found in tombs rather than settlements such as at Quwayliba, Irbid and al-Ḥuṣn. The present paper aims at studying all the excavated and surveyed sites dated to the Late Bronze Ages and found in the area located to the north of the az-Zarqā' River.

All these excavated sites added more information to our knowledge about the settlement patterns in the north of Jordan during the LB periods.

Sites: Settings and Distribution

The most extensive exploration of Jordan was carried out by Nelson Glueck between 1930 and 1947. After studying his collected pottery he came to the conclusion that the area south of the River az-Zarqā' was basically nomadic during the period from ca. 1900 to 1300BC . After some modifications on his theory, he presents the idea as follows: "during most of the following MBII period and much of the LB period, both in the Jordan Valley and in Transjordan, there seems to have set in a sharp decline of permanent sedentary settlement accompanied by a lessening and a centralization of sedentary population at a comparatively few mixed and strongly fortified points. In north Gilead and in the Jordan Valley, this decline seems to have been taking place mainly between the 18th and the 15th centuries BC, while in the rest of Transjordan south of the Wādī az-Zarqā' it seems to have extended between the 20th and 13th centuries BC. Available evidence confirms these inductions" (Glueck 1951a: 423, 1951b).

Albright agreed with Glueck concerning the gap. He also argued that there was a rapidly declining population density during that period (Albright 1961: 82).

W.F. Albright carried out extensive work in the south of the Levant; he conducted soundings and expeditions in the area of Moab (Albright 1924: 2-12, 1934: 13-18) and mentioned collected pottery sherds from the al-Karak area that he dated to the end of the LB period (ca.1300BC) (Albright 1924: 11). Albright's work at the site Tall Bayt Mirsīm in Palestine is still considered standard, because the pottery came from well-stratified contexts. Actually, Glueck uses this as dating basis .

H. Franken argues that the conclusion drawn by Glueck is defective and misleading. He notes that Glueck based his conclusion on biblical data and his interpretation lacks both chronological and historical precision (Franken 1970: 7, 9). In additon, Franken argues that the pottery of the east side of the River Jordan can not be tied chronologically to the Palestinian repertoire, as Glueck does (Franken and Power 1971: 119, 123).

It has been noted that the decline in population, and density of the LB settlements, in the south of the Levant has been reflected in the results of many studies (Bienkowski 1989; Knapp 1992, 1989a, 1989b). Bienkowski argues that the main causes of this decline in the of the Levant were the diversion of resources to the Egyptian by the Canaanite city-states and the Egyptian control of international trade (Bienkowski 1986: 136-155). Knapp argues that the Egyptian conquest, and especially Thutmose's III administrative and military policy, was the reason for this collapse .

Since Glueck's explorations, a large number of archaeological surveys and excavations have been conducted all over Jordan (Palumbo 1994). As a result of this fieldwork, it may be concluded that the Glueck's theory is no longer acceptable. Also, a reliable description of the patterns of settlement during the LB period in Jordan has already been discussed (Strange 2001: 295-299). However, Strange (2000) approves Bienkowski's claim (1992) that Glueck's view still reflects the reality for the southern part of Jordan.

It ought to be mentioned that very little material from stratified excavations has been published from the LB Age except for preliminary reports. However, parts of the excavations conducted at the sites Ṭabaqat Faḥl (McNicoll *et al.* 1992, 1982), Tall as-Sa'īdiyya (Pritchard 1985, 1980), Dayr 'Allā (Franken 1992; Van der Kooij and Ibrahim 1989) and the Baq'a Valley (McGovern 1986) have been published in final form. The final report on the Middle and Late Bronze Ages of the town of Tall Abū al-Kharaz in the Jordan Valley is close at hand (Fischer in press).

In addition to the Jordan Valley talls, archaeological excavations have already been conducted at major LB sites located on the mountainous region of Jordan such as Tall Irbid (Lenzen 1992), 'Ammān Citadel (Dornemann 1983), Saḥāb (Ibrahim 1989) and recently at Ya'amūn (Najjar *et al.* 2001).

As a result of the surveys conducted in Jordan, it has been argued that there were some changes at the end of the Middle Bronze Age including a decrease in the number of settlements. The published registered sites by Palumbo's JADIS project indicate that the number of the LB sites registered from Jordan is 295 sites (this exceeds the number of the MB sites, 290, by five sites).

Palumbo cited 117 LB sites in the northern part of Jordan. TABLE 1 shows a list of 15 excavated sites to the north of the az-Zarqā River; 7 of them are dated to the LBI and were occupied from the MBIII period; 6 dated to the LBIIA; 10 to the LBI-IB and 11 considered to belong to the transitional period from the LBIIB to the Iron 1A.

In addition, it is agreed upon that the period ranging from ca. 1550 to 1200BC was a dry period (Sauer 1986; Rosen 1995). This relative drought is thought to have affected the marginal areas to the east and to the south most severely and caused a change in settlement patterns and an economic decline (Strange 2001: 293). Nevertheless, it should be stated that this assumption, the reduction in the number of settlement during the LB compared with the other periods, is perhaps due to the small number of excavated LB sites.

This paper is restricted to a discussion of the settlement patterns in the area located north of the az-Zarqā' Valley. Table 1 indicates that this area has been continuously occupied from the Middle Bronze through the Iron Ages.

Late Bronze Age I Settlement Patterns (ca.1550-1400BC)

Ten sites located to the north of the Wādī az-Zarqā' are excavated and produced archaeological material dated to the Late Bronze Age. Unfortunately the excavated layers and material do not help scholars to attribute them either to cities, towns, villages or hamlets. However, the situation is different at the site of Abū al-Kharaz which has been described as a Late Bronze Age "walled town" by the excavator (Fischer: in press). Fischer argues that "there are at present no clear or well-established criteria for the terms "city", "town", "village" etc. And even if we all agreed on a list of criteria which would then create an equivalent between a certain term and the nature of an occupied area, we cannot compare urban settlements in the Southern Levant with, for example, those in Syria or Mesopotamia, because there would be only one site in the Southern Levant (Hazor) which is comparable with the large urban centres in Syria and Mesopotamia" (Fischer: in press).

However, it may be deduced that the sites of Tall

TABLE 1. shows specific information about the main excavated LB site to the north of the az-Zarqā' River.

Site Name	MBIII	LBI	LBIIA	LBIIB	LBII/Iron 1
Dhahar al-Madīna	Chocolate-on-White	Chocolate-on-White		Pottery Settlement	
Dayr 'Allā	Pottery (Yahudiyyeh and Chocolate-on-White)	Pottery (Chocolate-on-White, bichrome)		Pottery Architecture Settlement	Temple, inscribed tablets, Tauwsert Cartouch, Pottery
Al-Ḥuṣn	Pottery	Pottery	Pottery	Pottery Tomb	Pottery
Irbid	Pottery	Pottery	Pottery (Tomb D)	Pottery (cultic objects) Architecture Settlement	Pottery
Jarash	Pottery (Chocolate-on-White; White Slip Ware)	Pottery: (Chocolate-on-White; White Slip Ware)			pottery, floor fragments
Al-Juḥfiyya				Pottery Architecture? Settlement	Pottery Architecture?
Katārat as-Samrā		Pottery (Tomb)	Pottery (Tomb)	Pottery Tomb	
Qafqafā				Pottery (Tomb), seal stamp (unpublished)	
Quwayliba		Pottery (Tombs 13 and 14)	Pottery (Tombs 13 and 14)		
Riḥāb	Pottery (Chocolate-on-White, Tall al-Yahudiyyeh)	Pottery (Chocolate-on-White, Tall al-Yahudiyyeh)		Pottery Architecture? Settlement Tomb	Pottery
Saham (tomb)		Pottery ?	Pottery (and other items)	Pottery (and other items)	Pottery (and other items)
Ṭabaqat Faḥl (Pella)	Pottery (Tombs 1,62,91,94, 95 Areas III and XXV	Pottery (Tombs 20, 21, 62, 91,94,95 Areas III and XXV	Pottery Architecture (Shelters)	East Cut: Area IIIN Architecture Settlement	East Cut: Area IIIN,Governor's Residence
Tall Abū al-Kharaz	Pottery (Chocolate-on-White, Jordan Valley Bichrome), domestic structures, city wall Phases IV/1 and 2	Pottery (Chocolate-on-White, Jordan Valley Bichrome, Cypriote White Slip) city wall, casemate systems, commercial complex (bakery), domestic structures Phases V and VI	Pottery, Cypriote White Slip II, City wall, casemate systems, domestic structures, temple (!), Phase VII	Beginning of period: Pottery, domestic structures, city wall, casemate system Phase VIII	?
Tall al-Fukhār	Pottery (Chocolate-on-White)	Pottery (Chocolate-on-White) and Cypriot White Slip II "milk bowl")	Pottery	Pottery (Mycenaean) Fortification and a Palace building? Settlement	Pottery
Tall as-Sa'īdiyya				Pottery (Mycenaean) Settlement Tombs	Governors Residence, Pit burials
Tall Zar'a				?	?
Ya'amūn	Tomb 1	Tomb 1			Architecture?

al-Fukhār and Tall Dayr 'Allā attest to the presence a very short gap of occupation before they were reoccupied during the LB period. For example at Tall Dayr 'Allā the excavators noticed the remains of a big fire that could have ended the MBIII occupation. At Tall al-Fukhār the excavator made no mention of any MBIII remains at the site. However, it has been claimed by the excavators of both sites that Chocolate-on-White pottery of the MBIII/LBI tradition has been encountered at both sites.

The site Tall al-Fukhār, situated on the eastern side of Wādī ash-Shallāla about 15km to the northeast of the city Irbid, was excavated by a Scandinavian expedition in 1990-1993 and yielded rich layers from the Late Bronze Age (Strange 2000: 477). The Late Bronze Age I archaeological remains consisted of pottery sherds and straight and circular walls were found on the middle part of the tall. In addition to the LBI remains, others dated to the EBI-III, MBIIA, LBII, LB/I1, I1a, I1b, I2c, and Hellenistic periods were found (Strange 1997). Unfortunately, the excavated LBI layers and materials at Tall al-Fukhār did not help the excavators to clearly establish the nature of settlement during this period. Apparently only LBIA Chocolate-on-White, and other pottery sherds assigned to the LBIB/LBIIA, were found [with other artifacts] in the debris of the destruction level of the LBII public building (Strange 1997: 402).

At Ṭabaqat Faḥl just below the surface of Area XXV, the excavators recognized a stratum dated to the MBIII and the LBIA. Actually, the excavated pottery from this deposit has been dated to the late 18th century and the 16th or 15th century BC. Remains of a poorly preserved domestic architecture with a mud brick floor were exposed during the early nineties excavations and no LBI *in situ* artifacts were excavated (McNicoll et al. 1992: 37). However, during the later seasons of excavations, several walls, a courtyard with thick reddish-yellow plaster floors, and rooms containing Chocolate-on-White decorated pottery pots belonging to the LBI have been registered (Bourke 1994).

In addition to Area XXV, several tombs excavated at Ṭabaqat Faḥl yielded material culture ascribed to the LBI period. This may help in explaining the nature of the settlement at the site during this period, which may have served as a town or a city.

The site of Tall Abū al-Kharaz was occupied during the Early Bronze Age IB (Phase I), Early Bronze Age II (Phases II and III) and after an occupational lacuna during the MB II/III (Phases IV/1 and 2).

Other LBI sites such as Dhahar al-Madīna, Riḥāb, Irbid and Tall Abū al-Kharaz showed continuation from the MBIII to the LBI. The excavations conducted at those sites produced considerable amounts of Chocolate-on-White pottery objects; the sites of Tall Irbid (Lenzen 1992; Lenzen *et al.* 1985: 153-155) and Abū al-Kharaz yielded other structural installations such as domestic structures, defensive systems and temples. For example, during the LBIA Irbid was defended by a basalt wall that was first built during the Middle Bronze Age and continued in use during the LBII.

The sites of Quwayliba, Irbid, Tall al-Ḥuṣn, and Katārat as-Samrā yielded LBIA, LBIB and LBIIA pottery pots excavated in tombs. The first three sites are located in the same natural region, while Katārat as-Samrā is located in the Jordan Valley, just 6km to the southwest of the site Tall Dayr 'Allā.

To sum up, the published information from the excavated LBI sites in north of the Wādī az-Zarqā' do not provide us with a clear idea about the nature of settlement during this period because the excavated area at these sites is extremely limited. In addition, only the excavator of the site Tall Abū al-Kharaz has stated how large the inhabited areas were during the LBI period (Fischer: in press).

However, we present below general remarks about the LBI settlement patterns:

1. The LBI sites were mostly located in areas overlooking wadis or/and very close to perennial water sources.
2. It may be estimated that they were small in area.
3. Only two types of settlements are recognizable:
   a. Small cities or towns such as Tall al-Fukhār, Tall Irbid, Ṭabaqat Faḥl, Abū al-Kharaz and Tall Dayr 'Allā.
   b. Tomb sites such as al-Ḥuṣn and Katārat as-Samrā.

Late Bronze Age II Settlement Patterns (ca. 1400-1200BC)

Scholars have identified two sub-periods within the LBII: LBIIA (ca. 1400-1300BC) and LBIIB (ca. 1300-1200BC).

New terms	Earlier terms	Kings	Dynasties
MB:			
MB III	(MB IIC)	Hyksos	15-17
LB:			
LB IA	LB IA	Ahmose–Thut. III (22)	18
LB IB	LB IB	Thut. III (23)_IV	18
LB IC	LB IIA	Amen. III–Haremhab	18
LB II	LB IIB	Ramses I–Tewosret	19
LB II	LB IIB	Setnakht–Ramses III	19/20

Below we present a study of each period:

LBIIA Settlement Patterns (ca. 1400-1300BC)
Seven excavated sites located in the north of the Wadi az-Zarqā' produced archaeological material belonging the LBIIA.

Unfortunately, there is insufficient information from LBIIA settlement sites from the northern part of Jordan. It may be argued that, first, the surveyors never separated the LBIIA from the LBIIB while studying and publishing their collected material and, second, in their studies archaeologists concentrate on the intermediate or transitional periods from the MBIII to the LBI and from the LBIIB to the Iron Ages.

However, the Egyptian literary sources from this period, such as the Amarna letters. point to the presence of City-States (e.g. Ṭabaqat Faḥl) in this part of the country. Unfortunately, the excavated archaeological remains from Ṭabaqat Faḥl, dated to the LBIIA period, do not give the impression of a large city. The architectural remains found belonging to this period consisted of only post-holes cut into the plaster, and stake-holes cut between them that may indicate the erection of shelters. In addition to Ṭabaqat Faḥl in the Jordan Valley, the site of Tall Abū al-Kharaz continued to be occupied during the period from the LBI to the LBIIA.

It seems that the LBIIA people in north of Jordan continued using the caves to burry their dead. Four of the eight excavated sites (Quwayliba, Irbid Camp, al-Ḥuṣn and Katārat as-Samrā) are tombs. It is only the Irbid Camp LBIB/LBIIA tomb that may be connected with the Tall Irbid settlement, while the status of the others is still unclear.

To sum up, our study has shown that, the published information about the LBIIA period is scant. This may be due to the change of settlement patterns or to the smaller number of excavated LBIIA sites in the north of Jordan. In other words, it may be argued that this period witnessed a decline in occupation in this part of the country. Only six LBIIA sites have been excavated in north of Jordan, namely, Quwayliba, Tall al-Fukhār, Irbid Camp, Tall al-Ḥuṣn, Abū al-Kharaz and Katārat as-Samrā. Four of them are tombs (cf. TABLE 1). Actually, this may contradict the Egyptian literary sources which stress the city-state system.

LBIIB Settlement Patterns (ca. 1300-1200BC)
During the thirteenth century BC, the northern part of Jordan witnessed an enormous increase in the number of settlements. Strange (2001: 297) argued that this may not necessarily reflect an increase in population, but may represent a spread of inhabitants from central sites to other ones. Large cities attributed to the LBIIB period such as Tall al-Fukhār, Tall Irbid, Ṭabaqat Faḥl, Ya'amūn, Tall Abū al-Kharaz (in the mountain ranges), Tall as-Sa'īdiyya, Tall Mazār and Tall Dayr 'Allā (in the Jordan Valley) and Riḥāb (in al-Mafraq area) have been registered. In addition, tomb sites such as Irbid Camp, Saḥm and Qafqafā were also found. Sites, which served as hamlets (e.g. Tall Juḥfiyya) were dated to the transition from the LBIIB to the Iron I, were also found. Private and communal buildings have been excavated at the city sites. For example a massive fortification and a large public structure containing imported pottery vessels and a scarab belonging to the nineteenth Dynasty in Egypt were encountered (Strange 1997: 402).

In addition, Irbid was a city during the period ranging from 1300 to 1150BC. This is evidenced by a temple building, a basalt city wall as well as major structures and tombs (Lenzen 1992, 1986; Lenzen *et al.* 1985; Dajani 1964).

The Jordan Valley LBIIB sites must be easily attributed to cities. For example, a temple and a Governor's residence were excavated in the East Cut: Area III N at Ṭabaqat Faḥl (Bourke 1997), the same could be reported from Tall as-Sa'īdiyya (Tubb *et al.* 1996; Kafafi 2003). In addition, a temple dated to the LBIIB containing a cartouche belonging to Queen Tawsert from the Twentieth Dynasty and imported Mycenaean pottery vessels have been excavated at the site of Tall Dayr 'Allā (Franken 1992).

Most, if not all, of the LBIIB sites excavated in the northern part of Jordan reflected a continuation of occupation through the beginning of the Iron Age periods. However, many of these sites, such as Juḥfiyya and Ya'amūn, have recently been excavated. Future excavations may provide us with more information about the settlement patterns from the period assigned to the LBIIB/Iron I. The excavators of Juḥfiyya argue that the site served as a hamlet during this period (Lamprichs and Al-Sa'ad 2003). It must be mentioned that this site had connection with other contemporaneous sites located in the same vicinity such as Tall al-Ushay'ir, Tall Bayt Yāfā and Tall Irbid (Lamprichs and Kafafi 2001).

In the al-Mafraq region, two tomb sites have been reported. The first one is published by Piccirillo (1976: 27-30) and dated to the transitional period LBIIB/Iron1. The second tomb has been recently excavated by Abdel Rahim Hazim (PC: Unpublished) from the Department of Antiquities and is still unpublished. However, the excavated archaeological material from the last tomb may be dated to the LBIIB period.

The excavator of Tall as-Sa'īdiyya noted that the LBIIB inhabitants of the site buried their dead either in pits or in jars. The pit burials consisted of a simple pit that was dug into the thick silt deposit overlying the Early Bronze Age context and sometimes lined-up with small stones or mud-bricks. The published objects found in the Tall as-Sa'īdiyya cemetery include imported Mycenaean pottery vessels, local pottery, jewelry, scarabs and seals (Tubb 1997, 1990, 1988; Tubb and Dorrell 1994, 1993, 1991; Tubb et al. 1996; Pritchard 1980).

Another type of burial, which was also uncovered at Tall as- Sa'īdiyya and dated to the LBIIB, is the structural tombs. These consist of chambers that were built by horizontally laid and bonded two parallel rows of mud-bricks. The excavator argues that the roof was corbelled (Tubb 1988: 60).

Tall as-Sa'īdiyya produced another type of burial, in which the dead person was put inside a large jar. Infants (including fetuses) and adults were buried inside those jars but in different ways. Infants or fetuses, which were wrapped in a piece of cloth, were put inside one single jar sealed with a bowl or the base of another jar sometimes with funerary objects such as jewellery pieces. Adults required double pithoi, i.e. two large jars joined shoulder-to-shoulder after the removal of the necks and sealing the junction with large pieces of another jar or with stones. The excavator of Tall as-Sa'īdiyya argues that this type of burial custom may be connected with the Sea People while the city was under Egyptian domination (Tubb 1997: 453).

Conclusion

After studying the results of the excavated and surveyed LB sites in Jordan, it should be concluded that two different types of settlements were practiced during this period. First, people dwelt in cities spread all over the Jordan Valley, e.g. Ṭabaqat Faḥl, Abū Al-Kharaz, Tall as-Sa'īdiyya and the mountain region such as at Tall Irbid, 'Ammān and Saḥāb. Second, Bedouins represented by the *Ap/biru* and the *Shasu* spread all over the al-Bādiya, especially in the southern part of Jordan. This claim agrees completely with what was proposed by Bienkowski and Strange. Literary sources stated that Thutmose II is known to have campaigned against the *Shasu* people. This name, that was found written in the documents of the Eighteenth and Nineteenth Dynasties, refers to the nomads of southern Syria, Palestine and Jordan (Weippert 1974).

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Production of Bronze Works in the Nabataean Kingdom

Literary Evidence

The sole literary source on bronze working in Nabataea is Strabo's statement (Geography 16, 4, 26). Here he lists copper as well as embossed (τόρευμα) and moulded products (πλάσμα as goods not produced in the Nabataean kingdom. The most recent events incorporated into Strabo's Geography took place around 24AD (Dueck 2000: 145-151; Engels 1999: 36-40), however it is not probable that all his information was up to date at the time of the final edition. It is not known how Strabo obtained his information for the above passage, but because earlier he mentions a visit of his friend, the philosopher Athenodoros of Tarsos, to Petra (16, 4, 21), it is generally assumed that he relied on the eyewitness report of Athenodoros for this information.

The voyage and therefore the situation described in the text may be cautiously dated between 60 and 10BC. In a moreositivistic approach, Phillipson suggested that the visit took place between 30 and 25BC as a reconnaissance trip for the expedition of Aelius Gallus (RE Suppl. V Athenodoros 50).

Copper Ore Deposits and Smelting Works in Nabataea

At first glance it may seem surprising that the Nabataeans needed to import copper because both sides of the Wādī 'Araba present some of the richest copper ore deposits in the Levant. This copper ore deposit had already been exploited during various periods since the Chalcolithic. Its three main districts are situated around Faynān, Wādī Abū Khushayba, south of Petra, and at Timnā' on the western border of the rift valley (Bender 1965; Hauptmann and Weisgerber 1987: 420).

Faynān, around 40 kilometres north of Petra, was intensively surveyed and studied by a team of the German Mining Museum at Bochum, as well as in further surveys (Hauptmann and Weisgerber 1987; McQuitty 1998: 1). The surveyors state it is by far the largest of these mining centres according to the size of the slag heaps there. While there is in fact no evidence for mining or smelting activities in the last centuries of the first millenium BC, some of the pottery and coins found at the immense slag heaps near Khirbat Faynān, where the ore from several mines in the vicinity was smelted, hint to a production of copper from the end of the first century AD onwards (Hauptmann *et al.* 1985: 169ff.).

The second area is located about 15 kilometres south of Petra around the Wādī Abū Khushayba. There, several copper mines have been surveyed by Kind in 1964 and by Lindner during the past decades (Kind 1965; Lindner 1986), but to date a more intensive study has not taken place. The mined ore seems to have been smelted at Ṣabrā, where larger amounts of slag have been reported. Especially noteworthy are the slag from the fill of the temple-terrace, which provide a terminus ante quem for the smelting (Lindner and Zeitler 1997/98: 552). It would be interesting to know more about this mining and smelting area, especially at what exact date during the Nabataean or Roman era the exploitation was reestablished. The reported surface finds indicate frequent sites from the first century AD onwards (Kind 1965: 64; Lindner 1986: 183-188; Lindner 1992: 267). The temple, which was obviously erected after some smelting activities had begun, was dated, on the basis of its architectural details, to the first half of the first century AD (Lindner and Zeitler 1997/98: 557f). Nevertheless, until more work is done in the field one should be cautious with precise dating. A constructed road leads from the mines to Ṣabrā and from there to Petra. It was built to carry wheeled transport and enters the city at the southeast, not far from the hillock az-Zanṭūr (Lindner 1986:137-140, 170-183). A second road comes up the Wādī Abū Khushayba, passes Jabal Hārūn, and presumably entered the city in the southwest (Lindner 1992: 263; Hertell 2002). The construction date for both roads has not yet been determined.

At Timnā' finally, where several Nabataean and Roman sites have been excavated, there is no evidence for mining activities before the second century AD. The only exception is a foundry of the first century AD in the ruins of the Hathor temple, in which collected copper ore was stored and scrap-metal was remelted (Rothenberg 1973: 185-188). At Timnā', a large-scale production only seems to have started after the Roman annexation of Nabataea (Rothenberg 1973: 211-243; NEAEHL IV Timna' 1485).

Bronze Workshops in Nabataea

Apart from the previously mentioned foundry at Timnā', where copper was remelted and probably cast into ingots, to date we know of only one other bronze workshop in the Nabataean kingdom. It is located on the slopes north of az-Zanṭūr in the city of Petra and will be discussed below. Aside from this, near the temple of the winged lions, Hammond excavated a room in which several bronze items and a bar of lead were found (cf. Hammond 1987: 136-139, 1996: 51, 2000) but as there were no facilities for the bronze casting proper and the context clearly belongs to the late Roman occupation of the site it will not be discussed further.

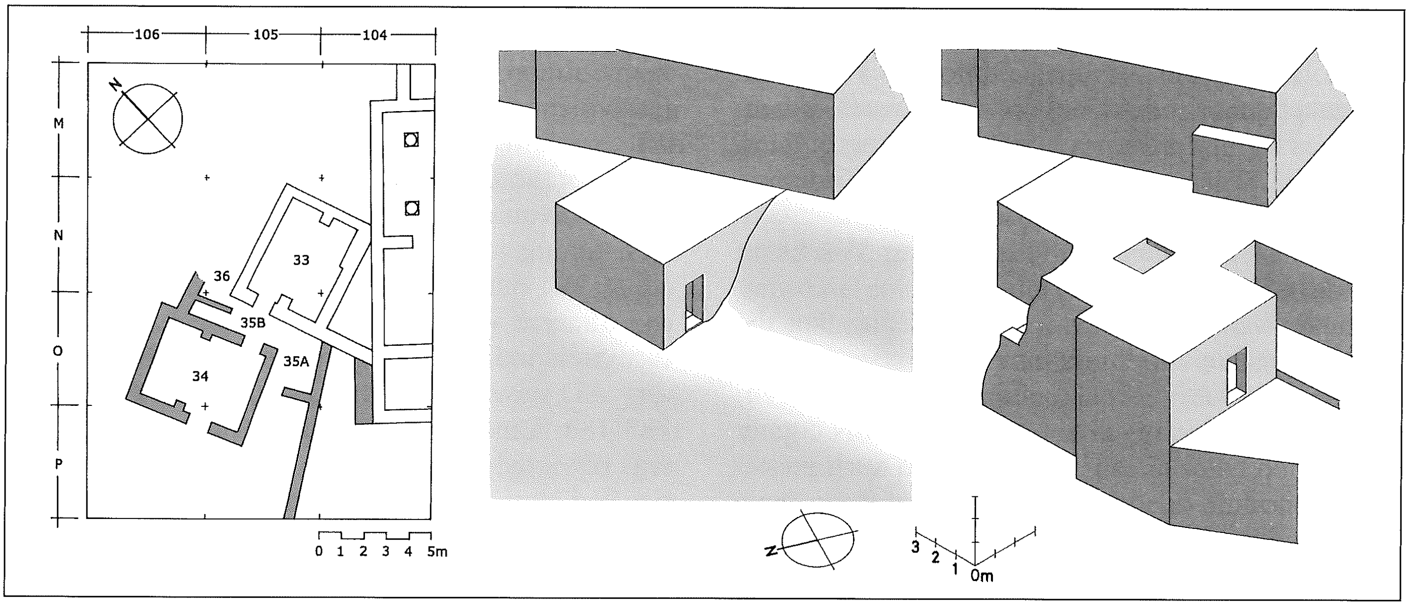
The Workshop at az-Zanṭūr[1]

The workshop at az-Zanṭūr (FIG. 1 left) is located on the northern side of the hill of the same name, which slopes down towards Petra's colonnaded Street. It was excavated in the years 1993 and 1994 by Rolf Stucky (Basel University) with funds of the Swiss-Liechtenstein Foundation for Archaeological Research Abroad (Stucky *et al.* 1994: 274-280, 1995: 299; Stucky 1996a: 26-30, 1996b: 340; Kolb *et al.* 1997: 241; Schmid 2000: 15, 32, 39).

History of the Building

The workshop was built into the steep slope on a small artificial terrace immediately north of the larger terrace EZ I on which a Nabataean private building stood (Stucky 1996a). Before the construction of the workshop, at the time when the house on EZ I was built (in the earliest first century AD), only a single room — probably used as a mill — occupied the otherwise untouched slope immediately to the north of EZ I (FIG. 1, middle).

The hypothetical urbanised system of the residential areas of the city at that time was described as a "petrified nomad's camp" with only the natural terraces of larger size being built up (Stucky 1992: 136ff., 1995: 197, 1996a: 49). In the area in ques-



1. Northern edge of the terrace EZ I and the slope north of it with the bronze workshop. Schematic plan with building phases and room numbers indicated. Isometric reconstructions of the building in its two phases (drawings M. Grawehr).

[1] The detailed study of this bronze workshop is the subject of my ongoing PhD-project at Basel University/Switzerland.

tion this situation must have changed considerably at the time when the workshop was built (FIG. 1, right). Terraced walls alongside the earlier house and the mill were constructed, they can be traced far beyond the limits of the excavation. This way the steep slope was organized in narrow terraces and therefore the whole space between the larger terraces could be utilized and built over. The evidence for the dating of these building activities is slight. In soundings made below the floor of the workshop only a few datable shards could be recovered. They belong to phase 3a of Schmid's fineware chronology (Schmid 2000), i.e. 20-70AD.

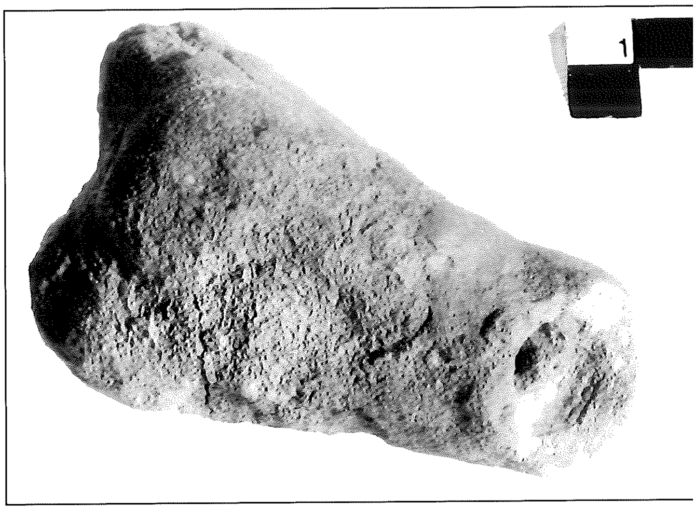
Description and Destruction of the Building

As far as the then newly erected workshop has been excavated it can be said that it consisted of five rooms (FIG. 1, left). Through a recessed door, a small corridor (35A) could be entered. This corridor led to the miniature courtyard 35B, from which one had access to the other rooms 33, 34 and to corridor 36, which extends to the limits of the excavation. The arched room 34 had its own street level access and seems to have served as a shop. It yielded next to no finds, except for a service of drinking vessels in its southeastern corner. Room 33 is the workshop proper. This is indicated by the finds that were encountered in a thick and seemingly undisturbed destruction layer, sealed by the debris of the rooms arched roof. While any indication for the cause of this destruction evades us, the dating of the event is clear. Through the evidence of the coins on the floor we arrive at a terminus post quem of 98AD. As there is plenty of fine ware in the destruction level, belonging to Schmid's phase 3b, but none of phase 3c, which according to him starts ±100AD, the destruction must have taken place at the end of the first or early in the second century AD.

Finds in Room 33

In room 33 large amounts of pottery as well as several implements and tools of a bronze worker were found. They include pieces of small portable ovens, casting and plaster moulds as well as plaster casts, which shall now be discussed in slightly more detail.

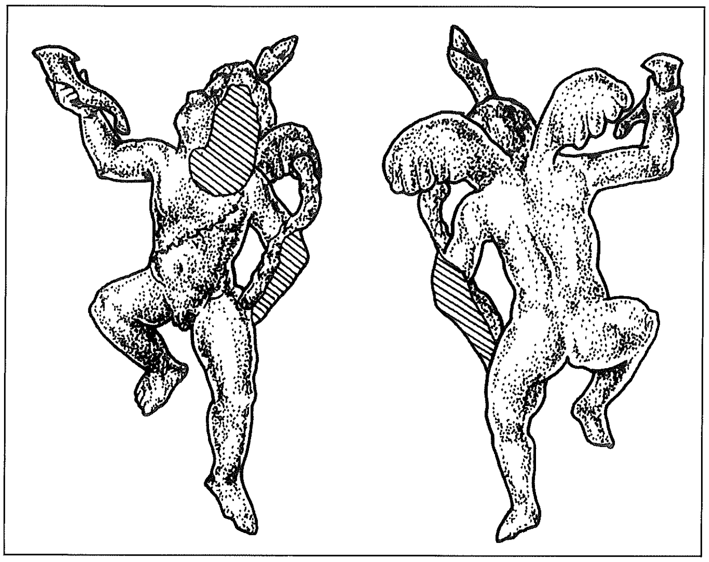
The casting mould in FIG. 2 was used for cire perdue casting. It was found in the stage where the wax model (around which the mould was formed) had already been melted out. In the moment of the destruction it was still awaiting its final cast-



2. Casting mould found in Room 33. Length: 97mm (phot O. Jäggi).

ing in bronze. To make the hollow space insid the mould visible, the vacuum of the actual objec was scanned using computerized tomography. Th resulting picture is shown in FIG. 3 in which th sprue and the channels, through which the liqui bronze flowed into the extremities of the figure can be seen. The reconstruction drawing in FIG. omits these features. The figure is a small chubby winged Eros with one leg raised as is common i the representations of small children. One hand i raised above the head and holds a rhyton, while i the other arm leans on a pedum, attributes usuall seen in the hands of Dionysos' company. On th head of the winged figure one can make out a sma crown, as worn by the Egyptian Harpocrates. Whil

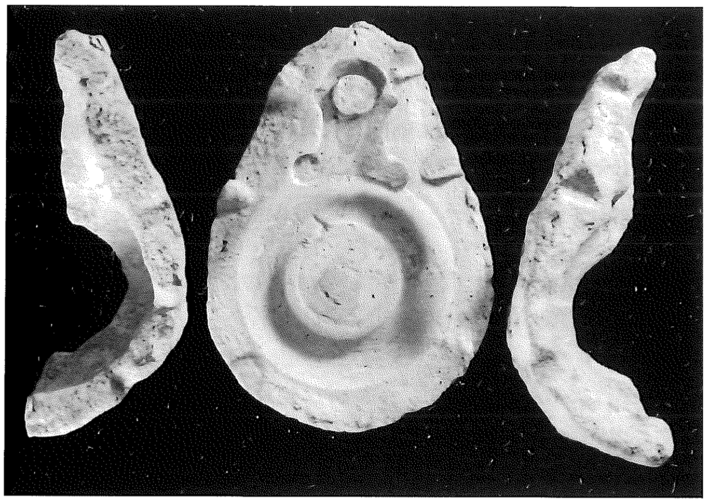
3. Three-dimensional reconstruction of the cavity insid the casting mould shown in FIG. 2 after tomographic data. Front and back view. Heigth of figure: ~60mm (C Röffke).



4. Reconstructive drawing of the figure to be cast in the casting mould shown in FIG. 2, front and back view. Height of figure: ~60 mm (drawing M. Grawehr).

many small Harpocrati with wings (LIMC IV Harpokrates 444), as well as many bacchic Erotes are known (Stuveras 1969: 13f.; LIMC III Eros/Amor, Cupido 1045; Daszewski 1994), the combination of all three elements is curious. Because of the size and the posture of the figure it was probably not intended as an artifact itself. It is more likely that it was attached at its back and served as a decorative feature of an utensil. As an alternative it is tempting to envisage the Eros on the back of an animal, i.e. a panther, which then would lead to an even stronger Egyptian appearance and might explain its iconography to a certain extent (Daszewski 1994).

For the creation of the wax models the bronze worker of az-Zanṭūr disposed of plaster moulds. Plaster waste and bowls with plaster-residue confirm the production of these moulds in the workshop. They were formed after prototypes made of clay and allowed the fabrication of an identical series of objects. Many of the moulds found in the workshop were intended for the production of bronze lamps; one example of a three-piece mould is shown in FIG. 5. Objects of this kind are known from various other sites in the Eastern Mediterranean (i.e. Edgar 1903; Siebert 1973: 583-587; Barone 1994: 31-45, 77ff., 94ff.; Seif el-Din 1998). With the help of plaster moulds the wax models for simple free standing objects could be produced easily, but when it came to the casting of reliefs or high reliefs with undercutting, the bronze worker had to use a flexible material for the moulds. More flexible but less durable than plaster is wet clay. The objects that had to be created using these clay

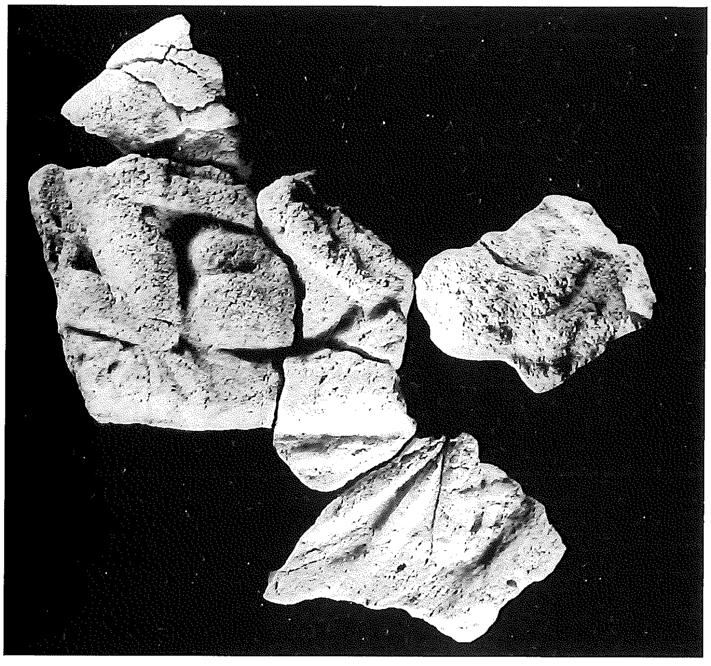


5. Plaster mould found in Room 33. Length: 155 mm (photo O. Jäggi).

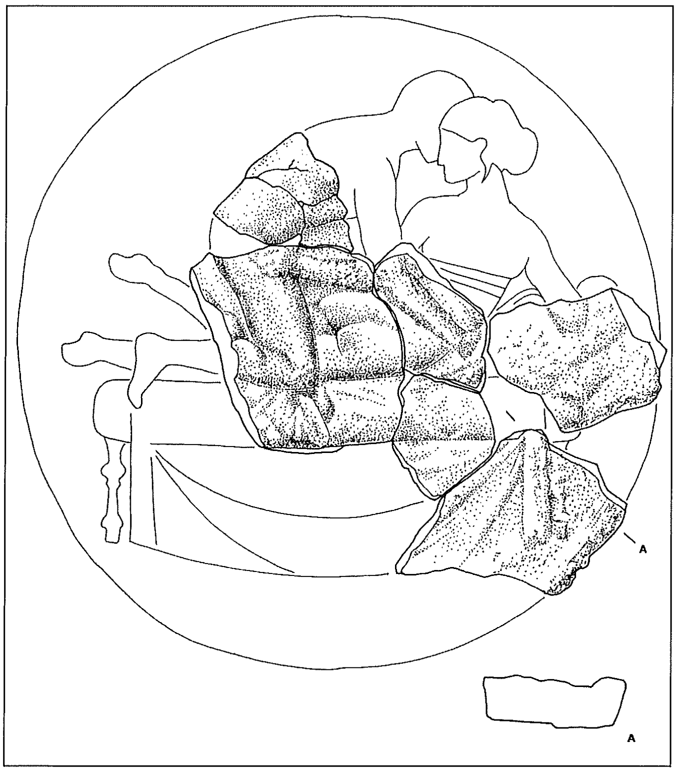
moulds were archived in the workshop with the help of plaster casts. From these casts the bronze worker could reproduce a pattern at any given time.

It is important to understand this difference in the work-process between plaster casts and plaster moulds, because they are easily confused. Plaster moulds were used for the reproduction of less complicated three-dimensional objects, while plaster casts were the appropriate tools for the production of reliefs and other objects with undercuttings.

One of the casts from az-Zanṭūr is shown in FIG. 6. The relief was recovered from a series of fragments and did not survive as a whole, but its original composition and shape can be reconstructed (FIG. 7). As the surviving fragments suggest it was taken from a mirror case or from an emblema



6. Plaster cast found in Room 33 (photo O. Jäggi).



7. Reconstructive drawing of the plaster cast shown in FIG. 6. Diameter: 180mm (drawing M. Grawehr).

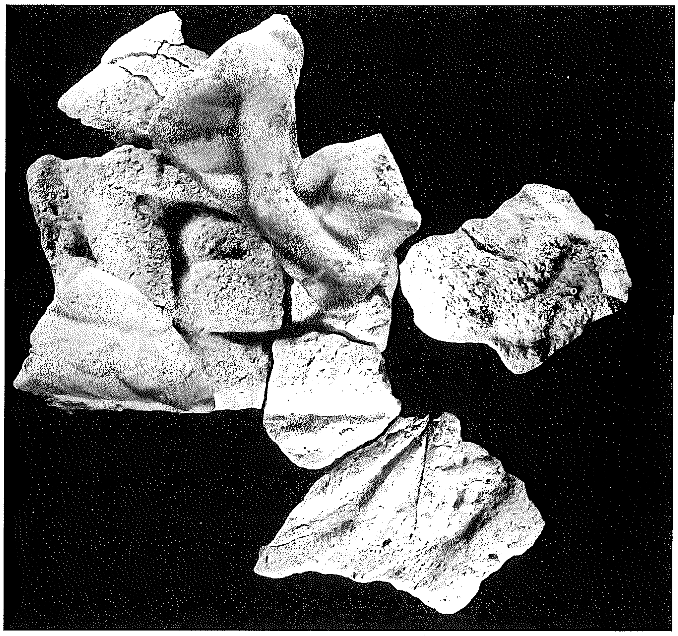
of a shallow bowl. The relief shows a couple on a couch. This specific iconographical scheme is also found on other vessels as Arretine sigillata or glass flasks (Lierke 1999: 76).

The Egyptian Connection and Further Thoughts

Plaster casts for the production of metalwork as they were found in the workshop at az-Zanṭūr are known through numerous other examples, but have rarely been found in their original context (cfr. Rubensohn 1911; Kurz 1954; Richter 1958; Reinsberg 1980; Burkhalter 1983/84; Vnukov *et al.* 1990). The largest known set of casts was dug up in the ruins of Memphis in Egypt over several decades at the beginning of the 20th century and found its way through the Cairo art market into various Egyptian and European museums. Two fragments (FIG. 8) of one of these casts from Memphis are today, together with many others, in the Roemer- and Pelizaeus-Museum at Hildesheim/Germany (Reinsberg 1980: 337f. no. 90, Fig. 105). They show exactly the same scene as the one from Petra described above.

Furthermore not only is the motif exactly the same but it is also identical in size. FIG. 9 shows the two Hildesheim fragments in a photomontage together with the cast from az-Zanṭūr. There is nothing to say that both casts could not originate

8. Fragments of a plaster cast in the Roemer- and Pelizaeus-Museum at Hildesheim Inv.-nos. 2958 and 2968 (photo M. Grawehr).



9. Photomontage of the casts in FIGS. 6 and 8 (M. Grawehr).

from the same mould or that they were at least taken from the same object.

As an explanation, it may be suggested that the bronze worker from az-Zanṭūr bought casts from Egypt in order to enlarge his repertoire or that he emigrated from Egypt and brought some of his casts with him. The latter hypothesis is especially tempting because it offers a variety of further possibilities. Was the bronze worker driven out of Egypt by the economical crisis that the country suffered in the mid-first century (Bell 1938; Braunert 1964: 153-164; but see Link 1993) or was he attracted only by an especially promising economical situation at Petra? Did he relocate himself solely on his own initiative or due to a favourable offer by Nabataean officials, who wanted to establish a new economic basis for the kingdom after a reduction in commercial benefits from the caravan trade (cf. Hackl *et al.* 2003: 74f.)? Is this effort of the Nabataean state also reflected in the coordinated building activities on the terraces of az-Zanṭūr that were described above and of which the construction of the workshop was only a small part?

Unfortunately the discussion above remains, to a large extent, speculative but in some respects more substantiated remarks can be made. First of all, at least towards the end of the first century AD, bronze production was established in Nabataea. This production is likely to have started only after the time of Strabo's writing, or after the time of his informants respectively. Secondly, because the objects made in the workshop at az-Zanṭūr were formed after Egyptian models, the output of bronze working from Petra does not necessarily display any local Nabataean style or iconography. Through stylistic analysis alone the bronze works made at az-Zanṭūr could not be distinguished from those of Egypt. On the other hand it is not likely that the reproduced motifs were meaningless to the Nabataeans. I think the foreign motifs were carefully chosen to meet the local taste, although we are rarely able to tell what their local interpretation was.

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Water Strategies in the Iktānū Region of Jordan

Introduction

In pre-modern societies, the environment was the principal dynamic controlling human responses to the need for water and to constraints on consumption of water. Generally, the environment of the region is similar to that of other areas on the east side of the Jordan Rift, with low rainfall and very hot, dry summers. Despite the low rainfall, at its lowest, in the vicinity of the Dead Sea, the southern ghawrs provide a larger alluvial fan than is usual further north. The southern ghawrs include (from north to south) the Ghawr Nimrīn, the Ghawr al-Kafrayn and the Ghawr ar-Rāma (the last two were called the Ghawr as-Saysabān in the nineteenth century). They are watered by several perennial streams, the principal ones being: the Wādī Shu'ayb/Nimrīn, the Wādī al-Kafrayn/Gharaba and the Wādī Ḥisbān/ar-Rāma/Gharaba, all of which have their sources high in the plateau edge to the east. The upper and lower courses of these rivers are usually distinguished by different names, which has been a source of confusion to visitors in the past, and names and identifications may vary even on modern maps. These systems are tributaries to the Jordan River.

There are lesser flow systems in the area to the south of the ghawrs, some with just a seasonal flow direct to the Dead Sea. These are the Wādī Djarafa (Ijarfa), beginning just south-east of Iktānū and flowing past the important Chalcolithic site at Tulaylāt al-Ghassūl, the Wādī 'Ayūn Mūsā/al-Muḥtariqa/Tarfa and the Wādī al-Ḥirī/'Udhayma. The water dynamics of the ghawrs were therefore less dependant on the low local rainfall than on run-off from the high plateau to the east, and thus have demanded localized responses from past and present inhabitants of the ghawrs which are different from the practices of the inhabitants of the plateau to the east, where the dependence lay on a higher level of seasonal rainfall and springs (see, for ex ample, Abujaber 1995). A major concern of the in habitants of the southern ghawrs through time ha been the control and harvest of the available wate not just for consumption by man and animals, bu for irrigation of crops.

River Systems and Springs

The river systems feeding the southern ghawrs ar broadly similar. The Wādī Ḥisbān/ar-Rāma, whic today passes a few hundred metres north of Iktānū is a river system less than 30km in length, but drops nearly 1200m in vertical height (Prag 1991 48). It has therefore a rapid, gravity-linked flo that depended on springs in the plateau edge, no seasonal rainfall, to maintain a perennial status, bu with a rate of flow which fluctuated seasonally an annually according to rainfall on the plateau an foothills. The Wādī Ḥisbān has its source above spring ('Ayn Ḥisbān) just below the lip of the pla teau, north of Ḥisbān, at contour ca. 800m ams where the average modern annual rainfall is ca 400mm, falling in winter and spring. The Ḥisbā is joined by lesser tributaries, and descends steepl through a deeply cut, narrow, almost gorge-lik course, with some severe drops, to the lower foo hills edging the Jordan Rift. The Early Bronze II Intermediate Bronze Age and Iron Age/Persia site at Tall Iktānū, situated on the last and lowes westernmost foothill, lies at ca. -120m bmsl, with modern average annual rainfall of ca. 164mm Th site is located at the mouth of the river, the poin where the water issues from the hills and emerge onto the plain. It overlooks the Ghawr al-Kafray and the Ghawr ar-Rāma to the north and west. Fro the top of the tall, there is a panoramic view acros the plain to the Dead Sea, and further to Jericho an the hills of Palestine. The Jordan River, in its low trough, is not visible. The Wādī Ḥisbān at this point becomes the Wādī ar-Rāma until its junction with the Wādī Kafrayn, at virtually the western limits of modern cultivation in the ghawrs. As the Wādī ar-Rāma flows through the ghawrs, its bed is deeply incised into the alluvial soils, and its high banks are actively eroding. The joint streams reach the Jordan River as the Wādī al-Gharaba and ultimately the Dead Sea, the surface of which lies at ca. 400m. bmsl, where the modern average annual rainfall is less than 100mm.

Although many springs in the foothills provide additional water sources, there are very few located in the ghawrs. Some appear at the edges of the Dead Sea, as at ʻAyn Suwayma.

The available water moves by gravity, not just in the major river systems, but also as run-off and seepage from the foothills, which contributes to the water-content, aggradation and erosion of alluvium in the ghawrs. Heavy rain turns the alluvium to deep mud, unsurfaced tracks become impassable to wheeled traffic, and surfaced roads may be cut by flood waters. This dynamic underlies the agricultural processes of the ghawrs. Heavy rainfall on the cliffy edges of the Rift can result in short-lived but powerful minor spates and waterfalls, which in turn create devastating erosion in the deep alluvium and especially in recently ploughed soils (FIG. 1).

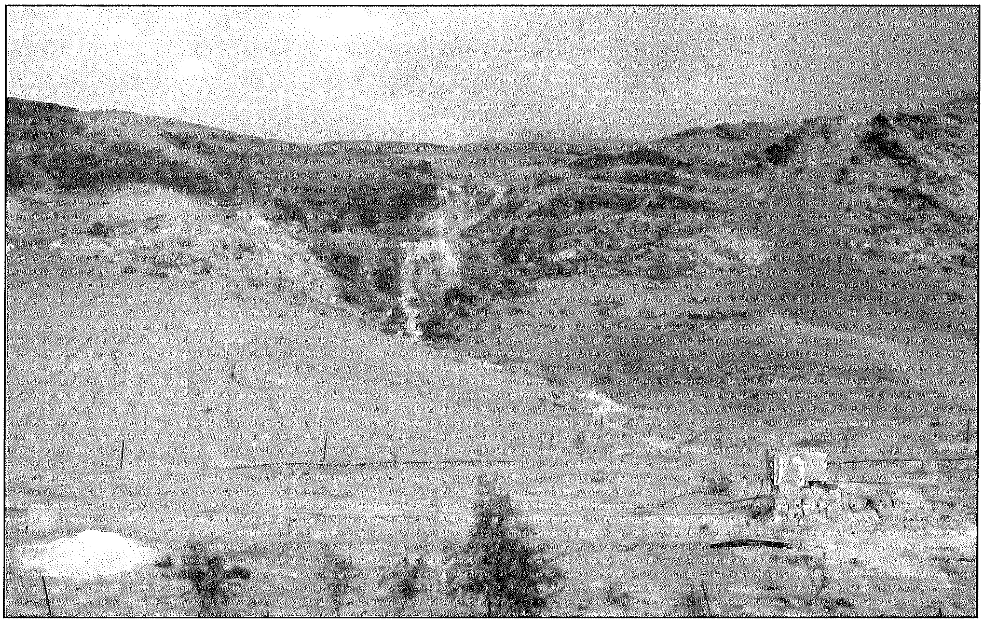
The structure of the responses and strategies at different times can be seen to vary from small to large scale, fed variously by private or public investment, but at all periods water-use was dependant on communal, integrated systems which required stable political and environmental conditions.

Irrigation Systems

In the past generally, dry farming was the natural resource for cultivators of the plateau region, and although dry farming of winter crops and early summer harvesting in the warmer southern ghawrs were possible strategies, irrigation of the alluvium in the ghawrs has for millennia been important, the flat, rich soils being readily tilled and permitting multiple cropping. Irrigated field systems were undoubtedly developed early. As with the documented Jericho estates in the Roman and Crusader periods, the land of the ghawrs could be a rich resource, and in Roman times the eastern ghawrs also (e.g. Hepper and Taylor 2004). Replaceable, variable, and easily repairable systems were required to contend with problems, arising from erratic flow, a high level of seasonal variation, flooding, erosion, periods of severe down-cutting of stream systems, and deposition of silt/alluvium, and probably to support systems of crop rotation and fallow.

During the nineteenth and twentieth centuries AD, the simple gravity flow channel maintaining water flow to the fields at a level above the down-cut streams was the norm for field irrigation in the ghawrs (Prag 2001: 182, fig. 1), and the practice still survives. Remnants of older systems only survive in the areas that have not been subject to modern agricultural development involving mechanized ploughing or, increasingly, on the upper fringes of the ghawrs, bulldozers, which have created vast level tracts for modern irrigation or are used in large gravel extraction projects.

In the sides of the Wādī Ḥisbān in the foothill zone there are old rock-cut water channels where



1. A storm passing over the edge of the Rift, east of ar-Rawḍa. At centre rear the waterfall (normally dry) is in spate, with the little gully below indicating the long term effects of erosion. The deep cracks in the fields to the left show recent erosion in ploughed land arising from less channelled run-off from the cliffs behind. In the foreground, rain pools on the alluvium where a modern tank feeds plastic pipe for drip irrigation to newly planted fruit trees. IKS785; photograph Kay Prag, 11/2/1989.

rock faces provided a suitable route. Channels had to be cut at a calculated level so that the rate of drop maintained control of the speed of flow of the water reaching the fields. Rock-cut sections were supplemented when necessary by built sections, which have long since eroded. The systems are not dissimilar to those which survive in the as-Sīq at Petra, for example. Beyond the wadi mouth, old stone-lined and plastered channels dug into the ground can still be seen leading into the alluvium, particularly in the more remote lower Wādī 'Ayūn Mūsā (see below).

Modern channel systems in the alluvium today range from concrete channels and pipes and plastic piping to simple earth channels with banked or stone-lined sides. Traces of the latter will be virtually invisible in the archaeological record. Principal feeder channels run mainly from east to west, and have lesser branches taking water to adjacent fields, as recorded in air photographs taken in the 1950s. The flow of water can be readily controlled and directed as required by even ephemeral channels dug or blocked, as needed, even on a daily basis (FIG. 2).

Such systems, involving small communal schemes and agreements – with dug, rock-cut or built channels, probably existed from at least the third millennium, and possibly earlier (Wright *et al.* 1998; Barker *et al.* 2000). The development of irrigation may lie in the fourth millennium as a result of a long, slowly developing process of iridisation, culminating in drier conditions with lower rainfall towards the end of the third millennium. During the fifth millennium the major Chalcolithic sites, especially Tulaylāt al-Ghassūl at the south-western edge of the Ghawr ar-Rāma, may have benefited from wetter conditions, with nearby slow-moving fresh water (Webley 1969: 21-23). The shift of population from major Chalcolithic sites on the western fringes of the Ghawr al-Kafrayn and Ghawr ar-Rāma to walled Early Bronze Age sites at the mouths of the rivers on the higher eastern fringes of the ghawrs (Prag 1995: 79), may be due to drier conditions and greater dependence on the river systems for irrigation. A location at the mouth of the wadis, at the point where the water issues onto the alluvial soils of the ghawr, gave both political and economic control of the water and thus of the rich irrigated fields on the alluvium, whereas a location at the lower end of the system presented contrastingly grave disadvantages, not least the inability to control or escape seasonal flooding from upstream on the river systems.

2. Temporary irrigation channel dug in the Ghawr ar-Rāma, north-east of Tall Iktānū, a concrete pipe has been used to bridge an army excavation. IKS643; photograph Kay Prag, January 1989.

Supporting this pattern of site distribution, the mouths of the three northern perennial streams are the location of quite large and complex EBA sites: Tall Mustah on the Wādī Shu'ayb, Tall al-Ḥamām on the Wādī Kafrayn, and Tall Iktānū on the Wādī Ḥisbān. All these sites have not just control of the distribution of the river water at this point, and excellent visual control over the fields lying to the west, but strategic locations on high ground. During the Early Bronze Age the harnessing of resources including control of gravity-fed irrigation from the foothills, is very clearly indicated in settlement patterns as a major factor in settlement distribution.

Geomorphological Changes

To what extent geomorphology has played a role in the control of the water resources is uncertain and is thus far insecurely dated. Tectonic agency may have led to or hastened the disappearance of water sources at al-Ghassūl, and to abandonment of sites in the western Ghawr ar-Rāma. It may well have been responsible for the severe down-cutting of river beds in the alluvium, although shrinkage and drop in level of the Dead Sea/Lisan Lake during the late Holocene or lower rainfall in the fourth millennium would also affect river flow by increasing the depth of fall of the river systems reaching the lake, leading to incision of wadi beds. In the Iktānū region, the bed of the Wādī Ḥisbān/ar-Rāma is today many metres below the irrigable surface of the alluvium (FIG. 3), and to bring the water to the adjacent fields would require either manpower or other energy resources to lift water from the river

3. The down-cut bed of the Wādī Ḥisbān with the township of ar-Rawḍa in the background. IKS629; photograph Kay Prag, January 1989.

bed. The more practical, cheaper solution was to bring it from higher levels upstream to the fields by means of channels or pipes.

Alongside the down-cutting of river beds, the surface of the alluvium has risen over the centuries. Epi-Palaeolithic, Early Bronze and Intermediate Bronze Age sites on the eastern fringes of the Ghawr have been located at depths of one to two metres beneath the modern surface and well above the deeply incised bed of the Wādī Ḥisbān/ar-Rāma (Prag 1990: 123 and 126, 2001: 183, fig. 3; Edwards 1999). This rise in alluvial soil is presumably the result of the deposition of silt from the foothills to the east, with the alluvial fan created principally by the rivers, but augmented by localized spates and run-off. This process of aggradation must have affected mainly the eastern edges of the ghawrs (the land surface within the Rift slopes down to the centre), and it is likely that many early sites today lie beneath the alluvium in that area.

The area of Iktānū is also subject to severe dust-laden gales from the east (*sharqiyya*), and to sand-laden storms from the south (*khamāsīn*) and thus some build-up of soils in the ghawr may be due to Aeolian deposits. Exposed ploughed soils, on the other hand, suffer depletion as dust is carried west and north.

Mills

The rivers also provided energy. In modern times the stream water was harnessed for whole systems of water-powered flour mills along the course of all the perennial streams (Shu'ayb, Kafrayn and Ḥisbān), where the products of a major cereal-growing area were processed. These were located especially on the upper and middle courses of the rivers, but mills were also built at the wadi mouths on the edge of the foothills and in the ghawrs. At least two mills were located at the mouth of the Kafrayn, and one at the mouth of the Ḥisbān, another several hundred metres into the alluvium on the Ghawr ar-Rāma. Of these, two have been destroyed during the last forty years, the one in the Ghawr ar-Rāma very recently as it stood in the way of agricultural development. On the upper and central Ḥisbān, the Ḥisbān Project (LaBianca 1990: 193, fig. 6.12; Ibach 1987: 194) listed 10 mills. Byzantine sherds found during survey appeared to be associated with many of the mills and according to LaBianca (1990: 194) "The possibility that most of these mills might originally have been constructed during the fourth or fifth century AD should be seriously considered...because water-driven flour mills of various kinds became a widespread phenomenon throughout the Roman Empire". Without additional evidence associated with the mills he concludes "The Hesban region reached the height of its maximization drive during the Early Byzantine Period....Roman-style....water mills were added on a scale never before seen in the region" (LaBianca 1990: 200). Alternatively, Ibach concluded (1987: 194) "The date of these mills could not be determined by direct evidence, but some indirect evidence suggests they belong to the Ayyubid/Mamluk period. The masonry style and the state of preservation of the mills indicate they are not of great antiquity". Rogan (1995: 756) also favours a date in the Mamluk period for the origin of the mills below as-Salṭ on the Wādī Shu'ayb. The mills in both Wādī Shu'ayb and Wādī Ḥisbān were certainly seen in use by travellers in the mid-nineteenth century, and the Ḥisbān mills were then owned by the 'Adwān tribe; the cereal production and processing of grain reflect reasonably settled circumstances in areas then under 'Adwān tribal control (FIG. 4).

Leats or lades were run by channel from river to mill, and sometimes served more than one mill before the water was returned to the river or used for irrigation. Although these mills are described by nineteenth century travellers, many were operating well into the twentieth century (Prag 1991: 59). A mill at the mouth of the Wādī Kafrayn was driven by an oblique chute, but most of those surviving on the Wādī Ḥisbān are of the arubah penstock variety, with a vertical drop shaft (see e.g. McQuitty

4. Water mill in the Wādī Ḥisbān, just south of Shunat Saqr (Ibach 1987: 226; Prag 1991: 50, fig. 3, incorrectly identified as the barn of Diyab). The aqueduct/leat is on the right, the drop shaft on the left. The mills were repaired at various times, and the masonry in this mill is testimony to three or four phases. There are quite large, rectangular, dressed (probably re-used Roman/Byzantine) masonry blocks visible in the lower four courses, at least one phase of smaller, squared blocks above (Ottoman period?) with rubble exposed at the top. HIS10; photograph Kay Prag, spring 1992.

1995: fig. 2).

Aqueducts

Aqueducts were built in the Iktānū region at least as early as late Hellenistic and Roman times; traces of two can be seen outside the forts at Barakāt and Ḥabbāsa above the lower Wādī Kafrayn, and were intended to supply drinking water for the garrison (Prag and Barnes 1996: 50, 53-55). At both Ḥabbāsa and Barakāt the stone-built aqueducts were fed by rain water run-off from catchments on the adjacent stony hillsides, which was led by channel to aqueduct, and then to multiple cisterns within the forts. These aqueducts represent considerable investment of public or state funding. The functioning of these aqueducts was linked to the fortresses they served, which were abandoned sometime in the Byzantine period at latest; and only the foundations now survive. They were vulnerable to enemy action, tectonic activity, and they and their catchments must have required some degree of maintenance. Many aqueducts of the late Hellenistic/Roman periods were built west of the Jordan also.

Aqueducts serving as raised mill leats were also in use along the perennial streams in the nineteenth century and were probably built earlier (FIG. 4) to bring water to the drop shafts of flour mills (for further illustration, see *e.g.* Greene 1995: figs. 4 and 5). The evidence described by Rogan (1995: 753-756) shows that the mills could be readily repaired, but it was an expensive undertaking, even on a small scale, and more likely to be done by central authority, or by a consortium of people, to spread the risk and investment. At Salṭ in the late nineteenth century Rogan noted a pattern of transfer by purchase of ownership of these mills from tribal heads to merchant townsmen, particularly to merchants from Nablus who had settled in the town.

In modern times the major aqueduct/canal (the Point Four development) serves modern irrigation, but the water is derived from outside the system described here, and represents major modern development.

Cisterns and Tanks

Covered cisterns and open holding tanks or reservoirs relating to channel systems are still well-preserved in arid parts of the region.

Fine Herodian-type covered cisterns, partly rock-cut and partly masonry, with strong hydraulic plaster and evidence of vaulted roofs, which could have contained water fit for human consumption, survive at the Ḥabbāsa fort above the Kafrayn, with less well-preserved examples at Barakāt (Prag and Barnes 1996). The lower sections of the cisterns are cut in the limestone foothills of the eastern Rift Valley. These monumental structures of the Roman period conform to contemporary state-funded activities known at Machaerus and west of the Jordan.

Relatively few ancient water-storage facilities are known to have survived in the cultivated alluvial soils of the ghawrs. An open tank/ reservoir survives at Maturdja (variants Tall al-Matarji/Muḥtariqa/ Rujum al-Muḥtariqa), at the edge of the foothills on the north bank of the Wādī ʻAyūn Mūsā, in the arid south-eastern edges of the ghawr. Although there has been much modern army disturbance at this site, it was still (in 1995) possible to trace the feeder channel for ca. 2km along the north side of the central course of the wadi, passing at the mouth along the south side of a hill and two lesser knolls, before turning north to the north side of a third knoll at the edge of the alluvial soils. The channel at this point was stone-built and plaster-lined, with a total width of 0.60m. The plastered water channel itself was ca. 0.30m wide, allowing for a reasonable volume of water (FIG. 5). Two sherds from the channel plaster were of late Byzantine/Umayyad/Abbasid date (Pamela Watson pers.

5. The stone and plaster lined water channel on the north bank of the Wādī 'Ayūn Mūsā/Muḥtariqa, at a point just above/ east of the tank. The A4 notebook indicates the width of the channel. IKS1244; photograph Kay Prag, 27/9/95.

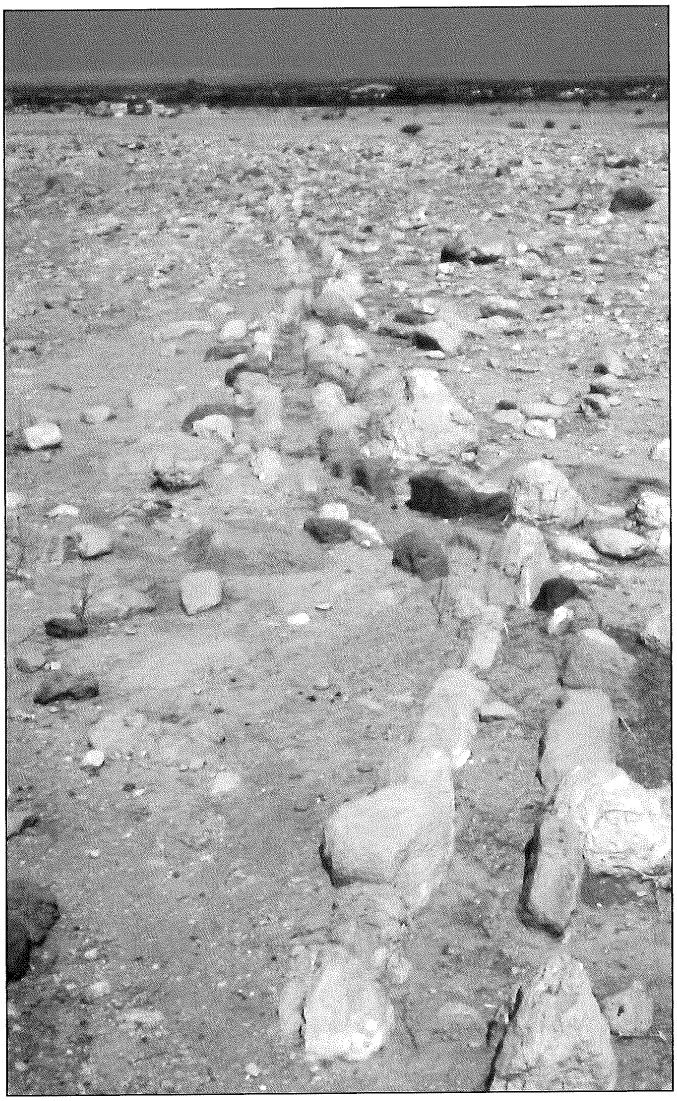
comm.). Although a section of the channel had been recently bulldozed, it formerly led to an open reservoir or tank, which it entered at the south-east corner. The tank itself is rectangular, with the long sides oriented north/south, ca. 27 x 13m (paced, not measured). The stone lining wall on the west side varied from 1.35 to 1.90m in thickness, with large stones set at the corners. The inner face of the east wall was exposed up to ca. 1.20m high, with five or six rough courses, mostly of rough rubble with patches of cement/plaster. This wall appears to be thickened at both ends, possibly for steps (FIG. 6). Thus unroofed holding tanks for water for agricultural/animal use also existed as part of the extensive system of rock cut and built channels associated with the rivers, and were intended either to store

6. The east wall of the tank at Muḥtariqa, with steps at the north-east corner; from the south-west. IKS1243; photograph Kay Prag, 27/9/95.

surplus water in winter or permit greater control of irrigation systems (for recent use of open tanks, see e.g. Abujaber 1995: 743).

To the west of the tank at Maturdja there is a stone wall ca. 0.40-0.50m wide, parallel to the south wall of the tank, but some metres further to the south, traced for ca. 29m to the west, and at least one rectangular stone structure ca. 7 x 20m, on a slightly different orientation, about 25m west of the tank. There were few associated sherds, and little else to be seen in the vicinity, but nearly 300m to the north-west a 40-50m stretch of stone-lined channel led away to the north-west in the direction of ar-Rāma (FIG. 7), before disappearing in ploughed land. It may have served the fields in the immediate vicinity, or run further (ca. 3km) to serve the cultivation around ar-Rāma.

This site, with structures, channels and tank, is probably the Byzantine farmhouse on the north bank of the Wādī 'Ayūn Mūsā referred to by Mallon (Mallon *et al.* 1934: 149) but it almost certainly survived into Umayyad/Abbasid times, and may also be considered in the context of the Umayyad/Abbasid site of Sahl as-Sarābīṭ immediately south of ar-Rāma (Suleiman and Betts 1981). Four trenches on a low mound, ca. 30m in diameter, occupied in Umayyad/Abbasid, and again in Ayyubid/Mamluk times, were excavated in a rescue operation in advance of building work. In the Umayyad/Abbasid level, as well as buildings, a stone-lined cistern ca. 2.50m in diameter, fed by channels from both east and west, was (partly?) excavated. Its depth is not recorded. The excavators suggested that the site might have been used for an industrial purpose because of the presence of glass and sand and the provision of water, but it may as well have been linked to a major cultivation system in the ghawr.



7. The water channel below and to the north-west of the tank at Muḥtariqa, with the Ghawr ar-Rāma in the distance. IKS1246; photograph Kay Prag, 27/9/95.

However, both Maturdja and as-Sarābīṭ provide evidence that channels, tanks and cisterns were cut in the alluvial soils and lined with stone and plaster in the Late Byzantine, Umayyad and Abbasid periods.

It is certain that intensive cultivation on even the fringes of the ghawr had a very long history, although in modern times these locations are very arid and have been used recently only for a little dry-farming of barley.

Dams

Evidence for ancient dams in the region is slight, though possible remnants of one on the Wādī Djarafa just south-west of Iktānū indicates that in the soft soil of the Ghawr such structures could well be washed out quite rapidly in heavy winter rains. The Djarafa in recent flooding cut the modern surfaced road from Ar-Rāma into Nahda. Due to rapid seasonal flow and high silt content, dams were probably an uneconomic investment in the past. The modern dams, on the Shu'ayb, al-Kafrayn and Ḥisbān, are also vulnerable to silting.

Conclusion

Seasonal flow in the river systems, with high but short-lived flooding following heavy rain to the east, was difficult to control. Channelling the water to the fields enabled the inhabitants to control the quantity, direction and speed of water reaching the fields, and also to construct leats to power mills. Access to drinking water provided other problems, which could be met by large scale investment in cisterns. No evidence for cisterns pre-dating the Hellenistic/Roman period have yet been discovered in the area, and it seems likely that prior to that date water was mainly drawn direct from the rivers and springs at a higher level, and held in jars and skins for domestic use. The investment in rock-cut channels and in channels built in stone and plaster was considerable, but these were probably long-lasting and could be maintained and repaired relatively cheaply. The construction of water mills was a greater investment, and in the nineteenth century the costs often a shared enterprise (Rogan 1995, 753). The document discussed by Bordreuil and Pardee (1990) and Cross (1996), if indeed it is to be associated with Iktānū, may suggest milling was a major enterprise in the region at least as early as the Iron Age, and site distribution patterns suggest that villages and towns began to colonize the central areas of the ghawrs during the Iron Age, spreading out from the major sites at the eastern edges, and developing into large towns in the Roman and Byzantine periods. Certainly cereals were being grown in the area from at least the fourth millennium. The construction of stone aqueducts, vaulted cisterns, and perhaps dams, represented state intervention and funding, or larger scale commercial or tribal activity. All the systems were relatively fragile and required regular maintenance. Damage to major installations, such as built aqueducts, and silting of dams, which were major investments, represented large losses to the economy.

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Housing and Transport at the Origins of Nomadic Pastoralism

Introduction and Purpose

Several decades of intensive research have not resolved major issues surrounding the origins of nomadic pastoralism in Jordan (e.g., Köhler-Rollefson and Rollefson 1990, 2002; Köhler-Rollefson 1992; Goring-Morris 1993; Martin 1999; Horwitz *et al.* 1999). Most of the effort is directed at assessing the significance of goat and sheep remains from the main towns in the highlands, and from lesser sites in the steppe/desert, in the overall Neolithic economy. Some writings focus on mechanisms that gave rise to, or necessitated, the emergence of nomadic pastoralism. Less attention is paid to nomadic pastoralism as an adaptation or life-way, how it was organized, what subtle things made it work, how it evolved into the life-way of the contemporary Bedouin. It is these latter topics with which this paper is concerned.

It is accepted here that the *origins* of nomadic pastoralism in what is now Jordan occurred toward the end of the Late Pre-Pottery Neolithic B (LPPNB), a little before 8,000 radiocarbon years ago[1]. Thereafter the nomadic pastoral life-way grew in importance and persisted through the end of the Neolithic and down to the present. In some regions, such as parts of the Black Desert of the Jordan panhandle, the extent of the archaeological record that has accumulated from this adaptation is almost overwhelming.

Establishment of this socioeconomic adaptation was an innovative paradox. The problem of providing a daily food supply for human herders, especially in a steppe/desert environment where plants were mostly unpalatable to humans, without compromising viable herd structure and size by reliance on meat, had to be resolved. This matter has received some attention in literature.

Beyond that significant problem, temporary housing and associated equipment for herding trips of several months duration had to be organized and provided, along with practical means of transportion. The establishment of a functional, mobile, pastoral economy in the absence of the pack animals of later prehistory is widely thought to have presented major technological challenges.

The nature of these problems and their Neolithic solutions can and must be addressed and speculated upon in order to anticipate the nature of the archaeological record that may have resulted from early pastoral activities, and to devise means of accessing that record. Without such a perspective there is little recourse but merely to react to what is found in archaeological contexts and to try to interpret it. This latter approach provides neither predictive potential nor clear means for discovering critically important new evidence that can be brought to bear on recognized problems. The admittedly speculative discussion offered here addresses these issues and attempts to anticipate and characterize some aspects of the life-way of the earliest paleo-Bedouin on the eastern Jordan steppe/desert more than 8,000 years ago.

Origin and Nature Of the Nomadic Pastoral Life-Way

This discussion builds on an earlier synthesis by Quintero *et al.* (2004). That work developed an explicit model of the origins of nomadic pastoralism late in the LPPNB of the Jordanian steppe/desert, and how it articulated with the socioeconomic structure of the main Neolithic towns. As summarized there, goats were the first common herd animals

[1] All dates given here are in uncalibrated radiocarbon years before the present.

to be added to the village farming economy of the southern Levantine Neolithic, and they were present in the Jordanian highlands well before 8,500 years ago. How goat herds were managed in the vicinity of Neolithic towns without seriously impacting nearby fields of cultivated plants is an important issue, the nature of which has been weighed elsewhere (Köhler-Rollefson and Rollefson 1990; Köhler-Rollefson 1992; Quintero *et al.* 2004). Even today these highly independent animals are not necessarily impeded by stone walls, and this situation must have prevailed from the beginnings of goat husbandry.

The addition of domesticated sheep to the Neolithic economy occurred, at least in northern Jordan, about 8,500 years ago, apparently introduced from what is now Syria (Horwitz *et al.* 1999). By 500 years later they are reported to have comprised a major part of the fauna at the Neolithic town of ʻAyn Ghazāl (Wasse 1997). Together, domesticated sheep and goats had to have constituted a significant threat to the fields of wheat, barley, lentils, etc., and competed with humans for cultivated crops. In the Mediterranean climate, wheat and barley were and still are planted in the fall, and the young plants make their early growth on the highly seasonal winter rains. Ethnoarchaeological research suggests that the solution to this dilemma of herd animals trashing cultivated fields was to take the sheep and goats afield, both in the highlands and to the steppe/desert of the eastern *bādiya* in the late autumn. Here, it was argued (Quintero *et al.* 2004), the herders spent the winter months, moving through a series of short-term camps as their animals foraged on the seasonal vegetation. The return to permanent towns would have occurred in the late spring or early summer after the grain was harvested, and after aridity had again reclaimed the steppe/desert zone.

It seems reasonable to suggest that then, as now, a mix of goats and sheep together constituted a viable herd for Neolithic nomadic pastoralists. It is tempting but unrealistic to conclude that such herd structure was necessary if for no other reason than that goats help lead the sheep and keep these dumb animals moving in the right direction. Colleagues have rightly criticized me for my earlier reasoning on this matter. They have pointed out that the decline in intelligence of domesticated sheep must have resulted during thousands of years of genetic manipulation by humans. During the LPPNB, sheep were but little evolved from their wild progenitors. They must have been as smart, wary, independent, and agile as wild sheep of today, notably the mouflon from which they are believed to have descended. They must still easily have been capable of living on their own and contending with natural enemies. So early domesticated sheep may have been difficult to manage as herd animals, and this issue has to be considered in research on early pastoral strategies. To return to the goats, while they may have been important in herd management, their essential presence has long been viewed as suppliers of meat (e.g., Bar-Yosef and Meadow 1995: 91). But while they may have been kept to supply meat to a certain extent, it was their milk, hair, probably kid skins, and other useful products for which they were really valued (Quintero *et al.* 2004).

The same winter rains that nourished cereal crops in the highlands returned life to the eastern steppe/desert zone. Perennials were revitalized, and annuals sprang to life. It seems likely that very little of this annual bloom of vegetation was palatable to humans or could be metabolized directly by the human gut. However, sheep and goats can metabolize both green and dry forage, including all manner of plants inedible to humans. In so doing, they convert otherwise worthless desert vegetation into milk (Köhler-Rollefson 1992; Köhler-Rollefson and Rollefson 2002), and goats were, and remain, the greater producers.

But it is unlikely that the milk of these small ruminants could generally have been consumed directly by Neolithic herders, and it did not have to be. Over much of the world, many adult human populations are overwhelmingly unable to metabolize lactose, the common sugar in milk. In these populations people lose their ability to produce adequate lactase, the enzyme that in the small intestine converts lactose into the simpler absorbable sugars galactose and glucose, by about the age of four years. From childhood on, most people who are lactase-deficient suffer great discomfort if they consume milk or milk products. The ability of adults to metabolize lactose in some populations evolved coincidentally with the evolution of dairy economies. Among Neolithic herders, lactose intolerance would have been a serious problem for most adults. Lacking refrigeration, milk, possibly contained in skin bags, would have soured within hours. This was a fortuitous and happy event that was to have great historical ramifications. "Domestication" of the right strains of the *Lactobacillus* bacteria, which metabolize lactose, would have occurred automatically, ultimately leading to the production of yogurt, cheeses, and other useful milk products. And a skin bag having once produced a useful cultured-milk product was irreversibly contaminated with the requisite bacteria, and it would make the same product the next day and forever after. Surpluses of some of these products, notably cheeses and yogurt, can be dried and reconstituted in water when needed. Importantly, after conversion of the lactose into more user-friendly agents, milk products could be metabolized by humans without further significant problems. Consequently, cultured-milk products must have formed a major part of the diet of the earliest paleo-Bedouin.

Today Bedouin and other nomadic pastoralists rely heavily on the products of cultured milk. They use the meat of their herd animals less frequently, and especially on socially important occasions. Older, barren female and younger male animals are eaten, but careful herd management must first consider the singular necessity of maintaining a reliable milk supply. It seems therefore that reliance on milk products would have been logical, fortunate, and necessary for nomadic pastoralism in the Neolithic as well. Regular meat supplies must have been obtained by hunting gazelles, ibexes, hares, and other desert animals, and projectile points are common artifacts in the site assemblages of early herders. In this regard it is tempting to speculate also on the antiquity of falconry and its possible role in game-getting during the Neolithic.

The sheep and goats of Neolithic herders provided other renewable resources. As with the familiar black tents of contemporary Bedouin, since ancient times goat hair must have been spun into yarn and woven on ground looms into coarse fabrics and rugs. Goat hair may also have been made into some forms of bedding and clothing. In terms of their coats, sheep of the LPPNB would have been similar to their wild ancestors, with outer coats of hairlike *kemps* concealing an undercoat of fine wool, as is seen today in wild sheep the world over. The undercoat molts and slips away in the spring a few weeks before the outer coat of kemps is shed and replaced. Ethnoarchaeological and archaeological evidence suggests the likelihood that in the Neolithic the undercoat was combed out as it began to molt (Quintero *et al.* 2004). This practice was recorded in recent decades in northwest China and Tibet where cashmere goats and hairy sheep are combed to obtain their fine undercoat (Ryder 1987; Goldstein and Beall 1990). The evolution of fleece occurred as a result of selective breeding, perhaps capitalizing on favorable mutations, probably no earlier than 7,000 years ago. But in the LPPNB, such sheep's wool as could be obtained probably was spun into yarn and woven into fabrics as it is today to make rugs, bedding, and warm clothing. Felt, the most elementary fabric, could also have been made by wetting the wool and pounding it out flat.

As suggested elsewhere, the annual cycle of herding on the steppe/desert, begun in Neolithic times, would have depended on seasonal vegetation for forage for herd animals. It would have taken advantage of seasonal rainpools, and knowledge of where seasonal or permanent subterranean flow could be tapped in the beds of wadis by digging shallow wells for water supplies. Departure from the highland towns would have been prompted by emergence of the next season's wheat and barley crop. So in effect it was the autumn rains that initiated the annual cycle of pastoral nomadism. Following perhaps six months of wandering on the steppe/desert, the herders would have returned to the Neolithic towns. They would have brought with them well-managed herds of animals, hair and wool, perhaps supplies of yarn spun from hair and wool, hides or tanned leathers, bags made of kid skins, dried yogurt and cheese, braided leather or goat-hair ropes, sinews, maybe woven textiles such as clothing items, blankets, and rugs, supplies of "Dabbah marble" for the lapidary industry, and other essential raw materials picked up along the way, all integral to the dual economy that now typified Neolithic culture.

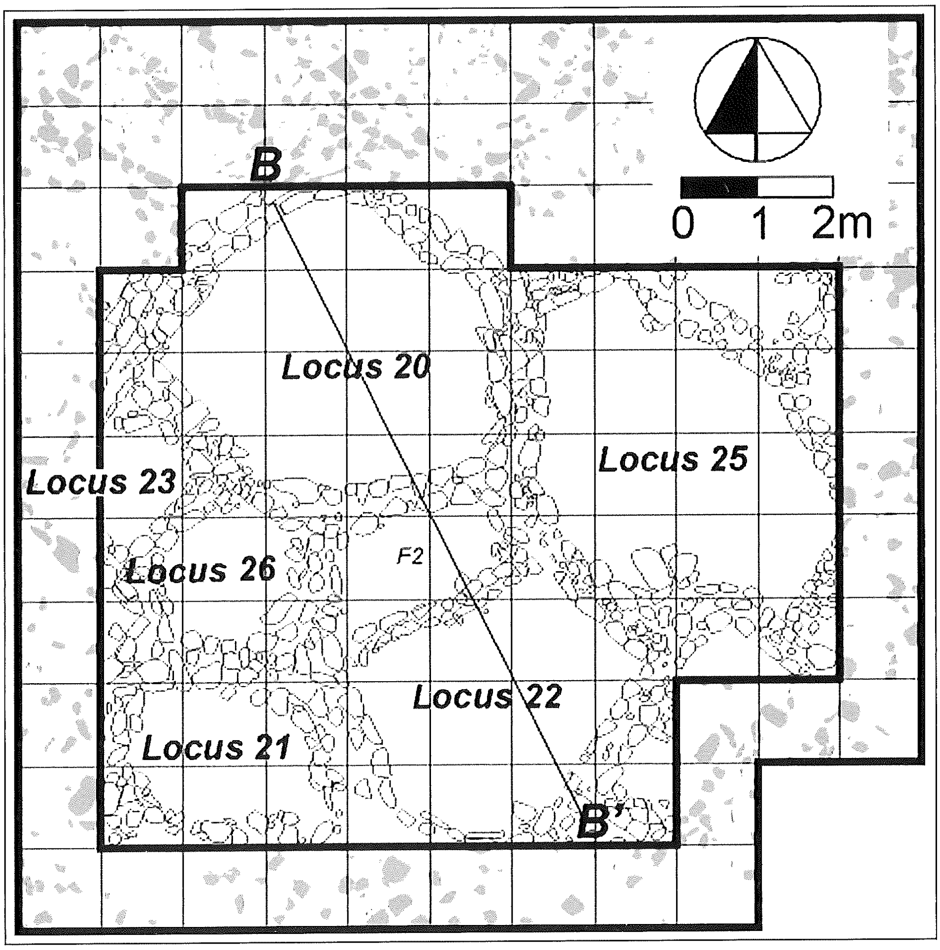
But how would these paleo-Bedouin have housed themselves during their half-year wandering through countless seasonal camps? What was the nature of their domestic structures, and how would they have transported them, or the transportable parts of them, from one camp to another? How would they have handled these problems of transport 2,500-3,000 years before the domestication of the donkey and perhaps 4,000-4,500 years before the domestication of the horse and camel? None of the standard pack animals of the Near East today were yet part of the Neolithic adaptation.

Paleo-Bedouin Housing

By the LPPNB, goat-hair fabrics must already have been part of the Neolithic industrial package for some time. It seems reasonable to suggest that the black goat-hair tent of the contemporary Bedouin has its origins in early nomadic pastoralism. Contemporary Bedouin social organization and its attendant residential arrangements certainly must be different from their Neolithic counterparts. So the design of the tent is likely to have been quite different. Immediately important would have been the need for a tent that could be accommodated by limitations of transport. Archaeological data from the southern Levant suggest ways in which paleo-Bedouin may have solved the mobile housing problem.

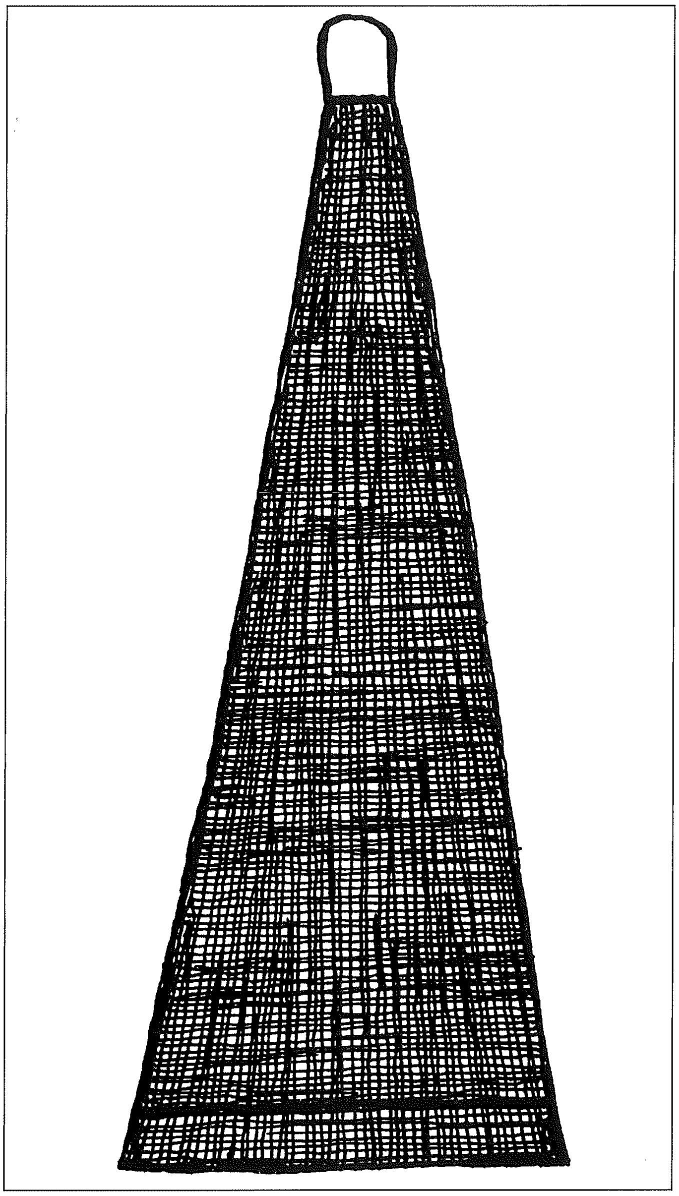
Examples of oval or circular stone houses, generally 3-4 meters in diameter, are described from several sites dating to the MPPNB/LPPNB, and later. Well-illustrated examples were excavated at ʻAyn Abū Nukhayla in Wādī Ramm (Henry *et al.* 2003) (FIG. 1), Nahal Issaron west of the southern Wādī ʻAraba (Goring-Morris and Gopher 1983), Wādī Tbeik (Gopher 1981) and Wādī Jibba I (Bar-Yosef 1984) deep in the Sinai, Shaqārat al-Musayʻid in the mountains north of Petra (Kaliszan *et al.* 2002), and elsewhere. Some of these sites and structures suggest more permanent occupation than others. The structures seem to represent either foundations of some kind of tent structure, or low stone-walled houses or pit-houses that often were built surrounding a shallowly excavated floor, and that once were roofed with materials no longer present. Or they represent a combination of these house types. It is significant that traces of the roofs of most of these structures are absent. While they simply may have collapsed and decayed, it seems more likely that these elements were emplaced each time the houses were occupied, and that they were taken away each time the houses were vacated. Whatever roofing material these houses once had must have been waterproof and thus capable of shedding the winter rains. A fabric cover woven from goat hair, which in contemporary Bedouin tents swells when wet and becomes waterproof (Weir 1976: 1), would have served the purpose then as it does now, and the sites date to the time when goats are expected to have been part of the local economies.

Roofing such structures with goat-hair fabric could have been accomplished with a single, light,



1. Excavated room block at ʻAyn Abū Nukhayla, Wādī Ramm.

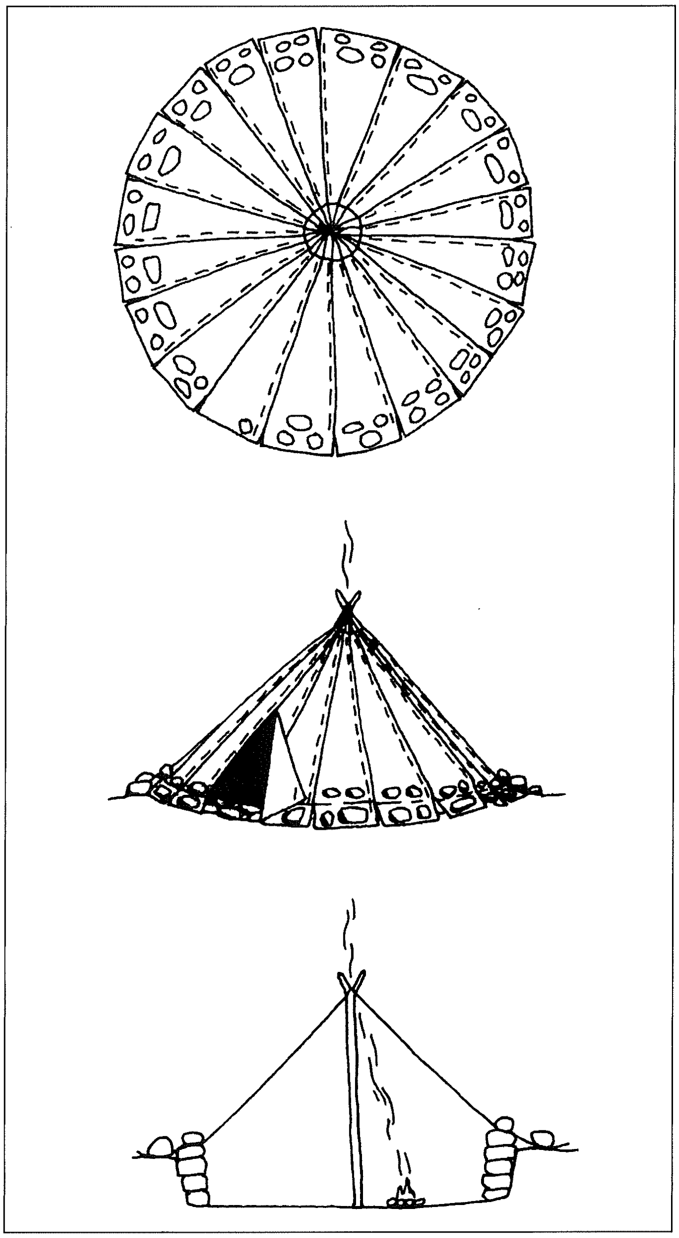
center pole of tamarisk or other timber supporting a series of joined, tapered, woven panels, each with a yoke at the narrow end (FIG. 2). Panels of this sort can be woven on ground looms with the taper accomplished by retiring warps as every few wefts are added. Contemporary Bedouin tent panels are joined together with tapered pins carved from wood (Weir 1976: 1-3, Fig. 4; Cribb 1991: 376) (or today often with iron nails). A similar pin mechanism would have worked in antiquity (FIG. 3). Somewhat similar coverings were suggested for houses excavated at Nahal Oren just south of Ḥaifa (Stekelis and Yizraely 1963). In thinking about structures such as these, it is necessary to reconcile what, especially in the Western world, are usually conceptualized as *either* "houses" *or* "tents" into a single hybrid entity. Cribb (1991: 376) termed such structures *composite dwellings*.



2. Tapered panel of woven goat hair.

One aspect of the composite dwellings postulated here would be that the fire hearth, if present inside the structure, likely would be positioned somewhat away from the center of the house floor to avoid the center pole (FIG. 3). Such off-center hearth positions are suggested in published drawings of domestic structures at Nahal Oren, Nahal Issaron, and Shaqārat al-Musay'id; they are also present in some of the structures at 'Ayn Abū Nukhayla (D.O. Henry, pers. comm. 2005).

Not all camps occupied by LPPNB and later



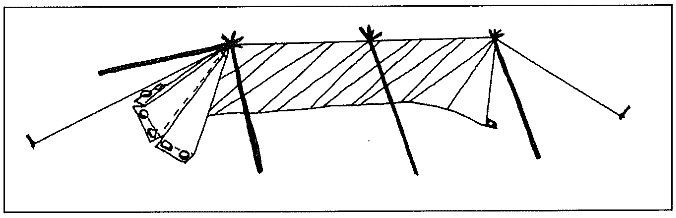
3. Composite tent/house structure suggested by oval and circular PPNB and later buildings, and a little imagination, top, side, and profile views.

pastoralists occurred in areas that lent themselves to the building of such composite dwellings. An example is the LPPNB site of Bawwāb al-Ghazāl on a slough in the former marshes of the al-Azraq Oasis (Rollefson *et al.* 1999). The sandy nature of the site area in the flat, once-marshy setting is marked by several rows of caliche blocks. The blocks were excavated on the site, perhaps during mining of green "Dabbah marble" exposed there, and were used elsewhere on-site for building stones. These rows of stones are positioned perpendicular to current prevailing winds, and they suggest use as anchors for windbreaks. Simply alternating the orientation of the same tapered panels that elsewhere served to cover round houses could result in a linear windbreak arrangement supported by several poles with tension lines (FIG. 4). The al-Azraq Oasis still contains abundant tamarisk trees, and in prehistory they or other species could have supplied the necessary poles for these shelters.

Transport without Pack Animals?

To think that early nomadic pastoralists in Neolithic Jordan would have themselves transported all the impedimenta discussed here is beyond reason. The world over, if any animals or mechanical contrivances can be brought to bear, they are always employed for transport. People are too practical, too lazy, or too smart, to become beasts of burden if they can possibly avoid it. Given all the baggage postulated above as essential for Neolithic pastoral adaptations, it is necessary to identify pack animals that could have transported it.

All nomadic pastoralists use pack animals, be they yaks, reindeer, camels, or whatever. What defines a pack or draft animal in a prehistoric context is not entirely clear. Usually it is the presence of a species known in other contexts to have been used for such purposes. Sometimes skeletal or dental modifications (such as tooth wear from use of bitted bridles) suggest that animals were controlled and used in transport or draft contexts. But none of the present Near Eastern pack animals are known with certainty to have been domesticated by the LPPNB. Accepted evidence for domestication of donkeys appears no earlier than the Chalcolithic (Grigson 1995; Sauer 1995). Other draft animals, such as oxen, are less able to metabolize dry vegetation and their water requirements are too great. In any case, there are no data that demonstrate their presence in steppe/desert Neolithic sites. Among traditional pack animals, then, conventional wisdom holds that there are no likely candidates. But such is not the case. Both goats and sheep need to be considered as possible pack animals.



4. Windbreak suggested by rows of rocks at Bawwāb al-Ghazāl. The same tapered panels shown in Figure 3 are oriented alternately end-for-end. Several different support and tensioning systems could be used to stabilize such a structure.

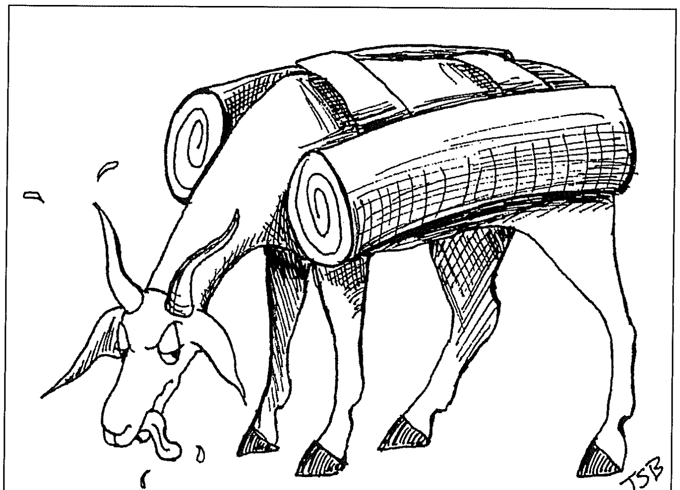
Certain breeds of goats and sheep have long been used as pack animals by nomads across much of Asia, and they are still used that way in western China, Tibet, Nepal, and India (Miller 2000). A well-documented example is in contemporary western Tibet where nomadic pastoralists tend yaks, sheep, and goats. There, adult male sheep and goats become pack animals when nomads are on the move. These people regularly travel to distant dry lake beds to obtain salt, which they transport by sheep and goat caravan for 225 kilometers in a month-long trip back to their home territory. Each animal must carry a load of up to 13.6 kilograms (30 pounds) of salt, and during the entire trip the laden packs are never removed. Then they caravan a similar distance to market areas to barter the salt for grain and other supplies, and the animals survive the ordeal (Goldstein and Beall 1990).

In the Neolithic Jordanian context considered here, the modular design of the housing panels postulated to cover the archaeologically documented structures would have enabled these tent-like coverings to be disassembled and rolled up into compact parcels of light weight. Balanced loads of rolled-up tent panels and other accoutrements discussed above, perhaps even in some sort of saddle-bag arrangement, would have been easily within the transport capability of small domestic ruminants (FIG. 5). Thus there is every reason to believe that goats, and possibly sheep, were used as light pack animals in the Neolithic. The goat is present at Bawwāb al-Ghazāl by about 8,100 radiocarbon years ago (Rollefson *et al.* 2002), where recovered horn cores are morphologically indistinguishable from those of modern goats. Analysis of the fauna recovered during the excavations has not been completed, so the presence of domestic sheep there remains to be determined. Reported faunal data from 'Ayn Abū Nukhayla (Henry *et al.* 2003) show ovicaprids to be poorly represented, but if the animals were essential for transport, and if such sites are nodes in a nomadic pastoral context, perhaps few of their bones would be likely to enter the archaeological record there.

Discussion and Prospectus

Much has been written and alleged about the reasons goats and sheep were added to the Neolithic economy and on how nomadic pastoralism emerged and operated as a viable economic strategy. Some authors have claimed that the original impetus for the origin of herding was to supply meat for the Neolithic economy (e.g., Bar-Yosef and Meadow 1995). Following the seminal work of Sherratt (1981), it has often been argued that the benefits of the so-called secondary products of ruminant domestication (milk, wool, hair, etc.) were realized only later. It is an error to think of primary and secondary products of herd animals, especially with regard to sheep and goats in the contexts of village farming and herding, and of nomadic pastoralism. Unless carefully managed, eating the meat of domestic animals can have deleterious effects on herd structure and vitality. But beyond that, there are significant benefits to be derived from viable herds of small domesticated ruminants beyond just the useful products (meat, hides, etc.) of dead animals.

It is more reasonable to think that Neolithic peoples were fully aware of the costs and benefits of sound herd management, and that they viewed



5. Domestic goat as a beast of burden.

milk, wool, hair, and manure all as renewable resources of domestic herd animals from the beginning of their association. In this light, it is more realistic to think that production of yogurts, cheeses, and butter from raw milk, the manufacture of milk bags from kid skins, textiles from animal fibers, roof and floor coverings from textiles, and other innovations that came from managing herd animals were all known and in place by rather early in the LPPNB. All were essential precursors to a nomadic pastoral life-way. And all that remained to launch nomadic pastoralism as an economic adaptation or strategy was some form of triggering mechanism.

It was suggested above, and by others, that this mechanism came about from competition between townspeople and their herds for fields of cultivated crop plants. Resolution of this problem occurred through scheduling a necessary spatial separation of the herds from the areas devoted to cultivation during the critical growing season. If this reasoning is correct, then it must be the case that the onset of winter rains prompted the annual nomadic migration. Textiles were adapted to mobile house construction, and cultured milk products became the basic food group for nomadic pastoralists. Goats and perhaps sheep were pressed into their new role as beasts of burden, and all of the other minor details were organized. Everything necessary emerged from existing technology. There was no need to invent anything new or complicated. All of the personal and field equipment simply had to be configured for transport.

Certainly the kind of composite dwelling I have suggested here is rather unique, and it has no conterpart in the tent architecture of today's nomads (Faegre 1979). But the housing requirements and physical alternatives, and the available options for transport in the paleo-Bedouin setting of Neolithic Jordan, as compared with almost all nomadic settings elsewhere in the world today, were also markedly different.

Social adjustments to the new dual life-way must have required the most serious accommodation. And this accommodation must have been serious, because the new economic arrangement was to divide forever what until then had been single social units. The social and economic relations between today's Bedouin nomads and their urban-dwelling kin are artifacts of those very choices made more than 8,000 years ago.

As anthropologists and historians it is important that we try to view Neolithic life in a more dynamic way, with greater attention to details, technological linkages, and possible alternative choices that were made and that could have been made. We should try to view the Neolithic in a more humanistic way also. Often our interpretations are narrowly constrained by the stone and bone remains we recover, and we fail to envision the colorful, perishable organic elements that we can be certain were present, and that gave beauty, warmth, vibrancy, and a sense of home and of place to people in the archaeological cultures we study[2]. When we look at the world of the contemporary Bedouin, the progeny of the economic revolution that began in the Neolithic, we view a measure of the essence of the early nomadic pastoral life-way. Pictured and described so well in Shelagh Weir's book *The Bedouin* (1976), we see woven tent panels with white stripes, colorful flat-woven kilims covering the tent floors and used as dividing curtains, elegant embroidery on clothing, decorated woven bags and camel harness, and intricate mechanisms for anchoring one's world against the relentless winds. And we see the means of production of it all. It is such impressions that enrich our studies and prompt us to look harder to see more clearly into the past, as I have attempted here.

Some will not be responsive to my arguments. They will correctly point out that there is no archaeological evidence for most of what I have suggested. They will correctly observe that almost every argument I have made includes the phrase "probably was," "could have," or "would have." Provocative ideas can simply be dismissed, or they can provoke problem-driven research. The latter is my purpose.

If we try to predict and anticipate the nature of the archaeological record of early nomadic pastoralism, we will have a better idea of what to look for, how and where we might find it, how we might recognize it if and when we do find it, and what it might mean. Otherwise our archaeology is only ever reactionary, and we will never be able to fit what we do find into a well-reasoned theoretical framework. With a more imaginative approach we can get beyond the limits of informed description to discovering what until now has been archaeologically invisible. It is time to seize the opportunity to understand better and appreciate more the web of complexities and practicalities of the daily lives of people who lived in prehistory. The role of the paleo-Bedouin in shaping the prehistory of the late Neolithic was profound, and it is time for their life-way to be seen in a better light.

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[2] For now, the best glimpses of this organic side of Neolithic life-way are in the perishable artifacts from Nahal Hemar Cave at the southern end of the Judean Desert (Bar-Yosef and Alon 1988).

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Romel Ghrayyib and Maria Elena Ronza

Archaeological Evidence of Water Distribution and Quarrying Activity at Qaṣr al-Ḥallābāt

Introduction

This paper concerns the results of three seasons of survey and excavation by the Department of Antiquities of the Umayyad settlement surrounding Qaṣr al-Ḥallābāt between 2002-2004 (Ghrayyib 2003).

Qaṣr al-Ḥallābāt is located 25km to the Northeast of the city of az-Zarqā', on the southeast edge of the modern town of al-Ḥallābāt al-Gharbiyya and was previously investigated by the Department of Antiquities between 1979-1981 (Bisheh 1980, 1982, 1985).

The most prominent architectural feature is the Qaṣr on the top of the mound, which dominates the site. Originally it was a Roman defense fort. In the first half of the eightieth century, during the Umayyad period, it was completely rebuilt and transformed into a lavishly decorated palace. A small mosque is located southeast of the qaṣr. A partnership project between the Department of Antiquities of Jordan and the Spanish Historic Heritage Institute, Ministry of Culture, aims to restore the Qaṣr and the mosque, under the direction of Ignacio Arce (FIG. 1).

An Umayyad settlement surrounds the qaṣr, its houses consisting of many rooms around an open courtyard (FIG. 2). They are built of undressed stones (limestone, re-used basalt blocks and fieldstone), and coated in order to hide the irregular surfaces of the walls and reinforce the structures. According to the results of the excavation, these houses were residences of servants working in the Qaṣr and contained pottery types and stone objects for grinding and processing seeds and vegetables (Bisheh 1985; Ghrayyib 2003). The settlement grew spontaneously, as is evident comparing the very fine architecture of the Qaṣr and the mosque with the masonry of the houses.

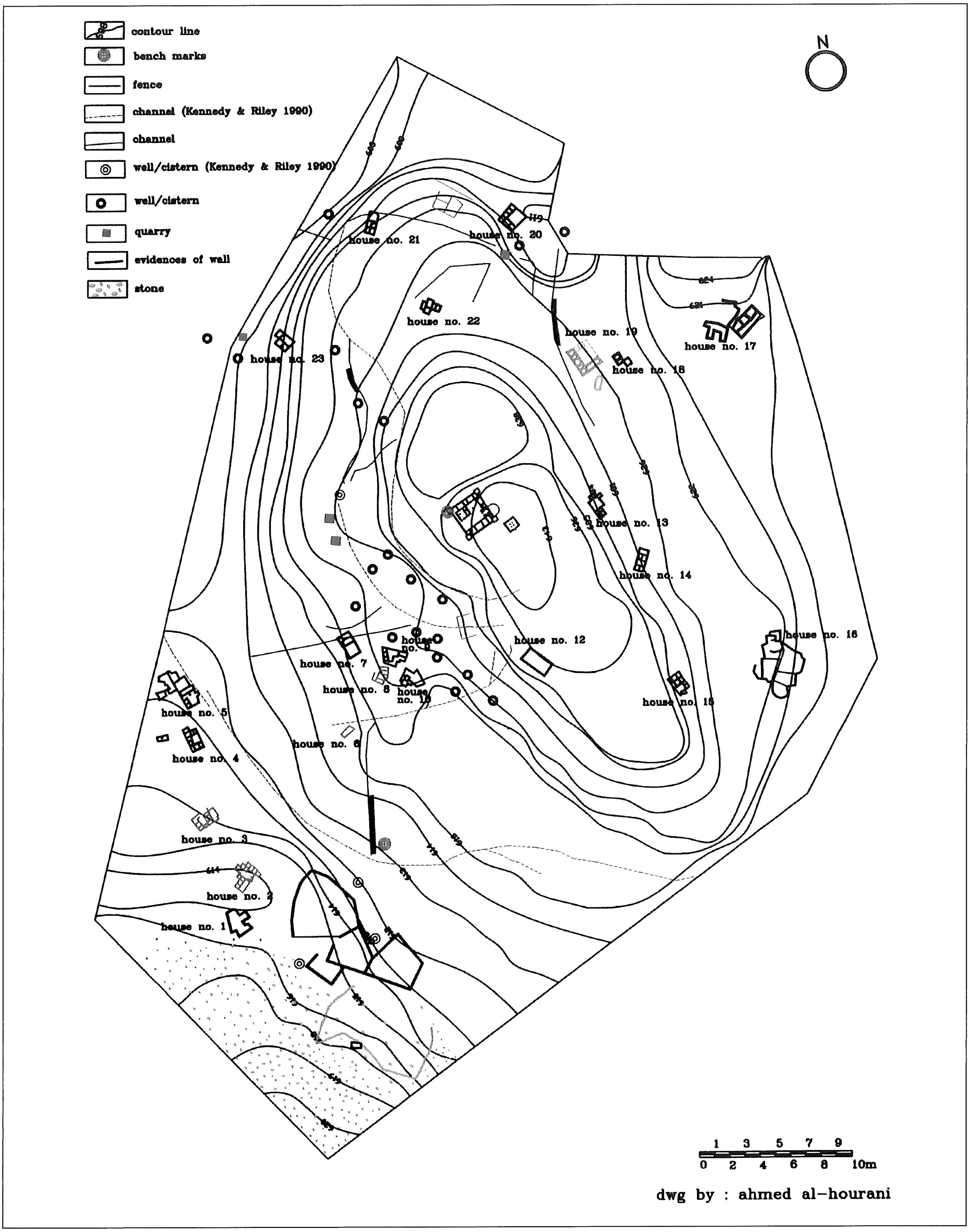
The site is served by a well-planned hydraulic system including different kinds of canals, a reservoir and several cisterns.

Quarrying Activity

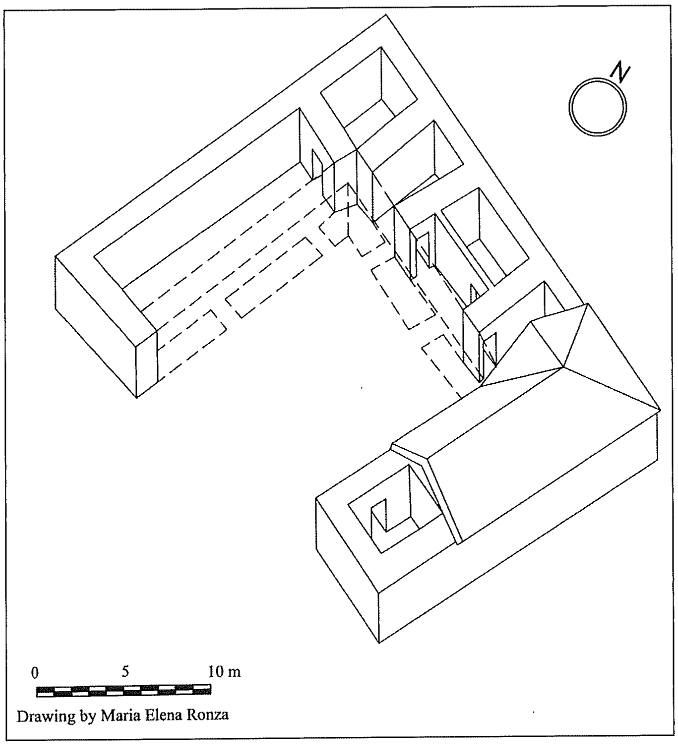
The site was exploited during the Roman period as source of stone. Evidence of quarrying was identified during the 2002 season (Ghrayyib 2003). Evidence of underground and surface quarrying has been identified. Four underground quarries are located on the western slope (FIGS. 3, 4) and the reservoir itself probably served as a quarry (Ghrayyib 2003). A large number of standardized quarried blocks are abandoned in the area of the reservoir (FIG. 1). They were quarried locally and most probably they were left there for maturing (FIGS. 5, 6). They are oriented (north-south or northeast-southwest) and organized in partitions according to their dimensions (FIG. 7). The measurements of the blocks fit in the Roman system of measurement (pes monetalis 0.296m). Similar standardized blocks are attested at the quarries of the area of Khirbat Yājūz dated to Roman period (Ronza 2004). This organization of the blocks was intended to test the quality of the stone (Ghrayyib 2003). Orientation and partitions were probably used to indicate the date of extraction and the provenance of the blocks in the absence of *notae lapidicinarum.* Those inscriptions were incised on the blocks by a chisel and were coloured with minium (Dolci 1997). They indicated the date, the name of the person in charge of the section, the engineer in charge of cutting and the names of his subalterns. Those marks are diffuse in the early period and became very rare during the Empire (Dolci 1998; Lugli 1957).

The Hydraulic System

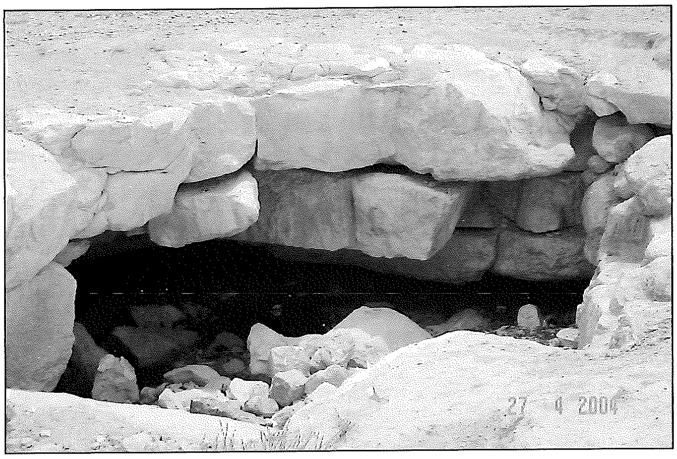
The hydraulic system depends on waterfalls and consists of a capillary canals network serving sev-



1. Topographical map of the site.

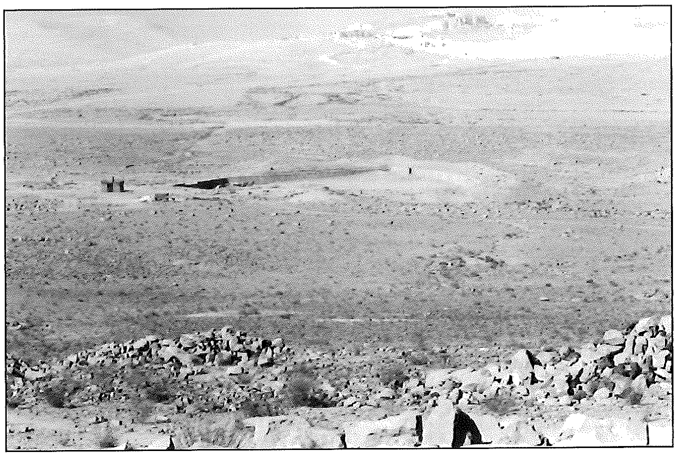


2. Typological reconstruction of an Umayyad house.

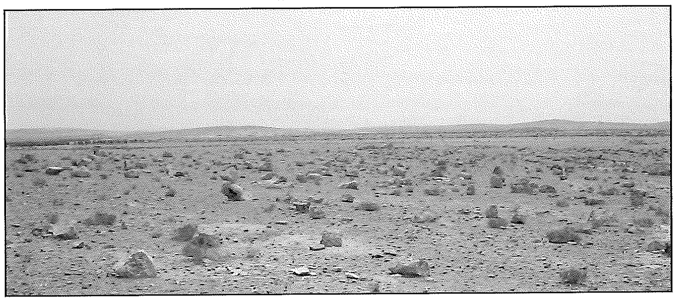


3. Underground quarry on the western slope.

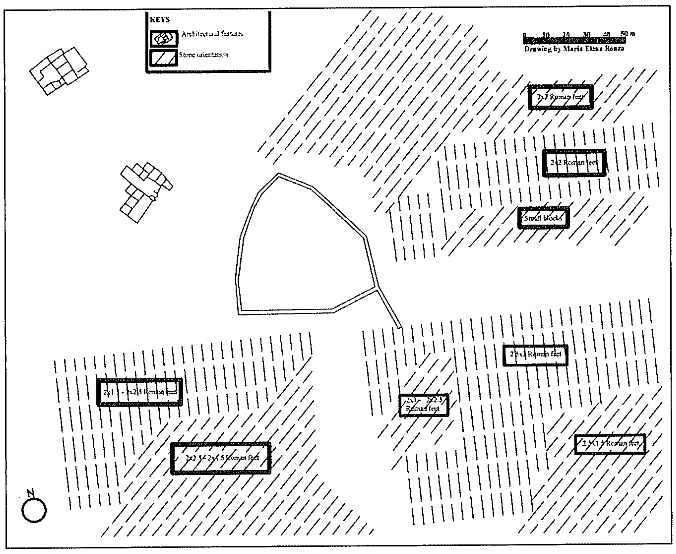
4. Detail of the quarry.



5. The reservoir and the quarried blocks.



6. The quarried blocks.



7. The arrangement of the blocks around the reservoir. according to orientation and dimension (Sketch).

eral cisterns. The canals were made of locally quarried limestone and were plastered and probably covered (FIG. 8). The main canals run according to the contour lines, the secondary canals follow the slope of the mound and direct the water towards the cisterns (FIG. 1) serving each single house or residential complex (Ghrayyib 2003).

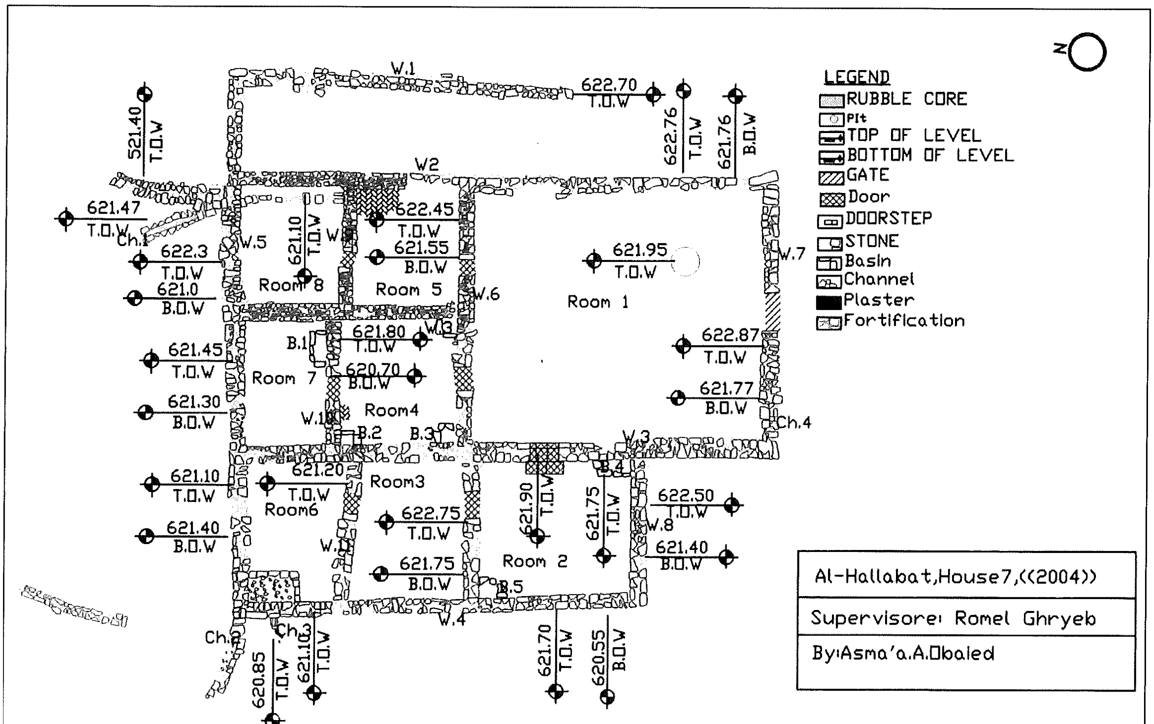
During the 2004 season of excavation at house no. 7 (FIG. 9), a 4.10m long canal was identified at the southeast corner of room no. 8 (FIG. 10). It

8. A water canal.

is made of stone and it is completely plastered. A drainage system related to several basin in rooms no. 2, no. 4, no. 5, no. 6 and no. 7 was investigated (FIG. 11). The basins are carved into the stone and some of them were plastered (FIG. 12). Most probably the other houses had a similar drainage system and were connected to the hydraulic system by similar canals, but no evidence had been found at the present stage of excavation.

As mentioned, each house or residential complex is served by one or more cisterns (FIG. 1) and although the canals appear to be part of a single large-scale project, due to the identical building materials and methods used, the cisterns are not. They are dug into the bedrock in a bell shape and were completely plastered (FIGS. 13, 14). The peculiar features of each cistern show that they are carved without planning, due to their location and the different materials, finishing and dimensions (FIGS. 15, 16).

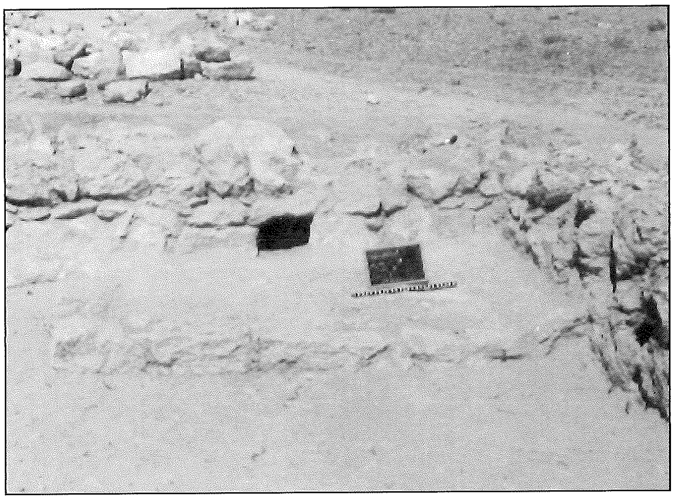
An interesting case is the cistern south of house no. 20 that has a square pilaster made of local limestone and re-used basalt blocks to hold the ceiling. Whilst its walls were plastered to avoid the loss of water due to the permeability of limestone, the pilaster is not plastered. Before entering the cistern the water is stored in a plastered settling basin (FIGS. 17, 18). A similar cistern lies under the pavement of the main courtyard of the qaṣr. It has a



9. Plan of house no. 7.

10. The 4.10m long canal of house no. 7.

11. Detail of the drainage system of house no. 7.



12. Basin in house no. 7.

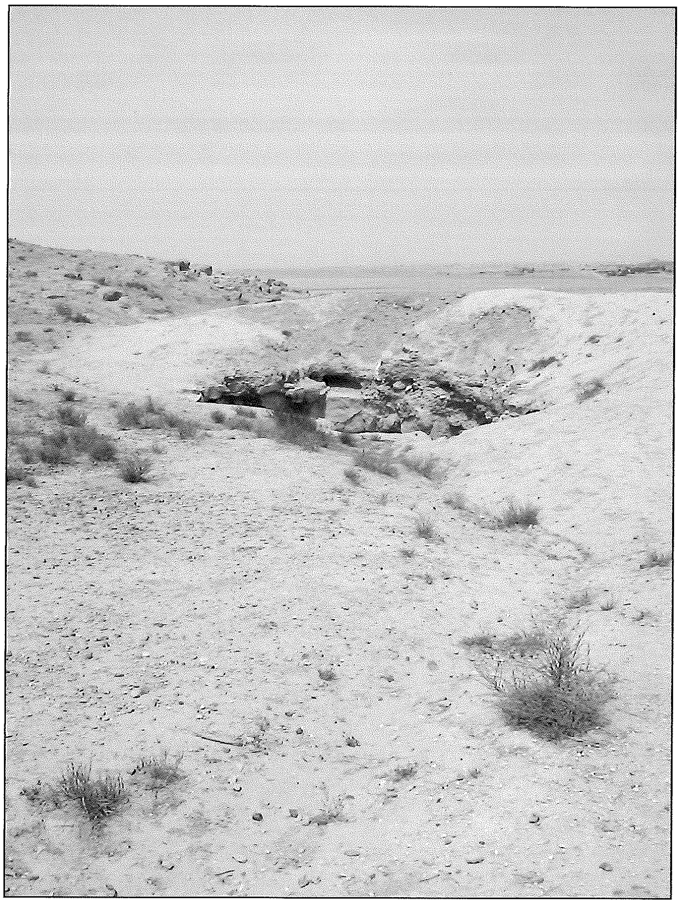
13. Cistern on the western slope.

square pilaster to hold the ceiling and its walls are plastered.

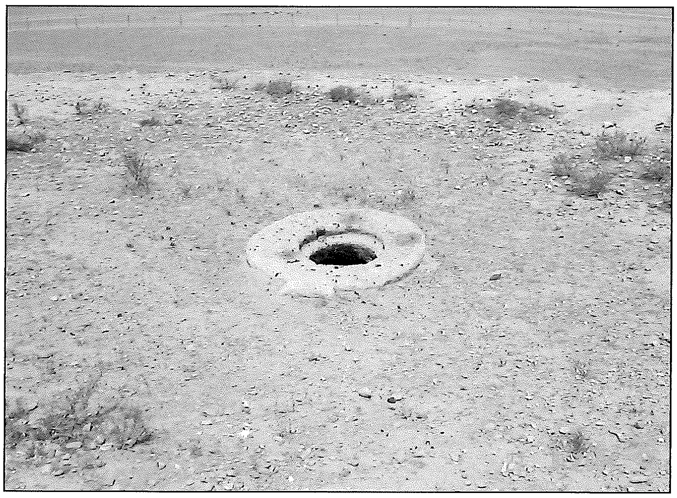
At the bottom of the mound is the reservoir of about 8000 cubic metres surrounded by earth (FIG. 5). It is partially dug inside the bedrock and partially built of local limestone with rubble core walls of well dressed external blocks and a core of small stones and concrete (Ghrayyib 2003). A settling basin is built along the southern edge of the reservoir.

Taking into account all of the above, it appears that the reservoir and the cisterns were not part of a single building operation: they probably belong to different periods. Some of them, on the southwest slope, are earlier than the settlement and influenced the position of the houses; some others are con-

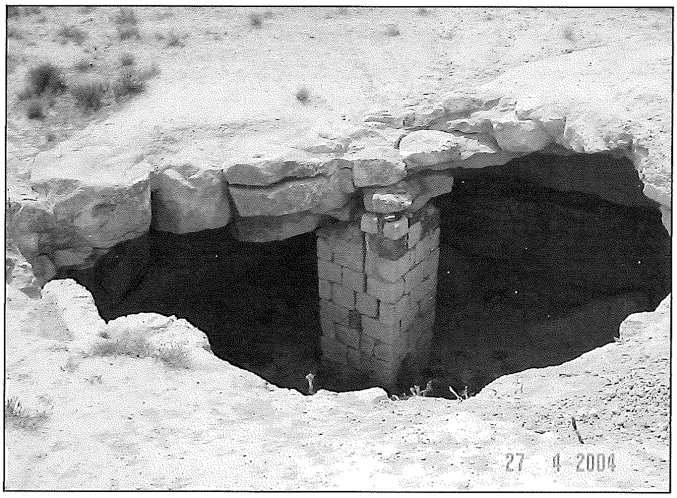
14. Detail of the plastered wall of the cistern.



16. Cistern on the western slope.



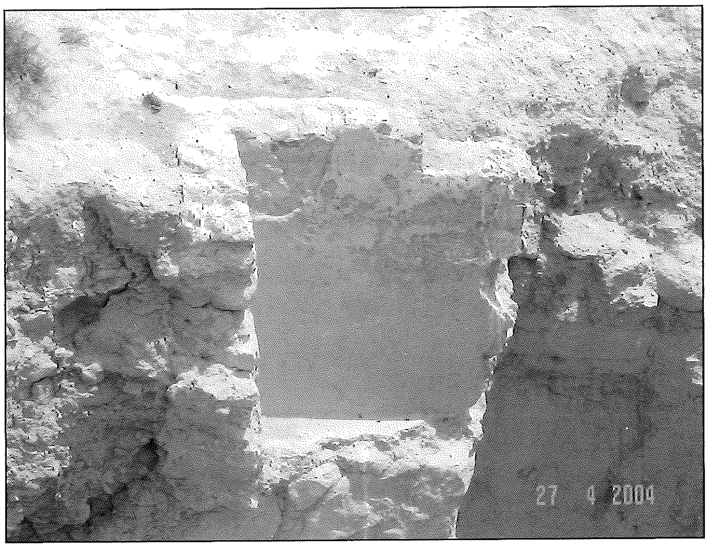
15. Mouth of cistern on the western slope.



17. The cistern near house no. 20.

temporary with the houses. On the other hand, the canal network is a single large-scale project which aimed at the preservation of the maximum storable volume of water and at the re-distribution of the surplus water to agriculture through the drainage system of the houses. A walled agricultural enclosure is located approximately 400m to the west of the castle and this also has a well planned water distribution system (Bisheh 1982).

The transformation of arid lands is a feature common to several Umayyad sites, such as Qaṣr Mushāsh (Bisheh 1989), Wādī al-Qanāṭir (Bujard and Genequand 2001), Umm al-Walīd (Bujard and Genequand 2001), Khān az-Zabīb (Bujard and Genequand 2001), Ma'ān (Genequand 2003). The Umayyad dynasty, due to the political stability, was able to settle the Jordanian steppe, introducing the agricultural exploitation of desert areas.



18. Detail of the settling basin.

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The Petra Great Temple's Water Strategy

Abstract
For over a decade Brown University archaeologists have excavated the spectacular Great Temple in Petra with an amazingly complex system of water strategy. Clear evidence, both stratigraphic and artifactual, shows that Nabataean water systems were built to serve this precinct. Were they put in place by Hellenistic trends and traditions? This submission looks at the evidence to reconstruct and interpret these unique water systems and to reconstruct how they might have been used during the Nabataean and Nabataean-Roman periods. Appearing to represent a number of more common construction techniques — cisterns, subterranean canalizations and open channels — they are in an excellent state of preservation. We will examine the Great Temple water systems as a focal point for serving the Nabataean city center.

Introduction to the Petra Great Temple

The Great Temple represents one of the major archaeological and architectural components of metropolitan Petra. As can be seen in FIG. 1, it is the largest freestanding building yet excavated in the city. Located to the south of the Colonnaded Street and southeast of the Temenos Gate, this 7560m^2

1. Aerial overview to the south of the Petra Great Temple at the close of the 2004 excavations (A. W. Joukowsky).

precinct is comprised of a Propylaeum (a monumental entryway, where there is a shrine of Nabataean double aniconic betyls), a Lower Temenos, and monumental east and west Stairways which in turn lead to the Upper Temenos — the sacred enclosure for the Temple proper.

In the Propylaeum and Lower Temenos are triple colonnades on the east and west with a total of 120 columns surmounted by phenomenal Asian Elephant Headed Capitals. The temple itself is tetrastyle in antis with four widely spaced columns at the entrance. Beyond these originally stood anta walls decorated with reliefs. Approximately 15m in height, the porch columns plus the triangular pediment and the entablature hypothetically place its height at a minimum of 19m.

Overall the Great Temple proper measures 35m east west, and is some 42.5m in length. The 1993-1997 excavation results have been published and annual reports can also be found in the *Annual of the Department of Antiquities of Jordan* and in the *American Journal of Archaeology*. The final report of these excavations is now underway. The water systems are the focus of this paper; we will begin at the rear of the precinct with the Upper Temenos and the East Plaza Great Cistern, followed by those in the temple and ending with the features of the Lower Temenos and Propylaeum.

History of Excavations and Research

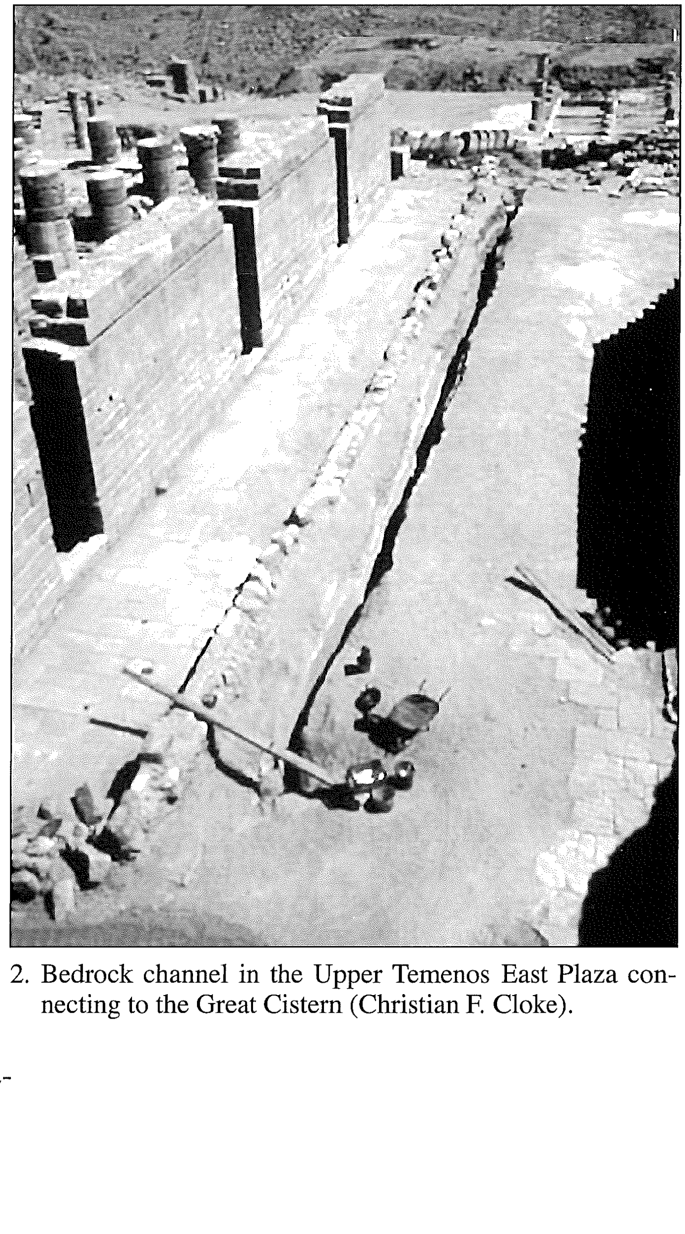
Excavation of the Great Temple began in 1993, and the following season the subterranean canalization system became apparent to archaeologists. Ground Penetrating Radar was utilized in 1995, under the supervision of Brown professor of Geological Science, Terry Tullis, confirming the presence of various stretches of subterranean canalization and detecting the locations of many presumed subterranean hydrological features. For our 1998 publication, *The Petra Great Temple: 1993-1997, Volume* I, Elizabeth E. Payne and Terry Tullis produced a comprehensive study of features discovered to date, although many more would be uncovered in the years to come. Christian Cloke's latest assessment of the water systems is currently in press.

The Purpose of the Great Temple's Water

Spring water for the temple's supply came from the 'Ayn Brāq and other natural springs to the south of the temple, and surface drains like the one shown in FIG. 2, located along the perimeter of the Lower Temenos and at the edges of the temple Forecourt or Pronaos collected rainfall. Once it made its way into the system, water was directed through a number of large channels toward various storage areas, primarily the East Plaza Great Cistern, a large subterranean bedrock cistern to the east of the temple proper, while overflow was transported farther north to the front of the precinct.

Progression of Water through the Upper Temenos and Temple

To the rear southwest of the Great Temple water entered the system through an aboveground settling tank, which likely modulated flow into a series of rock-cut channels and ceramic piping flowing east across the South Passageway (FIG. 3). Upon reaching the East Plaza these channels turned north and delivered the majority of this water to the East Plaza Great Cistern below, while the excess supply proceeded north through the large east artery beneath the East Plaza. Inside the temple proper a parallel central artery was set beneath the floors of the



2. Bedrock channel in the Upper Temenos East Plaza connecting to the Great Cistern (Christian F. Cloke).

3. Channels cut along the south perimeter wall leading to the Great Cistern (Christian F. Cloke).

Central Arch and the East Vaulted Chamber, leading north toward the temple forecourt. A map of the Great Temple Water Systems is shown in FIG. 4.

The East Plaza Great Cistern

The East Plaza Great Cistern was hewn out of the natural sandstone bedrock underlying the PGT (typical of Nabataean cisterns) with entrance and exit shafts to the southeast and southwest respectively. The Cistern's storage area measures 327.64 cubic meters. A cistern of this size could have held around 86,562.488 gallons or 327,640 liters of water, an astounding figure, making this the largest cistern yet documented in downtown Petra. A section of the Petra Great Temple east plaza cistern with its bedrock support column is shown in FIG. 5.

On the east side of the room a pillar of bedrock was left to support the ceiling, while a smaller masonry pillar was constructed on the west for the same purpose. To the south of these elements an arched wall was built spanning the entire width of the structure. The arches allowed water to fill the area behind the wall without compromising structural integrity. Farther north, a smaller cistern or reservoir, built into the East Perimeter Wall, was available for storage of additional water, and behind the East Exedra, the East 'Cistern' (in its original bedrock-cut incarnation) constituted an earlier water storage area. The interior of the East Plaza Great Cistern can be seen in FIG. 6.

The Lower Temenos

In the Lower Temenos, circular surface drains with hexagonal bronze fittings (to match the hexagonal paving stones, Joukowsky 1998: Figs. 5.6, 5.7) collected rainwater during the winter months, depositing it into the underlying canalization FIG. 7. Side channels extending from the east and west drain delivered water to the larger central and east arteries. The west drain toward the central artery can be seen in FIG. 8. The majority of water then traveled north through the continuation of the east artery or through the continued central artery shown in FIG. 9 down the middle of the Lower Temenos. Square shafts, or manholes, opened into the central artery to facilitate cleaning of the channel. The ultimate destination of water to the north is unknown, but it is likely that another cistern or storage area existed to the north of the Propylaeum.

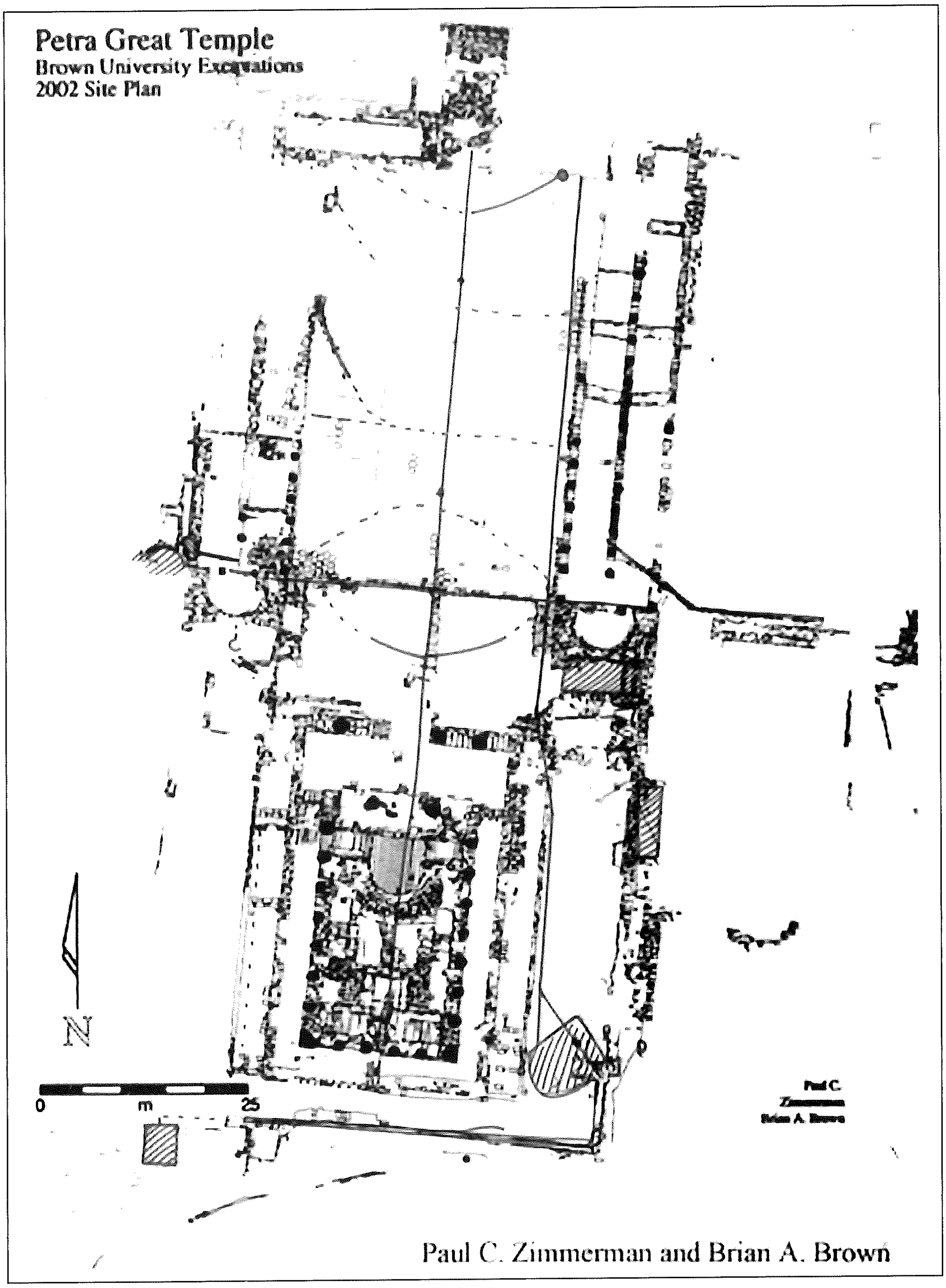
Ensuring Water Quality

Numerous features within the PGT water systems indicate a clear concern for the cleanliness of the water supply. A sill across the central artery at the north of the Lower Temenos was designed to catch silt and debris while water flowed over FIG. 10.

A basin in the northeast Lower Temenos, FIG. 11, also cleared the water of debris, which settled to the bottom while the cleaned water rose and flowed out toward the central artery. Additionally, all subterranean channels were capped with large stone slabs and lined with hydraulic mortar. Above the capstones were layers of packed, clay-like soil to seal the channels entirely, preventing intrusion of dust and debris from the surface. Ultimately, the concern for cleanliness of the water supply is seen in parts of the system dealing both with spring water and rainwater, indicating that both types of water were valued and intended to be potable.

Later Features

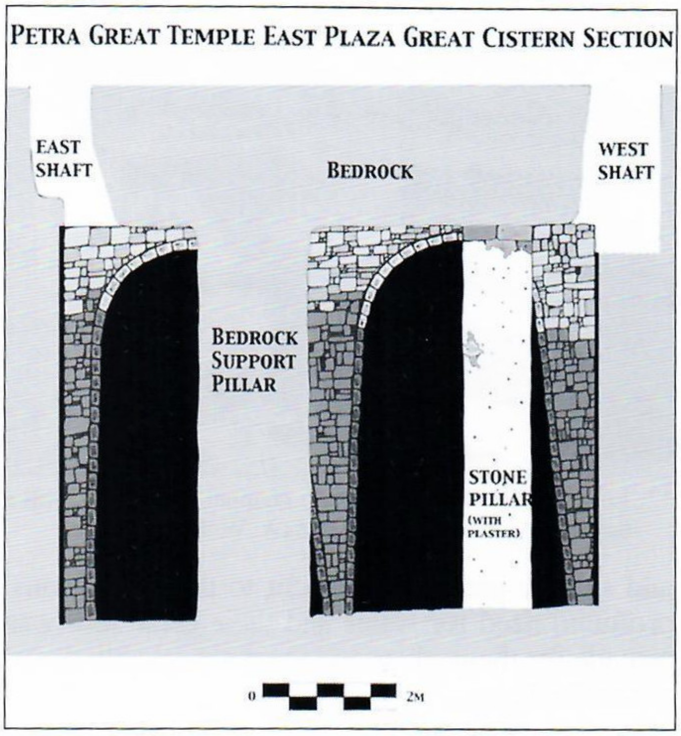
All water systems discussed to this point were



4. Top Plan of the Petra Great Temple with water features (Paul C. Zimmerman, Brian A. Brown and water features by Christian F. Cloke).

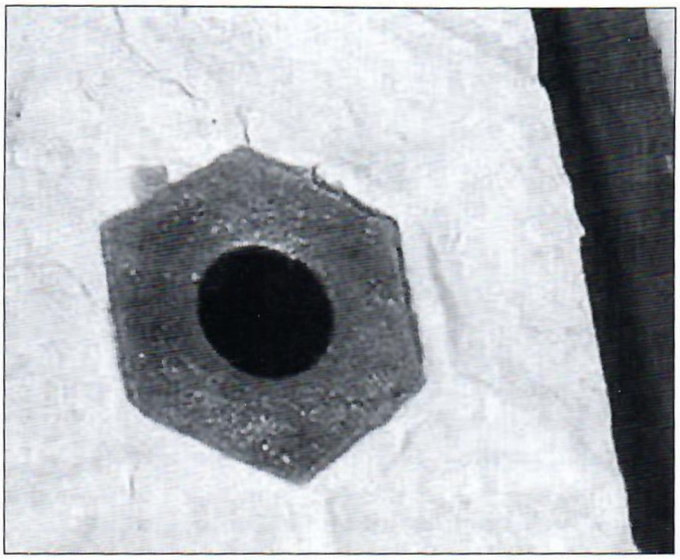
devised initially in the Nabataean phases of the temple's construction and use, dating to the late first century BC. This early system, however, was expanded upon and modified during Roman and Byzantine times as well. Spanning the east west width of the Lower Temenos south a lead pipeline was laid to traverse the precinct, delivering water from the direction of the Garden and Pool Complex on the east to the west side of the temple precinct, where water may have been needed, perhaps for a small bath near the West Exedra, which is of a much later date.

Other components throughout the precinct show numerous modifications to the water systems, resulting from various damage, changes in purpose and varying degrees of technological expertise and engineering capability. Artifacts within the East Plaza Great Cistern and channels to the south of the temple proper show that these systems were installed at the end of the first century BC, and used well into the Byzantine period at Petra, and even contained Islamic period ceramics. Ultimately, it is clear that these systems served many people for hundreds of years. Although modified somewhat,

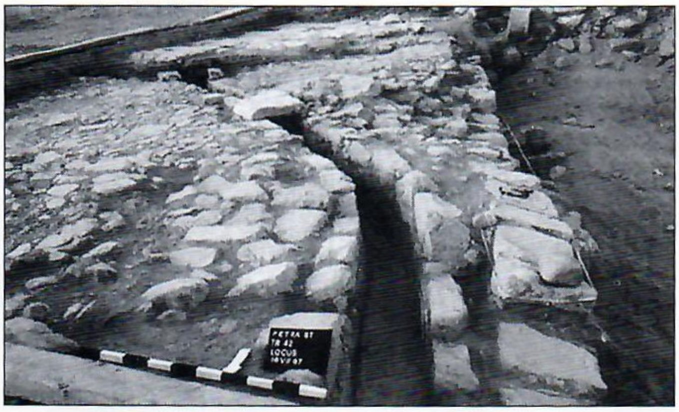


5. Cross section of the east Plaza Great Cistern showing masonry and bedrock features, wall with arches, entry and exit shafts (drawing by Emily Catherine Egan).

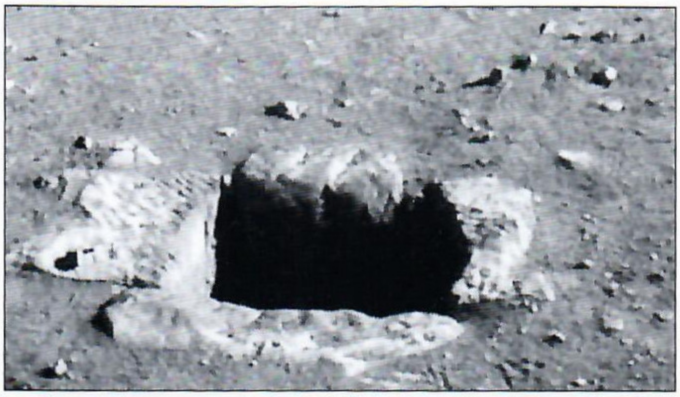
6. View to the southwest of the Great Cistern. To the left, is the west arch and to the right, the plastered face of the masonry pillar (Christian F. Cloke).



7. Bronze Drain Fitting for a Lower Temenos Hexagonal Pavement. (A. W. Joukowsky).



8. Lower Temenos canalization in the northwest (A. W. Joukowsky).

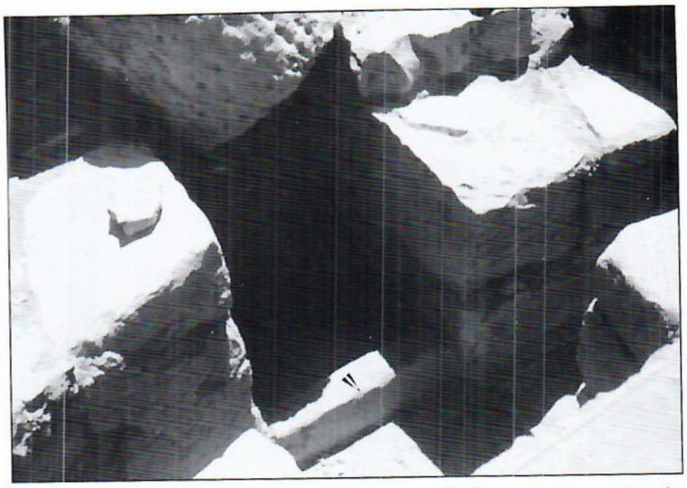


9. Lower Temenos manhole opening (A. W. Joukowsky).

they retained their original character while Petra itself underwent far more drastic transformations.

Conclusions

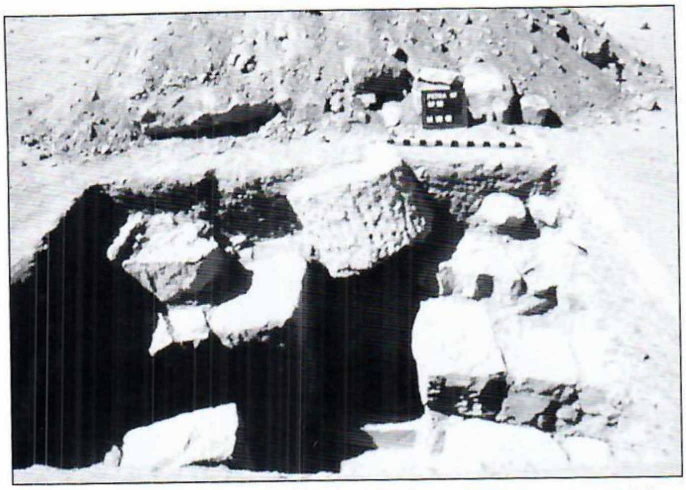
Our excavations at the Petra Great Temple have yielded much information about the fascinating water systems of the Petra Great Temple through use of traditional methods, Ground Penetrating Radar and computer applications such as virtual reality reconstruction of trenches and architecture. Parallels to the Petra Great Temple systems can be seen at other ancient sites within the Nabataean world and beyond. Particularly useful comparisons can be made to the cisterns, reservoirs, aqueducts and channels at the nearby site of al-Ḥumayma, near Wādī Ramm, excavated extensively by Oleson, Eadie, and others in recent years. Despite its clear



10. In the center is a stone ledge or sill for cleaning debris from water in the central artery (Christian F. Cloke).

11. Lower Temenos channel leading away from settling basin towards the central artery (Christian F. Cloke).

place within the wider Nabataean corpus of hydrology, the Petra Great Temple is unique in some respects, and its ingenuity, efficiency and utilization of many techniques for water collection, direction



12. Lower Temenos subterranean channel and artery with a collapsed column drum on top (A. W. Joukowsky).

and storage provide testament to the Nabataeans' profound need for water and their great ability to provide for themselves and their remarkable desert cities like Petra.

Acknowledgements

I am grateful to Christian F. Cloke for his preparation and help with this paper. Chris has been a loyal member of the excavation team since 2001 and wrote his Brown University Honors Thesis on the Great Temple water systems. These campaigns would not have been possible without the generous assistance of the Jordanian Department of Antiquities, Fawwaz al-Kraysheh, Director, and Suleiman Farajat Director of the Petra National Park, and the American Center of Oriental Research, Pierre M. Bikai, Director. We would also like to express our thanks to Brown University for making these excavations possible.

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Two-Humped Camel Drachms: Trajanic Propaganda or Reality?

In the reign of the Roman emperor Trajan (98-117AD), during his sixth consulship (112-117AD), several years after the annexation of the Nabataean kingdom in 106AD, two series of silver drachms were issued depicting camels. Trajan is on the obverse of both, but the images of the camel on the reverse differ. On one there is a personification of the goddess of Arabia, standing adjacent to a small dromedary at her feet to the left. The other issue has a two-humped camel on the reverse (FIG. 1). They are generally designated as the 'standing Arabia' and 'camel' types. The later type has proven to be controversial both in regard to the provenance of the mint and the interpretation of the 'two-hump camel' on the reverse. The mint where they were issued was originally postulated as Caesarea in Asia Minor, but more recently is attributed to a local Arabian mint. What has remained particularly puzzling is the presence of a two-humped camel (*camelus bactrianus*) on the coins, since it is normally associated with the region of Afghanistan and the Far East, not Arabia. Why should such a seemingly exotic foreign image be selected for coins that were intended to circulate in the new province of Arabia where the one-hump camel (*camelus dromedarius*) was dominant?

Various solutions have been proposed to account for this iconographic problem. Some have seen the two-humped camel as an economic symbol for the establishment of security of the trade routes between the Near and Far East that would result with the annexation of the Nabataean kingdom, bringing caravans from central Asia to Bostra and the Levant (Metcalf 1975: 96; Kindler 1983: 96). Others have seen it as political propaganda, an overt declaration of Trajan's military ambitions of seizing control of the Parthian realm and with it the Iranian plateau and Afghanistan (Bowersock 1983: 84). More re-

1. A two-Humped Camel Silver Drachm.

cently, it has been advanced that the image is nothing more than an error on the part of the officials at Rome who were responsible for designating the types of coinage. This proposal assumes that either the coins were minted at Rome and then were sent out to the relevant provinces for distribution or the dies were cut at Rome and sent out to the provincial mints (Butcher 1988: 36-37). In either case, the inappropriate symbol of the 'Bactrian camel' was selected for the Trajanic drachms and apparently "nobody in the mint at Rome knew or cared about the difference" (Butcher 1995-96: 114). The 'camel issues are then neither propaganda nor a reflections of reality, but simply a mistake.

In my opinion, there are substantial reasons for attributing the silver 'camel' drachms of Trajan to a local provincial mint, rather than Rome. Furthermore, there is some basis for assuming the two-humped camel was an inappropriate symbol for coins representing the new province of Arabia. First, let me set forth the reasons why a local mint in Arabia is the most attractive possibility for the 'camel' issues.

(1) The 'standing Arabia' type is found in large quantities in hoards in the Levant — 1,838 at Mampsis, 43 at Eleutheropolis, 23 at Wādī Murabba'āt, and 242 at Tall Kalak near 'Ammān. The 'two-humped camel' drachms are found in lesser quantities in the same hoards — 204 at Mampsis, 5 at Eleutheropolis, 9 at Wādī Murabba'āt, and 68 at Tall Kalak (Metcalf 1975: 92-94 and 100), but are completely absent in hoards from Asia Minor and Syria. In addition, none of the 'Caesarean' issues are present in the Arabian hoards. These facts suggest that both issues are the product of a local Arabian mint.

(2) The fact that a number of the local 'Arabia' drachms from the Mampsis (Negev 1971: 116) and the Tall Kalak hoards (Metcalf 1975: 95) were overstruck on Nabataean coins leads to the same conclusion: they were minted locally in Arabia, not Caesarea. This was already argued for the 'standing Arabia' type, but it has been overlooked that there also are clear traces of overstriking on a Nabataean coin on at least one of the 'two-hump' camel issues (Kindler 1983: 96). This provides further support for the 'two-hump camel' drachms being produced by a local mint in Arabia (as surmised already by Spijkerman 1978: 32-34, n. 1).

(3) Analysis of Roman silver coinage by bulk chemical and optical microscopy is proving to be a useful technique in measuring the silver standard of issues from the mints at Rome and the provinces. The present results reveal that the Romans appear to have deliberately overvalued provincial silver coinage against the standard imperial issues as a way of restricting the circulation of the provincial issues to a single province or sector of provinces (Butcher and Ponting 1998). In essence, the 'Rome' style coins were issued simultaneously with coins of 'local' style, but with dramatic differences in regard to the silver content. The Roman issues had from 67% or more silver content, versus about 50% for the provincial issues. Such analysis of the Trajanic issues has just begun, but the examination of several 'two-hump' camel drachms (BMC 65 and 66) has been conducted and both were struck on the 50% silver standard, not the 67% silver standard of the tetradrachms issues of the Roman mint. In addition, the silver-gold ratio of the 'camel' drachmas shows the same variability as the 'standing Arabia' type (cf. Butcher and Ponting 1998: 316-317, with chart on 325, nos. 1-5). This same 50% standard was used earlier in Nabataean silver issues (Schmitt-Korte and Cowell 1989). This 50% standard remained typical of the Eastern provincial issues long after Trajan, and was adopted for the West only in the reign of Septimius Severus in 197AD (Gitler and Ponting 2003). In sum, at least at present, there is no basis for separating the Trajanic drachms into a 'Rome' type (the 'two-hump camel' issues) and a 'local' type (the 'standing Arabia' issues) on the basis of silver content.

(4) The provincial character of the Trajanic portraits on the Trajanic coins is indicated by the iconographic style of the representation of the emperor. On imperial coinage, Trajan is depicted in rather delicate style, but the provincial issues of his sixth consulship portray him with exaggerated lips, a larger nose, a broader skull, and a different hairstyle (Weder 1977).

(5) Finally, the titulary of the two issues is the same, with one exception: the 'two-hump camel' issues of the sixth consulship add *optinus* (in Greek, APICTΩ), a title adopted by Trajan sometime between August 10th and September 1, 114AD. Trajan later adopted the title

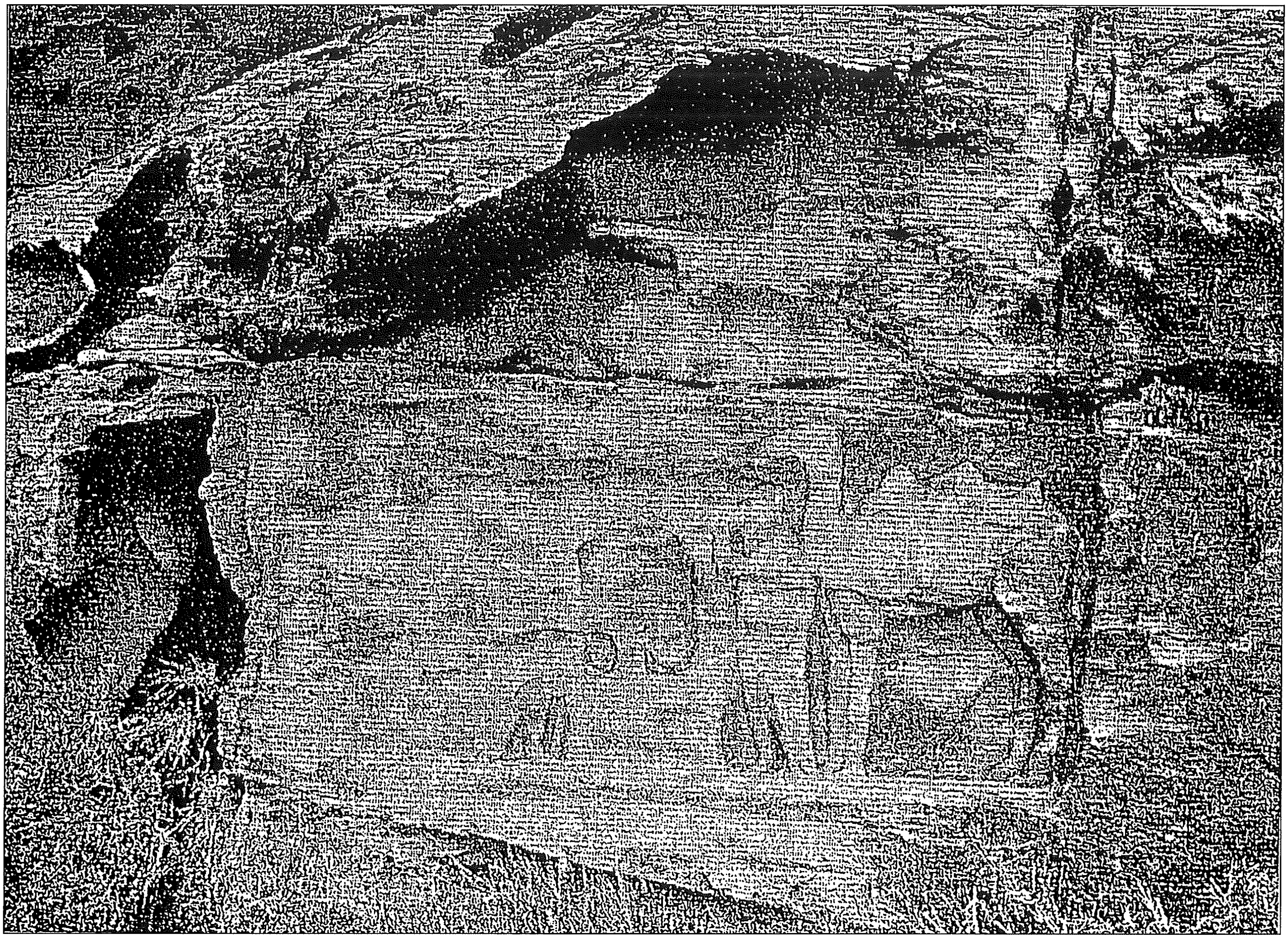
'Parthicus' sometime between the end of May and August 28, AD 116, but it does not appear on either of the Arabian drachm types (Metcalf 1975: 101; cf. Richier 1997: 603-606). This suggests the 'two-hump camel' issues were issued between August 114AD and May 116AD, evidently replacing the previous 'standing Arabia' type, which were issued between 112-114AD (Metcalf 1975: 101). This also helps to explain the disparity in the larger number of the earlier 'Arabia' type versus the smaller number of the 'camel' type. Metcalf's argument that the 'standing Arabia' and 'two-hump camel' drachmas were issued sequentially and separately as local issues, not concurrently as a 'Rome' and 'local' type, is still compelling.

What remains to be explained is why the 'two-humped camel' was selected for the later issues. Is the image advance publicity for the objectives of Trajan's Parthian campaign? Or is it merely a mistake by the engravers? In this regard, it should be emphasized that Trajan was familiar with the fauna on the landscape of the Near East. During the time his father was governor of Syria between 73/4-78/9, earning *ornamenta triumphalia* during a campaign against probably Parthia (Bowersock 1973: 135), Trajan joined him in Syria, sometime probably between 73-76, to begin his military career as a tribune in one of the Syrian legions (Pliny, *Pan.* 14.1 and 15.1-3), either the *III Gallica*, *IV Scythica*, *VI Ferrata* or *XVI Flavia* (Bowersock 1973: 140; Bennett 1997: 22-23). Afterwards, he served on the German frontier. There is no evidence that he returned to the East again, either during Domitian's reign or immediately after he became emperor in 98AD. Between 101-106AD, he directed the Dacian Wars and afterwards returned to Rome, and remained in Italy between 107-113. His only known return to the East was at the end of his reign, when he conducted the Parthian campaign. In January 114, he arrived at Antioch in Syria (Mal. *Chron.* 2.272), and then journeyed to Satala on the Upper Euphrates in April, where he assembled his army and marched into Armenia (Bennett 1997: 191-194). Trajan is then known to have been in Syria on two occasions, early in his career and late in his reign as emperor. The 'two-humped camel' coins were placed into circulation after his arrival in Syria and during his Parthian campaign, not before. It then seems highly unlikely that the coins were issued without the emperor's authorization or at least approval. It does not seem likely that the two-humped Bactrian camel issues were a mistake by bungling engravers.

But was the 'two-humped' camel a symbol of political propaganda by the imperial authorities or just a metaphor for Trajan's recent annexation of the former Arabian Kingdom of the Nabataeans? If the latter is the case, why was the common one-humped camel of Arabia not chosen as a symbol, rather than the two-humped camel that is commonly associated with Iran and Afghanistan further East? In response, it may be suggested that the two-humped camel is not as unusual in Arabia or the Levant as has been commonly assumed. What has been neglected, but is entirely relevant for the Trajan's 'two-humped camel' coins is the rock-cut relief on the ad-Dayr plateau, high above the civic center of ancient Petra (FIG. 2). Just to the north of the ad-Dayr tomb monument is a rock-cut depiction of two camels being led by men facing one another; much of the left side of the relief has been eroded, but the drover on the right is clearly leading a double-humped camel (Fig. 1 = Dalman 1908: 275-76, Abb. 218: Kamelrelief Nr. 464; cf. Brunnow and v. Domaszewski 1904: 336, Fig. 368. Petra: No. 466; and 188 "Skulpturen einer Kamelgottheit"). The date of the relief is undetermined, but it has a striking resemblance to the large relief of a caravan of four dromedaries with drovers recently discovered at a bend in the southern cliff of the as-Sīq at Petra. The camels in both reliefs are in profile with the drovers represented in frontal position. The relief in the as-Sīq is dated to the early first century BC, before the paved road was constructed in the late first century BC (Bellwald 2003: 40-52). The ad-Dayr relief is not as easily dated, but it at least suggests the two-humped camel on the Trajanic drachms is not as unusual for Arabia as has been assumed. In fact, there is substantial evidence from literary sources, artistic representations, and archaeological evidence to suggest the so-called *camelus bactrianus* is not as rare and unusual in the Levant as was previously thought, and that its selection on Trajanic coinage requires no ulterior explanation.

Two-Humped Camels in Neo-Assyrian Texts

There are at least three words in Akkadian for designating the 'camel', one general and two specific. The generic word for 'camel' is *gamnalu*, probably an Aramaic loanword and appearing only late in



2. The ad-Dayr plateau Relief from Petra (Dalman 1908: 275-76, Abb. 218 =BD no. 464).

Neo-Assyrian texts (Gelb 1956: 35-36); the term *ibilu* (= the logogram ANŠE.A.AB.BA) is the specific word for the 'Arabian camel' or 'dromedary,' and never appears in other Semitic languages, but is the distinctive 'Arabic' word for camel (Gelb 1960: 2; cf. Pellat: 1971: 665-668), finally, the word *udru* specifically refers to the "two-humped camel". It is a loanword of uncertain derivation, but perhaps is to be associated with Iranian *uštra*, as preserved in the name 'Zarathrustra' (Walz 1954: 68-69 and Von Soden 1981: 1401; cf. Bulliet 1975: 154-155, who suggests a hypothetical Indo-European root *vegh*, 'to carry'). The special Arabic word for dromedary, *ibilu*, is mentioned in Sumerian texts of the third millennium BC, where it is clearly implied that the camel is already domesticated. The logogram for the generic word *gammalu* is also written sometimes with a phrase to indicate the 'two humped' camel: 'camels whose backs are two (humped)'(ANŠE.A.AB.BA ANŠE.A.AB.BA *ša šu-na-a-a ṣi-ri-ši-na*) or 'camels which are called two (humped)' (ANŠE.A.AB.BA *ša 2-a za-kar-ru-u-ni*). But the distinctive word for designating the two-humped camel is *udru*.

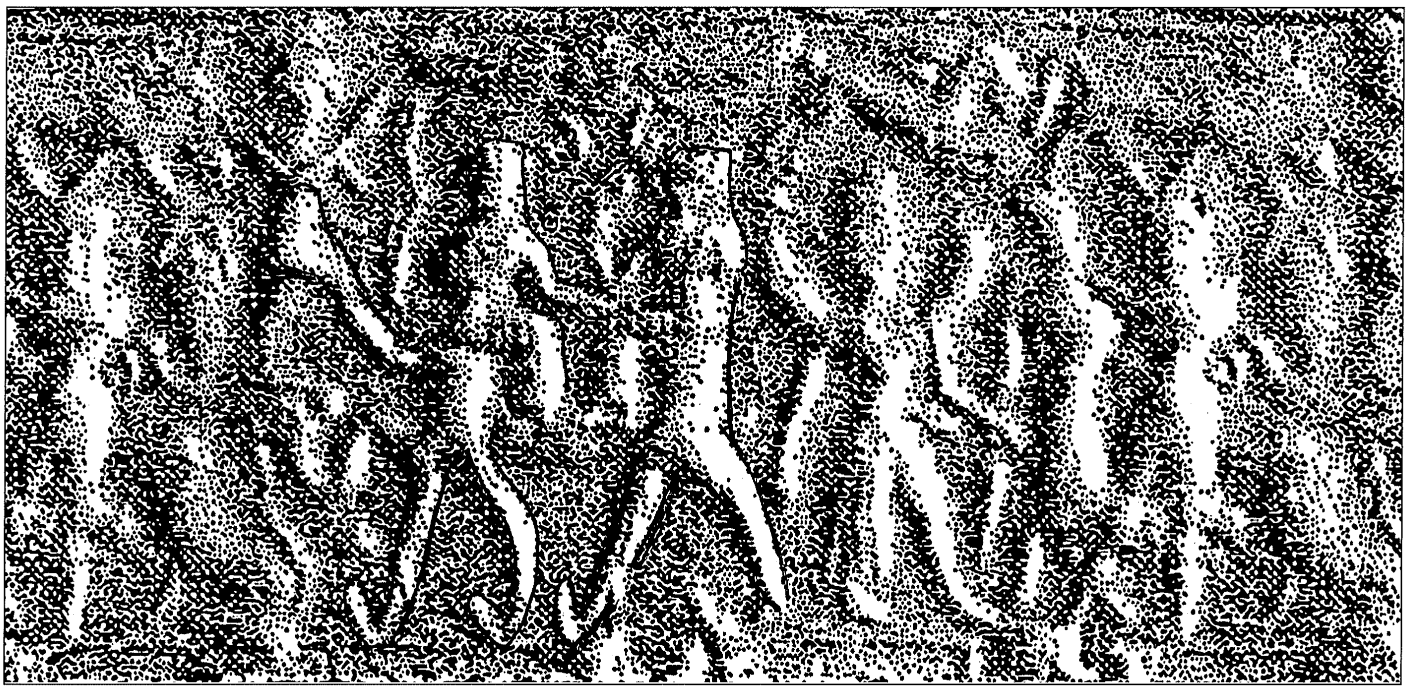
The term *udru* first appears in Neo-Assyrian texts in the 11th century BC. The "Broken Obelisk" text found at Konyunjik, records that the Assyrian King Ashur-Bel-Kala (1074-1057BC) dispatched merchants to acquire "two-humped camels", so that he could form herds of them, breed them, and display them to the people of his land with other exotic fauna he had amassed (Grayson 1976: 55 who incorrectly translates *udru* as 'dromedaries' in this text). Its next appearance is in the ninth century BC, in a text that mentions the tribute collected by Tukulti-Ninurta II (890-884BC) from the Aramaean king Amme-alaba of the city of Hindanu, in the Ḫabur region of North Syria (Wäfler 1975: 237); included among the agricultural products and fauna itemized in the list are 30 "two-humped" camels (Grayson 1976: 102, who again incorrectly translates *udru* as 'dromedaries'). A few decades later, in 859 BC, Hayanu, the ruler of the same Aramaean state of Hindanu, sent 'two-humped' camels as tribute to the Assyrian king Ashur-nasir-apli II (Grayson 1976: 125). In the very next year, the new king Shalmaneser III, collected "horses (and) camels with two humps" from a string of cities: Ḫargu, Ḫarmasa, Ulmānu, Simera, Sirišu, and Gilzānu — areas north of Assyria between Lake Van and the Caspian (Grayson 1996: 103 and cf. 149; for the geography see Wäfler 1975: 263-265, and Reade 1979: 176). In campaigns in the land of Nairi, in the Zagros mountains east of Assyria, the Neo-Assyrian kings conducted raids for "camels with two-humps" regularly from the tenth to the seventh centuries BC (Grayson 1996: 184), but this was by no means the only area they were found. In Sennecherib's campaign again the Babylonian rebel Merodach Baladan and his Arab allies, 81 walled towns and 820 minor settlements were conquered and looted in western Babylonia, including the seizure of "dromedaries" (ANŠE.A.B.BA) and "two-humped camels" (*udru*) from the allied armies (Eph'al 1982: 40-41). In sum, the "two-humped" camel is found in a northern crescent around Assyria, extending from northern Syria in the west across to the northern borders of Elam in the east, and as far south as southern Babylonia.

There are also indications of two-humped camels in Egypt. On the Black Obelisk of Shalmaneser III around 856BC, there are depictions of two-humped camels and the royal inscription on the Obelisk indicates: "I received tribute from Egypt (*Muṣri*): two humped camels (ANŠE.A.AB.BA ANŠE.A.AB.BA *ša šu-na-a-a ṣi-ri-ši-na*), a water buffalo (lit. "river ox"), a rhinoceros, an antelope, female elephants, female monkeys, (and) apes" (Grayson 1996: 150; cf. Deller 1983). This startling reference to two-humped camels from Egypt threw Assyriologists into turmoil, with various proposals offered for the possible location of another 'Muṣri' — in Anatolia, Arabia, or even Armenia (Garelli 1957: 1468-74; Wäfler 1975: 171-176; cf. Marcus 1987: 89). Strong bull elephants were known to have been in the Harran and Khabur River region in the 12th century BC (Grayson 1976: 16) and the depiction of a small-eared elephant on the relief associated with the text seems more appropriate for Asia than Africa; apes also appear as tribute received from the Levant in the ninth century BC (Grayson 1976: 142-43, cf. 149). Nevertheless, Africa certainly seems as the most appropriate source for the other zoological tribute in the list. So after the speculative dust settled, the view that Egypt is at stake is now the consensus (as persuasively argued as early as Tadmor 1961; see now Wapnish 1984: 180 and Kessler 1997: 497). The problem is that the camel is virtually unknown in Egypt in both written records and artistic representations in Saharan and Egyptian rock art during the historical periods (Midant-Reynes and Braunstein-Silvestre 1977). This silence about camels in Classical literary texts had led scholars to suggest the camel is a historical latecomer in Egypt and North Africa, introduced by the Severan emperors in the early third century for military reasons (Mason 1984: 20-25).

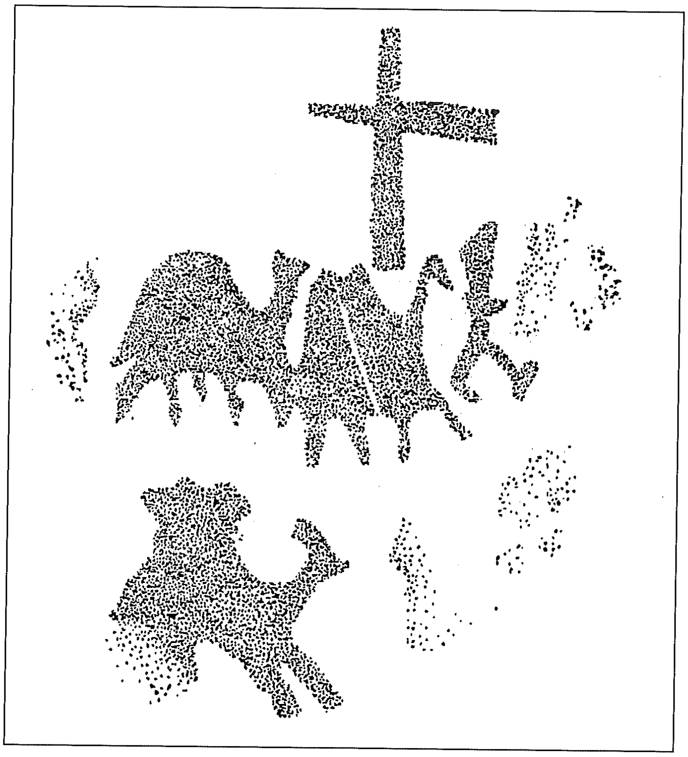
The facts belie the hypothesis. Today, African camels dominate Asian/Arabian camels four to one. In 1978, there were approximately 95,000 camels in Egypt, and 12 million in Africa, with less than three million in Asia and Arabia combined (Wilson 1984: 19-20). Pre-historians also have known the camel existed in Africa in much earlier periods, with finds of camel bones in the Paleolithic period appearing from northwest Morocco to southern Tunisia. This began with an amateur archaeologist in 1882, a veterinarian named Philippe Thomas, who discovered some camel bones of the Lower Paleolithic period that he interpreted as an extinct species of camel, so it was donned *Camelus thomasii*. It is now clear from subsequent finds in North Africa and the Sudan that *C. thomasii* is larger than the dromedary, and may be in fact represent *C. Bactrianus*. (Gautier 1966; Kohler-Rollefson 1989: 146). That camels existed in historical periods in North Africa also seems evident, but it has only been recently recognized that the nineteenth century scenario of the camel disappeared in historical periods until being reintroduced by the Romans was a classic case of the *argumenta ex silentio* that ignores all the contrary evidence (see the fundamental discussion of Shaw 1979 for the details). In actual fact, Caesar captured 22 camels from Pompey's ally, King Juba II of Mauuretania in 46BC (pseudo-Caesarian, *Bellum Africum* 68) and another resident of North Africa, Apuleius of Madauros, in the *Golden Ass*, alludes to the Bactrian camel in opposition to the dromedary (7.14, *camelo Bactrinae*), as if he were familiar with both. There is no reason to reject then that the reference to two-humped camels in the text on Shalmaneser III's Black Obelisk is accurately reflecting the tribute received by the Assyrian king. As the other references in Neo-Assyrian texts illustrate, the two-humped camel was present right across the Fertile Crescent in antiquity, from Egypt across Syria to southern Babylonia.

Artistic Representations of Two-Humped Camels
There is also abundant evidence for the two-hump camel in Arabia in pre-Islamic times. The literary evidence for two-hump camels in Arabia is admittedly limited. There is only a solitary reference in Diodorus Siculus to camels being bred in Arabia "in very great numbers and of the most different kinds, both the hairless and the shaggy, and those which have two humps, one behind the other, along their spines and hence are called *dituloi* (i.e. 'double humped)" (II. 54.6). It is unclear if Diodorus means the Syrian desert, East Arabia the interior of Arabia, or South Arabia, but there is no reason to reject his testimony. There are ample ancient artistic representations of two-humped camels throughout Syria and Arabia to support his testimony. The following list is not meant to be complete, but should sufficiently illustrate the possible presence of the 'two-hump" camel from Syria to Yemen in antiquity.

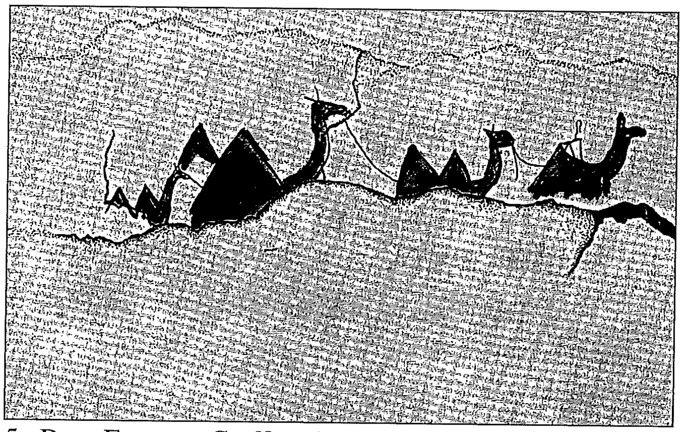
1) A North Syrian cylinder seal in the Walters Art Galley in Baltimore (WAG C 61) depicts, rather clumsily, a two-humped camel with two figures in long flounced robes seated on the humps facing one another (FIG. 3). The figure on the right holds up a cup. A date for the seal between 1800-1400BC has been proposed (Gordon 1939: 21, Pl. VII.55; cf. Brentjes 1960: 30, no. 2, who dates it to the 15th or 14th century BC; Wapnish 1981: 106, to the early second millennium BC). The significance of this representation of the two-humped camel at this time has been ascribed to its use as a pack animal on the international routes during a period of "intensive commercial activity in Western Asia" (Collen and Porada 1977: 345).
2) A petroglyph of a camel caravan from Demir-Kapu in Northern Mesopotamia, on the caravan road between Nisibis and Mossul (FIG. 4). The camel caravan depicts a walking human figure leading the camels, one of which has only one-hump, but the other two camels appear to have two humps (Von Luschan 1922: 188, Fig. 45, and discussion on 192). The date is a problem, but sometime in the second millennium BC has been proposed (Müller 1924: 179).
3) At Dura-Europos, a graffito on a stucco wall in the 'House of the Ravine' depicts a caravan of camels, each camel attached by a rope to the preceding camel, with a rider on the lead camel (FIG. 5). The lead camel appears to have one hump, but is followed by three two-humped camels. It was initially proposed that the two triangles on the backs of the camels were two loads



3. North Syrian Seal, 1800-1400 BC (Walter Art Gallery C61 =Gordon 1939: no. 55).



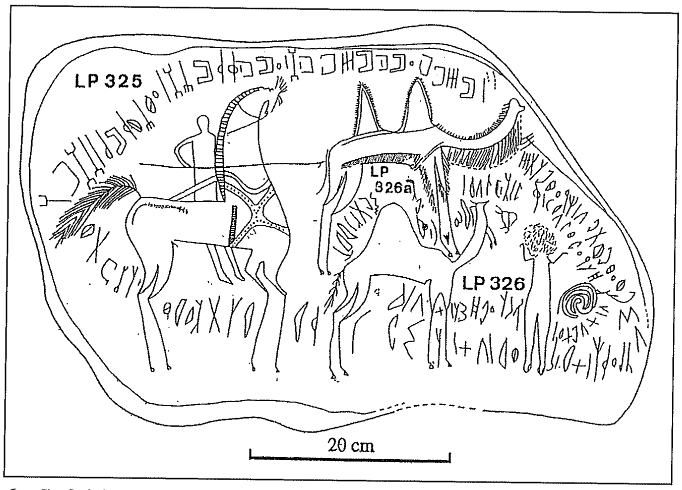
4. Early North Mesopotamian Petroglyph (von Luscham 1922: 89, fig. 45).



5. Dura-Europos Graffito (Baur, Rostovtzeff & Bellinger 1933: 221-222, P1. xxiii.2).

fastened on each side of the hump (Rostovtzeff 1933: 221-222, Pl. XXIII.2), but this interpretation is unnecessary. Two-humped camels were still present in caravans traversing the route between Baghdad and northern Syria as late as the 18th century AD (Russell 1756: 170 as cited in Bulliet 1975: 306, n. 57).

4) A graffito from al-'Īsāwī in the Southern Ḥawrān in Syria, depicts a shaggy two-humped camel in front of a horseman with lance, a dog, and what appears to be a standing figure (Littmann 1943: 80-81, No. 325) (FIG. 6). Several Safaitic inscriptions are strung around and between the figures (recently reinterpreted by Macdonald,

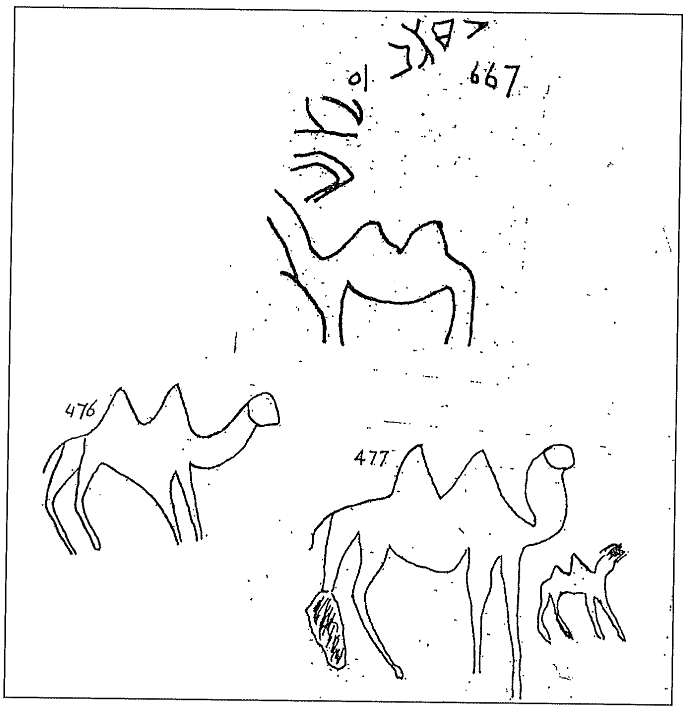


6. Safaitic Inscriptions with Rock Art from Al-'Īsāiwī in the Southern Ḥawrān in Syria (Macdonald, Mu'azzin and Nehmé 1996: 468, fig. 19).

Mu'azzin and Nehmé 1996: 467-477).

5) In the Wādī Miqāt region near H4 in the *ḥarra* of northeast Jordan, a series of drawings of two-humped camels were found on the lava stone while dismantling Cairn 9B (FIG. 7) (Winnett and Harding 1978). The drawings are unaccompanied by inscriptions, but they must pre-date the construction of the cairn.

6) In the same location, at Cairn 9, there is a graffito by *Sawa bn 'Alham* accompanied by a drawing of a two-humped camel (FIG. 7) (Winnett and Harding 1978: no. 667).



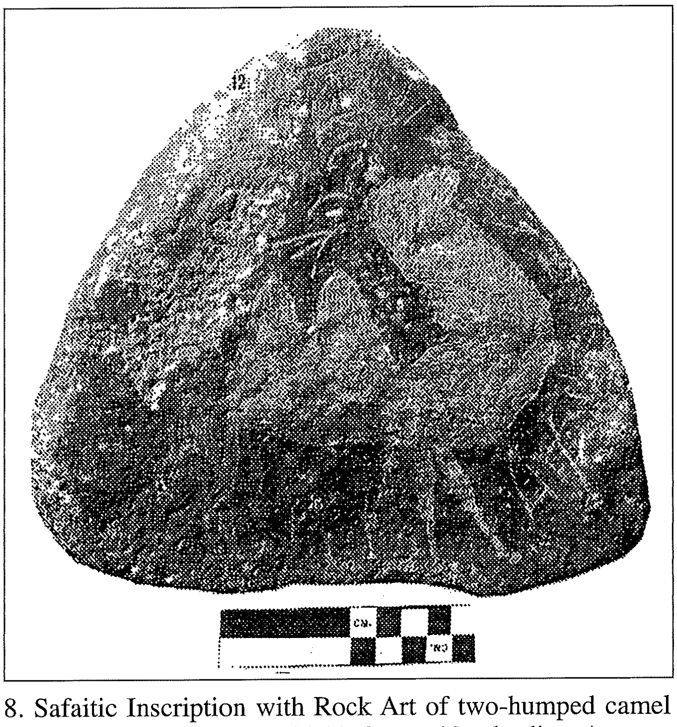
7. Rock Art from the Wādī Mīqāt region near H4 in the *ḥarra* of northeast Jordan (Winnett and Harding 1978: nos. 476-477, 667).

7) A Safaitic inscription from the Amman Museum (Registration No. J.13943) is on a basalt stone of unknown provenance acquired from Mr. Mahmud al-Afghani. The text surrounds a drawing of a two-humped camel (FIG. 8) (Macdonald 1979: 106-107, no. 12, pl. XXXVII for a drawing of the inscription and XLIV for photo). The text is fragmentary and difficult to read, but clearly in Safaitic script.

There are other representations of two-humped camels in Safaitic rock art which remain unpublished, one of which designates the two-humped camel as a *gml*, the same word that is used for single-humped camels (King 1990: 63-64). Another drawing has been interpreted as a rider sitting between the two humps of a camel (Knauf 1988: 79-82 and pl. 24), but it seems actually a horseman sitting on a saddle that has two upright horns (cf. Macdonald, Mu'azzin and Nehmé 1996: 471 n. 100). Khalid Jabour of the Department of Antiquities also is preparing to publish another Safaitic rock art representation of a two-humped camel, and is likely there are others yet to be discovered. What is striking is that there are no such depictions of two-humped camels in the rock art associated with the Thamudic inscriptions found throughout the Transjordan

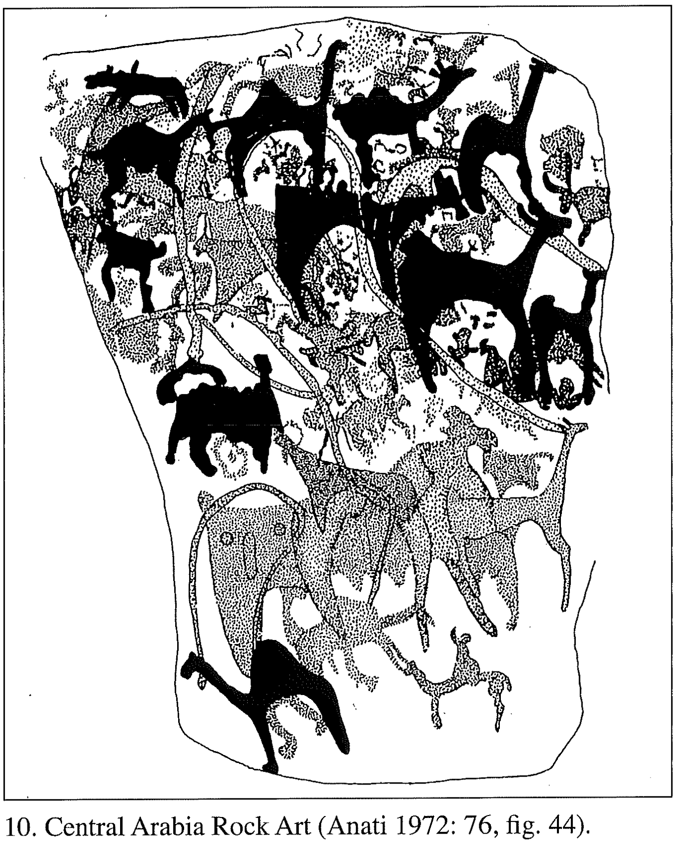
8) From al-Jaw, just over 100km south of Tabūk in the Northern Ḥijāz, there are a series of camels depicted on a rock surface, one of which seems clearly to have two-humps (FIG. 9) (Koenig 1971: 196, photo 62 = Tdr 21). It should be noted that the two-humped camel is drawn shorter and stockier than the one-humped camels that surround it.

9) Just west of the Dahthami wells, approximately 250km southeast of Mecca, in Central Arabia, a two-humped camel is depicted with a group of one-humped camels (FIG. 10) (Anati 1972: 76, Figs. 43-44). It appears in the center at the top of



8. Safaitic Inscription with Rock Art of two-humped camel from Jordan (Macdonald 1979: no. 12, pl. xliv =Amman Museum Reg. No. 51 3943).

9. Northern Hijaz Rock Art (Koenig 1971: 196, photo 62).



10. Central Arabia Rock Art (Anati 1972: 76, fig. 44).

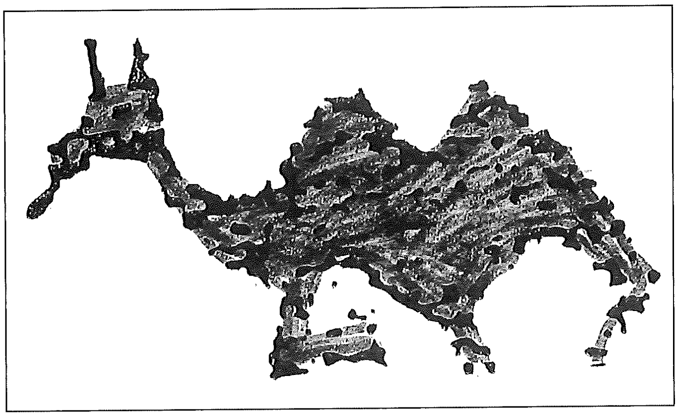
the group. Of the many rock engravings collected in the Philby-Ryckmans-Lippens expedition, this is the only representation of a two-humped camel discovered. Tchernov's suggestion that the artist may have made a mistake or that his hand accidentally slipped while making the engraving (Tchernov 1974: 215-216), is later modified to suggest the representation "may illustrate an unsuccessful attempt to introduce this kind of camel into the peninsula" (1974: 247).

10) a graffito from Rawḍa in South Arabia seems to depict a two-humped camel, although the two humps have been interpreted as the saddle (FIG. 11) (Rathjens 1953: 117, Fig. 121; cf. Jüng 1994: 236-237, Fig. 6).

These numerous examples of depictions of two-humped camels in Arabian rock-art should demonstrate that this type of camel was not an anomaly on the Arabian landscape. Such frequency and continuity in the representations argues for actual encounters with two-humped camels in Arabia, not mere reminiscing of witnessing the animals somewhere else (pace Köhler-Rollefson 1989: 145). It has been suggested that the Assyrian rulers possibly reused Bactrian camels received as tribute from their eastern conquests as baggage carriers for their military expeditions in the West, and that this accounts for their presence in the Levant (Wapnish 1984: 180). But the survival of the two-humped camel into later periods in Syria and Arabia suggests another explanation for accounting for their continual appearance in antiquity.

Hybrids

The genus *Camelus* is normally divided into two species: *C. dromedarius*, the one-humped camel whose habitat is Africa, Arabia, and the Near East; and *C. bactrianus*, or two-humped camel, whose original homeland is ascribed to eastern Iran, Afghanistan, and Turkmenistan in antiquity, but today in southern Russia and Central Asia. But separating the types into separate categories is acceptable (Mason 1984: 18-19). Such a division of the *genus Camelus* is dependent purely on morphological differences and the premise that hybridization between a *dromedarius* and a *bactrianus* is not possible and that any offspring would be infertile (Pellat 1971: 665). In fact, the two species are indistinguishable embryonically and modern experiments in hybridization in southern Russia have demonstrated that crossbreeding is not only possible, but effective. The hybrids produced by crossbreeding two-humped stallions with one-humped female camels, or the reverse, produces heterosis ('hybrid vigor'), in respect to size, hardiness, endurance, and longevity. The hybrids resemble the two-humped father only in regard to hair on their chin and legs, but have an elongated hump that is smaller than the dromedary (Wilson 1984: 48, with Fig. 3.13). This makes the hybrids extremely useful as baggage and draught animals. In the nineteenth century, some 8.000 dromedaries were imported into Turkey as studs for two-humped females precisely for this purpose, and the resulting hybrids were popularly known as the 'Turrkoman' camel. The same practices existed at the time in northern 'Iraq and Afghanistan. In antiquity, it is argued that crossbreeding was practiced by the Parthians, with hybrids considered ideal pack animals for caravans between Afghanistan and Mesopotamia (Bulliet 1975: 164-175). If the artistic representations outlined above are any indication, similar practices must have existed elsewhere in Syria and Arabia. In Asia today, the two-humped camel can carry 220-270kg for 30-40km daily, and a rider of one can carry 120kg for 80-100km a day (Walz 1954: 56), whereas dromedaries in the same region carry smaller loads of 150-200kg and for less distance (Gommans 2002: 126; cf. Pellat 1971: 668). It would then be advantageous for any camel breeder and caravaneer to have a few two-humped camels in his herd available for crossbreeding and producing hybrids.



11. South Arabia Rock Art (Rathjens 1953: fig. 121).

These practices are not attested in literary sources to my knowledge, but there is some archaeological evidence to support the hypothesis. In excavations at Mlleha in the interior of the Sharjah Emirate (UAE), some animal burials were found including nine dromedaries and some camel hybrids — cross-breeds of bactrian and Arabian dromedaries. Their central position in the burial site suggests they were status animals and part of a ritual burial. The whole assemblage of grave structures and other evidence suggest a date between 300BC and 290AD (Ueerpman 1999: 103). At Pella in Jordan, a similar discovery was made of seven camel skeletons killed in an earthquake in 747AD, their large size suggests that they may have been 'Bactrian' or hybrids, not dromedaries (Köhler-Rollefon 1989:142-149). But it is another such burial that may illuminate the Trajanic two-humped camel coins of Arabia, and strangely enough, from a rather remote quarter. At Intercisia, the Roman town along the Danube, excavation of a pit revealed the remains of animal sacrifice consisting of two camel skulls without mandibles, but two mandibles similar in size were found in the vicinity. The large size of the skulls suggests they may have been two-humped camels. The pit dates to the second and third centuries AD (Borkonyi 1989: 402; cf. Bartosiewitz 1996; 448-49). More camel bones were found at the site with a large cut-mark on its dorsal surface suggesting the skull had been severed. There were the skeletal remains of other animals in the pit — cattle and dogs, but only of the meatless areas. All this is suggestive of the practice of ritual sacrifice, such as was practiced by Arabs in pre-Islamic and Islamic times (Henninger 1948: 10; Chelhod 1955: 60-67, 93-125; Simons 1961: 87; Pellat 1971: 666). It is well known that Syrian troops were stationed at Intercisia — namely the *cohors I milliaria Hemesenorum* (Fitz 1972: 45-51). Both dromedaries and two-humped camels entered Europe here and elsewhere with military units transferred from the Near East to the western regions, and camel remains found along the fortified roads of the western provinces reflect this practice (Dabrowa 1991; Bartosiewitz and Dirjec 2001; Muñiz *et al.* 1995).

We can now more appropriately assess the Trajanic drachms that depict the two-humped camel on the reverse. It seems clear that they were issued during Trajan's Parthian campaign in 114-116AD, but were local eastern issues, and are found predominantly within the boundaries of the province of Arabia. Although it is assumed that the two-humped camel was foreign to the Arabian landscape, there is abundant evidence of such camels in the Levant and Arabia from the Neo-Assyrian period into Hellenistic times. Artistic representations of two-humped camels from Syria to Yemen also appear throughout the same period, but especially in the Roman era in Arabia. In this regard, of particular importance is the ad-Dayr relief at Petra that depicts a double-humped camel. The depictions of two-hump camels in rock-art elsewhere in North Arabia suggest this was not a distortion of reality or an anomaly. Although the dromedary dominates Arabia, the two-humped camels were ideal baggage carriers and advantageous for crossbreeding, as the hyrids were even more suited for long-distance caravans. It is entirely possible that Trajan witnessed such two-humped camels on the Syrian landscape in his youth and recommended later as emperor that they be used as the symbol for the Arabian issues. No ulterior political message in the image needs to be sought.

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Peder Mortensen and Ingolf Thuesen

Investigating "Conder's Circle" at 'Ayn Jadīda, near Mount Nebo

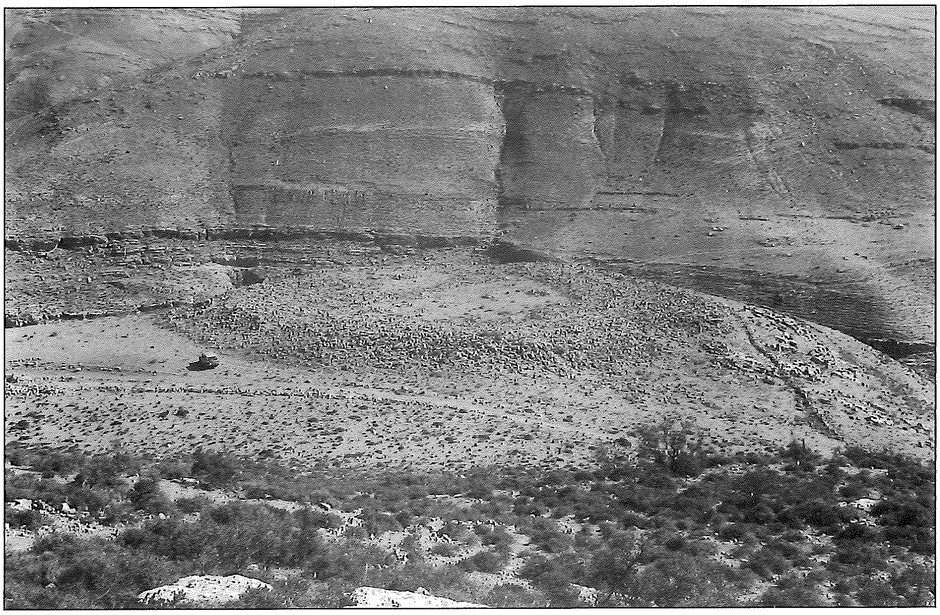
During six seasons, from 1992 to 1998, an archaeological survey was carried out by a small group of Danish archaeologists in the area around Mount Nebo. The survey was accomplished at the invitation of Professor Michele Piccirillo, under the auspices of the Department of Antiquities and the Franciscan Archaeological Institute at Mount Nebo. Covering approximately 35km^2, 747 sites and monuments - in time ranging from the Lower Palaeolithic to the Late Ottoman periods - were located, described and put on the map (Mortensen and Thuesen 1998). Many of these sites were already known — and in some cases investigated — by members of the Franciscan Archaeological Institute. Famous examples are the monasteries and churches at aṣ-Ṣiyāgha, Khirbat al-Mukhayyaṭ and al-Kanīsa.

The earliest survey of the area, however, was undertaken for the Palestine Exploration Fund by Colonel C. R. Conder during his reconnaissance of Eastern Palestine in 1881. The Turkish Government had categorically refused any kind of foreign exploration in the area. In his subsequent publication Conder notes: *"...when we remember the lamentable fate of Professor Palmer and his companions, betrayed by an Arab Sheikh, and butchered in the heart of the desert by Bedawin set on probably by the creatures of the rebel Egyptian Government, it will, I think, be allowed that our mission was pushed to the utmost limits......it is not always, when things appear to be going smoothly, and Arabs are obsequious and Govenors apparently asleep, that a small party of explorers is really most safe. Thus our presence was certain to be discovered sooner or later, through the jealousy of some Government creature among the Bedawin....*(But) *although discovered four weeks after crossing Jordan, we did not finally leave Moab until the 29th of October, and during this period of eleven weeks we surveyed in all nearly 500 square miles, discovered 700 rude stone monuments and obtained a volume of notes, plans, and drawings..."* (Conder 1889: 85ff.). Even under these dangerous and stressful circumstances Conder succeeded in carrying out his measurements and drawings with extreme accuracy.

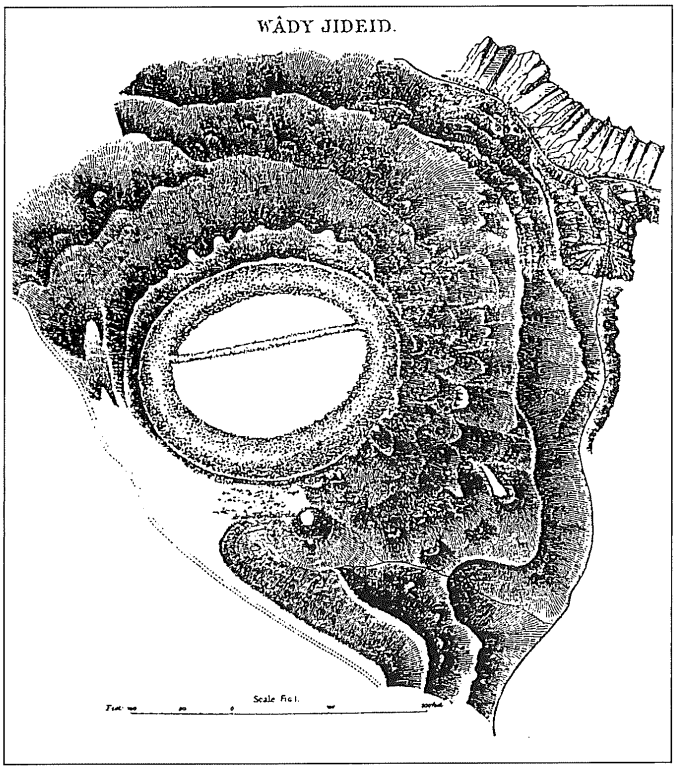
Four years ago — in continuation of our survey — we felt that a few supplementary investigations of megalithic monuments in the area might be useful. The first of these monuments is a large, roughly circular structure, discovered and first described in 1889 by Colonel C. R. Conder in his "Survey of Eastern Palestine". The monument is situated above the spring of 'Ayn Jadīda between a large Late Chalcolithic/Early Bronze Age settlement northeast of the spring and a high plateau towards the south with 157 contemporary dolmens, lines of stones and 21 menhirs, still standing (FIG. 1).

Above the spring of 'Ayn Jadīda Colonel Conder found what he in 1889 described as a large circular platform surrounded by a rubble wall (FIG. 2). He writes: *"The Survey camp was pitched inside the circle, which is divided into two irregular portions by a wall 6 feet thick running in the line, 260 degrees true bearing; that is in the direction approximately of the great cairn of Rujm el-Mekheiyit on the hilltop to the east about in the line of the summer solstitial rising of the sun..."*(Conder 1889: 98-99).

Unfortunately, this intriguing hypothesis, that the wall dividing the circle into two irregular segments might have something to do with mid-summer rituals carried out at the site, more than 5000 years ago, was disproved when a section through the monument showed that the so-called wall was a superficial line of stones from the Byzantine Period, probably representing the division between two ag-



1. "Conder's Circle" at 'Ayn Jadīda seen from SW in September 1992. (A car parked in front of the monument gives an impression of the size of the circle).



2. Colonel Conder's plan of the circle at 'Ayn Jadīda, September 1881.

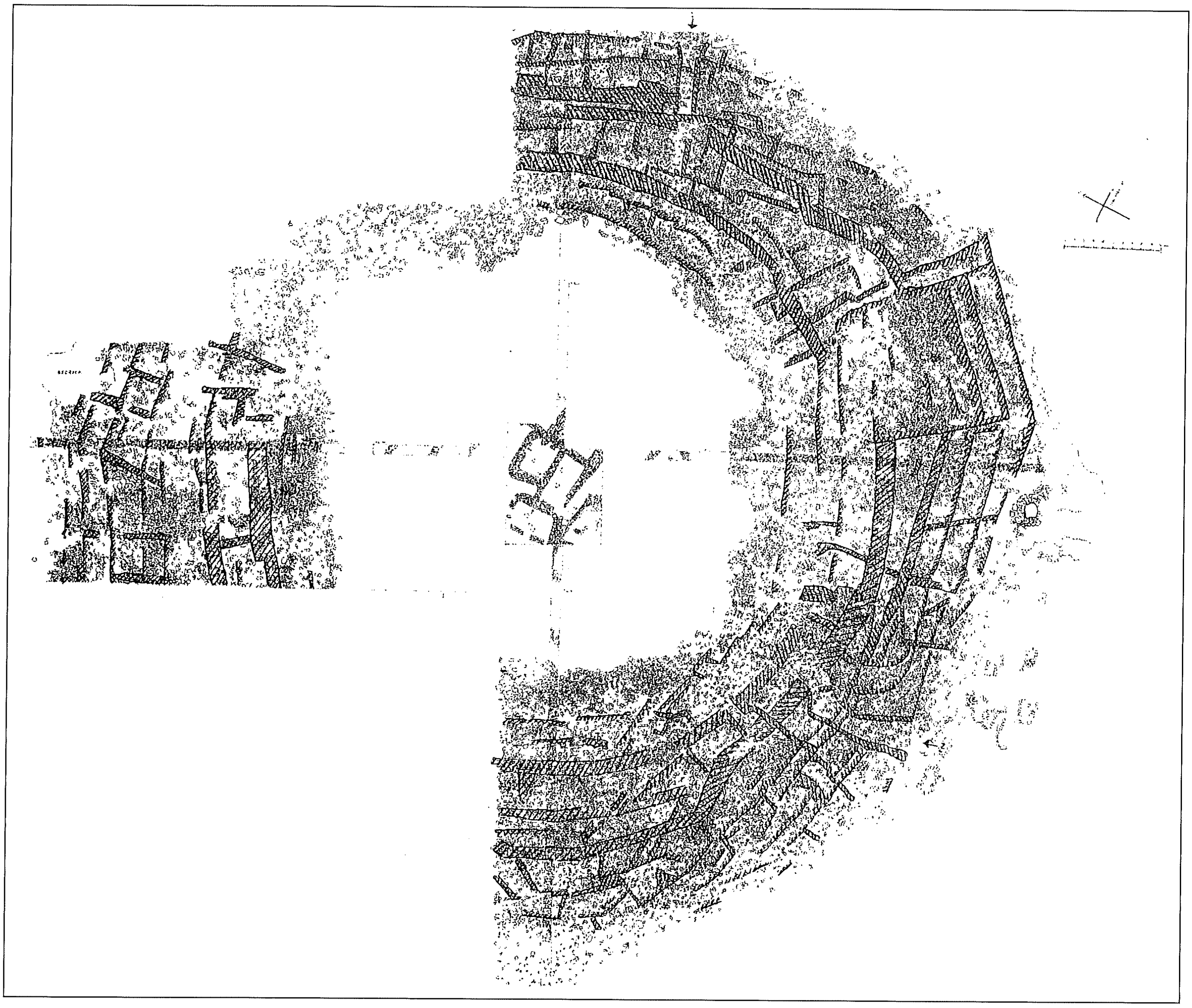
ricultural fields within the large circular structure.

In order to determine the date of the circle and to get an idea about its function we started in the year 2000 an investigation of the monument, including a detailed map of the circular wall, a cross section through the monument and subsequently an excavation in the central area within the circle. These investigations are still in progress, so what we can present in this context is just a brief preliminary report.

The total extent of the monument varies from 92m EW to 102m NS. The central platform is almost circular, varying from 50 to 52m in diameter. It is surrounded by a rampart, 18-29m wide and founded on bedrock, sloping towards the north and east, so that the height of what remains of the rampart varies from 3 to 8m above bedrock.

It was our first impression that the rampart was just an earthen construction containing a number of small and larger stones. However, looking more carefully we were able to distinguish a number of walls, some of them composed of undressed ashlars, and in some cases preserved to several courses, on the surface of the rampart and in the sections.

In order to get an impression of the pattern of these walls, incomplete as it might well be, we decided to make a plan showing every stone and fragmentary wall as they appeared on the surface of the rampart. The plan reveals a complex and surprisingly irregular system of walls (FIG. 3). On the top of the rampart are the foundations of two, or sometimes three major walls, the thickness of which varies from 1.6 to 2.2m. On both sides of these walls terraces slope towards the plateau on the outside, and towards the inside platform. The terrace walls are cut diagonally by a number of smaller walls dividing the terraces into minor segments, many of which are now filled in with stones, possibly from the collapsed walls. These heaps of erratic stone formations contributed to our difficulties during the planning of the site. However, a few observations may be added at this stage of the investigations:



3. Partial plan of the circle, October 2003.

Towards the southeast the foundation of a large square building or platform protrudes from the top of the rampart, and towards the east, along the outer wall, the foundations of two buttresses or small towers appear, each 3m wide and protruding 70cm from the wall. Finally, there are perhaps two entrances across the rampart, one from the south and one from the northeast, but it is our impression that the main entrance to the monument may be from the west, which we have not yet measured and drawn.

On the face of it, the complex and very irregular system of walls, terraces and segmentation walls might perhaps suggest, that we are dealing with several phases of construction of the rampart — but not necessarily so. A slightly similar early Bronze Age monument with a system of segmented walls around a somewhat later burial, has been reported by Israeli archaeologists in the occupied Golan heights. However more striking, as parallels, are a number Late Chalcolithic and Early Bronze Age monuments from the eastern Mediterranean — small oval or circular settlements or ritual buildings surrounded by numerous defensive walls, in some cases connected by segmented walls and with buttresses like at 'Ayn Jadīda. The earliest known monument of this type seems to be the Late Chalcolithic settlement of Dimini in Central Greece — with a megaron, which has been interpreted as part of a ruler's house, protected by six irregular defensive walls (Tsountas 1908: pl. II). Like 'Ayn Jadīda, the fortification at Dimini is a little less than a 100m wide.

Moving into the central platform, we have — until now — uncovered an area of 115m². The excavation has revealed what seems to be part of a large building. The stone foundations and the lower part of the walls rest directly on a layer of greyish clay. They are made of stones and small ashlars, dressed and preserved in 2-3 courses to a height of 20-38cms (FIGS. 4-5).

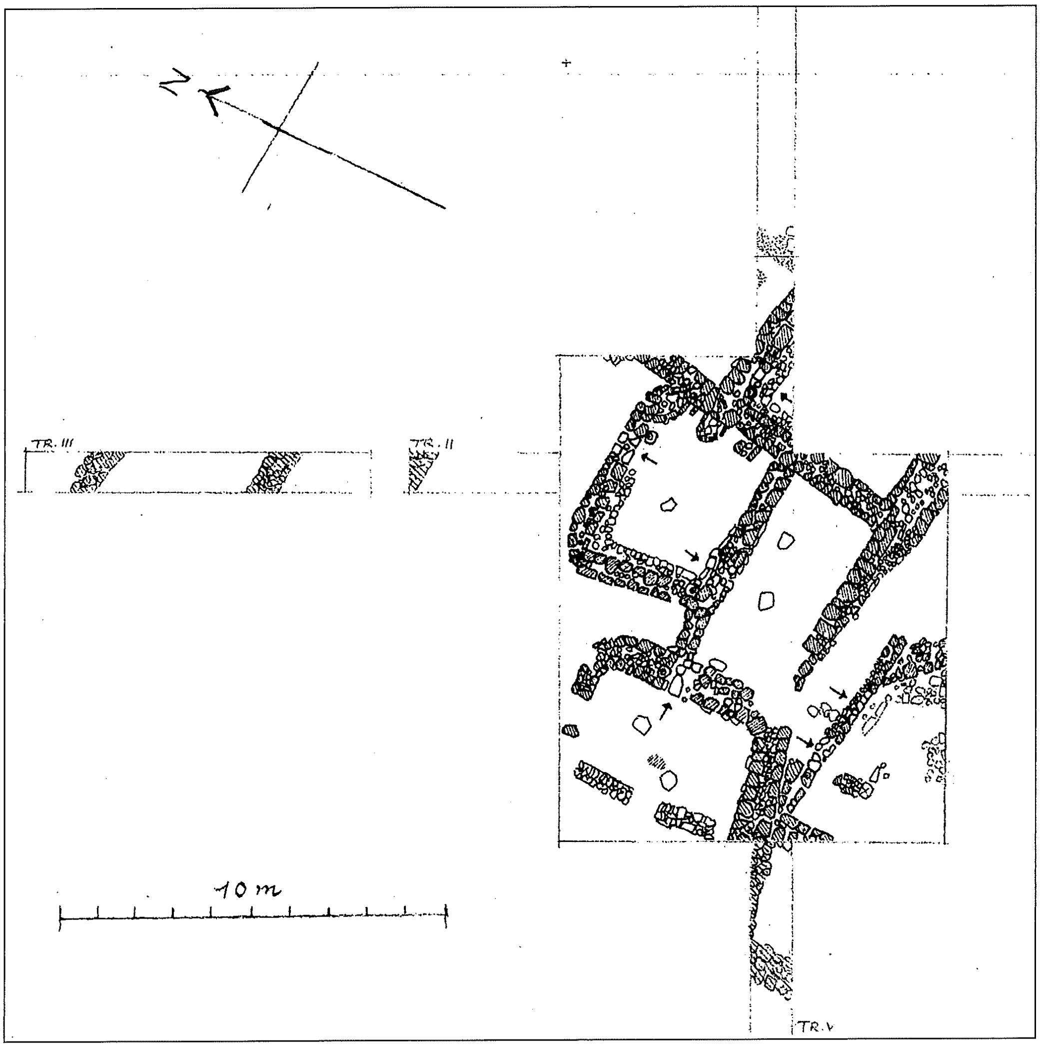
The rooms are rectangular, some of them with slightly rounded corners. They are connected by doors, marked by one or two steps from one room to another by door socket stones — and on the plan: by arrows (FIG. 4). There were no clear indications of floors, but in all rooms there were one or two large stone ashlars placed in such a way that they may originally have functioned as bases for wooden pillars supporting the roof.

In one of the rooms there was a small fireplace and a kind of table made of standing stone slabs and filled in with smaller stones. Three similar tables or constructions were found in another room along the eastern wall: one of them square and two of them semi-circular (FIG. 6).

So far, the rooms and walls all seem to belong to one period. Hundreds of sherds were found in all rooms, but no complete pots *in situ*. Most of the sherds derived from large cooking pots, many of them with knobs or ledge handles characteristic of the Late Chalcolithic and Early Bronze Age. A few sherds were painted or represented fine, red-slipped and polished pots with small lug- or loop-handles. Apart from pottery, there were animal bones, fragmentary mortars and querns of basalt, sherds of basalt vessels, in some cases decorated with knobs, a few beads of stone, and points, sickle-blades, and scrapers made on tabular flint.

In conclusion, it seems that the rooms we have excavated until now represent the domestic quarters of a large building, that can be dated within the transitional phase, incorporating the Late Chalcolithic and the Early Bronze Age IA periods.

The function of Conder's circle is not yet clear,



4. Segment of the building in the central part of the platform.

5. The excavation of the building in the central part of the platform, as seen from NE, October 2003.

6. Two of the three small "tables" along the eastern wall in one of the rooms, October 2003.

but it is tempting to believe that in the future it must be interpreted in a wider context in connection with the contemporary settlement northeast of the spring and the large number of dolmens, lines of stones and menhirs on the plateau just above this unique monument.

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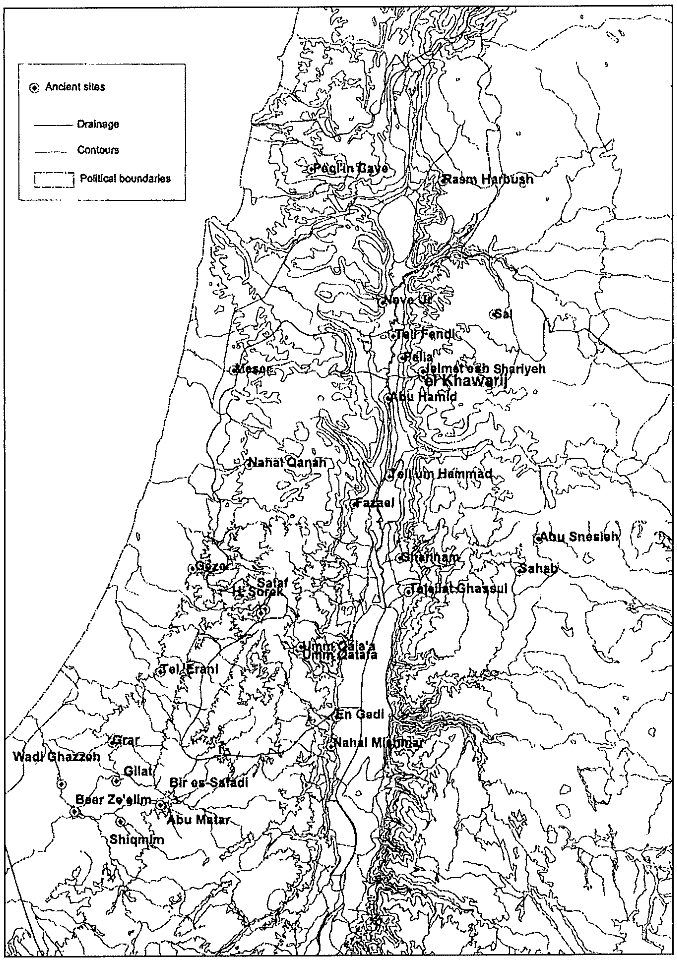
The Wādī ar-Rayyān Archaeological Project (WRAP): Investigating the Chalcolithic – Early Bronze Age Transition

Introduction

Chalcolithic sites in the Jordan Valley are now relatively well understood, and an overarching chronology is beginning to be established (Lovell 2001). In addition, specific questions about the nature of interaction are beginning to be addressed (*e.g.* Roux and Courty 1997). The nature of settlement and exploitation of highland regions remains under-examined and of great interest. Despite this most of the Chalcolithic sites so-far excavated come from low-lying areas (*e.g.* Tulaylāt al-Ghassūl, Abū Ḥāmid, Tall Findī *etc.*). Very few sites have been excavated above 400m, the natural habitat for olive, but if olive was the developing crop in the Chalcolithic then one would expect a fair number of sites in this highland ecology[1]. The two sites which form the focus of the Wādī ar-Rayyān Archaeological Project (WRAP) lie between 400 and 500m asl (FIG. 1) and excavation here is intended to examine the relationship between olive domestication, olive oil production and the transition from the Chalcolithic to the Early Bronze Age.



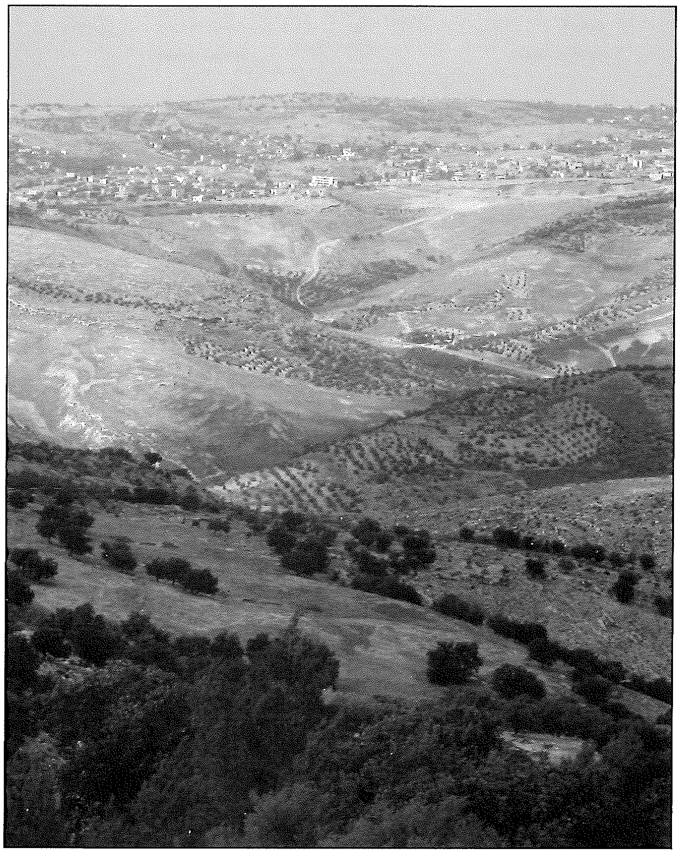
1. Map of southern Levant showing location of al-Khawārij and Jilmit ash-Shariyya.

Geographic shifts have been suggested as part of the explanation for the apparent break between the Chalcolithic and Early Bronze Age periods (*see* Lovell 2002). Meadow's work (2001, 2005) suggests that olives were domesticated by the Middle Chalcolithic period, confirming an original surmise by Zohary and Spiegel-Roy (1975). It is generally presumed that olive oil was a feature of Early Bronze Age trade with Egypt (Ben-Tor 1986: 10, 14, 16, 1991: 8; Stager 1985; Joffe 1993; *cf* Ward 1991: 20, n 4), and we can also document a significant antiquity to interaction between the two regions (*e.g.* Bar-Yosef Mayer 2002). It may be that this new horticultural resource made it possible for Chalcolithic inhabitants to more fully exploit new highland territory (*see* Gophna and Portugali 1988).

[1] Visibility or identification of late Chalcolithic sites may be affected by our understanding of typology in this respect. Many sites in surveys are simply designated Chalco-EBA because dating survey sherds is notoriously difficult (see Lovell *et al.* 2005). The University of Toronto's Wādī Ziqlāb project (*e.g.* Banning *et al.* 1998) is redressing the balance by sounding a variety of sites up and down the wadi. It is hoped that the Wādī ar-Rayyān project may be able to integrate with their results.

The site of al-Khawārij lies on a long terrace (FIG. 2) overlooking the Wādī ar-Rayyān (previously known as the Wādī al-Yābis). The site was located in the Wādī al-Yābis survey in the 1980s along with another Chalcolithic site, Jilmit ash-Shariyya (Palumbo *et al.* 1990). The WRAP began in 2003 with an intensive survey of the site of al-Khawārij (Lovell *et al.* 2005), and has progressed to full-scale excavation in 2004[2]. WRAP was set up as an intensive, targeted survey and excavation program designed to investigate olive production in the upland region of Jordan at the end of the Chalcolithic period.

Preliminary results from recent seasons have already been published in brief format (Lovell *et al.* 2005, *forthcoming*). This paper will confine itself to matters of research design and application.



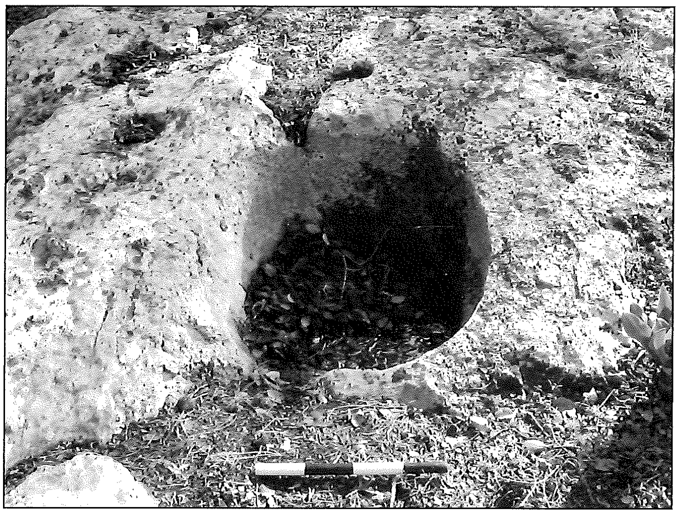
2. al-Khawārij, looking northeast from Ḥalāwa, 'Ajlūn district (Photograph: P. Kottaras for WRAP).

Survey (2003)

During preliminary visits to both al-Khawārij and Jilmit ash-Shariyya[3] we had noted the numerous rock-cut installations that peppered the protruding bedrock (FIG. 3). We felt that these might be associated with some kind of agricultural production[4]. Rock cuttings are notoriously difficult to date and it seemed that one way to attack the problem was via mapping the associated artefact scatters and examining the relationship of rock-cut installations to concentrations of artefacts[5].

The first step was to conduct a full survey of the site itself, the results of which have been published in preliminary form (Lovell *et al.* 2005). The aim was to map the frequency of artefact scatters and to produce a detailed map of the visible surface features that would later inform excavation.

Certainly some of the rock cut features, and perhaps some extant walls, date to post Chalcolithic times. There is evidence for Byzantine cisterns and well heads within our survey area (predominantly on hill tops or vantage points), but the vast majority of artefacts recovered dated to the Chalcolithic



3. Rock-cut installation Features 361, 362 and 363 in unit F9 (Photograph: A. Browne for WRAP).

[2] We particularly thank Dr Fawwaz Al-Khraysheh, Director General of the Department of Antiquities, and his staff in the 'Ammān and 'Ajlūn offices for generous assistance during our time in Jordan. The Wādī ar-Rayyān Archaeological Project is funded by the *Australian Research Council* (DP0342465). The project is based at the University of Sydney. We thank His Excellency, John Tilemann, and his staff at the Australian Embassy in Amman, for invaluable logistic support.

[3] A reconnaissance survey in 2001 was funded by an *Australian Academy of the Humanities* travel grant. I thank Alex Wasse (then Assistant Director, CBRL) and his trusty Landrover for generous assistance at that time.

[4] See also Gibson *et al.* 1991, who argued similarly for their site in the Judean hills.

[5] Van den Brink has made some headway with similar work at Nevallat (van den Brink *et al.* 2001, *pers. comm.*) and determining a *terminus ante quem* for similar rock cuttings via stratigraphic association is possible at other sites, see for instance Giv'at Haoranim (Scheftelowitz and Oren 2004).

period, with some possible EBA sherds (Lovell *et al.* 2005).

Excavation (2004)

The careful surface survey of 2003 located several areas of rectilinear architecture in association with dense surface scatters of artefacts. On this basis, after preliminary studies of the associated finds, six main areas were selected for excavation (Areas A to F) and in each of these areas at least two 5 x 5m squares[6] were excavated. The result of these excavations are still under study (Lovell *et al. in press*), however some brief points can be made concerning those areas that are of value in illustrating general approach and research aims.

Area C

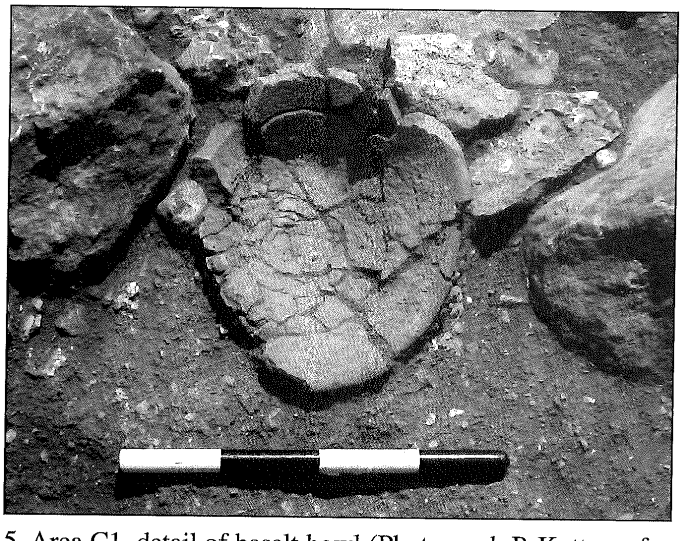
Area C is located in the southern portion of the site inside a modern corral (Lovell *et al.* 2005: Fig. 5). In this area three squares were excavated, revealing a rectangular structure and associated walls[7]. These trenches were excavated down to undulating bedrock (lying ca. 50-70 cm below the surface), which had rock-cut channels and pits within it. It is not immediately clear what these pits and channels might have been used for; careful examination of their contents may assist. However, the real interest lay in the structure itself. A corner of what appeared to be an intact building was revealed in trench C1, and this was picked up later in C2 and C3 (FIG. 4).

The structure is made of rough field stones and had a hearth, or other circular installation, directly in the centre of the room. The external dimensions of the structure are approximately 7 x 4 m, which compares reasonably well to other 'classic' Chalcolithic architecture in the region (*e.g.* Abū Ḥāmid, see Dollfus and Kafafi 1988: Fig. 41-42). Despite the shallow trench, it was clear that the deposits retained considerable integrity. While ploughing or other surface activities had made some impact (resulting in the breakage of some artefacts), it would appear that many still lay where they had been left. For example, a complete basalt bowl, although heavily cracked, lay presumably *in situ* in the corner of the building (FIG. 5). It is clear that in shallow sites one can excavate relatively intact deposits, and depth *per se* is no guarantee of a clean deposit.

4. Rectangular house structure in Area C showing installations (note bottom left hand corner shows removal of one corner of the building during excavation of C1) (Photograph: P Kottaras for WRAP).

Area D

To the north of Area C, on the main terrace, we excavated two promising areas. Area D[8] was located next to a rock-outcrop with a number of rock-cut installations (Lovell *et al.* 2005: Fig. 4). Whilst the architecture did not survive so clearly in this area, there were structural remains of single course walls as well as a number of important finds. Three 5 x 5 m squares were excavated. D1 was located where traces of architecture were noted during the survey (Lovell *et al.* 2005: Fig. 4). The excavator revealed a 2.5 m exposure of a single-course, 50-60 cm wide



5. Area C1, detail of basalt bowl (Photograph P. Kottaras for WRAP).

[6] On occasion the dimensions varied, *e.g.* 4 x 6m.
[7] I thank Tim Adams, field director and supervisor of this area.
[8] I thank David Thomas, field director of Areas D-F, and Guadalupe Cincunegui for her work as field supervisor in area D.

wall [1092], constructed of undressed, sub-angular stones and smaller stone infill, running approximately east-west. An almost complete small Chalcolithic churn was found in fill deposits beneath wall [1092] (FIG. 6).

To the north of this wall at least two large ceramic vessels, broken and lying on their sides, were excavated from lower topsoil. A complete basalt stone bowl was found in an underlying deposit, in the south-east corner of the trench. Another wall, [1096], was exposed beneath these deposits. It ran perpendicular to [1092], north-south, and was of similar construction and about 75 cm wide. It was constructed on bedrock and survived to a height of 25 cm. A 10 cm thick deposit of what appeared to be crushed, decayed and redeposited limestone bedrock formed a 'threshold' running through the southern part of wall [1096]. This deposit seems to have been deliberately laid[9] with patches of this same material were found at various points throughout the trench.

Of particular interest is a macehead, found just to the north of the 'threshold' (FIG. 7). It is made from greenish-grey igneous stone, a micro-granite or diorite[10]. A second, slightly smaller and fragmentary, example was found in area E. The stone appears not to be locally available and it may be

6. Area D1, showing relationship between context [1105] which lay directly beneath wall [1092] (Photograph P Kottaras for WRAP).

7. Area D1, detail showing the crushed limestone 'threshold' and the micro-granite macehead '*in situ*' (Photograph P. Kottaras for WRAP).

that it comes from Egypt. The object fits into the 'convex topped disc-shaped' macehead type as defined by Cialowicz (Cialowicz 1987: 15-17). This type derives from the Sudan but 2 of the 20 known pieces of this type, come from Egypt itself. The first from the Fayyūm (Caton-Thompson and Gardner 1934: 33, pl. 30.3)[11] and the other from Ma'ādī (Rizkana and Seeher 1984: Fig. 4, 7-8[12]). The type of macehead is dated to the Badarian – Naqada I period, and is therefore, in all probability, one of the earliest of the predynastic maceheads (Cialowicz 1987: 17). Given that these are most common in the Sudan, their existence in the oasis and further north at Ma'ādī appears to attest to contact between the upper Nile and lower Egypt. We can now add two more examples to this group from the 'Ajlūn

9 This was determined from its relatively homogenous appearance and more concentrated orangey grey colour, and from the fact that it seals 15cm of fill, above bedrock.

10 Another possible identification might be *syenite*, which is known from Badarian sites (e.g. Ashmolean 1929.439, a stone axe from Mostagedda 100).

11 Note that it was not actually picked up by Caton-Thompson and Gardner but was reportedly found in the Wādī ar-Rayyān divide.

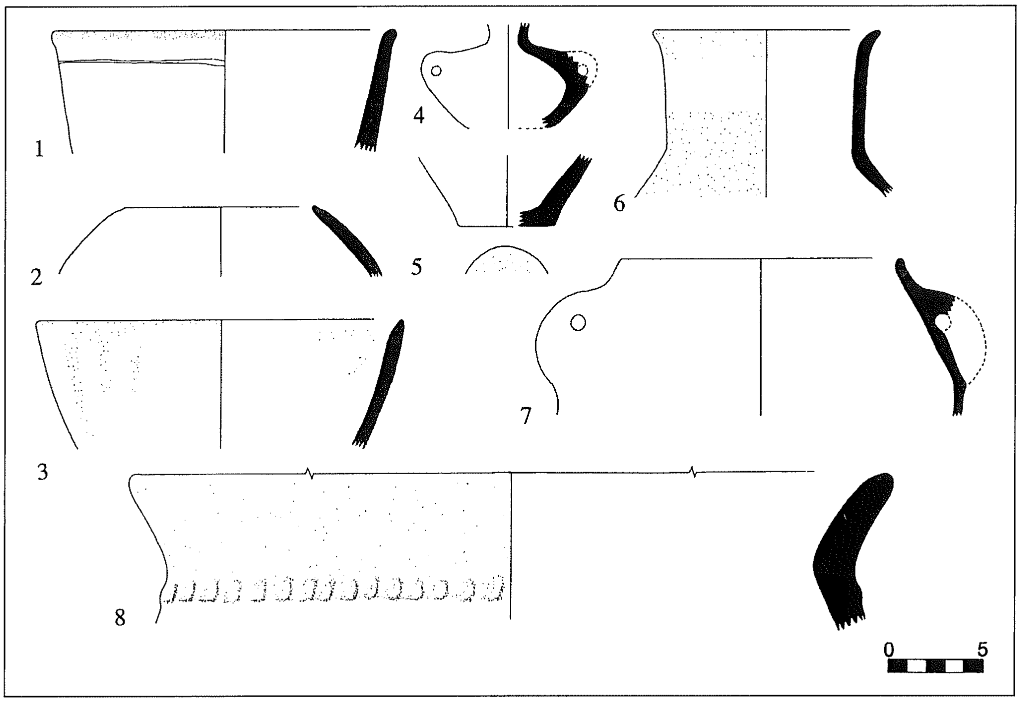
12 A Badarian piece from 'the villages' (Area 5500), of approximately the same size provides another instructive parallel. It is exactly the same shape (convex topped disc) and is described as a 'pink limestone whorl' (Brunton and Caton-Thompson 1928: 30, pl. xxiii). It was found along with other stone and ivory objects in a basket (Brunton and Caton-Thompson 1928: 6).

district of Jordan[13]. How these two objects came to be traded as far north and east as al-Khawārij is an intriguing question to be explored in future publications.

FIG. 8a shows selection of ceramics from the areas discussed above. All of these finds have good parallels in Chalcolithic contexts (Lovell 2001). FIG. 8b shows a selection of lithics from the site[14]. A fuller discussion of the ceramics, lithics and other finds associated with the excavation will be presented in Lovell *et al.* (*in press*).

Area E

Area E[15] is located on the southwestern edge of the



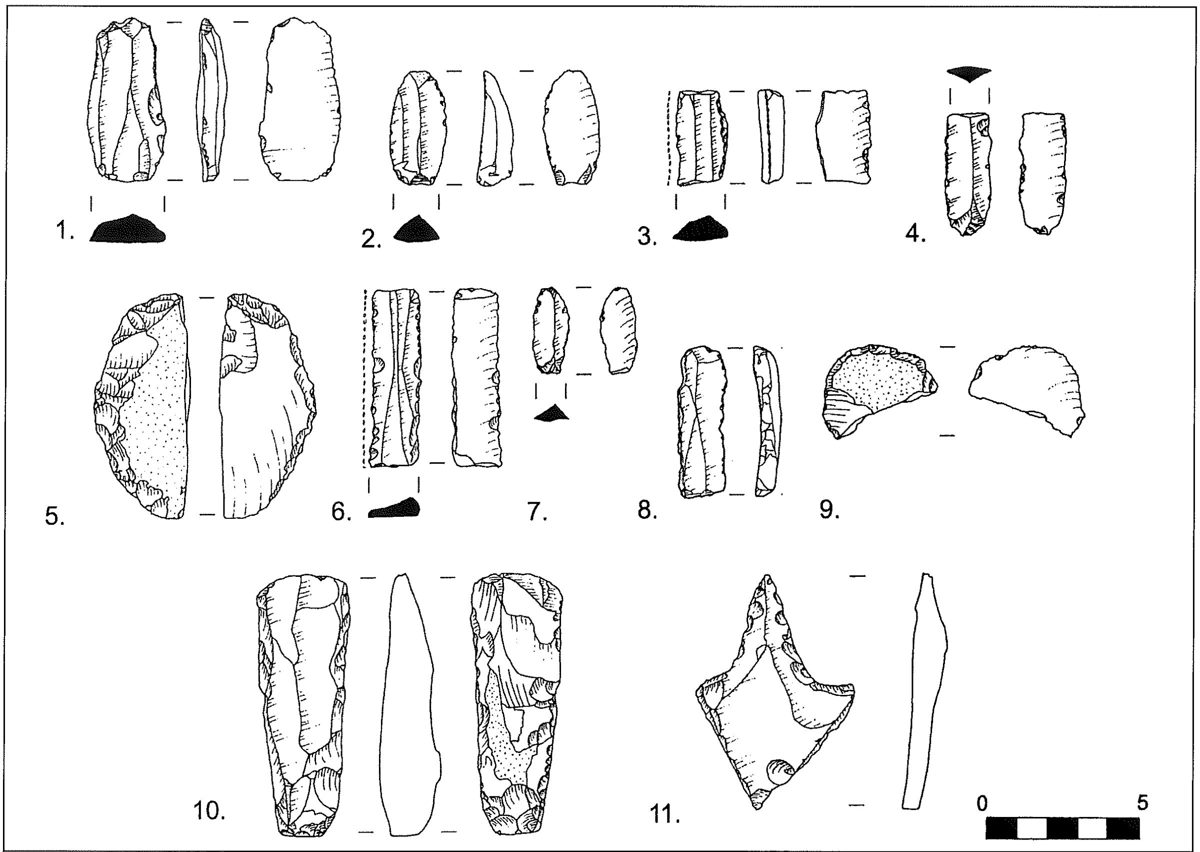
	Catalogue #	Area/ Trench	Context	Description
1	20114	A2	1079	Basin, out-turned rim, black paint / slip, incision or string impression below rim ext
2	20002	E2	1129	Holemouth, simple, red slip / painted ext
3	20090	E3	1282	Bowl, fine, red painted (linear) ext
4	20073	C2	1229	Churn, miniature, red painted (traces) ext
5	20118	C1	1222	Base, V shaped bowl, string cut
6	20059	A1	1077	Jar, tall neck, red painted (bands) ext
7	20099	C3	1351	Holemouth, fine, red painted (traces) ext
8	20021	D1	1088	Jar, storage, painted applied /impressed ext

8a. Ceramics from the 2004 excavations at al-Khawārij.

[13] The recently published Egyptian material from Tall al-Kharaz in the EBI (Fischer 2002) would suggest that the newly uncovered maceheads form the beginning of a longer story of Egyptian connections with this part of Jordan.

[14] For an extended discussion see Lovell *et al.* 2005.

[15] I thank David Thomas for his work in this area as excavator of E1, 2, 3 and 5 and field director of Areas D, E and F.



	Catalogue #	Description
1	1246	Simple, non-prismatic retouched blade
2	1209	Simple retouched blade
3	1359	Backed and truncated sickle blade segment
4	1248	Prismatic, simple retouched blade
5	1204	Tabular scraper-knife
6	1254	Backed and truncated sickle blade segment
7	1262	Retouched bladelet
8	1010	Straight-backed blade
9	1263	Tabular scraper fragment
10	1217	Straight edge axe
11	1231	Drill

8b. Lithics from al-Khawārij.

terrace area (see Lovell *et al.* 2005: Fig. 3) and revealed the richest complex of architecture including a large rectilinear structure with rooms running off the edges. The large, main room (excavated as trenches E3 and E5) has external dimensions of approx 13 x 5m. In places the walls were laid on bedrock, but at certain points they also lay upon actual deposit. The nature and proportions of the architecture are therefore similar to the long chain houses excavated by Epstein in the al-Jawlān (*e.g.*

Epstein 1998: 73, Fig. 100), although many of her examples are considerably larger[16].

In two adjacent trenches, E4 and E6, we uncovered a further long rectangular structure (external dimensions are estimated as: 12+ x 4.25 m)[16]. It is from this structure (FIG. 9) that we obtained our richest archaeobotanical remains. Within E4 and E6 there were a number of deposits ([1309], [1310], [1311] and [1312]) representing a continuous grey to yellowish cream floor surface. The finds from the surface and the deposits upon them included small 'v' shaped bowls and holemouths as well as jars. Quite a few pieces were decorated with red painted bands and all appear to fit within the Late Chalcolithic assemblage discussed above.

Al-Khawārij and the Olive

The shallow nature of these deposits and the *terra rossa* topsoil does not create an ideal environment for archaeobotanical preservation. However, because this project is driven by interest in olive production, archaeobotanical sampling was obviously a key priority and a number of samples contained appreciable numbers of well-preserved carbonised specimens (Meadows n.d.).

Bulk samples of sediment were collected from all securely-stratified contexts, and processed by machine flotation. Where possible, two large bags of sediment were collected per sample, giving a notional sample volume of 20 litres. Extensive

9. Area E4 and 6 showing large rectangular structure and associated surfaces (Photograph P. Kottaras for WRAP).

contexts were sometimes sampled more than once. Light fractions (flots) were collected in 1.0mm and 0.3mm mesh sieves, and scanned briefly before being packed for shipment to Australia. They are currently undergoing more stringent laboratory identification. Preliminary identification indicates that the samples included seeds of a wild grass, probably *Lolium* sp. (rye grass, a common weed of cereal crops); grains of emmer wheat (*Triticum dicoccum*) and hulled barley (*Hordeum vulgare*), the typical cereal crops at Jordanian prehistoric sites; lentil (*Lens culinaris*), also a common cultivar, and at least two other pulses – probably pea (*Pisum sativum*) and bitter vetch (*Vicia ervilia*), as well as olive (*Olea europaea*) (see below). All of the above are quite 'at home' in a [Late] Chalcolithic assemblage (Meadows n.d.)[18].

Most of the olive stones recovered are suitable for measurement. Olive was found in all trenches across the site. Eight whole carbonised olive stones were recovered from seven contexts and at least twenty other samples contained fragments of carbonised olive stones, some of which may be large enough for radiocarbon dating[19] (Meadows n.d.). The plaster matrix of one surface also included a few voids in the shape of olive stones, which indicates that uncarbonised stones were present when the surface was laid.

Residue Analysis

In order to expand the ways in which we might explore the connection with oil processing and the site we are embarking on a programme of residue analysis. Recent research has demonstrated that unglazed ceramics absorb a substantial quantity of lipids (animal fats, plant oils, waxes, resins *etc.*) that were stored in them (Evershed *et al.* 1992; Herron and Evershed 1993). The fired clay effectively functions as a molecular trap that preserves the lipids during burial over many millennia. What this means is that residues do not have to be visible to be present. However the difficulty lies in unambiguous identification. Presuming that lipids are identified within the WRAP samples, separating and identifying an olive oil signature from other oil signatures will be the key problem (Evershed *et al.*

[16] For plans and photographs please see Lovell *et al. Forthcoming.*
[17] I thank Iona (Kat) McRae for her work as excavator of E4 and 6.
[18] I thank John Meadows for allowing me to use his unpublished report in this paper. For a fuller discussion see Meadows in Lovell *et al. forthcoming.*

[19] We thank the *Australian Institute of Nuclear Science and Engineering* (AINSE) for a recent grant of 10 AMS dates (AINGRA05104). We will shortly be submitting some of the archaeobotanical material discussed here for dating at their facility.

2001: 336; Serpico and White 2000: 412-420).

Following the discovery of highland sites in the al-Jawlān it was suggested that a number of artefact types (basalt bowls, spouted jars) may be associated with olive oil production (Epstein 1993). A detailed study of the repertoire at al-Khawārij will bring new insights. We aim to combine the archaeobotanical, residue and artefactual analyses in order to be more specific about what was produced at and exported from al-Khawārij.

The Broader Picture

Given the statements made by researchers in recent years regarding social complexity in the Late Chalcolithic period (Joffe 1993; Levy 1995), the development of tree crops and incipient long-range trade in horticultural produce would not be out-of-place. At Ashkelon, in the EBIa, we have some evidence that suggests sea traffic between Egypt and the southern Levantine coast in connection with olive oil (Gophna and Liphschitz 1996: 147-51). There is no reason to suggest that the Egypto-Levantine trade in oil products did not begin earlier (see Stager 2001).

The period of the Chalcolithic - Early Bronze Age transition is one of the least understood of late prehistory and we are hopeful that the excavations at al-Khawārij will be able to make a significant contribution to our understanding of why the Late Chalcolithic population chose to utilise this area and how communities might have negotiated their position within what we know as a wide and rich Late Chalcolithic material culture.

What we can already demonstrate is that objects perhaps associated with Egyptian/African material culture are present as far east as al-Khawārij in the Chalcolithic period[20], and that the site appears to have been involved in olive production and consumption on the very cusp of what others have termed the 'social power revolution' (Levy and van den Brink 2002: 5). Ongoing investigations aim to be more explicit about how Chalcolithic inhabitants were engaged in the trading networks of this period, and what part olive production might play in developing stories that archaeologists are weaving around this important transition.

Survey and Excavation

The 2004 excavations confirmed the utility of the surface survey. The surface survey allowed us to understand the site more intimately before excavation, and it allowed us to locate extant architecture. One thing we did notice was a greater concentration of later Bronze and Iron Age material in units E11, F11 and G11-12 (Lovell *et al.* 2005: Fig. 5). We suggested then that the architectural traces picked up in G11 and H11 might be later in date. Excavations in Area B did in fact reveal a Bronze – Iron Age structure – underlining, once again, the value of intensive pre-excavation surface survey.

Excavating Shallow Sites

It is equally important to note that the shallow nature of the deposits revealed at al-Khawārij does not negate their importance. It is true that the damage by ploughing and other recent activities has affected the archaeological integrity of some deposits, but despite this it is possible, with careful excavation, to reveal an intriguing and informative picture of Chalcolithic activities on the site. We are hopeful that ongoing investigations in the Wādī ar-Rayyān will reveal further valuable information via spatial analysis of artefacts and detailed artefactual and scientific studies (including use-wear *etc.*).

Conclusions

In terms of the research approach and design the WRAP project[21] has already made steady progress towards its final objectives. Although some might avoid excavation in these upland regions the survey and excavations at al-Khawārij have shown that, with appropriate method and thorough procedures, good results are not only possible, but highly valuable.

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[20] Note also that the invasively retouched tools picked up in the 2003 survey are also sometimes associated with Egypt, although these may date to the EBI (Rosen 1997: 81). Interesting our best example (Lovell *et al.* 2005: Fig. 10) seems very close to the Egyptian example from Tall Erani (Rosen 1997: 83, Fig. 3.40).

[21] In addition to myself, project members have included: Mr. Adeib Abu Shmais (Dept of Antiquities Representative 2003) Mr. Mohammad Al Balwaneh (Dept of Antiquities Representative 2004), Dr. Bruce McLaren (Field director 2003), Mr. Timothy Adams and Mr. David Thomas (Field Directors 2004), Mr. John Meadows (Archaeobotanist), Mr. Angus Browne and Ms. Pamela Kottaras (Archaeologists and photographers), Mr. Tobias Richter (Chipped stone), Mr. Jamie Fraser and Ms. Guadalupe Cincunegui (Archaeologists), Ms. I. Katherine McRae and Ms. Melissa Kennedy (Student archaeologists), and Abu Isa and Aladdin Madi (Camp managers) and Abu Sami (Cook). I thank Jamie Fraser and Stephen Bourke for proof reading and valuable comments; any errors are, of course, my own.

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Sedentism and the Village: Social Motivations for the Beginning of Farming

For a long time the main focus of research regarding the beginning of farming has been on economic change, the processes of domestication and the practical matters surrounding farming. A problem always faced in these models was to explain why farming was adopted, once it was accepted that a unilinear evolutionary idea of progress was not an explanation, and that the benefits of early farming were not obvious as they required greater work effort and new social structures. The importance of social change has gradually been understood to be important, at least equal to the significance of the economic changes. The work of authors such as Cauvin has emphasised the social aspects of the so-called Neolithic Revolution (eg Cauvin 1997 and 2000). The number of references to Cauvin's work in this paper reflects the importance of his thoughts on this subject. However, in a sense he, and others, have focussed on a secondary phenomenon: the growth of ritual. Furthermore, it does not appear that this school of thought has been any more successful in explaining the origin of the changes simply by asserting the primacy of social and idealogical factors. I argue that the rise of ritual, in the same way as both agriculture and sedentism, is the product of human choice. Recent attempts to view the change from a cognitive perspective, such as those by Watkins (2002), while they seek to address the underlying causes and to explain why these happen at the end of the Pleistocene and the start of the Holocene, suffer by assuming that Cauvin's models can be taken as a given. In addition, there is an assumption common in archaeological literature, that there is a huge gulf between hunter-gatherer and farmer. This has a long history, through the work of Childe (1942) who introduced the concept of a Neolithic Revolution, Hodder's *Domestication of Europe* (1990), and in arguments by Renfrew (2003) and Watkins (2002) that not much happened before the Neolithic. At times there even appears to be a risk of dismissing the humanity of hunter-gatherers. This is of course not a new viewpoint, and the 19th century rationale put forward by Engels is discussed by Ingold (1996), and has remained within archaeological thought since (cf Braidwood 1957).

It is now widely agreed that the transformation from hunter-gatherer to farming societies involved a significant social change, and was not solely economic in nature. Some recent papers have almost ignored the economic aspect of the change using the term Neolithic to refer almost entirely to a cultural change involving the way people lived together. This viewpoint generally interprets the economic changes as secondary events forced upon people in order to sustain the societies and populations being created by the cultural changes occurring and the approach has many strengths. Interestingly, one aspect is that the changes that occur appear to have a long gestation, starting at least in the Natufian and continuing well into the Neolithic.

This paper will not attempt a broad sweep through such a long time period, rather it will focus on what appears to be the critical moment, the Pre-Pottery Neolithic A, or PPNA (ca. 11,700 – 10,500 calibrated 14C years BP, Kuijt and Goring-Morris 2002). Final Natufian (ca. 12,500 to ca. 12,000 calibrated 14C years BP) communities in the Jordan Valley ranged in size from small ephemeral hunting and gathering locations to somewhat more sedentary camps relying upon the intensive harvesting of wild cereals. With the end of the Younger Dryas period of aridity this economy began to change, and climate change must be seen as an important factor in constraining the economic options. PPNA communities ranged in size from small, clearly temporary camps (up to 150m^2), to medium-sized hamlets (ca. 2,000-3,000 m^2), to large (more than 2 hectare) villages. The presence of well built structures in the medium and larger-sized communities and rare large non-domestic buildings, like the tower of Jericho, suggests that a degree of sedentism may have been practiced, although this remains questionable (cf. Edwards and Higham 2001). The PPNA economy was based on a combination of hunting of wild animals and harvesting a mixture of possibly domesticated cereals, wild seeds and fruits. There is general agreement that by the end of the PPNA, settled communities were present across much of the Near East and sufficient unity in their social and economic systems justifies their designation as the Pre-Pottery Neolithic B (PPNB), although what this means in human terms is less clear. Whether the changes that led to cultivation arose at one center as proposed by Zohary (1996), or in a broadly contemporaneous manner throughout the region and within differing ecological zones, remains an issue for research. The second hypothesis is given greater weight by the variability apparent between PPNB sites.

Although generally accepted, the transition remains remarkable and dramatic. In southern Jordan, Wādī Faynān, there is a striking juxtaposition between the PPNA site of Wadi Faynan 16 and the PPNB site of Ghuwayr 1. The two sites are only a few hundred metres apart, and have radiocarbon dates that actually overlap slightly, which puts this transformation into stark relief (Simmons and Najjar 1998, 2003; Mithen *et al.* 2000). Mohammad Najjar and Alan Simmons, the excavators of Ghuwayr 1, are able to discuss the density of the architecture, the possible presence of two story buildings, the scale of the site, how big, how deep, how well built. From the perspective of PPNA Wadi Faynan 16, with its relatively slight and apparently malleable architectural forms, Ghuwayr appears as a different world. But if the transformation has happened by the Middle PPNB, it makes the PPNA all the more interesting. The ephemeral and apparently difficult to understand structures on Wadi Faynan 16 represent precisely that moment in time between hunter-gatherer and farmer. How much of the new PPNB has arrived ready-made from the Early PPNB in northern Syria, and how much is a local adaptation and development is hard to establish, but this is as a consistent problem of middle PPNB settlement (Cauvin 1997).

Of course Ghuwayr 1 should not be considered in terms of a modern fellahin village although sometimes it appears that many archaeologists do have the picture of *fallāḥīn* working in their fields when they discuss Neolithic farmers, the "confirmed peasants" of Cauvin (2000: 63). The changes that we can observe occurring within the PPNB continue to be very important. The PPNA is however a crucial period in our understanding of the huge changes that happened at the start of the Neolithic, especially within Jordan. Although we may be able to trace some of these changes back in time through the Natufian and Epi-Paleolithic, even into the Upper Palaeolithic, there is an enormous transformation that happens in the PPNA, or at the end of the PPNA. The differences between Ghuwayr 1 and Wadi Faynan 16 illustrate this very well. The point is made even more forcefully when a wider site distribution is taken into account, where the PPNB appears to explode, manifesting itself in the development of the truly large sites such as 'Ayn Ghazāl (eg Rollefson and Kafafi 1997), and in the increasing wide region occupied by PPNB settlements, as seen in the colonisation of Anatolia and Cyprus (McCartney and Peltenberg 2000). Within the Levant, figures compiled by Kuijt (2000) regarding the extent and the depth of deposits of PPNA, MPPNB and LPPNB show that the increase is exponential.

The PPNA suffers from a number of classificatory problems, including whether it should be treated as Epi-Paleolithic or Neolithic, and whether it can be divided into an early and a late, a Khiamian and a Sultanian. Indeed some have gone further and refer to the first phase of the PPNA as Epi-Palaeolithic, and the later as Neolithic (Cauvin 2000). Arguably this last problem is still caused by the small sample of sites examined, and problems with residuality from the Natufian in PPNA sites (Pirie 2001; Garfinkel 1996; Kuijt 1996, 1997; Gopher and Barkai 1997; Nadel 1990 and 1998; Ronen and Lechevalier 1999). As to whether we should consider the PPNA as Neolithic, this varies with different definitions of what the Neolithic is. The original definition of Neolithic was stretched to include a pre-pottery phase, but some recent works have begun to use Neolithic to refer specifically to a social change, and to ignore the economic basis for the Neolithic. For these scholars the PPNB (or late PPNA - Sultanian) villages are the evidence for this social change having occurred, so Neolithic in a sense is used to refer to the village culture (Watkins 1990), although Cauvin, in the final revision of his book *Naissance des Divinites* (the English translation), despite his concern with social and ideological matters, still considered the economic change to be his "ultimate criterion" for the Neolithic (Cauvin 2000: 214).

It appears increasingly that the fundamental driving force for the direction of change must have been social. Of course, environmental changes almost certainly provided an impetus for change, with increased aridity making Early Natufian ways of living less and less viable, but they did not provide a direction to the change that led to the Late Natufian, nor to the subsequent development of the PPNA at the end of the arid phase. The impetus that led to villages came from social changes, and although clearly people did not set out to develop the PPNB as a deliberate plan of action, decisions must have been made regarding trying to live together in larger groups and to stay in one place as long as possible. The social and economic problems caused by this course of action are not slight, and much of the complexity of the PPNB arises out of the consequence of the route taken.

However, there are problems with changing the definition of what it may be to be Neolithic. Such terms are in essence labels that we apply for convenience and for shorthand. Trying to define them closely, or to re-define them, may from time to time be an interesting exercise, in that it exposes difficulties and problems, but our objective is not about terminology. Cauvin maintained a strict distinction between the process (neolithisation) and the state (Neolithic) (Cauvin 2000: 216). Emphasizing this distinction appears not to be productive. Rather we need to be looking at the process of change, and by establishing rigid barriers between phases, cultures and economies, we make it all the more difficult to understand the changes that took place, or we turn them into fundamental ontological shifts. This is what has happened with the Neolithic, with arguments about people's worldview changing dramatically, especially the perception of the wild and the domestic, the concept of *domus* (Hodder 1990), the idea of the home (Watkins 1990), and the development of religion, not just religion, but religion we can recognise, involving the mother goddess and the virgin birth (Cauvin 1997). Some ideas, including the idea that humans had to objectify the world, or nature, in order to start modifying it seem very heavily based in a western rationalist mode of thought. Ingold goes further, and observes that for some cultivators "the colonial image of the conquest of nature is entirely foreign to their way of thinking" (Ingold 1996: 17).

The research biases that exist begin with the identification of villages and the subconscious understanding of the beginning of the Neolithic as some sort of evolutionary process, a major hurdle to be jumped on the road to modern western civilisation. In Trevor Watkins recent translation of Cauvin's work this is not that subconscious (Cauvin 2000). Cauvin states that "we are the inheritors and the direct result of that artificial turning point, it is to that point that we must take our history back" (Cauvin 2000: 3). To read many accounts it would appear that the transition of farming is a one-way step to be taken, yet we know, both from what appears to happen on the arid zone margins with hunting in desert kites (Helms and Betts 1987), or in Cyprus (Peltenburg *et al.* 2001), that the PPNB was not a monolithic culture or economy. Hunting and gathering was still an option. This flexibility is apparent in modern anthropological studies, which have repeatedly shown that the boundary between farming and living on wild resources is a fluid one, with variations on the theme, and indeed with people oscillating between the two modes of subsistence. Ironically of course some of the ideas regarding prehistoric hunter-gatherer modes of thought come from analogies with modern post-colonial hunter-gatherers who may have previously subsisted as farmers, or at the very least have lived side by side with farmers for a very long time.

Much of our contemporary way of classifying people arises from a specific moment in imperial history, when hunter-gatherers were held up in opposition to so-called civilised people. Our contemporary way of categorising people by their mode of production has arisen from this. Indeed, the belief that modern hunter-gatherers make good analogies for prehistoric hunter-gatherers 10,000 years ago is based on very simplistic neo-evolutionary logic. The association between hunter-gatherers and their environment comes out of a belief that they are closer to nature, of nature. This is another idea that may seem past its time, but here again Cauvin states that "they drew from nature ... just like any other predatory species" (Cauvin 2000: 1) and man's "manifest ...unique supremacy" as "the king of creation" "in the bosom of nature is a sort of certificate of excellence" (Cauvin 2000: 2). Cauvin's view of hunter-gatherers is certainly not one that would be openly shared by social anthropologists or archaeologists who study hunter-gatherer societies. However, perhaps it remains at the back of many minds, as it is this placing of hunter-gatherers within nature that allows the common focus on changes in hunter-gatherer societies to be placed on external forces, such as environmental change, while subsequent changes are assumed to lie primarily within the social domain.

Anthropologists such as Ingold (1996, 2000), Descola (1994) and Bird-David (1990) make it clear that these generalised archaeological attitudes are misplaced. Many modern hunter-gatherers do not make the dichotomous distinctions between culture and nature, human and non-human characteristic of modern western thought. Instead they understand the world in terms of relationships and forces that are encountered and engaged with. Relationships between people and environment are understood as similar to those between people and people. Understanding of an environment is therefore often comprehended in social relationships. In this sense the modern concepts of domestication and management of resources may not be at all appropriate. Similar perceptions arise with some cultivators who see the relationships with ancestors and the environment as reciprocal. While perspectives will vary from group to group, and in different parts of the world, both within hunter-gatherer and simple cultivator societies, the relationship with the environment remains personal. In this sense, if, as Cauvin does, we interpret figures of people with upraised arms as in prayer, we are seeing a change in attitude, but not a quantum leap. Ironically, many of the fundamental perspectives that are nowadays taken for granted, appear to be 19th century changes in understanding. In particular is the Marxist idea of the transformation of nature by labour, be that by craftsman or farmer. In contrast, Ingold (1996) observes that both contemporary traditional farming societies and European thought from at least classical Greece to the 18th century, saw the work of craftsmen and farmers as quite different. Specifically, farmers are helping nature, not opposed, or trying to dominate it.

Furthermore, modern common sense and rationality may not be useful in understanding the past. Seeing nature and culture as separate and opposed entities is both ethnocentric and objectifying, and therefore probably misleading. That understanding human – environment social relations may be "difficult to interpret is no reason to assume that our values are the most appropriate way to understand them" (Warren 2001: 139). Barrett has argued that a social archaeology "considers how people reproduce (1) their material conditions through their actions on the environment; (2) the social system by maintaining the demands, and meeting the obligations of, social discourse; and (3) their knowledge and understanding of how to proceed in such practices. The emphasis here is on *reproduction* in the sense of the routine maintenance of social practices, rather than upon discovering descriptive terminologies for entire social systems, such as band, tribe, chiefdom, state etc. These routines are daily and traditional practices" (Barrett *et al.* 1991: 6-7).

In searching for the nature of the transformation that does occur with the Neolithic revolution, it can, and has been, argued that the development of storage techniques is perhaps more important than farming (Testart 1982). The delayed return economy has many of the features of an agricultural economy with its seasonal routines, and storage makes a more sedentary lifestyle possible without the need for the appearance of new natural resources throughout the seasons. The intensification of hunting and gathering of wild foods may also be a vital step in changing societies. Such intensification has been accepted in the European Mesolithic as the critical path for increased complexity, leading to sedentism, territoriality, and many other features which might be seen as Neolithic, but which occur in what are generally referred to as complex hunter-gatherer societies (Rowley-Conwy 1983). The classic ethnographic example used to demonstrate this are the people of the North-West coast of America, although there is no evidence that any European early Holocene hunter-gatherers reached similar levels of complexity. Group size rises and consequently social differentiation increases as a means for ensuring adequate decision making. The whole idea of complexity has become a dominant, orthodox interpretative framework in North West Europe. Yet of course in the European context it occurs absolutely without farming, indeed is seen as resistant to farming. However, it should be clear that such people are no more a part of nature than the Neolithic peoples of the Near East, nor is their concept of religion any more primitive. The idea of complexity amongst hunter-gatherers is a useful reminder of the range and variety of strategies adopted. Contrary to much apparent archaeological usage, hunter-gatherers were, and are, not all highly mobile tropical people (Rowley-Conwy 2001). What is more, they are not static in social or economic behaviour. The often-accepted notion of a Natufian equilibrium existing until shattered by environmental pressure is unlikely (cf. Cauvin 2000: 65).

Rather than start from the premise that farming is opposed to hunting and gathering, it may be more helpful to try and understand early agriculture as part of the spectrum of available hunter-gatherer strategies. Certainly there is a continuum in environmental management strategies, from conservational management, where there are culturally sanctioned restrictions of resource use, to promotional management which uses active manipulation of resources to increase their productivity (such as selective culling and scrub burning), to domestication. Indeed all of these elements of the spectrum may be in use at any one time.

It may be useful to make a few more comments about religion, given the important place it undoubtedly held in the development of societies who could live together in large settled groups. Cauvin and Watkins have both suggested that while we can appreciate the aesthetic qualities of Palaeolithic art, and realise that it has ritual and religious meaning, we cannot understand it (Cauvin 2000; Watkins 2002). Cauvin stresses that (Venus figurines aside perhaps) there are no gods in the Palaeolithic. In contrast they suggest that we can truly understand Neolithic art, not just on a superficial level but at a more sophisticated level. Cauvin states that "The ambiguity of the symbol …. is readily decipherable for us who bear the 'terrible' mother in the deepest stratum of our unconsciousness" (Cauvin 2000: 71). What is more, Cauvin argued that we can see the origin of the mother goddess who dominates oriental pantheons until the time of the male dominated pantheon of Israel, the origin of the Minoan bull contest, even the origin of sacred theatre, in Neolithic religion. He noted a few problems, for example the 'Ayn Ghazāl statues which he considered not very beautiful to modern perspectives. He argued that he could make such an aesthetic judgment as the evidence from Jericho shows that the sculptors of the PPNB could also produce what he saw as works of talent. Yet this use of modern aesthetics surely confirms the fundamental problem of trying to force a modern understanding of religion and belief back into the past. The 'Ayn Ghazāl statues are remarkable, but their eerie appearance is surely as much because we do not understand them, as it is anything to do with aesthetics. In a sense these extraordinary figures make very clear the ritual context of PPNB artwork, and that we need to be very careful in assuming that we really comprehend PPNB religion. Such a need for caution is further revealed by Cauvin's statement regarding the burial of modelled skulls. These he assumes must be ancestors who have fallen out of favour as it "makes no sense at all for a skull that is buried" (Cauvin 2000: 114). It seems impossible for us to believe that we have such a knowledge of PPNB ideology and religion that we can make such statements. In a review feature both Hodder and Rollefson observe the difficulties with Cauvin's interpretation of figurative objects (Hodder 2001; Rollefson 2001).

The skull cult alluded to appears to go back to the PPNA in a complex form. At Wadi Faynan 16 there are good examples of multiple and single burials, comprising in one case arranged collections of bones from several bodies, or an intact skeleton in the other, but in each case there is only one skull, and both are raised on a stone above the level of the other remains, and apparently placed as part of the initial construction of the building, with the skull apparently bulging out of the plaster floor. The importance of the association of dead bodies and skulls and buildings is clear. However, the highly variable architecture at Wadi Faynan 16 makes statements regarding the idea of house and home more difficult than might be though (Watkins 1990). The purpose of some of these buildings should be questioned, with possible alternatives including ritual and storage, as well as the often-assumed domestic function. The modern western linkage between the concept of a home being linked to a fixed building is in any event less obvious working in the South of Jordan amongst the Bedouin and their tents.

If we cannot easily make links between evidence for growing sedentism and the concepts of *domus* and home, nor between evidence for increased material culture relating to ritual and religious practices or ideology, how far can we advance our understanding? I believe that it is clear that the social changes occur in advance of the economic changes, further, that the economic changes occur because they are required to enable people to lead the lifestyle they have selected. That way of life notably includes leading an increasingly sedentary life, in increasingly large communities. The development of ritual also appears to have occurred as a result of this social choice as a necessary mechanism for enabling people to live together in a more permanent manner. There is however an important point to be made here. The visibility of ritual inevitably increases with increasing sedentism. If ritual is practiced in permanent structures then it will, as with all other cultural and economic material, leave greater quantities of tangible evidence. In other words, perhaps the presence of structures apparently set aside for ritual activities in a permanent settlement should be no surprise. This is especially the case as one of the features observed during this process of transformation is the increased segregation of space. With permanence comes a clearer division of settlement and structures into work areas, storage areas, refuse areas, and presumably living space, as well as ritual space. This would appear to be an almost inevitable consequence of long-term settlement. The need to separate refuse in particular from other activities becomes more important, if not for health, then for the simple physical requirement of maintaining living and working space. This separation can be seen in the widespread change to clean occupation horizons or floors in the PPNA from typical hunter-gatherer dirty surfaces, strewn with artefacts in the preceding periods (Hardy-Smith and Edwards 2004). It can also be seen in the separate deposition of midden material at Qermez Dere (Watkins 1990), adh-Dhrāʿ (Finlayson *et al.* 2003), and Wadi Faynan 16 (Finlayson *et al.* 2000). Use of space in a settlement may be one of the key ways to see changes in society, including the development of patterns of community working.

Unfortunately, trying to argue for a clear sequence of changes: social, then ritual and economic, is impossible. The changes must go hand in hand to allow them to successfully proceed. What is of great interest is what was provoking the changes, especially as this process does turn into a global phenomenon during the Holocene. In a sense economy and ritual appear to be proxy indicators of underlying behaviour. Hodder is right to suggest that it is necessary to contextualise the rise in symbolism with changes in economy and the processes of power (Hodder 2001).

Our current archaeological knowledge of early villages (as opposed to smaller camp sites) of this period is largely geographically limited to the Mediterranean Woodland zone due to the historical context of research. The majority of recent archaeological research on the PPNA period has focused on smaller settlements, with the majority of these settlements being located within Levantine Corridor, from Jurf al Aḥmar in the north, to adh-Dhrāʿ and Wadi Faynan 16 in the south, but with a distinct concentration in the Jordan valley, just north of the Dead Sea, which contains the largest known sites of Jericho and Netiv Hagdud (Belfer-Cohen and Bar-Yosef 2000: 29, Fig. 3). It remains unclear, therefore, if these PPNA communities were characteristic of all other regions of the southern Levant, or represent a regional adaptation located north of the Dead Sea. Current work being undertaken at adh-Dhrāʿ and Wadi Faynan 16 suggests that many of the same features are present further south too (Finlayson *et al.* 2000, 2003).

There is substantial variability in material culture at PPNA sites, and at present this is poorly understood. Alternative arguments have been put forward that this arises from variation in time, space, and functional activities that occurred within sites. Variability in stone tool technology between settlements is very high and includes significant differences in the percentage of diagnostic tool forms, such as lunates, projectile points and Hagdud truncations. It has been argued that this reflects either different periods of occupation, variation in archaeological recovery methods, variation in functional activities, and the mixing of cultural material from different periods of time, or a combination of these possibilities. The simple chronological phasing – the Khiamian followed by the Sultanian – that has been assumed by Cauvin to be real and allows his division of the PPNA into an early hunter-gatherer phase and a later Neolithic phase – appears on recent evidence from adh-Dhrāʿ and Wadi Faynan 16 to be largely the result of small samples and mixing of material as noted by Garfinkel (Garfinkel 1996). At both adh-Dhrāʿ and WF16 there appears to be good evidence that assemblage composition is related more closely to spatial distribution, and therefore presumably function, than to chronology. What is more, the function, and therefore the assumed symbology of projectile points, seen by many as vital images of virility, has been severely questioned (Finlayson *et al.* 2003; Goodale and Smith 2001). Research at a number of sites, for example adh-Dhrāʿ, Wadi Faynan 16 and Cayonu

(Coskunsu and Lemorini 2001)), has indicated that so-called projectile points frequently have wear traces indicating other functions.

There is an urgent need for a greater understanding of PPNA society and population. The keyhole excavations designed to provide data leading to greater cultural and chronological resolution have largely failed to achieve these limited objectives. It has proved impossible to comprehend the significance of the material recovered. We have to look at the settlement level. We need to reconstruct the size of community and how it was organised by looking at the size and density of residential structures, and the number and types of non-residential features, including food processing locations, fire hearths, and storage areas. The size of individual features, the labor invested in their construction, the presence of non-portable artifacts such as pestles, grinding stones, and cup-holes, all furnish a general proxy measure of the relative permanence of occupation and the degree of sedentary life. The organisation of space will provide evidence of social organisation.

In effect, we can now argue a plausible case for the importance of social change, but as fieldwork to-date has focussed on economic aspects, with interesting observations when dramatic evidence of ritual has been encountered, we do not as yet have an adequate corpus of data within the PPNA to assess this model. The purpose of further work at adh-Dhrā‘ and Wadi Faynan 16 is to rectify this situation.

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Water Stategies in the Southern Ghawrs and Northeast ʻAraba

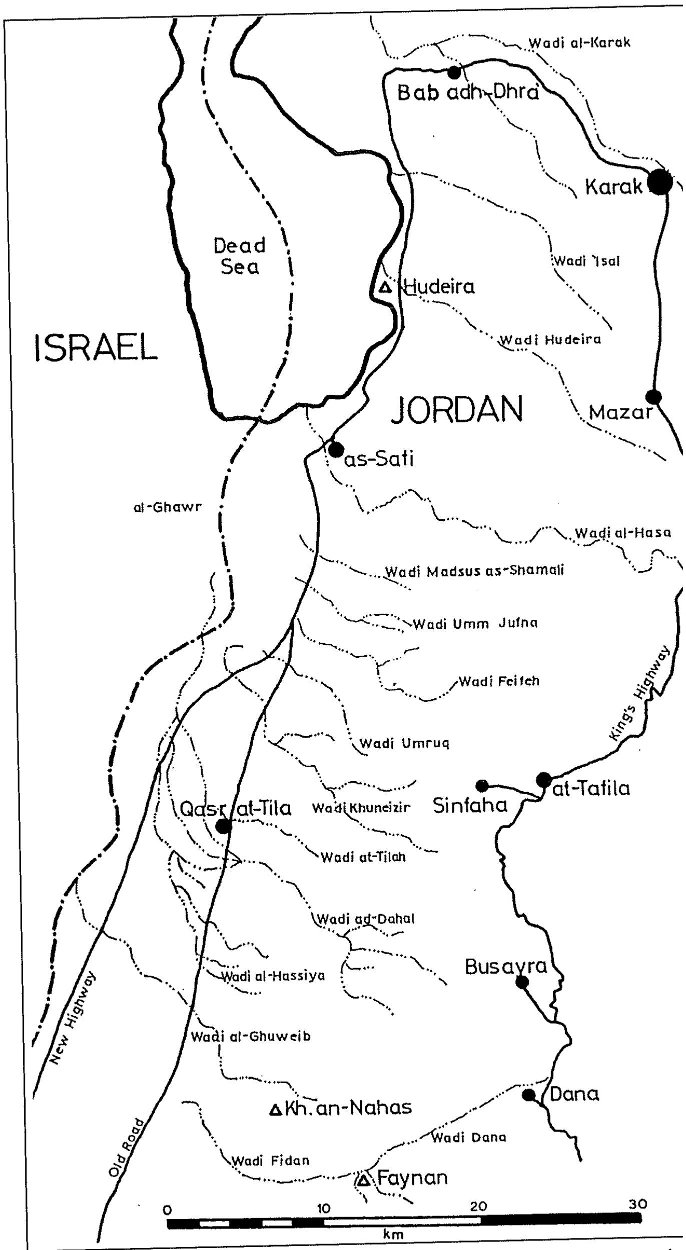
Introduction

The Southern Ghawrs and Northeast ʻAraba are arid zones (FIG. 1). Their most critical resource is water. The water supply determines the abundance and distribution of other resources such as plants and animals available for hunting-gathering cultures, the crops that can be grown by farmers, and the animals that can be reared by both farmers and pastoralists.

The primary source of water is rainfall. Secondary sources are flowing streams, springs, wells, and moisture stored in the soil. All of the secondary sources are dependent ultimately on rainfall, which generally falls in the Highlands at the Eastern Rim of the Wādī ʻAraba-Jordan Graben to the east of the Wādī ʻAraba-Dead Sea-Jordan Depression (FIG. 2).

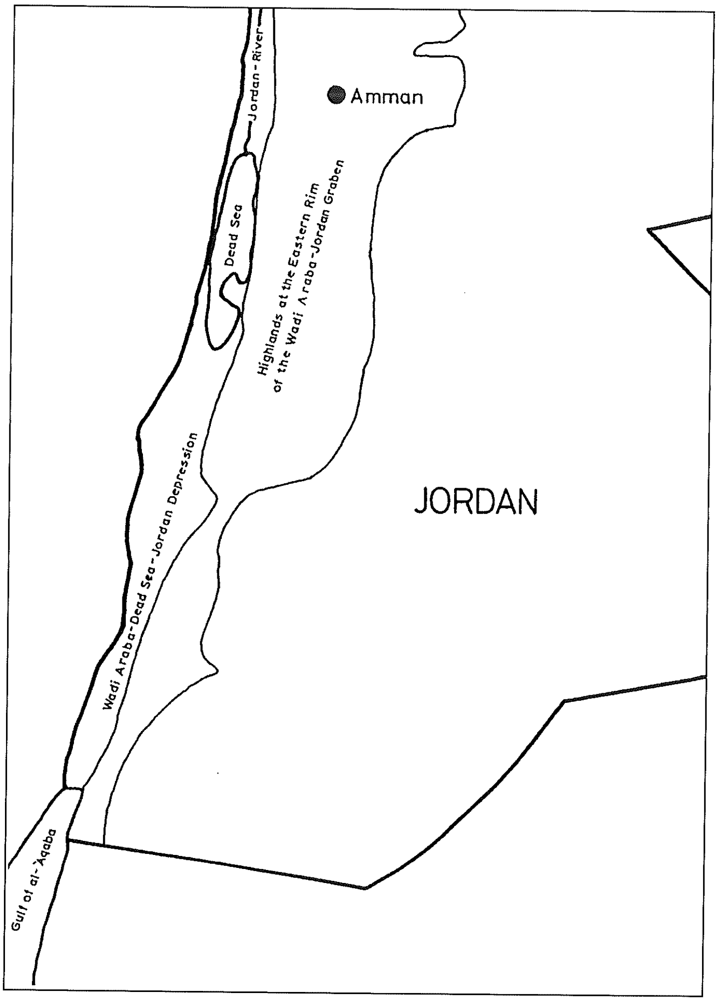
The distance between the two zones is not great and the ecological ties between them are intimate, fragile, and sensitive. For this reason, an understanding of the water resources of the Southern Ghawrs and Northeast ʻAraba must depend to some extent on an understanding of the ecology of the Highlands. For example, water delivery in the two zones depends not only on rain in the Highlands but on water retention that is trapped and allowed to percolate slowly to the springs below or is released slowly from the upland soils to the perennial streams. In summary, the Southern Ghawrs and Northeast ʻAraba ought not to be considered as isolated from the Highlands.

This paper will consider the main water sources between Wādī al-Karak in the north and Wādī Fīdān in the south, a distance of ca. 70 kilometres. These water sources include streams, some of which are perennial, and springs. Moreover, water is stored in the soil where it is available through the digging of wells. In addition, water from these



1. General Map of the Southern Ghawrs and Northeast ʻA ba.

sources is stored in reservoirs, cisterns, and po And the water from these sources is used by p ple, animals, and plants. And it was the availabi



2. Map Showing Relationship between the Highlands and the Southern Ghawrs and Northeast 'Araba.

of water that made it possible for people to live in the areas.

Rainfall in the Southern Ghawrs and Adjacent Highlands

According to the rainfall data that Harlan used, a 37-year record at al-Karak, on the plateau east of Bāb adh-Dhrā', reports 360.7mm annual precipitation. A 36-year record at al-Mazār, on the plateau north of Wādī al-Ḥasā, and a 37-year record at aṭ-Ṭafīla, immediately south of the wadi, reports 339.8mm and 280.6mm annual precipitation respectively (Harlan 1981: Fig. 1, Table 1). In contrast, Ghawr al-Mazra'a, just north of Wādī al-Karak, and Ghawr aṣ-Ṣāfī, at the western extremity of Wādī al-Ḥasā, record only about 65mm annual precipitation over a 28- and 26-year time range respectively (TABLE 1).

From the data presented in TABLES 1 and 2 it is evident that the amount of rainfall in the Southern Ghawrs "is negligible from an agricultural point of view" (Harlan 1981: 155). The amount is so low that it can only replace one or two irrigations during the winter-growing seasons (Harlan 1981: 155). Crops must, therefore, be raised under irrigation.

Farther to the south, rainfall in the Wādī 'Araba region is also less than 100mm annual precipitation. Specifically, the mean annual rainfall in 1959/1960 and 1966/1967 was less than 25mm (Anonymous 1984: 112-14).

From the above, it is evident that water sources in the Southern Ghawrs and Northeast 'Araba are dependent on rainfall in the Highlands.

The Wadi System in the Southern Ghawrs and Northeast 'Araba

Some of the rainfall that falls on the Highlands reaches the Southern Ghawrs and Northeast 'Araba by means of the west-flowing wadis that include, in a north-to-south order: Wādī al-Karak; Wādī I'sāl; Wādī Ḥudayra (= an-Numayra); Wādī al-Ḥasā; Wādī Madsūs ash-Shamālī; Wādī Umm Jufna; Wādī Fīfā; Wādī 'Umruq; Wādī Khunayzīr; Wādī aṭ-Ṭilāḥ; Wādī ad-Dahal; Wādī al-Ḥassiya; Wādī al-Ghuwayb; and Wādī Fīdān (see FIG. 1).

If the rainfall on the Highlands is heavy, the resulting precipitation very frequently reaches the Southern Ghawrs and Northeast 'Araba, via the above-listed wadis, in the form of destructive floods. And, as indicated in TABLE 3, these floods are frequent for the majority of the wadis in the Southern Ghawrs.

Since the water flowing in these wadis must be harnessed for use, those who wished to live in the Southern Ghawrs and Northeast 'Araba had to build dams and aqueducts in an attempt to harness the water. However, as will be indicated below, flash floods frequently destroyed these structures. As a result, the dams and their associated aqueducts and canals built to harness and to bring wadi water to people, animals, and crops were constantly in need of reconstruction and/or repair.

The greater the deforestation and general environmental degradation on the Highlands the greater the amount of rainfall that runs off into the wadis. As a result, the more destructive the floods can be (Harlan 1982: 73, 76; 2003).

Springs and Wells

Water delivery in the Ghawrs and Northeast 'Araba, as indicated previously, depends not only on rainfall in the Highlands but on water retention that is trapped and allowed to percolate slowly to the

TABLE 1. Rainfall at Three Highland and Two Ghawr Stations (from data sheets of the Natural Resources Authority. The Hashemite Kingdom of Jordan).

Location and Recording Period	*Average*	*Range (mm)*
Al-Karak 1937/1938-1973/1974	no missing data	
Ave. 37 seasons:	360.7	(101.9-661.0)
Ave. first 10 years:	414.7	(122.8-540.6)
Ave. last 10 years:	411.5	(187.1-661.0)
Al-Mazār 1937/1938-1973-1974	one season missing	
Ave. 36 seasons:	339.8	(119.8-610.0)
Ave. first 10 years:	414.6	(171.0-491.0)
Ave. last 10 years	315.7	(136.5-610.0)
Aṭ-Ṭafīla 1937/1938-1973-1974	no missing data	
Ave. 37 seasons:	280.6	(82.7-751.1)
Ave. first 10 years:	310.8	(131.0-463.5)
Ave. last 10 years:	315.2	(82.7-751.1)
Ghawr al-Mazraʻa 1939/1940-1973/1974		
Ave. 28 seasons:	65.6	(6.5-149.0)
Ave. first 10 years:	63.5	(12.5-100.2)
Ave. last 10 years:	73.6	(22.0-149.0)
Ghawr aṣ-Ṣāfī 1939/1940-1973-1974		
Ave. 26 seasons:	65.2	(18.0-151.5)
Ave. first 10 years:	70.3	(35.0-109.6)
Ave. last 10 years:	57.2	(18.0-151.5)

More recent rainfall data (TABLE 2) than that which Harlan used supports the contrast between precipitation on the Highlands and in the Southern Ghawrs.

springs below or is released slowly from the upland soils to the perennial streams that are formed by the process whereby the rainfall on the Highlands infiltrates slowly through a chalky formation and is trapped by the hard limestone to emerge where erosion uncovers the impervious layers in the Wādī ʻAraba-Dead Sea-Jordan Depression. The larger springs flow all year long and tend to be more stable with less fluctuation than the streams (Harlan 1981: 162-63; 2003: 60).

The process whereby the rainfall on the Highlands reaches the Southern Ghawrs and Northeast ʻAraba can take months if not years. For example, the 1964/1965 season broke all records for rainfall on the Highlands at al-Karak, al-Mazār, and aṭ-Ṭafīla. However, the base flow at aṣ-Ṣāfī was less than the previous year and more than the next. The base flow at aṣ-Ṣāfī did not increase, in fact, until the 1966/1967 season (Harlan 1981: 157).

There are springs in most of the wadis flowing into the Southern Ghawrs and Northeast ʻAraba. The water from these springs is also used for irriga-

TABLE 2. Rainfall at Three Highland and One Ghawr Station (from data sheets of The Hashemite Kingdom of Jordan, Meteorological Department).

Location and Recording Period	*Average*	*Range (mm)*
Ar-Rabbah/Al-Karak 1970-2003	no missing data	
Ave. 34 seasons	346.8	(123.5-638.8)
Ave. first 10 years	353.8	(184.2-582.0)
Ave. last 10 years	296.6	(123.5-518.2)
Mu'tah University 1986-1993		
Ave. 8 seasons:	389.4	(204.6-653.4)
Mu'tah University 1997-1999		
Ave. 3 seasons:	271.9	(183.0-385.1)
Mu'tah University 2001-2003		
Ave. 3 seasons	256.8	(147.7-349.1)
Al-Ḥasan/Aṭ-Ṭafīla 1971-2003	one season (1999) missing	
Ave. 32 seasons	235.0	(80.4-795.3)
Ave. first 10 years	300.5	(80.4-795.3)
Ave. last 4 years	158.0	(89.5-250.2)
Ghawr aṣ-Ṣāfī 1975-2003	no missing data	
Ave. 29 seasons	74.0	(25.1-130.4)
Ave. first 10 years	63.8	(25.1-111.7)
Ave. last 10 years	68.9	(33.9-130.4)

TABLE 3. Predicted Flood Frequencies per Century.

Wadi Name	Number
al-Ḥasā	2
I'sāl	262
Numayra/Ḥudayra	357
Fīfā	460
Khunayzīr	512
al-Karak	540

tion purposes. For example, water from springs in Wadis al-Karak, Ḥudayra, al-Ḥasā, Fīfā, 'Umruq, and aṭ-Ṭilāḥ irrigates fields nearby. Farther south, team members of the Southern Ghawrs and Northeast 'Araba Archaeological Survey (SGNAS) noted two springs near the western extremity of Wādī ad-Dahal (MacDonald *et al.* 1992: 269). And still farther to the south, 'Ayn Fīdān is located near the western extremity of Wādī Fīdān while farther to the east there are springs in both Wadi(s) al-Ghuwayr and Ḍānā (Barker *et al.* 1998: 23). These springs feed into Wādī Faynān and eventually into Wādī Fīdān.

Recent data compiled by the Geological Survey of Israel and the Natural Resources Authority of Jordan relative to the Dead Sea and northeast Wādī 'Araba indicates the present location of both springs and water wells (Sneh *et al.* 1998) (TABLE 4).

Where the impervious layers are not too deep, dug wells can tap sufficient amount of water for irrigation (TABLE 4). These sources are usually less

TABLE 4. Modern Springs and Wells between Wādī al-Karak and Wādī

Location (Ghawr - Wadi)	Spring(s)	Number of Wells
Ghawr adh-Dhrāʻ (W. Karak)	ʻAyn Wadaʻa; ʻAyn Umm Sidra	1
Ghawr Iʻsāl (W. Iʻsāl)	In upper reaches of wadi	6 (4 are in the wadi)
Ghawr an-Numayra (W. Ḥudayra)	ʻAyn Sadd Hābīl; more springs to the east	1
Ghawr aṣ-Ṣāfī (W. al-Ḥasā)	ʻAyn ʻAbāṭa; ʻAyn Khakhān	1 (wind pump)
Ghawr Feifeh (W. Fīfā);	Springs in W. Fīfā	1 in Ghawr and 12 in W. Fīfā;
W. 'Umruq Wādī Khunayzīr	Spring in W. 'Umruq Springs in wadi	2 in W. 'Umruq 5 between W. 'Umruq and W. Khunayzīr
Wādī aṭ-Ṭilāḥ	Springs in wadi	
Wādī ad-Dahal	Springs in wadi	
Wādī Fīdān	ʻAyn Fīdān	1 to the southeast of ʻAyn Fīdān

reliable than springs and wells often go dry. Wells that are dug on low terraces near perennial streams in the wadi bottom are more reliable and these are exploited on a limited scale.

While springs depend upon rainfall on the plateau to the east, we must not think that the locations of present-day springs are also where ancient springs were located. Change in the location of springs is due to the fact that the down-cutting of the wadis of the Southern Ghawrs and Northeast ʻAraba has gone on for millennia. This would have likely resulted in spring disruption (Donahue 1981: 153). Moreover, since the Dead Sea-Jordan River Rift is a tectonically active area, fault movements may have altered spring locations (Donahue 1981: 153). Relative to Wādī al-Karak, for example, Donahue points out that "it seems certain that the wadi floor had a higher elevation than at present" (1981: 151; see also 2003; Harlan 2003: 56). As a result, the present spring below Bāb adh-Dhrāʻ was not available to the Early Bronze residents of the site. The inhabitants, however, may have had access to the spring to the east in Wādī Dhrāʻ (Donahue 1981: 151).

Springs, being dependent on rainfall, do dry up. This is the case in periods of drought. As a result, ancient sites in the Rift Valley could have lost their source(s) of water. Thus, archaeological sites are not always located where there are present-day springs.

Wadi Sources of Irrigation Water for the Southern Ghawrs

Binnie and Jouzy Arup Bookers have studied the wadi sources of water for irrigation purposes in the Southern Ghawrs (TABLE 5). These water sources would come from the wadi flow and the springs, listed above in TABLE 4, associated with the wadis.

As indicated in TABLE 4, Wādī al-Ḥasā is, by

TABLE 5. Wadi sources of Irrigation Water for the Southern Ghawrs.

Location	Ave. Yearly base flow (l/s)	Hectares Irrigable
Wādī Dhrāʻ	40	68
Wādī Iʻsāl	30	51
Wādī Ḥudayra/an-Numayra	30	51
Wādī al-Ḥasā	810	1,377
Wādī Fīfā	110	187
Wādī Khunayzīr	40	68

far, the most important of these wadis for the purpose of irrigation. It is a perennial stream and, as TABLE 2 indicates, is considered more stable and reliable than other wadis flowing to the Dead Sea Rift and is less subject to disastrous floods than other wadis of the eastern rift escarpment (Harlan 1985). The base flow at aṣ-Ṣāfī, at the western end of Wādī al-Ḥasā, has been rated at 810 l/s based on a limited number of measurements (Harlan 1981).

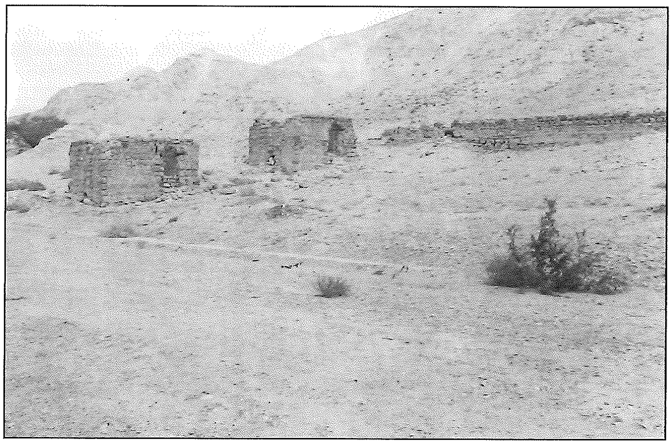
The overall pattern is one in which permanent agriculture can be developed near copious and reliable springs and at sites along the wadis that flow from the Highlands into the Southern Ghawrs and Northeast ʻAraba.

Dams and Aqueducts

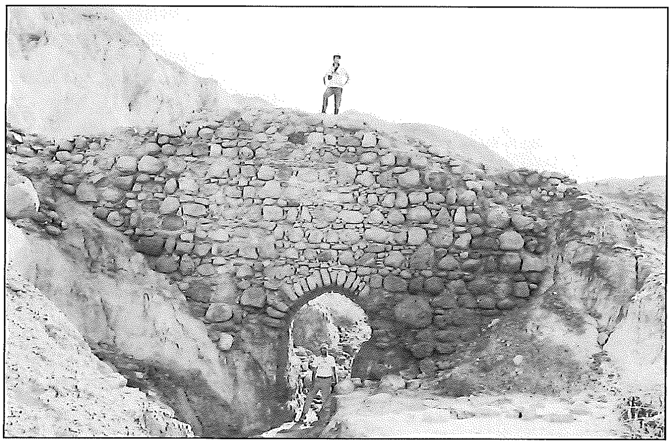
The problem is to harness the water from the wadis, springs, and wells to provide a permanent supply of water for settlers and animals and to irrigate the crops that farmers wish to grow and to provide water nourishment for the plants in the surrounding areas that the settlers harvest and animals eat. To this end, dams, aqueducts, water canals, reservoirs, cisterns, and pools needed to be constructed[1].

Harlan, in his investigations of the water resources of the Southern Ghawrs, states that he found evidence of broken and abandoned irrigation ditches along the sides of each of the wadis that he surveyed (1981: 156). Specifically, he noted the remnants of an aqueduct in Wādī al-Karak that was used to bring water to the edge of Bāb adh-Dhrāʻ itself (1981: 156-57). SGNAS team members found remnants of irrigation canals throughout their survey territory. For example, they found evidence of such structures in: Wādī al-Ḥasā (MacDonald *et al.* 1992: 249 [Site No. 1]; see also Waheeb 1995: 555); Wādī Fīfā (MacDonald *et al.* 1992: 167, 257 [Site Nos. 77, 84]) (FIG. 3); Wādī Khunayzīr (MacDonald *et al.* 1992: 178, 261 [Site No. 112]) (FIG. 4); Wādī aṭ-Ṭilāḥ (MacDonald *et al.* 1992: 89, 265 [Site No. 155]); and Wādī Fīdān (MacDonald *et al.* 1992: 156 [Site Nos. 16, 21]). From the above, it is evident that the struggle to maintain irrigation facilities has gone on as long as the Southern Ghawrs and Northeast ʻAraba have been farmed.

Despite the rapid rate of development in the Southern Ghawrs and Northeast ʻAraba, SGNAS team members found evidence of what would have been methods, probably not unlike ancient ones,



3. Aqueduct in Wādī Fīfā.



4. Aqueduct in Wādī Khunayzīr.

of irrigating the fields in the vicinity of both Fīfā (FIG. 5) and aṭ-Ṭilāḥ (FIG. 6).

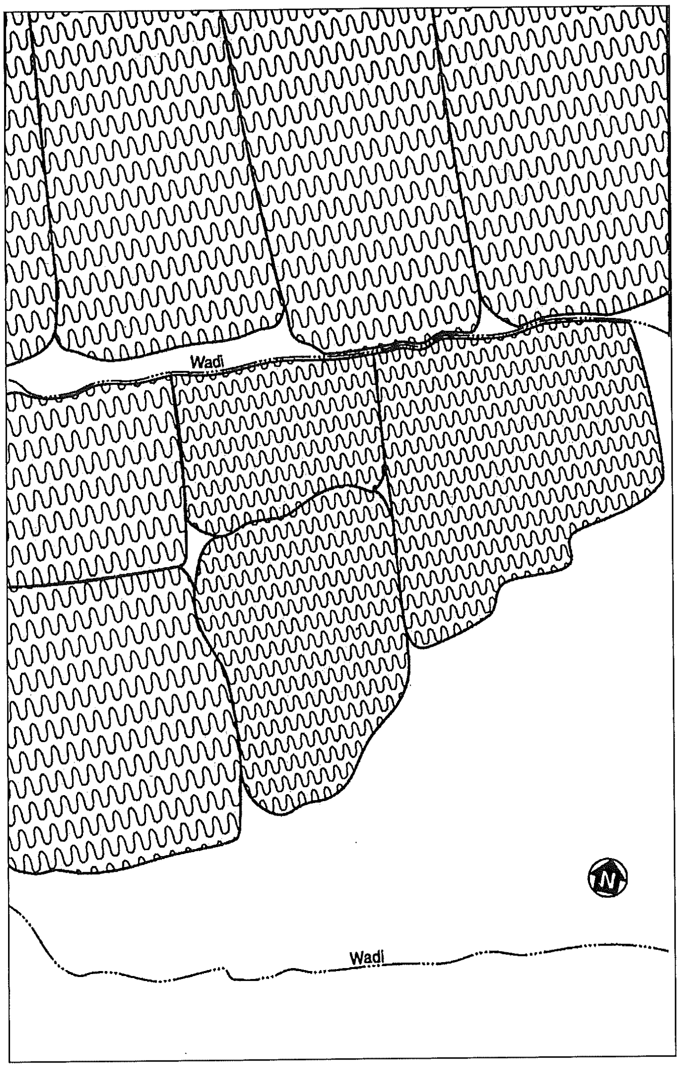
There are presently modern dams in Wādī al-Ḥasā – with plans for an additional one in the eastern segment of the wadi – Fīfā, and Khunayzīr. Moreover, the Jordan Valley Authority has plans to build a dam across Wādī Fīdān (Levy 2003: 4-5). The water from these dams is used for the purpose of irrigating the fields of the Southern Ghawrs (and eventually the Northeast ʻAraba).

Reservoirs, Cisterns, and Pools

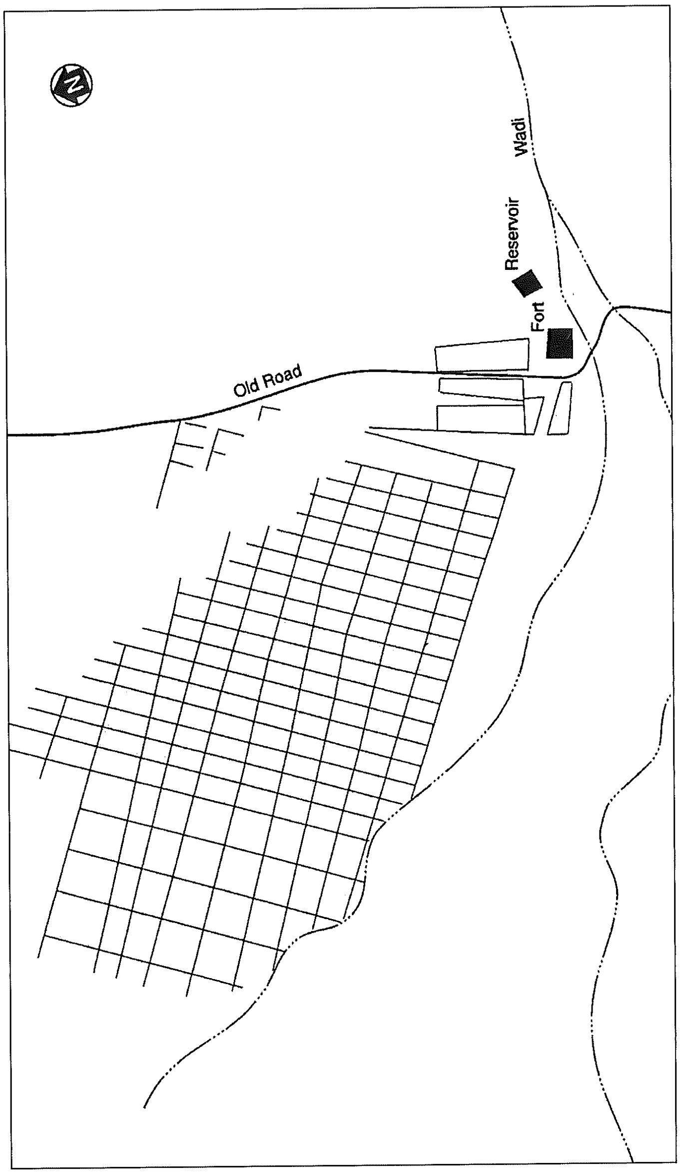
Water used for humans, animals, and plants can also be stored in reservoirs, cisterns, and pools. There is evidence of the first two of these devices in the archaeological record from the Southern Ghawrs and Northeast ʻAraba.

Politis excavated a well-built cistern at Dayr ʻAyn ʻAbāṭa/Lot's Cave (1998: 229-30, 232; see also MacDonald and Politis 1988 and MacDonald *et al.* 1992: 171, 254 [Site No. 46]) (FIG. 7).

[1] For the distinction among these terms see Oleson 2001.



5. Irrigated Fields to the North of Fīfā.



6. Irrigated Fields to the West of Qaṣr aṭ-Ṭilāḥ.

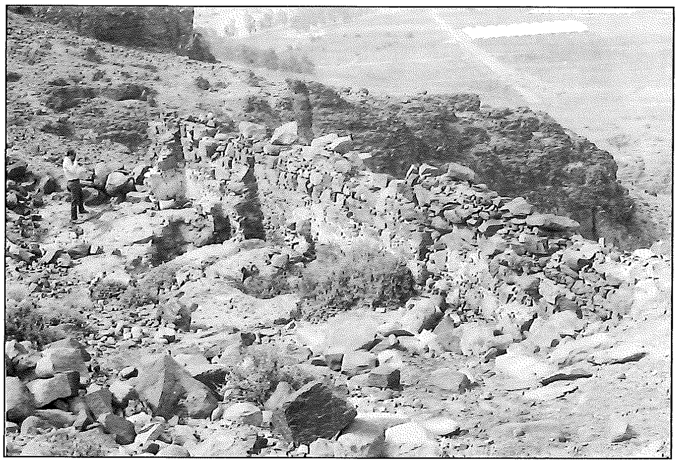
The structure measures 18 x 7m and is built into a steep cliff. The remnants of seven arches within the structure are what remain of the roof supports. Excavations of the structure uncovered an associated water catchment and distribution system (Politis 1989: 232).

SGNAS team members noted a rock-cut cistern in association with the hermitage at the mouth of Wādī al-Ḥasā, north bank (MacDonald *et al.* 1992: 104, 250 [Site No. 7). The structure measures ca. 2.2 x 3.5 metres. Plaster was visible on its interior walls at the time of the visit.

In the area of ʻUnayz, between Wādī al-Ḥasā and the modern al-ʻAqaba-Dead Sea Highway, SGNAS team members recorded a reservoir, al-Juwar (FIG. 8). It is presently located in an agricultural field. It probably dates to the Medieval Islamic period. The north and south walls of the structure are partially preserved (MacDonald *et al.* 1992: 252 [Site No. 27]; see also Politis 1998: 627). At the time of the survey team members' visit to the site, a modern (?) canal ran immediately to the east of the reservoir. SGNAS team members also surveyed a reservoir at Qaßr aṭ-Ṭilāḥ, a well-known fort and caravanserai (MacDonald *et al.* 1992: 89, 265 [Site No. 155]) that Glueck measured as 34.2 x 33.6m (1935: 12) (FIG. 9). The aqueduct that brought water from ʻAyn aṭ-Ṭilāḥ to the east could still be seen at places along the north side of the wadi at the time of our visit to the site (MacDonald *et al.* 1992: 89 and 92, Fig. 19)[2].

Although there are no reports of ancient pools, that is, depressions in the earth to store liquids,

[2] For additional information on Qaṣr aṭ-Ṭilāḥ, see T. M. Niemi's paper in this volume.



7. Cistern at Dayr 'Ayn 'Abāṭa/Lot's Cave at the time of its "discovery" in 1986.

8. Al-Juwar, reservoir.

9. Reservoir at Qaṣr aṭ-Ṭilāḥ.

there were undoubtedly some. These pools would have been used in times of flooding to preserve some of the water rather than having it all run off uncontrolled into the neighbouring fields. Such pools, especially where the soil is mostly clay, can hold water for an extended period of time.

Salinity

Hunting Technical Services conducted water analyses on six of the Southern Ghawrs water sources (1973). The result of this study is that the dissolved salts in the waters are fairly high. In Harlan's opinion, the waters carry more salt than is desirable (1981: 158). However, they are usable. Nevertheless, salt incrustation does occur on the irrigated fields.

The lighter the water application at each time of irrigation, the greater the problem with salt build-up. One solution to this problem is the application of heavier, less frequent irrigations.

Conclusions

Despite the fact that the Southern Ghawrs and Northeast 'Araba are arid zones, the archaeological record indicates that people have lived there for millennia. Such was possible because of rainfall on the Highlands to the east.

Some of this rainfall reaches the areas of concern almost immediately by means of west-flowing wadis. More of this rainfall percolates to the areas by means of the aquifers or water-bearing rocks, gravel, and sand that lie between the Highlands and the Wādī 'Araba-Dead Sea-Jordan Depression. This water then became available to humans, animals, and plants in the forms of springs and moisture stored in the soil.

One of the tasks of those who wished to live in the Southern Ghawrs and Northeast 'Araba was how to deal with the often destructive floods that frequently destroyed the devices that they erected to harness the water. The settlers built dams, aqueducts, and water canals for this purpose. Moreover, they dug wells and constructed reservoirs, cisterns, and probably pools to preserve the water so that it could be rationed out for the purposes of living and growing.

The amount of salt in the waters of the Southern Ghawrs does cause problems for the growing of crops. However, one solution to this is heavier and less frequent irrigations.

The above-described water-control strategies made, and continue to make, settlement in the Southern Ghawrs and Northeast 'Araba possible.

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The Water Supply Systems in the Region of Udhruḥ

Introduction

In the 1980s an archaeological research project was initiated by Alistair Killick in the region of Udhruḥ. Kellick's study included excavations at Udhruḥ and a survey in the adjacent areas (1983, 1986, 1987a and 1987b); however, little information can be derived from that study as it was not fully published. Since that time, no archaeological research project has been initiated in the region of Udhruḥ. However, useful information regarding the study area is available from studies concerning other topics and broader areas (i.e. 'Amr *et al.* 1998; 'Amr and al-Momani 2001; Parker 1986; Fiema 2002 and 1991; Graf 1995). The water supply systems in the region of Udhruḥ have never been the topic of any previous scholarly research study.

Analysis of the water supply is part of a comprehensive archaeological study initiated by the author for his postgraduate studies (PhD). The research will consider the settlement patterns and the military arrangements in the region of Udhruḥ from the second century up to the seventh century AD. This study incorporates evidence gained from both recent field survey and from the published literature. The data on the water supply presented here was collected together with information on the settlement patterns, road network, military structures and other finds from the field during a two-month survey between 15/10/2003 and 15/12/2003 in the region of Udhruḥ (Abudanh forthcoming). This paper will consider the evidence for the water supply systems in the study area from pre-Roman times until the present day.

Rainfall

The study area falls within two topographical regions; the mountains of ash-Sharā (in the north?) and the steppe or arid area (in the south?). Official records for rainfall in the region of Udhruḥ are not available. However, the map (FIG. 1) shows that the annual rainfall of the area around Ma'ān, including the study area, does not exceed 300mm and is usually ≤100mm. These figures underline the effort required by people in ancient times to overcome the lack of water resources or the low level of rainfall by the invention and utilisation of many water supply strategies.

Springs (FIG. 2)

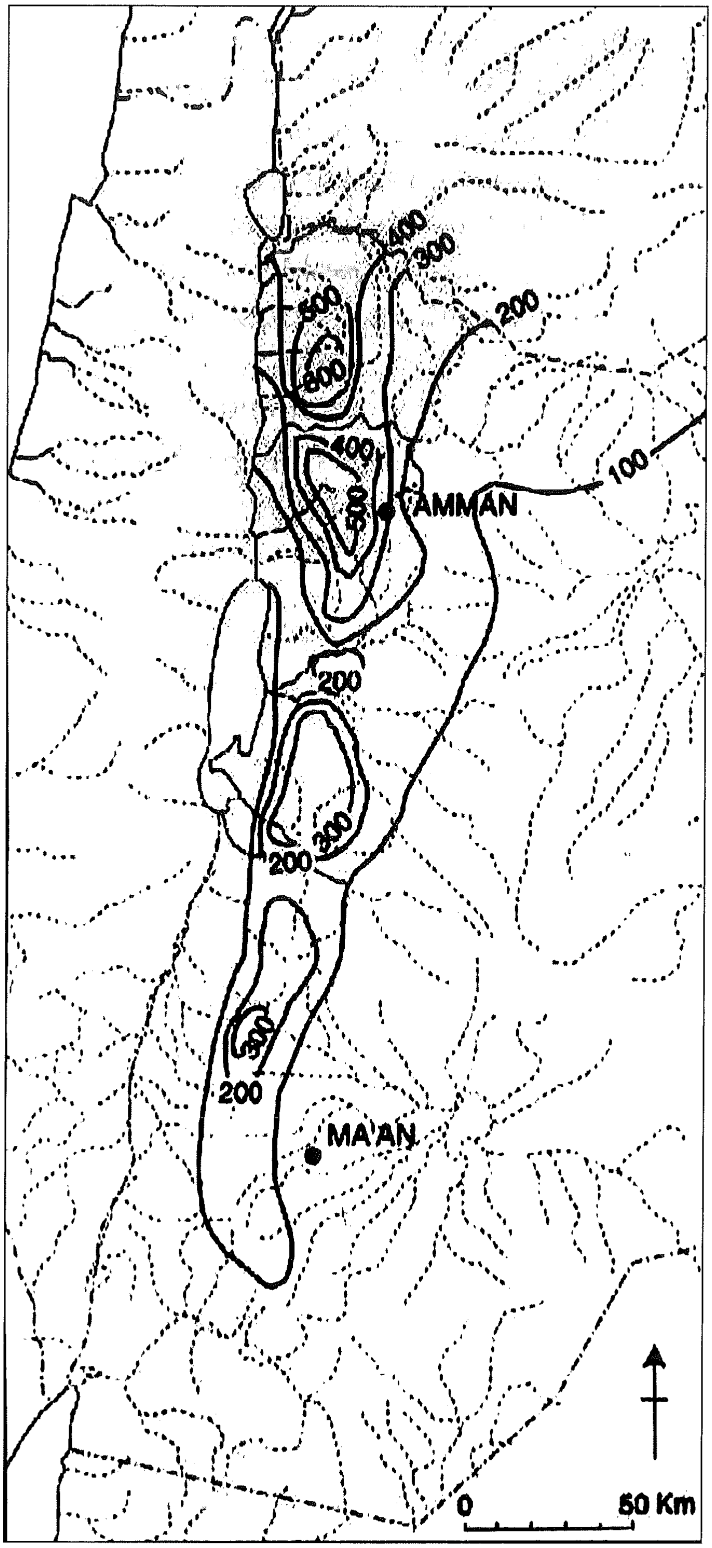
Two types of spring were identified in the study area:

A- Springs not associated with any water distribution or storage techniques such as reservoirs and channels.

B- Springs associated with water diffusion and storage techniques such as reservoirs and channels.

Ten springs of type A were documented by GPS points in the study area. However, it is conceivable that other springs of this type were missed either because they are no longer active or due to their topographic locations. One might argue that since this type of spring was not associated with any ancient water distribution or supply strategies, it cannot be safely considered as an ancient water resource as springs may start discharging at any time. Such an argument can be easily disregarded as all of these springs were either directly associated with ancient human activity or located near an ancient settlement site (Oleson 2001: 604). In fact ancient structures were recorded even near springs in remote areas.

Springs of type B are the most important type as they were found near most, if not all, of the sites that had evidence of ancient settlements. It is also interesting that all the modern settlement cluste



1. Map shows the mean annul precipitation in Jordan (after Kennedy, 2000).

were located near this type of spring. Very good examples are the modern settlements at al-Jarba, Udhruḥ, Basṭa, Ayl, al-Fardhakh and aṣ-Ṣadaqa. At each of the abovementioned sites there is an ancient settlement cluster or *khirbat*.

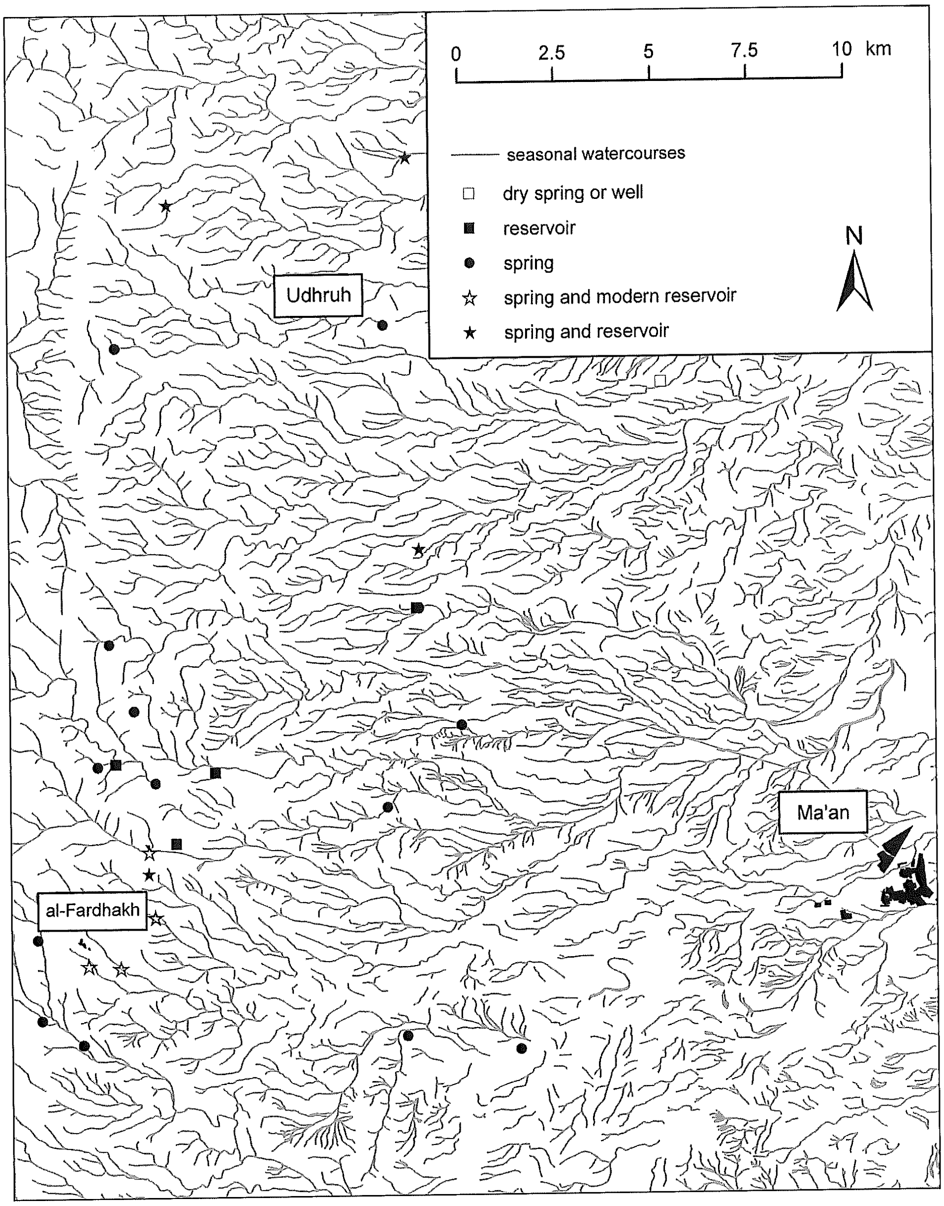
This type of spring was associated with reservoirs and channels, both surface and ground-level channels. Well-preserved tunnels were reported by workers in Ayl, Basṭa and al-Fardhakh during a campaign of maintenance and rehabilitation for the water resources in the district of Ma'ān in the 1990s (pers. comm). The construction of these water supply, storage and distribution features was necessary to fulfill the needs of the population. Reservoirs can store water for a long time and release it through channels to the nearby fields. At the same time people can obtain fresh water at the point where the water flows into the reservoir. One more reason that might have made it essential to build reservoirs is the fact that the source of water or the spring usually lies somewhere in the mountains.

Most of the ancient reservoirs were either replaced by modern reservoirs or abandoned due to the dehydration of the spring itself. In some areas, where a modern reservoir was constructed on a different location, the ancient reservoir is still fairly well preserved such as at Ayl, Basṭa and Muḥaydhrāt. The latter were not previously reported However, modern reservoirs seem to have overlapped or replaced ancient reservoir at al-Jarba, Udhruḥ, Abū al-'Idhām, al-Dirbāsī, al-'Unayq and al-Fardhakh. Traces of the ancient reservoir can still be seen near these structures. Moreover, the local people confirm the presence of ancient reservoirs in the areas where modern reservoirs were constructed.

Reservoirs (*Birkat*) (FIG. 3)

The reservoirs mentioned here are not associated with springs; a different water supply system was used to provide them with water. Very good examples of this type are the three reservoirs in the area between Ma'ān and Udhruḥ. The source of water for the three reservoirs has not been firmly identified.

1- *Birkat Udhruḥ* (site no. 048): the reservoir of Udhruḥ is approximately 5km to the southeast of Udhruḥ. It was built on a very low hill between two valleys. This reservoir cannot be definitively linked to a particular water source. The closest source is the spring of Udhruḥ, 5km to the northwest. No channel linking them was found between the two sites; thus the reservoir was fed from somewhere else. A potential source was speculated to the west of the reservoir, about 1km to the south of Udhruḥ on the east base of Tall 'Abara (Abū ar-Ru'a) (site no. 055) (see below, the qanat system).

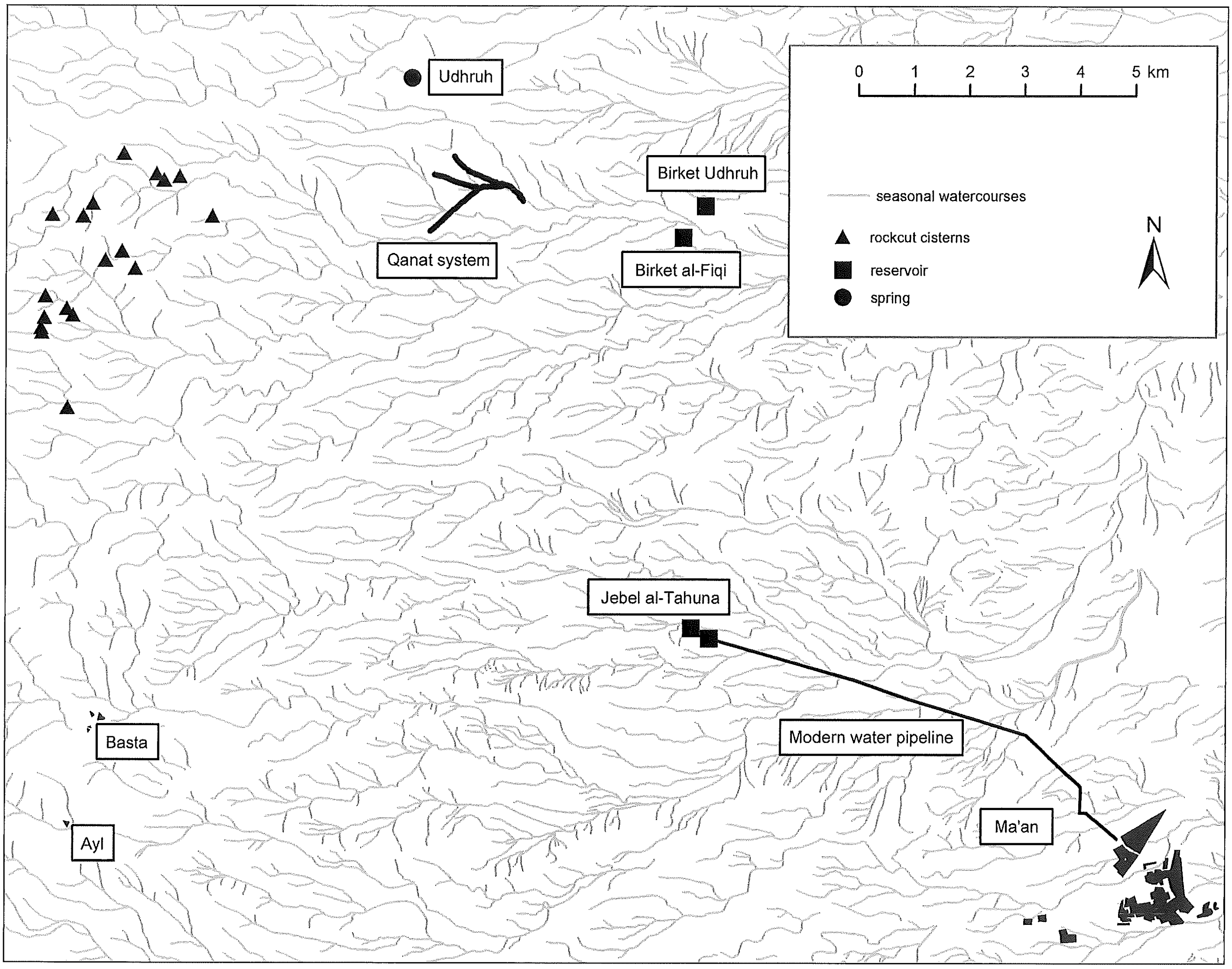


2. Map shows the springs (type A & B) in the study area.

The reservoir is still relatively well preserved and measures 50 x 50m. However, it is not a freestanding structure. A huge hole was probably dug into the ground and then the walls were built. The interior face can be clearly seen and is still standing up to 120cm. The walls however seem to have been elevated above the ground — this would decrease the risk of erosion. The walls are about 1m thick as they are built of two rows of hewn limestone blocks. The gap between the two rows was filled in with small stones and ancient concrete. The interior faces of the walls were coated with a white layer of hydraulic concrete. The water flowed into the reservoir through the west side; a settling basin was found 1.5m away from the wall. A channel running west to southwest must have brought the water to the site (see channels below).

An aerial photograph (FIG. 4) clearly shows the function of this reservoir. It was constructed to irrigate a huge cultivated area to the east of it. The field walls are still in a good state and can be easily recognised in the aerial photograph. The northern field wall runs east-west, in a straight line, and starts a few metres from the northeast corner of the reservoir. The area between the north and south field walls seems to have been organised into two areas by horizontal walls.

To judge from the ceramic evidence, the site appears to have been utilised from the first century AD until the Ottoman period. The following periods were predominantly well represented by the ceramic evidence: the Nabataean, Roman, late Byzantine and early Islamic, and the Ottoman. A precise date for the reservoir cannot be given



3. Map shows the reservoirs in the area between Ma‘ān and Udhruḥ and the rock-cut cisterns.

4. Aerial view shows the reservoir of Udhruḥ and the agricultural fields to the east of it.

without further analysis by excavations. However Killick (1987b: 28) dates it to the Nabataean period. This date is logical, since the Nabataean remains are common in the region, and Nabataean settlements are well attested in neighbouring areas, particularly at Udhruḥ (Killick 1987b: 7-9). In later periods, especially the late Byzantine and early Islamic period, the reservoir seems to have been in use and received some maintenance.

2- *Birkat al-Fiqiyy* (site no. 042): the reservoir of al-Fiqiyy lies about 1.5km to the southeast of Birkat Udhruḥ. It was located just on the eastern base of a very low hill. The architectural material and the way in which it was laid out are similar to Udhruḥ's reservoir. The structure was built of quarried limestone blocks. Two rows of stones in each course made the walls very thick (1m), and the space between the stones was filled in with small stones and concrete. The walls measure 33m north-south and 40m east-west. Their exterior faces are buried except for the eastern wall, where the wall was elevated. It is therefore believed that part of the hill was dug out to prepare the area to construct the reservoir; a big mound, probably of the excavated soil, was seen outside the northern side. A channel runs west to northwest providing the reservoir with water.

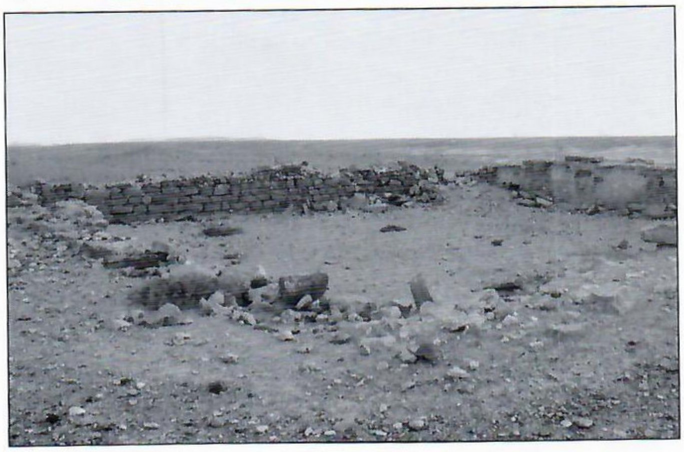
This reservoir irrigated a huge area in Wādī al-Fiqiyy below it. The valley seems to have been fertile and cultivable in antiquity. A well-defined area (site no. 41) was probably divided into small agricultural units by many horizontal and vertical field walls in the valley; about twelve units were counted there. Random sampling measurements for some of the units gave roughly the same dimension of about 90-60m. Having calculated the whole area of the units, a total of 64,800 square metres would have been cultivated. In 1940 Sir Aurel Stein described this site:

"Near the small oasis of Ma'an, the last place which the Hejjaz Railway, derelict farther south, still reaches, a close plane-table survey allowed us to determine the true character of an interesting and extensive old irrigation scheme which had puzzled former observers. A large area of flat desert ground between two wadis (*valleys*), some 4 miles in circumference, had been enclosed with rough walls and laid out into fields. They were to be watered from a canal brought with great labour and skill from the distant hill above the ruined Roman cantonment of Odhrah (Udhruh)". (1940: 435).

3- *Birkat(s) Jabal aṭ-Ṭāḥūna* (at site no. 216): the site of Jabal aṭ-Ṭāḥūna is significant in the region — it is unique in its components and location. It consists of a huge enclosure, settlement structures, agricultural fields, water supply and storage systems. Most of these features, including the two reservoirs, were located within the enclosure (Killick 1987a: 176; Kennedy and Bewley 2004: 210-211).

Two reservoirs were documented at Jabal aṭ-Ṭāḥūna; the first, the biggest, lies at about 300m northeast of the base of the mountain whereas the second is just on the northern base of the mountain. The main reservoir is still in a very good state, and it measures 26m north-south and 24m east-west. The walls were built of hewn limestone blocks; the blocks in the eastern wall are dressed (FIG. 5). The blocks were laid down in two rows filled in with small stones and concrete. A white layer of hydraulic concrete coated the interior face of the walls. This reservoir was first reported by Killick (1987a: 176). The second reservoir is much smaller and not as well preserved as the first. Only one course of the limestone walls is visible on the surface, and it measures approximately 10-5m. This reservoir was not reported before.

Both reservoirs seem to have been supplied by a qanat system to the west of Jabal aṭ-Ṭāḥūna (below); a surface channel connected them with the qanat system. The construction of these cisterns was necessary not only to supply the inhabitants of the village at the site, but obviously to irrigate the agricultural fields to the east and southeast of the main reservoir. The fields are well organised, and have such precise rectangular shapes that David Kennedy (2000: 173), from an aerial photograph, speculated one of them was a buried *castellum*. The



5. The main reservoir at Jabal aṭ-Ṭāḥūna; view to southeast.

reservoirs were also the best features for storing unused water.

Channels and Aqueducts

Long channels and aqueducts are not common in the study area. A few sites display this system of water supply. Surface channels were seen in Wādī Basṭa, and below the reservoir at Malghān, and were most likely for irrigating crops. The channel system in Wādī Basṭa is remarkable. Traces of three separate channels were seen there, two on the edge of the valley and one in the bed of the valley. The channels that run along either side of the valley meet at a certain point in the valley bed. What looks like part of a channel was found further down in the valley, and may have been constructed to carry the water that flows from the two or three channels in the valley to a yet-to-be-determined place. A channel carried on a solid wall (an aqueduct) was found in Wādī al-Fiqiyy, a few hundred metres to the north of Khirbat al-Fiqiyy (FIG. 6).

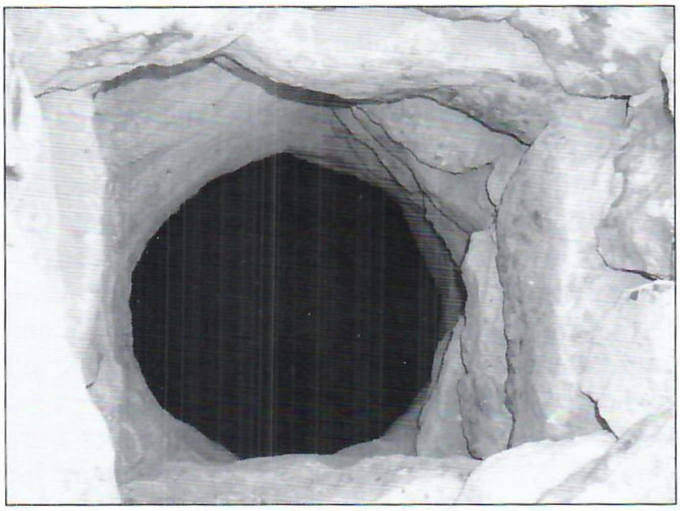
Rock-cut cisterns (FIG. 3)

Using rock-cut cisterns to supply and store water was probably one of the earliest techniques used in the region. They were found in key Nabataean key, e.g. Petra and Hawra' (modern al-Ḥumayma) (Oleson 2001: 606). Two factors seem to have played a role in choosing a place to make a rock-cut cistern; topography and geology. Topography is important since rock-cut cisterns cannot be fed from anywhere; it has to be at a point where collecting run-off water by earth channel is indeed possible, and this can occur on gentle upper or lower slopes of hills.

6. Part of the aqueduct in Wādī al-Fiqiyy southeast Udhruḥ.

Geology is also important as only certain types of bedrock can be easily cut and shaped. Shapes vary from one cistern to another, but most of them have a bottle-like shape, however, some of them are rectangular or of irregular shape. Rock-cut cisterns are abundant in the area southwest Udhruḥ. About twenty eight cisterns were recorded in the area west and northwest of the modern settlement at Rāshid (al-Qā'); both the topography and geology of that locality seem appropriate for this system. The vast majority of them open vertically, end with shafts (FIG. 7) and seem to have had covers or doors. Some of them have settling basins in front of the cistern (FIG. 8). One other common feature is the layer of plaster which covers their internal walls. Some cisterns were still in use in the last fifty years.

Due to the relatively large number of the rock-cut cisterns recorded in the study area, a full discussion of every single cistern cannot be presented in this



7. The shaft of a rock-cut cistern; vertical view.

8. Settling basin in front of a rock-cut cistern.

paper, therefore the discussion below focus upon one example:

Site no. 095: this cistern is probably the most significant rock-cut cistern in the study area. It was located on a moderate slope of a rocky hill; the elevation of the hill gradually decreases from southwest to northeast. The cistern was found near the northeastern base of this hill, and the area where it was cut consists of relatively soft limestone layers associated with chalk. A long earth channel running southwest to northeast, along the slope of the hill, directed the rainwater to the cistern. Near the cistern, where the exposed rocks were cut to lead the channel, the course of the channel is very clear. A rectangular settling basin was built at the end of the earth and rock channel, in front of the cistern, to clean the water of sediments and debris, and finally a short, stone channel fed the cistern from the settling basin.

The cistern appears to have been cut between two horizontal bedrock layers from one side. The diggers made a big, round and deep hole in the bedrock partly roofed by the bedrock itself; thereafter, a wall, of approximately 1m height, was built on the edge of the hole to carry the artificial roof. The short stone-channel and the only entrance to the cistern were located in the north side of this wall. The entrance is quite small, approximately 80cm in height and 50cm in width; however, it gives access to the floor of the cistern through 17 steps cut into the bedrock (FIG. 9).

9. Rock-cut steps inside the cistern at site no.095; Umm al-'Awsaj.

The interior of the cistern is roughly round and is approximately 9m diameter including the side, which has the rock-cut steps. The diameter at the bottom of the cistern is approximately 7m. Although some debris has collapsed from the roof and stones were thrown to the floor by local shepherds, it is still 6m in height. Apart from the roof, its entire interior, including the steps, was coated with a waterproof layer. It is therefore highly likely that the water level would have reached a point, close to the entrance, in a good rainy season. The steps must have given access when the water level was low, or during the dry seasons, when the cistern was being prepared for the next season. Finally, a short Nabataean inscription was noted inside the cistern and near the entrance.

Wells

According to Hodge (1992: 51) "the word well should be confined to man's attempts to obtain water from the earth, vertically below the spot where it is required, when it is not obviously present at the surface". Vertical shafts therefore vary in depth, but are usually lined with masonry. The survey of the study area revealed a small number of wells. Two significant wells, the well of Abū Danna and the well of al-Biṭār, were well known in the region for their water quantity and quality. Both of them have circular shafts lined with stones. Ancient tracks and roads approaching the two wells bear witness to their importance in ancient times, and more importantly the settlements they attracted in antiquity ('Amr *et al.* 1998: 543 for al-Biṭār). However, other wells must have existed but either collapsed and became untraceable, or are still traceable but dried up (FIG. 10).

10. Dry built well in Wādī al-Bīr.

Dams

The author did not record any dams in the region of Udhruḥ; however Killick (1987a: 176) located a dam at Jabal aṭ-Ṭāḥūna. Although no traces of the ancient dam can be seen at present, the earth dam which has been recently set up on the south end of the Jabal (mountain) might have overlapped the one seen by Killick. The area to the southwest of the mountain is a very typical natural catchment (FIG. 11).

Qanat system

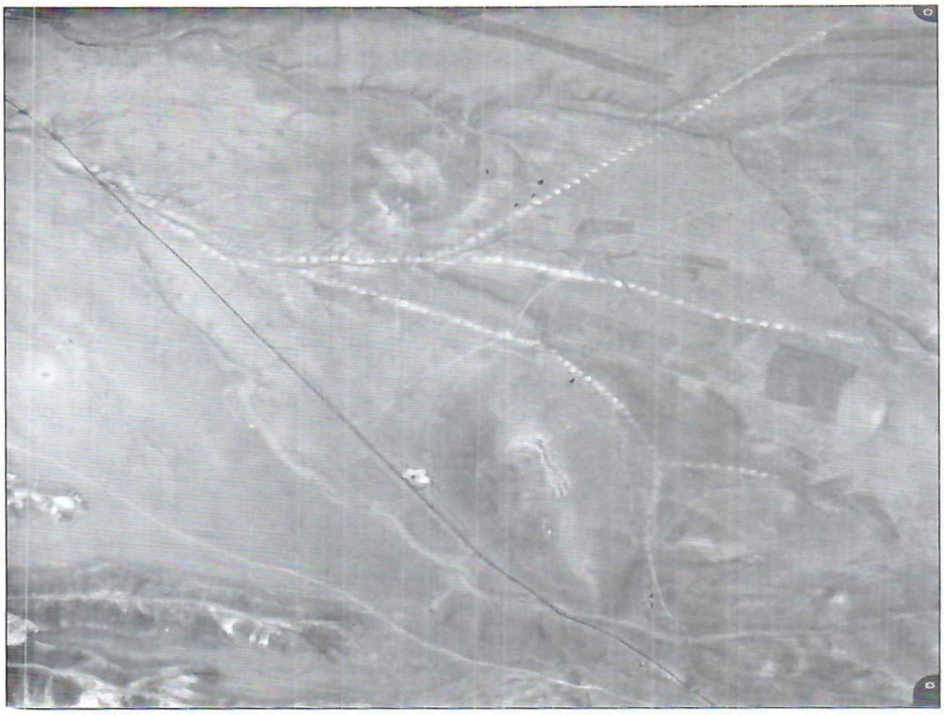
What is the qanat system? The following quotations clearly explain the exact meaning of the term qanat:

"The qanat is a tunnel driven into a hillside to tap an aquiferous stratum deep inside it. The tunnel has just enough of a downward slope for the water tapped to run down it and into the open air by gravity, and is punctuated at intervals of 20m or so by vertical shafts to the surface" (Hodge 1994: 20).

"Qanats are a form of subterranean aqueduct-or subsurface canal-engineered to collect ground-water and direct it through a gently sloping underground conduit to surface canals which provide water to agricultural fields or oases" (Lightfoot 1996: 321).

The Qanat system is very common in the Mediterranean basin countries, especially in the arid regions (Hodge 1994: 20-24; Lightfoot 1996: 322). According to Lightfoot (www.waterhistory.org/histories/jordan) "ten sites, with thirty-two separate qanat galleries, have been identified in Jordan". One of them lies in Udhruḥ, about 1km to the south of the legionary fortress, and it was first identified by Alistair Killick (Killick 1987b: 28). Three lines of filled-in yellow shafts are still clearly visibly on the ground. At one point the three lines join (FIG. 12). The area where these shafts were dug, at the base of a hilly landscape, is very suitable for tapping the ground water. It is likely that the qanat supplied what he calls a Nabataean reservoir (Birkat Udhruḥ) to the east of the site as (Killick 1987b: 28). The available evidence

11. A catchment area southwest Jabal aṭ-Ṭāḥūna.



12. Aerial view shows the qanat system south Udhruḥ.

indicates that the qanat system may end in the valley below Khirbat al-Fiqiyy. From there a fairly well preserved aqueduct carries the water to Birkat Udhruḥ, and another channel runs southeast to supply Birkat al-Fiqiyy. Notably, a modern water pump station has been located just a few hundred metres to the west of the ancient qanat system.

Another possible qanat system was noted from aerial photographs at Jabal aṭ-Ṭāḥūna (D. Kennedy pers.comm.). However, little data is available for this system. On the ground, the qanat's shafts are not as clear as those of qanat Udhruḥ, and this is probably due to the erosion caused by seasonal floods, in addition to the similarity in colour between the shafts and the ground in which they lie.

The qanat system was located to the west of Jabal aṭ-Ṭāḥūna, and this is naturally appropriate as the reservoirs has to be on a lower elevation since gravity is the decisive factor in the flow of water. Moreover, the area to the west and north of the site is a huge natural catchment area, and is also good for tapping groundwater. At the north base of the Jabal there is a major water pump station providing the city of Ma'ān with water. Many wells have also been recently dug in the area around Jabal aṭ-Ṭāḥūna. Finally, it is worth mentioning that the city of Ma'ān with a population of approximately 30,000 is fed only by the wells of aṭ-Ṭāḥūna.

Watermills

Watermills are quite common in Jordan particularly in the north part of the country (McQuitty 1995: 745-751). In the study area, Alistair Killick (1987b: 28) mentioned an Ottoman watermill at the foot of Tall Udhruḥ. It is a pyramidal structure built of small limestone blocks and still fairly well preserved and stands for about 3m (FIG. 13). At the base, the sides are 3.5m long. This length gradually decreases by approximately 10cm in each course. Although there is no access to the roof of this structure, one can see, from the Udhruḥ-Ma'ān road above, a small hole in the centre of its roof (nozzle). On the west base of the structure, a small ground-level structure can be seen, and it seems to be related to the hole in the centre of the standing structure. Roman pottery sherds were found at the site but further investigations, particularly excavations, are required to determine the function and date of this watermill.

13. Watermill to the south of Udhruḥ.

Others

The following techniques were also used as part of the water supply system in the region:

Natural caves: natural caves with appropriate locations for collecting the run-off water were acquired as cisterns. This type of cave can be easily identified through the layer of plaster and the earth channel leading to the cave. In some cases the area in front of the cave's entrance was elevated and terraced to prevent any run-off outside the cave.

Exposed bedrocks (know locally as *Ṣne'*): in some cases, exposed bedrocks seem to have been used as a rainwater collecting point, either by deepening the bedrock itself wherever it was possible to cut or by surrounding the bedrock with earth and stone walls (FIG. 14). This strategy was definitely useful

14. A water basin (*Ṣne'*) cut into a bedrock to the east of Bīr Abū Danna.

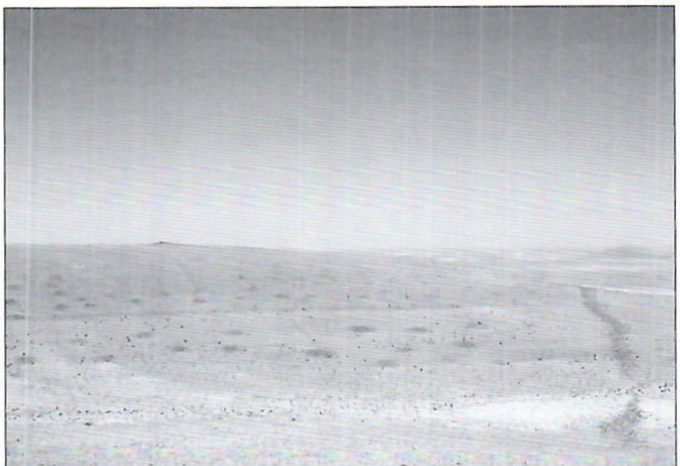
for a few days or weeks after having a great deal of rain, but not for a long period — it was especially beneficial for watering animals.

House-based cisterns: at many of the sites which display remains of ancient settlements, deep and circular masonry holes were observed within the settlements. These features have been tentatively identified as cisterns on the basis of their plans. Directing the run-off water from the roof into a cistern was probably the technique that householders used to collect the rainwater.

Heaps of stones: a remarkable sight in the landscape to the east and southeast of Basṭa and Ayl in particular and in other areas is the heaps of stones (‘Amr and al-Momani 2001: 276). Hundreds of piles significantly cover slopes of hills and the relatively flat grounds in the abovementioned areas. Many more heaps can be seen particularly on the slopes; and each heap consists of many multi-sized stones (FIG. 15). It is possible that these piles were formed as a result of a ground clearance for agricultural purposes although Oleson (2001: 606) refers to similar piles in Hawra' (al-Ḥumayma) and notes their importance in keeping the run-off water in the ground to prevent soil erosion.

Chronology

The fact that construction inscriptions are extremely rarely found in association the water supply systems in the study area makes any other dateable archaeological deposits particularly valuable. Hints from historical accounts could also be useful. Evidence comes mainly from ceramics and architectural elements.



15. Heaps of stones on hillsides between Ayl and Basṭa.

The availability of the ceramic evidence at the aforementioned water supply systems can be divided into the following:

1- No ceramic evidence was collected, as was the case with most of the rock-cut cisterns.
2- Ceramic evidence was not available at the water supply system feature but available at a neighbouring archaeological site such as a settlement site.
3- Ceramic evidence was found at the water supply system feature itself.

According to Diodorus (Oleson 1995: 709), the technique of making rock-cut cisterns was known among the early Nabataeans. Abundant Nabataean settlements have been long documented in the region of Edom, including the study area. Rock-cut cisterns in the region of Udhruḥ were reused during the first three quarters of the 20th century AD, especially those which were located near a traditional house or village, known as *Qa'īr*. This strategy would have been effective for water supply and storage throughout the first millennium AD.

Ceramic sherds associated with the significant reservoirs to the southeast and south of Udhruḥ predominantly date to Late Byzantine and Early Islamic periods. Similarity in the masonry material was also observed between *Birkat* (reservoir) Udhruḥ and Birkat al-Fiqiyy. The official Byzantine tax archive from Beersheba for the towns of Palestina Tertia puts Udhruḥ the second on the list; paying a tax of sixty five gold pieces (Killick 1983: 231). This archive was referred to as a sixth-century document (Mayerson 1986: 148). In addition, Udhruḥ and al-Jarba submitted to Prophet Muhammad and paid the poll tax in 630AD (Schick 1994: 149). The region was prosperous in the Byzantine and early Islamic periods. As agriculture has long been a very common factor of prosperity in ancient societies, one could claim that the presence of such water supply systems increased the arable lands in the region of Udhruḥ and in return the region's economy would have also improved.

Giving a precise date for the qanat system to the south of Udhruḥ seems to be impossible at this stage. The qanat technology was in use in the ancient Middle East from at least the seventh century BC and continued to be used until the 20th century AD (Lightfoot 1996: 323-325). Lightfoot claims that "every qanat in Jordan is adjacent to Roman and Byzantine settlements or outposts.

Because the supporting evidence is strong, most scholars believe that Jordan's qanats were built by the Romans and used by the Byzantines from the 1st century B.C to the 7th century A.D." (www.waterhistory.org/histories/jordan). This could equally apply to the qanat system at Udhruḥ, as the evidence for Roman and Byzantine settlements in the region of Udhruḥ is abundant. The presence of Roman legionary fortress and Byzantine church at Udhruḥ itself is beyond any speculation. Even so, a thorough understanding of the relationship between the two reservoirs, the aqueduct to the southeast of Udhruḥ and the qanat system would be necessary to support or contradict Lightfoot's assertion.

Ancient surface channels or conduits preserving their original architectural conditions are very rare in the study area due to continuous utilisation and maintenance throughout most of the historical periods. Most of their ancient masonry material was replaced or coated by modern material such as cement. Two ancient channel systems were seen during the survey; one to the southeast of Udhruḥ and the other in Wādī Basṭa. The former seems to have been in use during the late Byzantine and early Islamic periods by association with settlements and agricultural activity in those periods in that area. The significance of this channel lies in the solid wall which carries it across Wādī al-Fiqiyy.

Parker (1986: 99) reported that an earlier traveller mentioned a conduit carrying water from the spring of Basṭa to a Roman site three kilometres to the east of Ma'ān. The topographical location of the spring of Basṭa, at more than 1400m above sea level, is typically suitable for carrying water through a channel to an area like Ma'ān with an elevation less than 1100m above sea level. This strategy of water supply was utilised in Hawra' (al-Ḥumayma), where a 27-kilometre-long conduit provided water for the site from springs on the high mountains to the northeast (Oleson 2001: 608, 1992: 270). Even so, the available evidence does not allow us to claim that such an aqueduct existed.

Springs associated with reservoirs usually exhibit a long history of use. Moreover, this type of water supply system was implemented in the areas where continuous and intensive ancient settlements mark the landscape in adjacent areas to the spring or reservoir. From north to south along the survey area, and at larger settlement sites associated with this type of water supply, the ceramic evidence presents different periods from at least the Iron Age up to the late Islamic period.

Water Consumption

The available evidence from most of the water supply systems in the region of Udhruḥ clearly indicates that agriculture was a central focus throughout most of the historical periods. There are many examples where particular water supply systems were associated with field walls and agricultural fields. Surface channels seem to have been used mainly to supply water for agricultural fields well beyond the main source of water; this type of channel usually carries the overflow water from a reservoir constructed at the end of a ground-level tunnel. Ancient field walls associated with traces of surface channels are clear in Wādī Udhruḥ, Wādī Basṭa, Wādī al-Jarba, Wādī al-Fiqiyy and Wādī Malghān. Water for human consumption could have been obtained from the point where it flows into the reservoir; this running water would have been fresh and suitable for daily life activities including drinking, cooking and washing. Animals could have also been fed immediately from the reservoir if it had a stable level or may have been provided with basins.

In a semi-arid area with scanty precipitation one would expect the existence of water storage strategy. Rock-cut cisterns seem to have been constructed exactly for this purpose. This type of water supply technique was found in association with both ancient settlements and agricultural fields. However, the degree of care which was given to most of the rock cut cisterns indicates that the water was utilised for human use. The walls of most of them and sometimes the floors were carefully coated with a waterproof layer. This layer not only prevented the absorption of the water into the walls or floors, but also kept the water clean and ready to drink. For this particular reason, many rock-cut cisterns continued to be used and even attracted traditional settlements in the study area until the 1960s.

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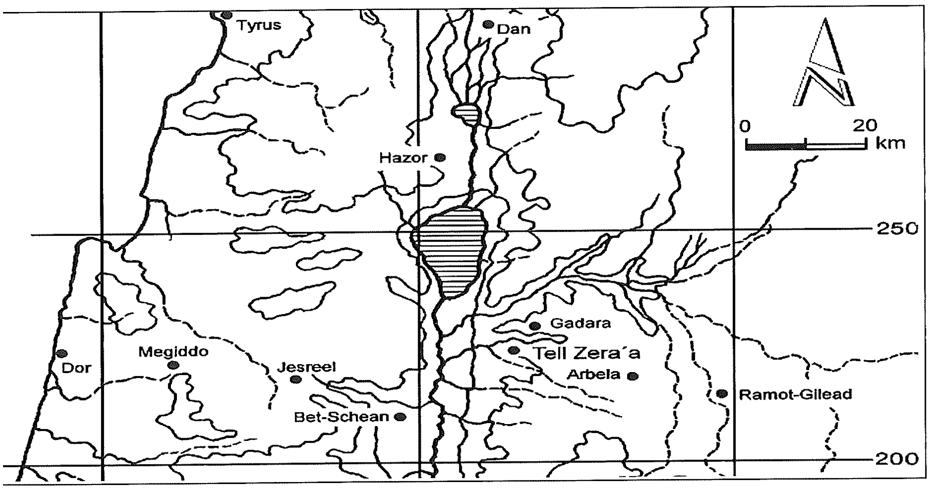
The 'Gadara Region Project' Archaeological and Archaeometric Investigations

The ruins of the Decapolis city of Gadara are fascinating because of their archaeological relevance as well as their extraordinary scenic location (FIG. 1). The city is majestically sited on the northeastern mountain spur of Transjordan high above the Lake of Galilee. If one looks to the south, one sees an unusually fertile valley: the Wādī al-'Arab and its tributary, the Wādī az-Zahar. Nevertheless, its relevance for the antique city of Gadara and its pre- and post-classical development has hardly received any attention until now. The wadi and the trade route running through it are dominated by a remarkable settlement – the Tall Zar'a (FIG. 2).

For the next ten years an integrated study of the Wādī al-'Arab and its urban centers (Tall Zar'a and, from Hellenistic to Byzantine times, Gadara) will constitute the main research work of the Biblical-Archaeological Institute Wuppertal. The exploration, excavation, and conservation of the antiquities to be found in Tall Zar'a are the focal points



1. Map of northern Palestine, showing the location of the Tall Zar'a in the Wādī al-'Arab.

2. Tall Zar'a.

of the archaeological project. The excavation of Tall Zar'a will be conducted in close and trusting cooperation with the German Protestant Institute, Amman.

Aims

Within the framework of the 'Gadara Region Project', the research of the Biblical-Archaeological Institute, Wuppertal, focuses on the following specific questions:

(1) What can be said about the ca. 5,000 year long settlement history of Tall Zar'a, which is distinguished both by its artesian well and its privileged location in the fertile and geostrategically important Wādī al-'Arab, and can be expected to reveal a stratigraphy representative of the Jordan valley and northern Jordan?

(2) What insights can be expected into a settlement process of comparable duration in this relatively isolated, but clearly defined geographic area?[1]

(3) What were the survival strategies developed by the inhabitants over the millennia to adapt to the natural conditions of the valley, and how did they respond to changes in climate and given resources?[2]

(4) What conclusions are to be drawn from the above for the trade routes (Mediterranean-Transjordan)?

(5) What relations existed between the Tall Zar'a and the urban center of Gadara, which flourished almost exclusively in the Roman-Byzantine period?[3]

These regionally oriented questions, taking into account the interplay of various factors within the region, assists us to develop the archaeology of a landscape.

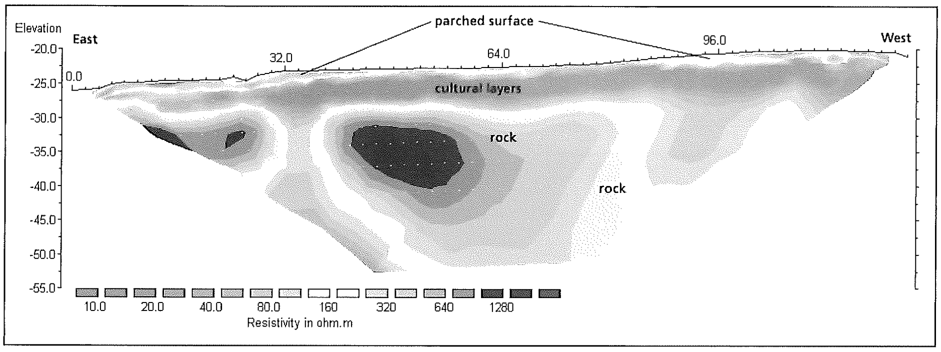
Geoelectric tomography

Within the scope of the geophysical exploration of the tall, geoelectric mapping and two-dimensional as well as three-dimensional tomographic techniques were brought into action in order to:

- be able to plan archaeological excavations in advance and to develop exact strategies for the planned excavation,
- acquire knowledge of non-excavated areas also, and
- leave larger excavation areas undisturbed for coming generations.

For the purpose of the geophysical exploration a LGM 4-Point Light μC and a Geolog 2000 GeoTom were used. On Tall Zar'a we measured more than 50 profiles in various configurations. Two outcomes are interpreted as follows:

The first measurement (FIG. 3) shows a profile (in dipol-dipol configuration) that runs across the tall in an east-west direction and yields essentially geological insights. For this, 63 electrodes were positioned at a distance of 2m. In the profile a cultural layer of 6 to 7m thickness can be recognized, showing a low-ohmic value (up to 100 Ωm to the max.) below the dried-up surface which, as expected, appears as a high-ohmic anomaly (more than 160 Ωm). An important observation of our survey confirms the enormous thickness of the cultural layer of Tall Zar'a. The cistern found in the



3. East-west profile of the tall plateau (Iteration 4, RMS-fault = 24.5).

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[1] This includes a study of the neighboring settlements of Khirbat Bond (2128.2233) and Tall Kinīse (Ra'ān) (2191.2271), where settlement traces are present from the Early Bronze Age to the Ottoman period.

[2] This integrates an investigation of the agricultural potential, flora and fauna geological aspects (water, rock formation, and soil types), trade (road, infrastructure), and the strategic importance of the wadi.

[3] Although Iron Age ceramics have been found in disturbed layers in ancient Gadara as well as evidence of residential buildings of the Islamic Age, the investigation of the "classical periods" there was rightly considered of primary importance. The time before and after the flowering of Gadara will no doubt require further research. The region south of Gadara offers a unique opportunity to examine in a systematic and comprehensive way the development of settlement activities within a naturally defined territory, i.e., in relation to Gadara, exploring in greater detail the pre- and postclassical periods of the Gadara region.

southeast of the tall, which has a depth of 5.75m, reaches up to the actual tall surface directly above the cistern's round vault and is built on bedrock. In the east, bedrock almost reaches up to the surface. Since the tall as a whole slopes slightly toward the east, drainage occurred in that direction. The remarkable downward oriented double-conic (low-ohmic) area at meter 32.0 is connected with the functioning of the artesian well.

On the western slope (FIG. 4) about 20 parallel profiles were plotted and measured with 50 electrodes at 0.5m distance. Here the dipol-dipol configuration was also used in order to ensure a better resolution of the screen process prints. In this way, a location of the walls on the tall's slopes could be explored in 2001. In the model illustrated below, two high-ohmic anomalies can be traced at meter 4.0 and 11.0, lying up to 2m below the surface. Since these anomalies occur in all 20 parallel profiles, we assumed in 2001 that they were related to the remains of wall structures. When we excavated them in 2004 – these walls turned out to date from the Late and Early Bronze Age.

Survey in 2001

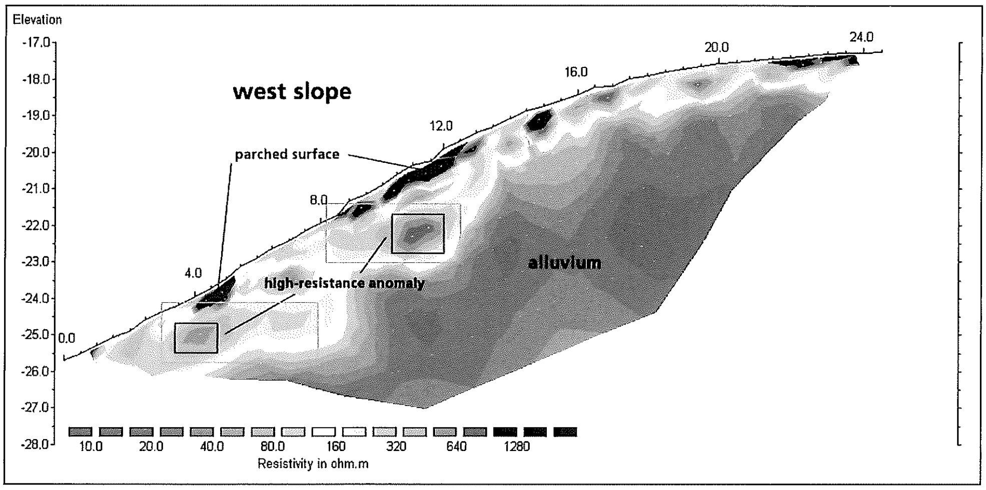
The survey area covered the whole tall and all its slopes. In all, 127 survey squares of 20m x 20m size were searched, i.e. 5.08 ha. We found about 24,000 sherds and plotted them on the tall and its slopes as shown in Vieweger 2002a, b.

Photogrammetry

Aerial Photogrammetry for the Production of Site Maps

The mapping of features in large-scale surveys has long since been carried out by GPS in an effective and time-saving way. We combined this mapping method with the recording of objects, as has been common in archaeology for some time. We fastened a camera platform, equipped with three-dimensional mobility via remote control, to a helium-filled balloon. With a rope, the balloon was tied up on the ground or directed to the areas to be surveyed. In order to take photos, the camera had to be positioned perpendicularly above the areas to be mapped. This was done with the help of radio tele-control. The section in the viewfinder was relayed digitally to a ground station (TFT monitor or head display during strong sun radiation). Photos taken from heights of up to 135m supplied ground segments of 15,000m per picture. On one hand, these photos served as photograms for specific site data supplemented by GPS data. On the other, the overall view of the excavation area and its surroundings could be impressively documented. The pictures were rectified and assembled into a mosaic by way of control points (FIG. 5).

5. Rectified photographes, assembled into a mosaic by way of control points.



4. West slope profile (Iteration 4, RMS-fault 12.9).

Photogrammetric Documentation of Archaeological Features
With this method we documented our excavation areas in 2003 and 2004. On a daily basis, nearly perpendicular photos were taken from about 4m above the squares. First, the distortion of the lens was corrected. Then the digital photographs were rectified via control points (here the corner points of the squares). In this way, both the progress of the excavation could be documented and site sketches produced with great accuracy.

The evaluation of these photographs should be undertaken jointly by the surveyor and the archaeologist in charge, to ensure that the represented data are correctly interpreted. To improve our techniques, we will analyze potential error sources inherent in deeply excavated squares and consider strategies to eliminate these while taking into account aspects of practicality and accuracy.

Excavations in 2003 and 2004
The 2003 campaign marked the start of the tall's excavation. In addition, the survey was extended to the Wādī al-'Arab area. To begin with, excavations on Tall Zar'a concentrated on its northwestern slope (area I). The tall survey done in 2001 showed a clear concentration of prehistoric (in particular Early Bronze Age) sherds on the surface, especially on the slopes of this area.

Four hundred and fifty square meters (18 squares measuring 5m x 5m each) were opened up and explored to a depth of 3.3m. We excavated five strata: the most recent stratum dates to Roman-Byzantine times, followed by two cultural layers from the Iron Age and one from the Late Bronze Age. According to our geophysical investigations, the cultural layer as yet unexplored in this area is another 4m deep. Our survey indicates there may be settlement layers reaching down to the Early Bronze Age. An Early Bronze Age city wall has just been uncovered on the slope about 1m below the Late Bronze Age city wall.

Of course, little can be said about the excavated architecture after the first digging campaigns, but some basic features can already be described. In the top stratum (stratum 1), three large houses on both sides of a paved street were found from the Roman-Byzantine period, whose rooms showed a nearly exact northward orientation (like our grid). In one room, a threshold (AL 118), a pedestal/column base and, adjoining it, a narrow bench (AM 118) was found. Toward the western part of the slope, the building breaks off near the edge of the slope's steep incline.

The two subsequent strata (strata 2 and 3) date to the Iron Age. The building activities traced in these two layers are quite different. A sawtooth-like wall, following the curve of the tall, marks the western limit of the built-up area of the more recent Iron Age stratum (AL-AO 117). Due to the baulk it is unclear, if the wall in the squares AK/AL 116 is a continuation of the aforementioned wall. Both walls are built with field stones and are 1-1.20m thick. In AL 117, a well-wrought working surface, including a grinding stone, was exposed.

The older Iron Age stratum was disturbed several times by subsequent settlements. Therefore a comprehensive building structure can not yet be clearly determined in the few areas excavated so far, but all fragments found in this stratum follow the same alignment as a sizeable oven that was excavated in AM 118. Older Iron Age structures were partly built directly onto the wall stumps of the Late Bronze Age city wall located underneath, perhaps reusing the outer part of its wall (AL 116/117).

On the western slope, a settlement layer of the Late Bronze Age (stratum 4) and a contemporaneous casemate wall were excavated. In square AM 116, a small, stone-lined silo was found in one of the casemates. To the south and adjacent to this, a stone-paved room was found, which led into an extended paved room possibly belonging to something like a gate or a postern. Inside the casemate wall, a street ran alongside it. Unfortunately, several pits of the Late Iron Age disturbed the Late Bronze Age floor that was otherwise generally well preserved. A water channel was covered by stone slabs; the water drained from the city via a 3m deep vertical shaft.

The Late Bronze Age is characterized not only by its architecture but also by rich finds which, apart from bronze objects (fragments of daggers, mirrors, pins), include Cypriote and Mycenaean ceramics. On the floor of a building to the east of the street (AM 118), several stone vessels, ceramics, bronze fragments, and a fully reconstructed alabaster stand were found.

According to the survey conducted in 2001, the Early and Late Islamic settlements on Tall Zar'a do not extend across the entire tall area. They are concentrated near the spring and in the south of the tall.

Excavations will be continued in spring 2005.

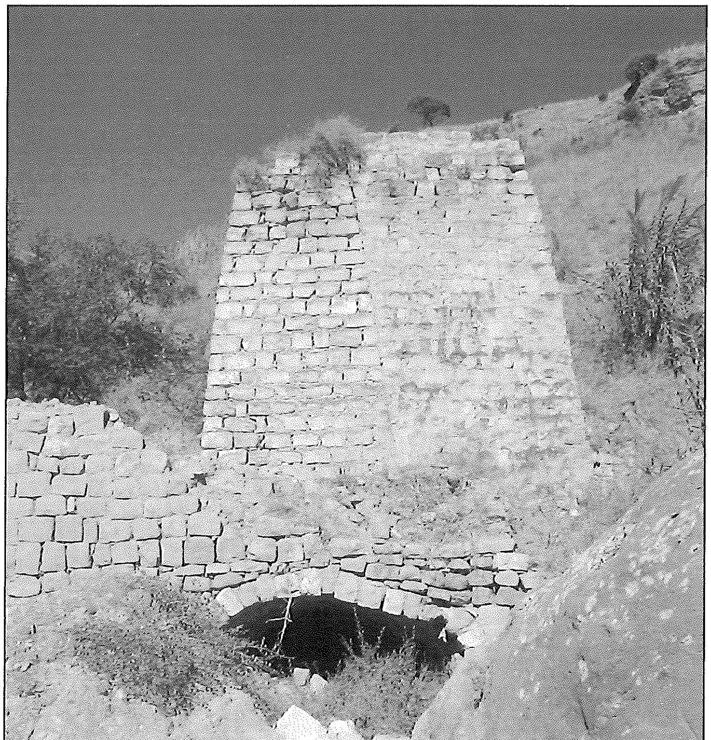
Ceramics

During the excavation campaign, ca. 25,000 sherds were found, *all* of which were determined according to ware; of these, the diagnostic sherds were additionally determined on the basis of typological criteria.

Together with the Bergbaumuseum in Bochum (Dr. Andreas Hauptmann), a selection of representative ceramics from Tall Zar'a will be scientifically analyzed on a continual basis. In the course of this, the focus will be on questions of provenance (local production, production in the surrounding areas, e.g., in Gadara, imported goods) and aspects of their technical production.

Mill and Water Culture in the Wādī al-'Arab

In the Wādī al-'Arab, six water mills[4] were explored and measured (FIG. 6). In spring 2004, the building construction and milling technology of the individual mills will be studied as well as their respective water supply. Another point of interest will be the water management in the wadi where the mills operated: to the northeast of the tall in fairly close proximity to it.



6. Water mill in the Wādī al-'Arab.

Experimental Archaeology

Following the excavation, a project with a technological-historical background was carried out. Within three weeks, Mustafa Saleh, the son of the last Tabunye still living in Umm Qays, built a bread-baking oven commissioned by the Biblical-Archaeological Institute. In particular, we analyzed and documented the following stages of construction: origin, grinding, cleaning, mixing of the clay, origin and use of added materials (e.g., rush and goat hair), manual construction of the oven, special make-up of the oven's base and upper rim, preparation of the pit in which the oven was set, heating it and of course, the baking of bread.

Acknowledgments

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[4] Cf. Older survey work of M. Gadiner and A. McQuitty 1987.

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Wādī Al-Usaykhim: Strategies of use and of Valorisation of the Desertic Land of al-Bādiya through the Archaeological Heritage

The Roman castle belonging to the *limes arabicus*, situated on a cone-shaped orographic mount (FIG. 1) constituted of limestone overlaid with basalt stratifications, is today called by the Bedouins of the area Wādī al-Usaykhim.

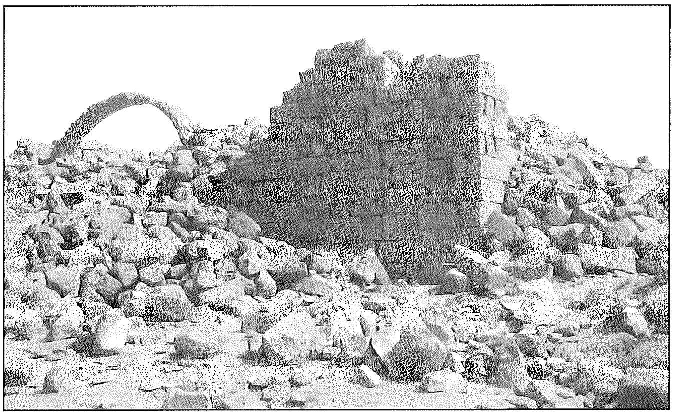
The castle is on top of Jabal al-Usaykhim, 641m. asl (FIG. 2). The castle faces south to the Wādī al-Usaykhim and northeast to the contemporary Qaṣr al-Azraq, which is approximately 19.2km away.

The remains of the Roman castle of the *limes arabicus* are made up of huge precisely-squared stones (FIG. 3), scattered around in a disorderly fashion. The primary boundary walls, of quadrangular shape (FIG. 4), belong to the first elevation of the castle (FIG. 5).

The Archaeological Excavations and Restora-

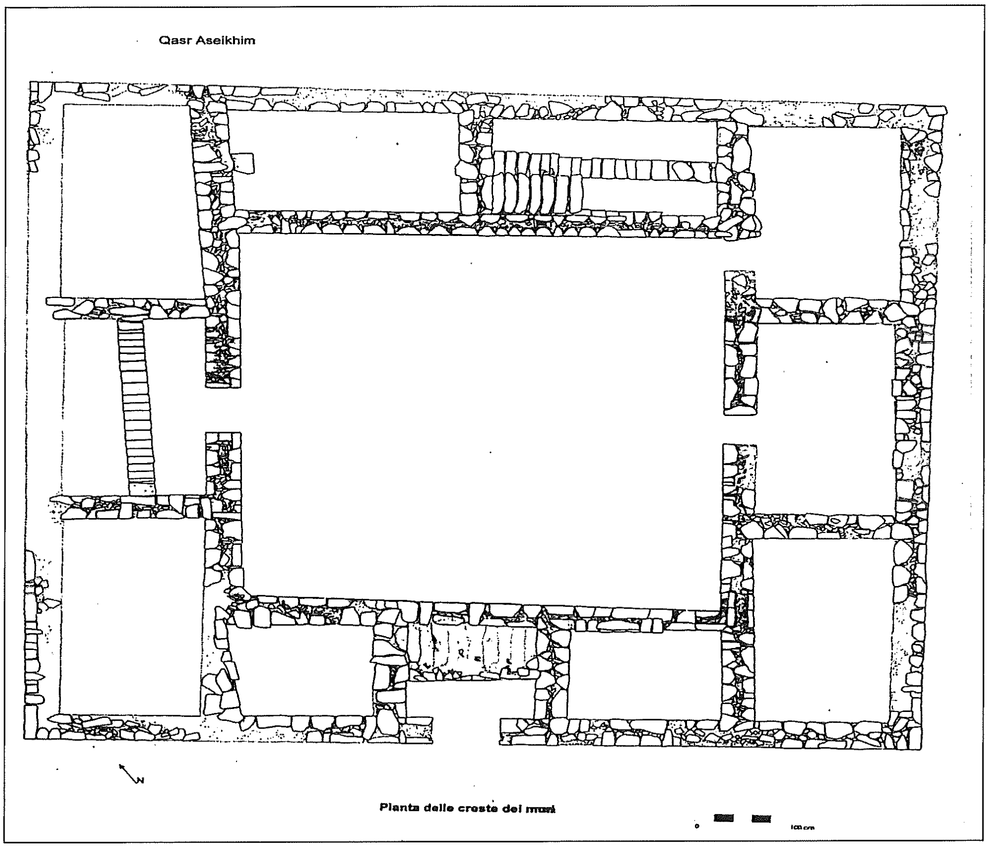
1. Arial Photo of the site.

2. The Roman castle on the top of the hill.



3. The south western corner of the castle.

5. The first elevation of the castle.



4. The Plan of Qasr al Usaykhim.

risons lived side by side with the local population.

Al-Usaykhim castle itself was under the military control of al-Azraq castle, from which the Roman *Legio III Cyrenaica* oversaw the area. Along with Qaṣr al-'Uwaynid and Qaṣr Jawa, al-Usaykhim is believed to have been part of a complex military system to defend this part of the limes. The troops quartered there were probably auxiliaries of Arab origin.

It is known from historical sources that the fortifications were occupied by military garrisons until the fifth century AD; their abandonment was perhaps a result of the major earthquake that occurred sometime between 498 and 552AD. After that point, only the military settlements of al-Lajjūn, al-Fityān, and Yāsir remained along the *limes*.

During the course of our excavation, we have compiled a proposal for the conservation of the area, including the castle, which we delivered to the Department of Antiquities in 2003. We have proposed two possible funding sources for this project, the first being the Italian Cooperation. This solution would cost approximately €1 million, and would require extensive bureaucratic procedures. The other solution would be to restore only the Roman castle, with funding from the Department of Antiquities of Jordan and the Italian Istituto Superiore per le tecniche di conservazione dei beni culturali e dell'ambiente "Antonino De Stefano".

In 2003 we published a book titled: *Limes Arabicus*.

The Roman castle, situated along the *limes Arabicus*, was built on the highest hilltop in the eastern strip of the Arabian province. It is situated on a conical hill that dominates the underlying plain and overlooks the sinuous Wādī al-Usaykhim, which stretches out to the arid clearings of the Mesopotamian desert. The castle appears to have been built during the period when the desertification processes were beginning in the al-Azraq plain, and the environment was transforming from green savannah, full of water, to an arid steppe. From that time until the present, the arid landscape of al-Usaykhim has remained unchanged.

The Oriental frontier of the Arabian province had been under direct Roman control for a long time, and the army had already built the first military structures of the new alignment of the *limes Arabicus*. The reason for the shift in the alignment of the *limes* was a strictly economic one, linked to the control of the principal silk, incense and spices trade routes from the East. It was thus of specific importance the construction of a new *limes* would integrate the pre-existing one with the newer *Strata Diocletiana*. The conical hill of al-Usaykhim would have commanded an open view in all directions, much as it does today.

The landscape of the area also contains variation in both color and geology. The winding path of the Wādī al-Usaykhim crosses areas characterized by layers of cooled volcanic lava, changing into vast heaps of black basalt stones and finally into calcareous plain overlaid by a stratum of flints.

The colours are also unique in their chromatic variation: from east to north the black of the basaltic rocks is shaded with a whitish patina of lichen. From south to west the yellow calcareous hills are painted in red by a multitudes of red flints and punctuated with spots of white.

The plain below the al-Usaykhim hill has the same geo-morphological characteristics as the top. It is constituted of black basalt, while the declivity appears yellowish in colour because of the combination of calcareous conformation and the purple red of the flints. It was because of this chromatic variation the hill was named Usaykhim, which, in Arabic, means a strong change of colour from black to red.

The al-Bādiya around al-Usaykhim, however, is both full of life and rich in archaeological and historical heritage, including Bedouin settlements, rounded enclosures for domesticated animals and huge hunting estates used by the lords of the desert for hunting gazelles, foxes, ostrich, and other wild animals that once used to live in this area (before their extermination at the hands of aforesaid desert lords). The estates are built of dry-laid walls of basaltic stones of various shapes and sizes, with occasional square protuberances.

The arid environment must have been surprisingly active, with both people and goods crossing the frontier on a daily basis, while the vegetation and fauna were rich and blooming.

The Construction Technique of the Roman Castle of al-Usaykhim

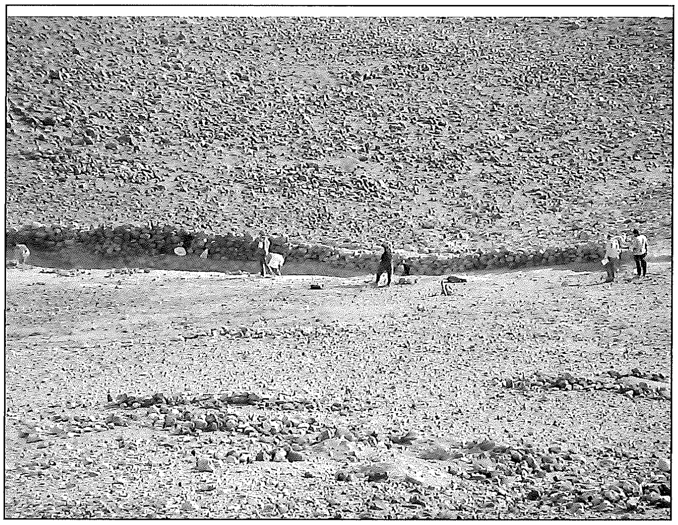
The castle was certainly built from local stone. Remains of a quarry have been discovered nearby, in which traces of manufacture and extraction of the large blocks used in the construction of the fortress are still visible today (FIG. 10). The masonry of the castle's imposing raised walls appears to have tion at Qaṣr al-Usaykhim Project, is a cooperation between the Department of Antiquities of Jordan and the Istituto Superiore per le tecniche di conservazione dei beni culturali e dell'ambiente "Antonino De Stefano". To date this project has conducted four archaeological campaigns, the initial project took place in 2000.

The archaeological excavations inside and outside of the castle date it to the third century AD, rather than to the Nabatean period, of which there are no traces.

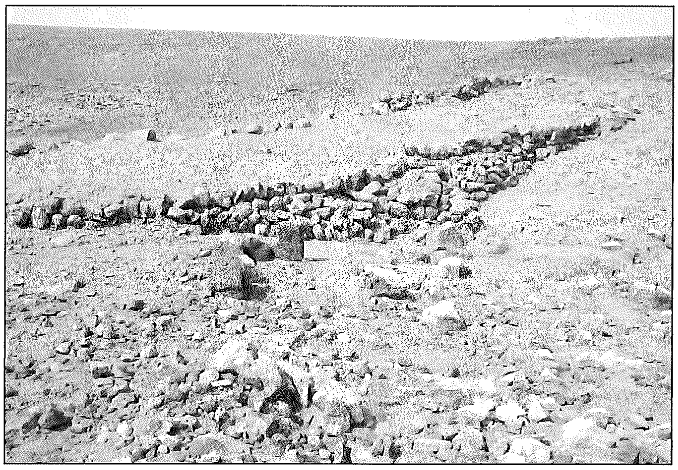
We restored the foundations of the castle that in many places had been exposed by looters. In addition, we effected a test for the restoration of the boundaries of the castle (on the east side). We studied the two boundary walls, which we believe to belong neither to the Roman, nor to a later period, but to an earlier period, owing to both their formation and to their construction technique; which is primitive both in its manufacture and in its placement. On the other hand, within the boundary walls of Qaṣr al-Usaykhim, two stemming were found, which probably sheltered the soldiers' horses in Roman times. On the southern side, a series of small round stemming about (2,00m) have been found made of basaltic rock, possibly obtained from the stone blocks from the external boundary walls of the castle. Then we made a survey in the area around the Castle, and we found urban installation in the vicinity of the Roman castle with 105 residences and two surrounded buildings from the Neolithic period.

We discovered a dam from Neolithic period (FIG. 6) and we restored it (FIGS. 7, 8). Besides, we discovered 36 villages of the urban installation of Jabal al-Usaykhim from Neolithic period (FIG. 9).

We presume that Wādī al-Usaykhim was populated with small villages, which continued to exist through the Byzantine domination. During the *limes arabicus* period, we believe the military gar-

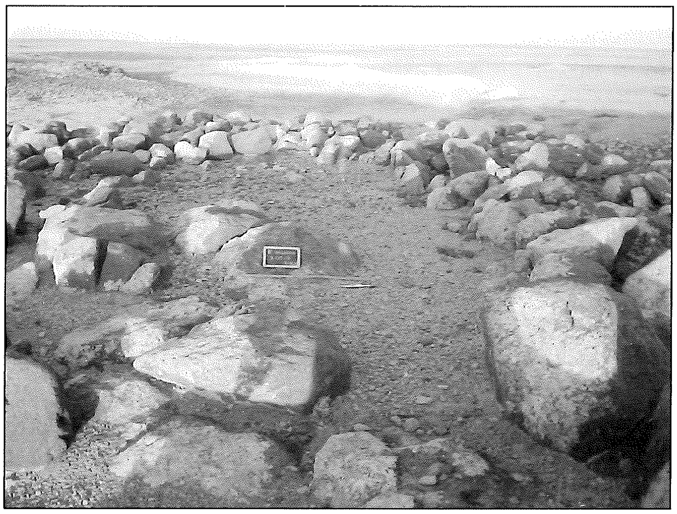


6. The dam from Neolithic period.

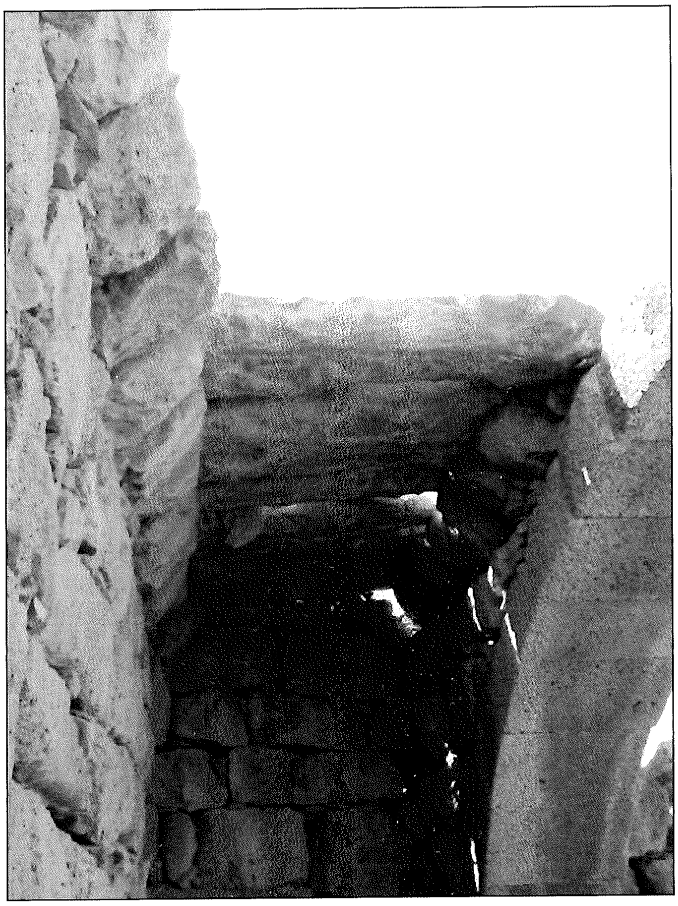


7. The dam after restoration.

8. The dam after restoration.



9. Remains of urban installation.



10. Roofing with a large blocks.

been built with the *pseudo-isodomus* technique, however, further analysis of the structure indicates it was a unique construction technique developed in the border regions of the Roman Empire. This technique has strong architectural characteristics; in Jordan the traditional buildings were built in this way. We have called it *opus pseudo-isodomus in a Roman manner*.

The *Anastilosi* at Qaṣr al-Usaykhim

The original construction work of the castle was carried out by two groups of workers, starting from the centre of each side and meeting at the corners. For this reason the sides are not equal, but are slightly off.

The *opus pseudo-isodomus in a Roman manner* is constituted of the reciprocal contrast between the blocks.

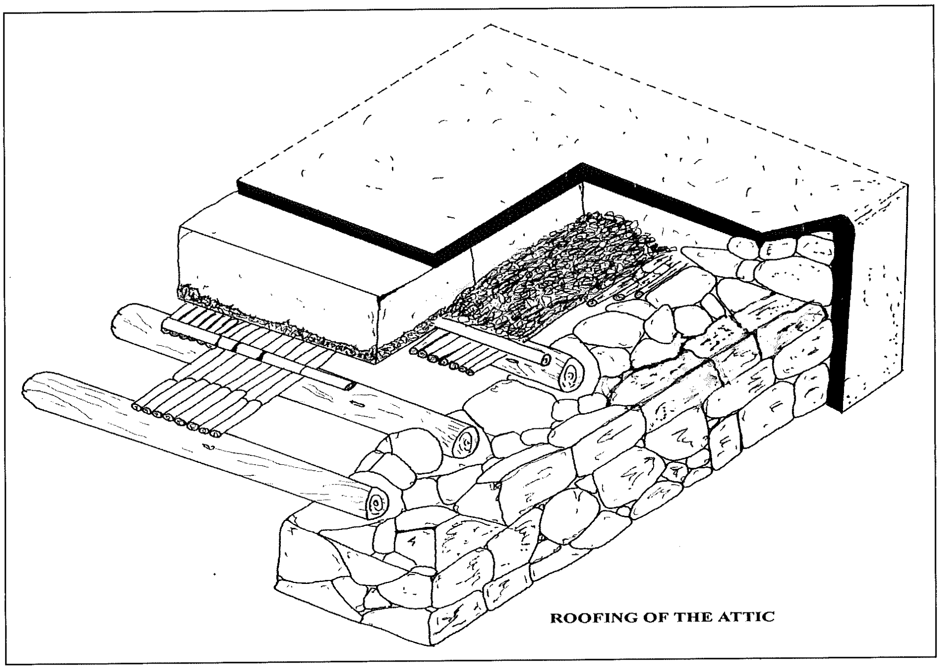
The *anastilosi* will proceed with only two groups of workers, working in opposite directions to reach the corner, as did the original procedure.

The construction techniques used by the Romans at Qaṣr al-Usaykhim are still used in Jordan for the construction of dwellings and Bedouin villages close to the Jordanian desert, which often substitute the typical village tent.

For this reason it would be easy to find skilled labour for a possible reconstruction of the castle, after studying the stratigraphic units of the collapse of Qaṣr al-Usaykhim.

With the ability and experience that some local workers still posses, with the guidance of the Italian restorers they can rebuild the castle, using the *opus pseudo-isodomus in a Roman manner* (FIG. 11).

In order to facilitate this work the reconstruction will use a crane and therefore the reconstruction will be carried out in quite a short time period.



11. The *opus pseudo-isodomus in a Roman manner* (Attic roofing).

Analysing all the archaeological remains of the roman castle of al-Usaykhim we created the *abacus* of all the original architectonic elements of the castle. The *abacus* is the most useful instrument and will allow the realization of the reconstruction intervention of the archaeological conservation (FIG. 12)

In this *anastilosi*, we will not use new materials, but instead we will use the original stones; with the original technique the *opus pseudo-isodomus in a Roman manner.*

Already in this analytic phase, it was possible to establish that all the architectural elements that composed the castle are to be found on site. In order for this important verification to proceed the intervention of the archaeological conservation that we called *anastilosi* is necessary (FIG. 13).

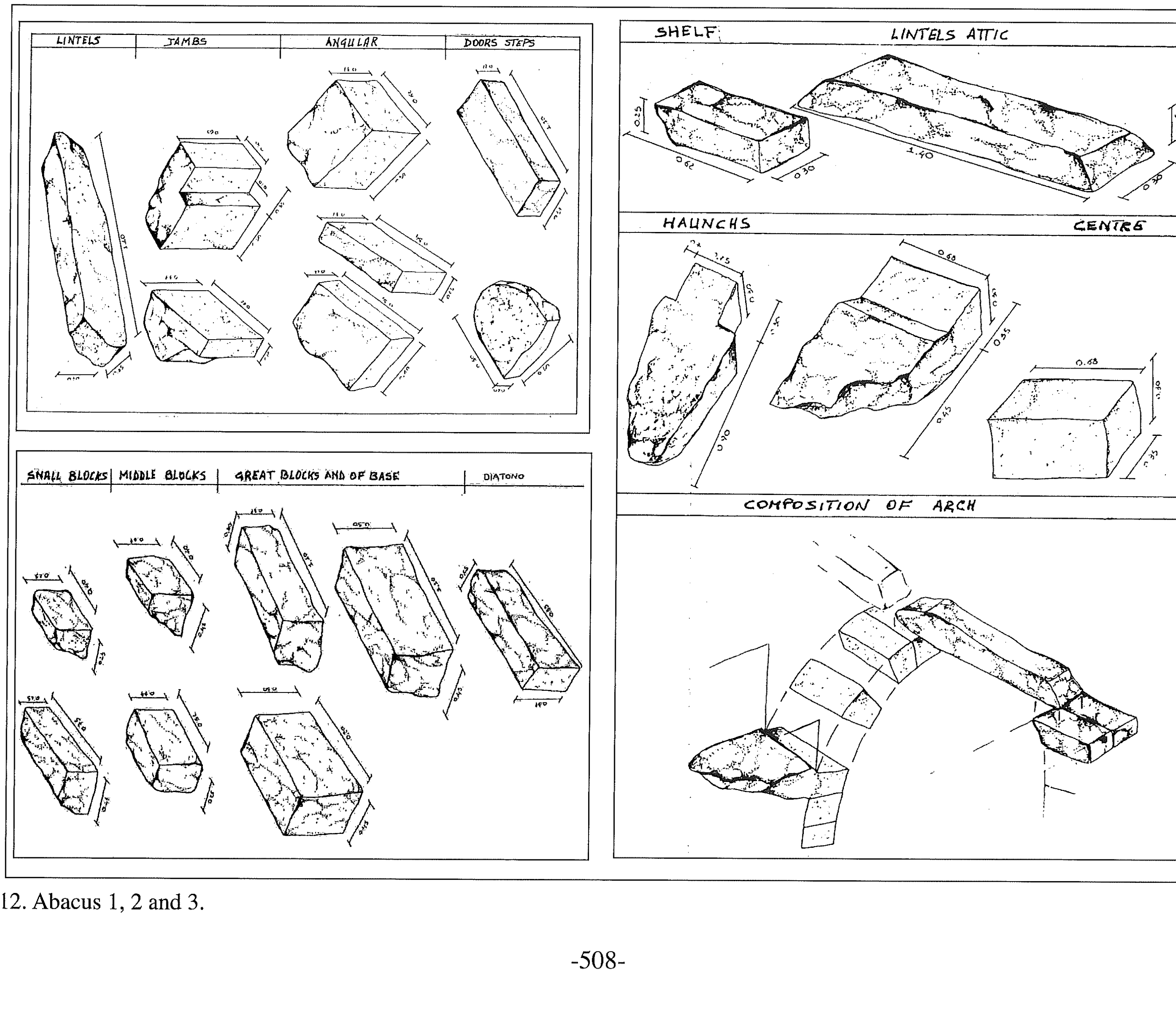
One of the first steps will be to carry out the stratigraphic analysis of the collapses and thus proceed to clear the rooms from the debris, placing the retrieved blocks in an area close to where they will be replaced.

As previously mentioned the work will have to start from the central room then to move towards the corners of each wall facing. This operation will have to be carried out with the use of a crane, numbering the blocks according to the stratigraphy of the collapse.

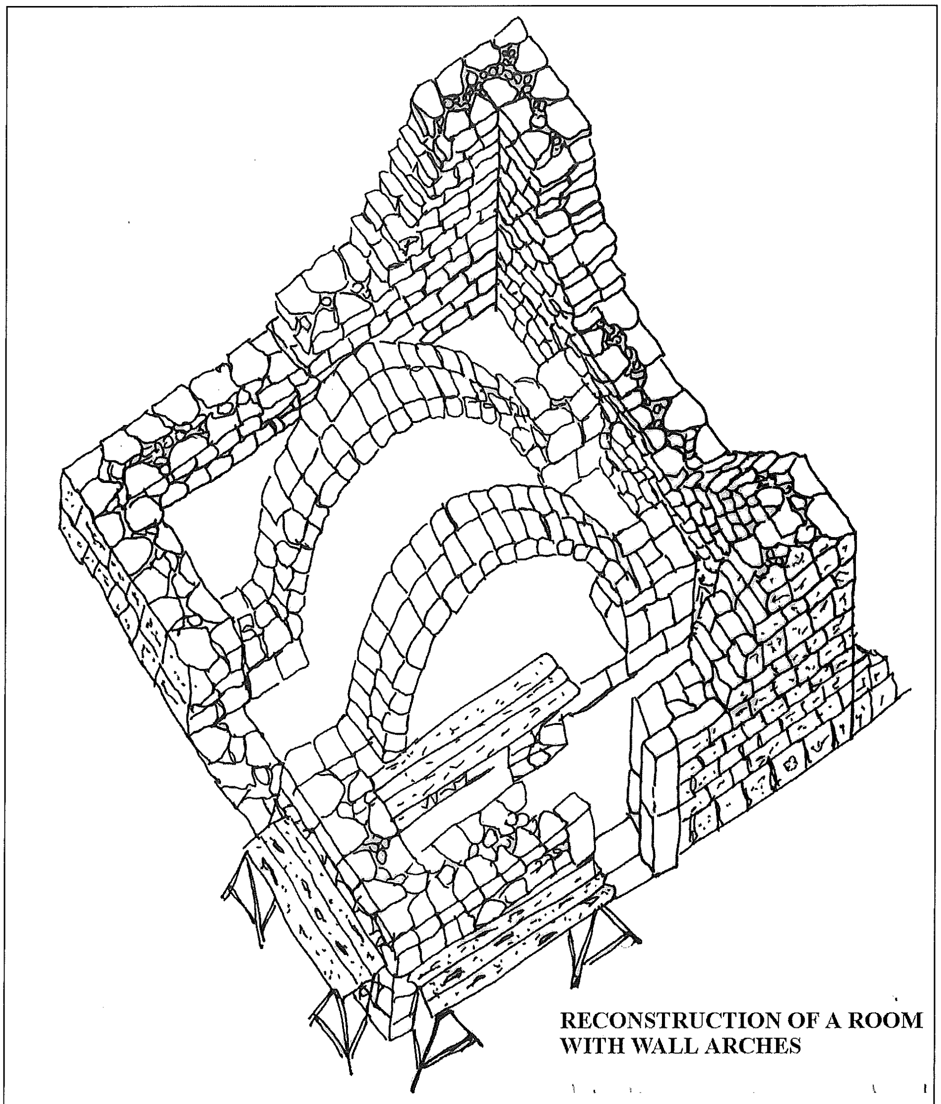
Plan for the Safeguarding of the Area and Integration of the Monument

Connecting the project of restoration of the Roman Castle of al-Usaykhim, a plan to safeguard the territory and the environment of Wādī al-Usaykhim has been prepared to guarantee an essential continuity of intents for the maintenance of the archaeological emergencies and the environment of which the area is rich, so to transform it in *cultural resources.*

The project acquits to the explicit wishes manifested by the local community that intends to preserve the archaeological site Qaṣr al-Usaykhim,



12. Abacus 1, 2 and 3.



13. Reconstruction of arched room.

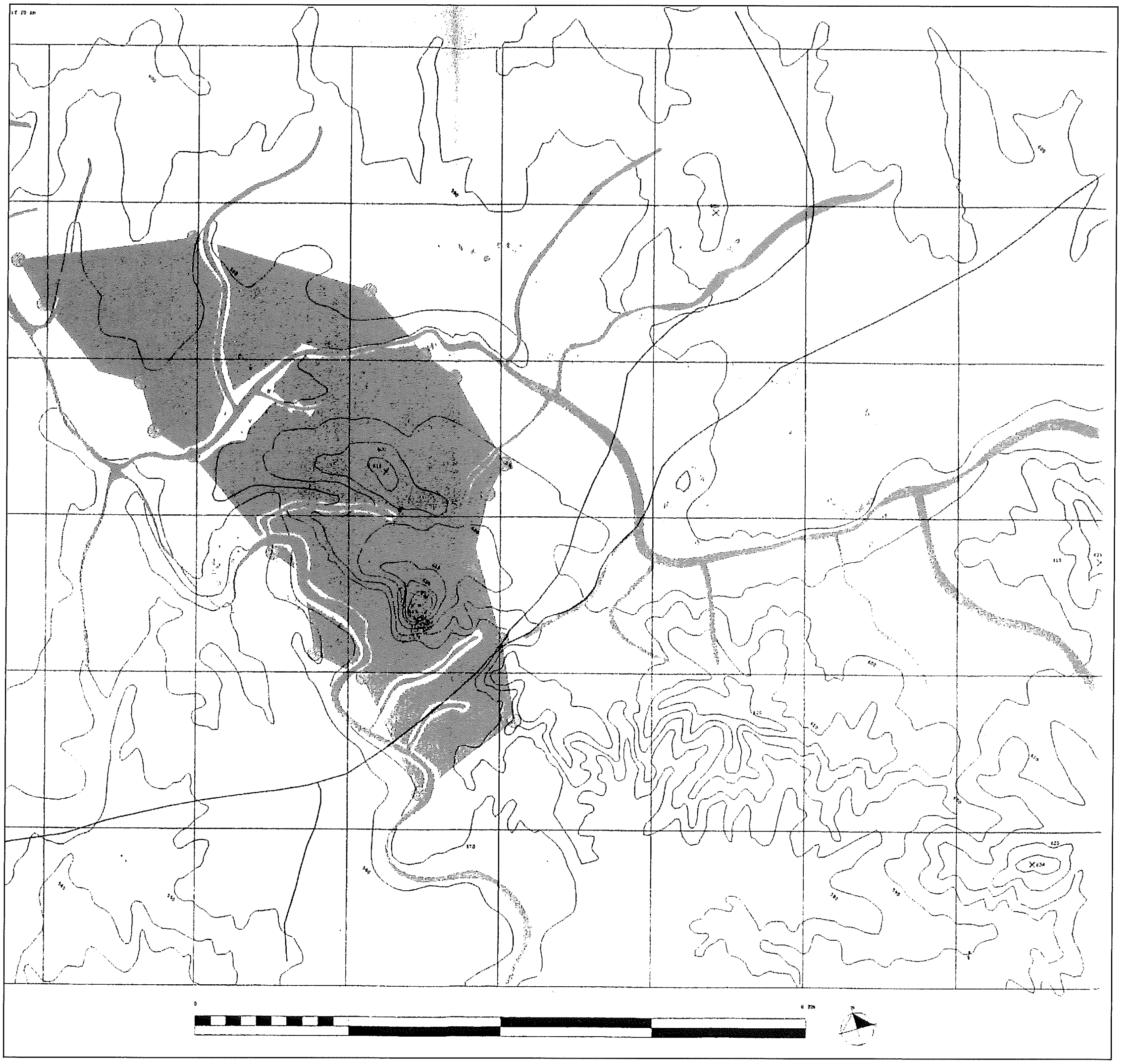
together with the environmental value that it possesses.

From here the double faceted nature of the project is born, that includes the integrated conservation not only of Qaṣr al-Usaykhim, but of the whole testimonies and archaeological remains present in the area (FIG. 14), among which we remember the Bedouin villages, the Roman towers of the *Limes Arabicus*, the thousand of epigraphs of different epochs (FIG. 15) that have been recovered carefully by the team of Prof. Fawwaz al-Khraysheh. Imposing the difficult assignment to restore the best environmental conditions to return a living territory to the native populations.

The scientific orientation of the integrated conservation that will be applied to this territorial and environmental context, is that legacy to the joined action of the techniques of the restoration and the search for the most appropriate functions, for the purpose of rediscovering and exalting, not only the *cultural value* of the archaeological remains, but to underline an indisputable value of use.

The relationship between archaeology and environment is one of total continuity, where the environment is not only a container, but it always constitutes the same motive for the existence of the archaeological heritage.

The principal objective of the project is to give gravitas to the ancient and delicate role, that will be represented by giving life to the resource water and to the fauna: this will be pursued by trying to exploit, to the best of our abilities, the quantities of superficial waters that sporadically stagnate on the bed of the wadi. avoiding that these are inexorable victims of the phenomenon of the evaporation, derived from the joined action of the elevated temperatures, together with the strong winds that insist on this zone, and inserting some special native ar-



14. Project Area.

Arabicus, the thousand of epigraphs of different epochs (FIG. 15) that have been recovered carefully by the team of Prof. Fawwaz al-Khraysheh. Imposing the difficult assignment to restore the best environmental conditions to return a living territory to the native populations.

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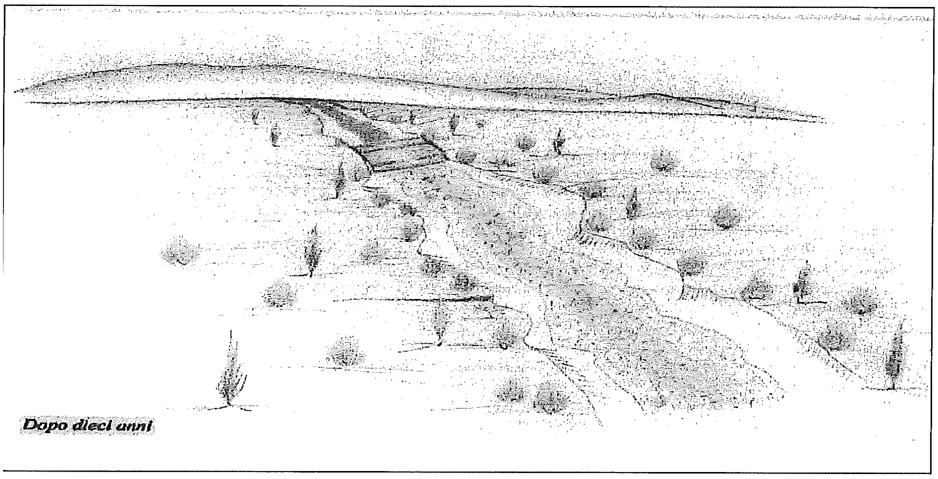
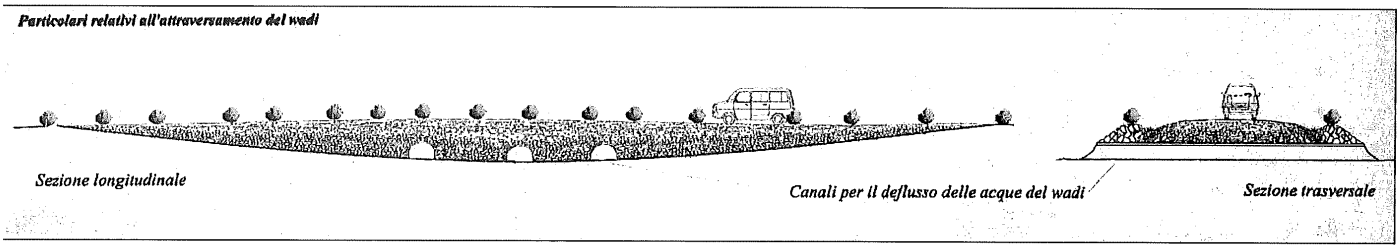
15. Epigraph.

and to the fauna: this will be pursued by trying to exploit, to the best of our abilities, the quantities of superficial waters that sporadically stagnate on the bed of the wadi. avoiding that these are inexorable victims of the phenomenon of the evaporation, derived from the joined action of the elevated temperatures, together with the strong winds that insist on this zone, and inserting some special native arboreal kinds, to perennial character, to the purpose to stimulate the restoration of the environment of the wadi (FIG. 16).

Secondly, the attention of the project will be stretched to the realization of a real archaeological basin (FIG. 17) will have as fulcrum Qaṣr al-



16. Wadi al-Usaykhim ten years later after the reconstruction of the dam.



17. Road of the archaeological basin.

Usaykhim and with the epigraphs, the traps and the archaeological emergencies of the area, with the rest of the Bedouin villages that are found on the banks of the wadi.

The creation of the *archaeological basin* of Qaṣr al-Usaykhim means to redeliver a territory to the contemporary society, which lives in the area.

For a best organization it is correct thought about the archaeological basin as agile tool of management in which everybody feel as protagonist of the actions that is required to him for the development of the area of Wādī al-Usaykhim.

In Italy, now, there are Archaeological basins like Cornus, Leopoli-Cencelle and Castro, and not more archaeological park.

Instead the archaeological basin seen logically as the maximum share and the maximum social involvement, it is the proper tool to manage a project and an intelligent planning that involves the residential population, in the same way as the visitors, or the personnel of guardianship, in the same way of the tourist operators.

Jordan already has a lot of experience in this sphere, with the examples of Petra and Wādī Ramm or with the so-called archaeological park in the historical centre of Madaba. In which an open system exists, where the inhabitants freely cohabit with the archaeological heritage. They know the value of the cultural resources, as do the custodians and the true protectors of it.

In Petra and Wādī Ramm, these processes of integrated conservation of the social and economic value are realized in spontaneously. In fact, the intervention of the Bedouin populations have impose their way to converge the social and economic affairs on the cultural and environmental resources.

With all this in mind we recommend creating for Wādī al-Usaykhim not a protected area but an open system in which the Department of the Antiquities of Jordan is the principal holder, that collaborates with the contemporary society and the population of residents, so that together they manage all the actions for the anticipated safeguarding of that territory and for those cultural resources.

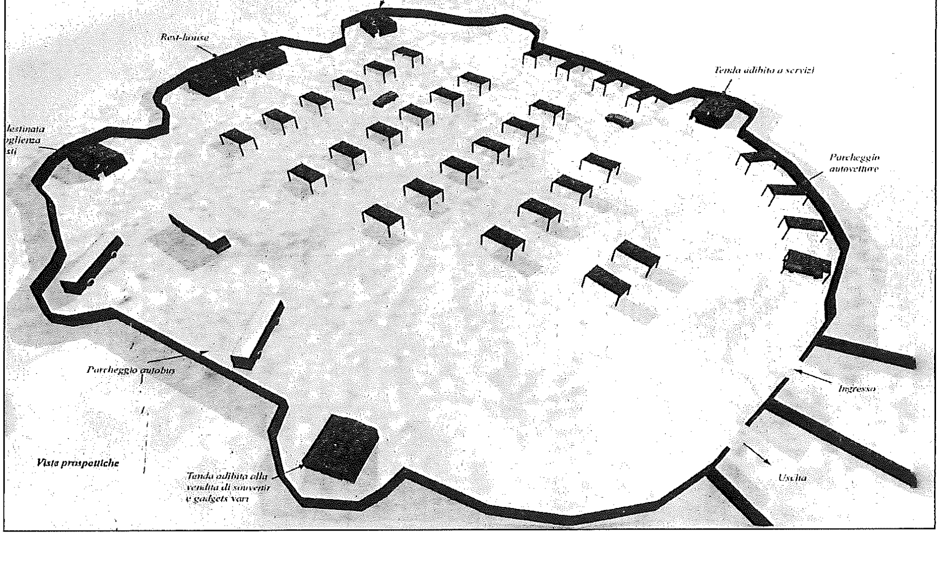
The fruition of the archaeological heritage will involve as a result the necessity to create some special infrastructure for the project, to guarantee the correct management of the archaeological basin. Not forgetting that it will include, besides Qaṣr al-Usaykhim all the other archaeological sites of the area.

Particularly the project foresees the realization of a parking area, where the visitors will leave their own vehicles, motorcars or bus and from which will begin a tour of the area using the Pick-ups of the Bedouin (FIG. 18), that will also act as tourist guides.

The parking area will be developed on a surface of around 459m. square, there will be an area to park the buses and another area designated for motorcars, this last zone will be protected with a series of wooden covers with the same mats used for the Bedouin tent.

This great structure will be inserted in to the environment, and will be realized with traditional constructive and material techniques of the area.

The area of the parking will be built with basalt stones, this solution is inspired by the Bedouin traps



18. Parking Area.

for animals, that are today still present in Wādī al-Usaykhim.

In the service area for the visitors there will be a rest-house tent (FIG. 19), a services tent and another tent for the first reception for the tourists.

Environmental Aspects and Project Hypothesis for the Safeguard of Wādī al-Usaykhim

From the archaeological studies in these regions we have been able to ascertain that the climate has not always been so arid as it is today: this area in fact was populated, even though in irregular way, since the prehistoric times.

We know that in the past the banks of the wadi were rich in vegetation, which is today present in a sporadic way. This guaranteed, in turn the existence of many kinds of animal that were suited to the difficult climatic situation. Besides, there is certainly the presence of different fertile grounds, mainly in the numerous cities of the *limes arabicus* that in the past contributed to making this zone a place of attraction for the nomadic populations.

In the conservation project of the archaeological site of Qaṣr al-Usaykhim we tried to create all the possibilities that would lead to the return of the castle of al-Usaykhim to a place of attraction for the local population.

Water is the principal objective in the project in order to safeguard the whole area.

The program of exploitation of the water resources of Wādī al-Usaykhim is tightly connected to the quantity of water and the economic resources in such an operation. The safeguard plan for the environment of Wādī al-Usaykhim aims to increase the availability of alternative sources of water, among which a priority role is given to the use of the superficial waters, the artificial recharge of the superior water-bearing and stagnation and of maintenance of the water.

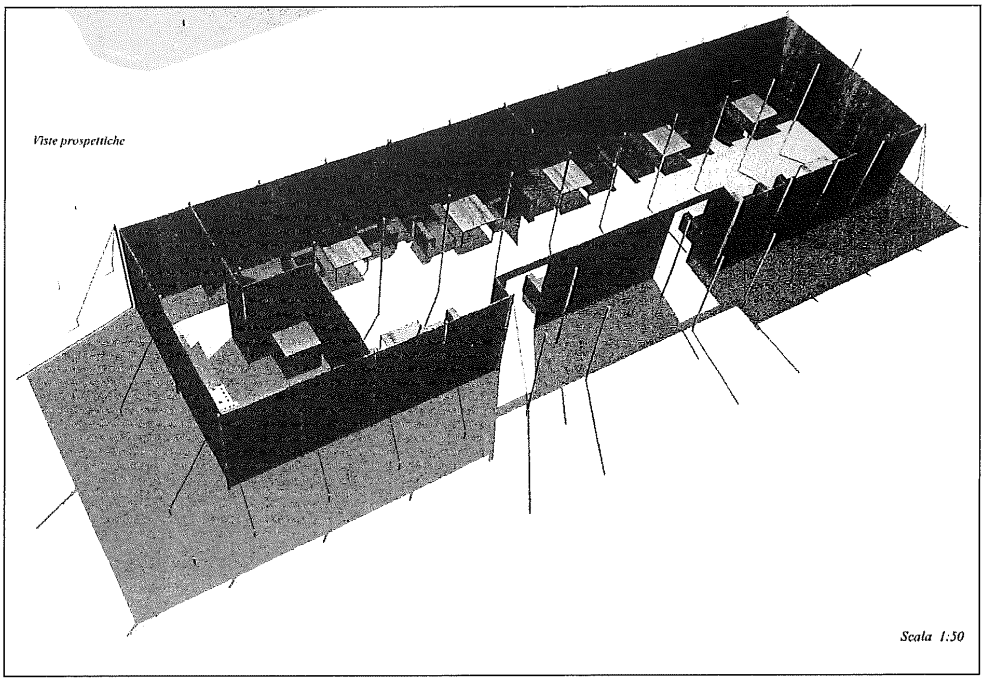
From the history we have learned that the wadi constitutes the motive for the existence of the life in the zone. Instead from the ideological point of view it represents a potential water resource disposition.

Then the principal problem to be avoided is that of the evaporation, with the problem becomes how to best utilise the precious quantities of superficial waters. The excessive exploitation of the available waters in the subsoil has changed the direct needs of the zone.

Our intervention foresees the realization of obstruction in the wadi, located in more points, for limiting the phenomenon of the evaporation to favour the infiltration of the waters in the subsoil. In this way we have created a natural recharge of the superior water-bearing, which will have as the first consequence the reinvigoration of the vegetation.

The recharge of the superior water-bearing, gotten through the obstruction, will allow us to excavate more wells that will constitute the principal water resource.

The wells foreseen by the project will be in low

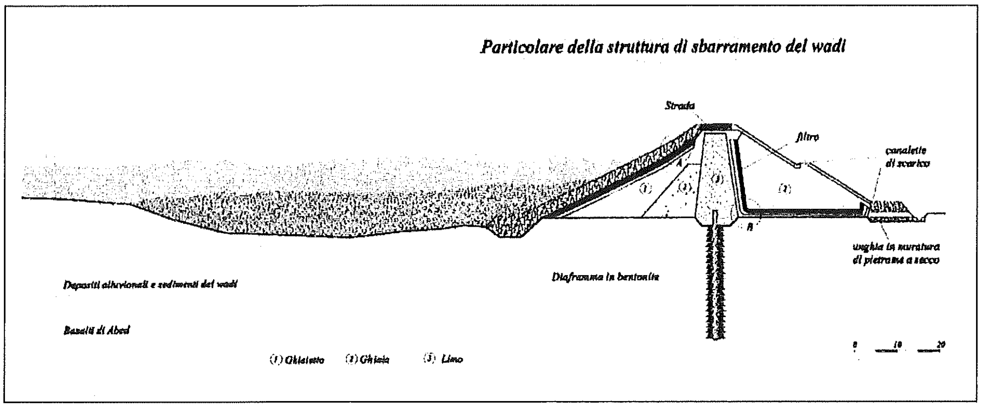


19. Tent of services.

output. There will be three structures of obstruction, constituting small dams, 3m high and around 40m wide, realized with loose materials, with a nucleus of mud and covering in basalt, both are available *in situ*. The choice of this type of structure derives from the necessity to totally integrate them into the environment of the wadi

In order to favour the infiltration of the water, the subsoil of the dam will be endowed with a diaphragm in *Bentonit* (FIG. 20) that will avoid obstructions occurring in the water.

With this intention we have already restored a dame from the Neolithic period to the east of the Roman castle and the Neolithic city. With this restoration we have been able to make green the grounds around the dam, since it holds the water for along time.



20. Section of reconstruction of the wadi.

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الفترة فمادة الصوف متوفرة وأدوات النسج موجودة أيضا.

كما أقام العمونيين الآبار والقنوات وقد ورد ذكر مدينة عمون المائية في التوراة (صموئيل الثاني ٢٦:١٢-٢٧) وأقاموا السدود لحجز المياه في كل من منطقة العميري (LaBinca 1990: 149) وجبل القلعة حيث عثر على الكثير من آبار جمع المياه.

استغلال الطرق التجارية

لقد ساعد موقع المملكة العمونية الاستراتيجي على الطريق التجاري المميز (Herr 1999: 224) على جعلها دولة قوية فاستغلت الأرضي المحيطة بالطريق التجاري من خلال إقامة المباني كمحطات للقوافل على محاور الطرق التجارية مثل تل صافوط (Glueck 1939: 163) وأم الدنانير وتل سيران وجبل الزهور، كما اقيمت المنشآت الصناعية مثل أبو نصير بالقرب من الطريق التجاري القادم من الجنوب إلى الشمال (Abu Shmais 2003: 8)، إضافة إلى تخصيص جزء من المباني لخزن المنتجات الزراعية مثل زيت الزيتون والحبوب مثل موقع المبرك (الزبن ٢٠٠٢: ١٨).

الخلاصة

إن التوازن البيئي الذي اعتمده الإنسان العموني كان متميزا من خلال عدم إزالة الغابات الحرجية واستغلال الأرض الزراعية وإقامة المباني المعمارية على الأراضي الأقل خصوبة والمصاطب الزراعية على المنحدرات الجبلية وزراعة المحاصيل الزراعية الاستراتيجية المربحة مثل الزيتون والعنب وإقامة المعاصر لاستكمال عملية الإنتاج، واستغلال المصادر المائية وبناء السدود والآبار والقنوات، كذلك استغلال الطريق التجاري وإقامة المباني الزراعية والصناعية ومحطات للقوافل.

أحسنت المملكة العمونية استغلال مواردها الطبيعية من خلال الزراعة والتجارة فجنت الكثير من الأموال ويظهر ذلك من مقدار الضريبة التي كانت تدفعه للدولة الآشورية حتى أنها دفعت ٢ مينا من الذهب في حين دفعت جارتها المملكة المؤابية ١ مينا من الذهب.

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خلدا (النجار ١٩٩٢: ٤٢٠) وجبل الزهور (عجاج ١٩٩٣: ٥) والمبرك (الزبن ٢٠٠٢: ١٨) (Younker 1989: 196) جاءت لتؤكد على أن هذه الأبراج تمثل نمطا معماريا ذو استخدامات زراعية وسكنية وصناعية مثل أبو نصير (Abu Shmais 2003: 8) وهذا لا يمنع من وجود استخدام عسكري، إضافة إلى وجود بعض الأبراج في مواقع تفتقر إلى الأهمية الإستراتيجية مثل خربة بدران ورجم الحنو الغربي (Kletter 1991: 39) وحتى مباني تل العميري مقامة على منحدرات وليس لها أهمية استراتيجية (Younker 1989: 195) فقد استطاع العمونيين استغلال الأرض لإقامة هذه المنشآت بشكل متوازن وجاء الاختيار بأشكال متعددة كإقامة المباني بجانب الأراضي الزراعية وعلى التلال والمنحدرات وعلى أطراف الوديان كصوامع لتخزين المنتوجات الزراعية (النجار ١٩٩٢: ٤١٢) أي على الأراضي الأقل خصوبة مثل (خلدا وابونصير والزهور والمبرك ورجم الملفوف الشمالي) وأحيانا في حالات نادرة جداً في وسط الأراضي الزراعية مثل خربة المضمار في سهل البقعة، ولكن كل هذا فرضته ضرورة تنظيم المجتمع الزراعي (MacGovern1992:180) لان سهل البقعة منطقة واسعة ومفتوحة من عدة جهات كمباني تل العميري (Herr 1999: 233) ومن أمثلة إقامة العمائر على محاور المواصلات والطرق التجارية مستوطنة أم الدنانير وتقع على الطريق الذي يتجه نحو الغرب إلى الأغوار (MacDonald 1994:58) وتل صافوط (Glueck 1939:168) وخربة الحجار ذات الموقع المميز على الخط التجاري القادم من الجنوب إلى الشمال (Thompson 2000: 483).

إن طريقة بناء هذه العمائر تعطينا دلائل واضحة على الكيفية التي تعامل بها العمونيين مع البيئة المحيطة فاستخدموا الحجارة المتوفرة كالحجارة الصوانية الضخمة وغير المشذبة المتوفرة على السطح بكثرة في كل من أم صويوينية (الزهور) ورجم الملفوف الشمالي وخلداء والحجارة الكلسية مثل قصر الوسيه (Glueck 1939: 156)، أو صوانية وكلسية معاً مثل مبنى خلدا الشرقي (المومني ١٩٩٦: ٧٧)، إضافة إلى استخدام الصخر الطبيعي كأساسات لهذه المباني (MacDonald 1994: 58).

كما أقام العمونيون المباني بالقرب من مصادر المياه مثل مدينة المياه العمونية التي أشارت لها التوراة (صموئيل الثاني ١٢:٢٦-٢٧) وخربة الحجار التي تشرف على التقاء سيل حسبان مع مياه الكفرين (Thompson 2000: 483).

ومجمل القول إن الأبراج العمونية والبالغ عددها ١٣٠موقعا (المومني ١٩٩٦: ٩٣) تظهر كوحدات سكنية منتجة وتتمتع بنوع من الاكتفاء الذاتي ضمن نمط سكني يوازن ما بين الأرض ومتطلبات الإنسان الأساسية.

استغلال الأراضي للزراعة

"الكرم والحدائق وقناة الماء والآبار – فليفرح ويبتهج بأيام عديدة وسنين مديدة" كلمات نقشت على قارورة تل سيران (Zayadine and Thompson1989: 170, 1973: 129-130) لتعبر عن الاستغلال الأمثل للمياه ومهارتهم في الزراعة وهذا ربما عائد لأصولهم الشمالية (Grimal 1995: 222-250). حيث كانت الزراعة تقوم على استغلال منابع المياه والأراضي الصالحة للزراعة وإزالة بعض الأجزاء من الغابات لزيادة رقعة الأراضي الزراعية، فأراضي المملكة العمونية واستنادا إلى نوعية التربة ونسبة هطول الأمطار قد زادت من نسبة الأراضي الصالحة للزراعة، إضافة إلى الغابات الحرجية مثل أشجار الصنوبر والبلوط التي كانت تغطي بعض أجزاء الأراضي العمونية (Geraty 1989: 195).

لقد عرف الإنسان القديم عملية الاندماج ما بين البيئة المحيطة واحتياجاته (Geraty 1989: 40) وأثبتت الدراسات الأثرية على أن الإنسان العموني لم يقم بإزالة الغابات الحرجية لزرع الأشجار المثمرة بل على العكس زرع الأشجار المثمرة داخل الغابات الحرجية (Geraty 1989: 37)، فهذا استغلال بيئي متميز.

كما استغل العمونيون الأراضي المنحدرة والوديان بإقامة المصاطب الزراعية التي تحافظ على المياه والتربة من الانجراف (Herr 1997: 354) فانتشرت المصاطب الزراعية بشكل واسع في العصر الحديدي الثاني (Christopherson 1996: 6).

كما انتشرت زراعة المنحدرات والجبال بالأشجار المثمرة مثل العنب والزيتون، فقد أثبتت الدراسات الأثرية على أن زراعة الزيتون كانت مزدهرة في العصر الحديدي الثاني حيث بلغت نسبة بقايا الزيتون ٧٥٪ من مجمل البقايا النباتية التي عثر عليها في محيط منطقة حسبان (LaBianca 1990: 146) أما العنب فقد كان إنتاجه أكثر من حاجة المجتمع المحلي وكان يصدر على شكل نبيذ (Geraty 1989: 196) وفي نهاية العصر الحديدي الثاني دفعت المملكة العمونية الضريبة المفروضة عليها إلى البلاط الفارسي على شكل نبيذ (Herr 1999: 233)، وفي خلدا عثر على كميات من بذور العنب والزيتون (النجار ١٩٩٢: ٤١٤).

كما عثر على العديد من المعاصر في كل من خلدا (النجار ١٩٩٢: ٤١٨) وتل العميري وحسبان، إضافة إلى انتشار جرار النبيذ المختومة والمعدة للتصدير (Herr 1999: 232).

أما المناطق السهلية فقد زرعت بالحبوب مثل العدس والقمح والشعير (Geraty1989: 196) .

الإنتاج الحيواني: إن الدراسات العلمية التي تمت في حسبان والعميري ومحيطيهما على مخلفات العظام الحيوانية، دلت على وجود عدد كبير من الحيوانات الأليفة والماشية (LaBinca 1990: 145; Geraty 1989: 197) كما عثر أيضا على عدد كبير من ثقالات المغازل في مواقع العصر الحديدي الثاني (Abu-Shmais 2003: 6) مما يظهر ازدهار صناعة النسيج في هذه

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دائرة الآثار العامة

جهاد اسماعيل هارون

العمونيون: استغلال الأراضي في العصر الحديدي الثاني

مقدمة

لقد سطر العمونيين ذكراهم في الكثير من المخلفات التي تركوها لنا والتي تمثل بعضا من أصولهم، لغتهم، حياتهم الاجتماعية والاقتصادية، فالغموض لا يزال يكتنف بعض هذه المخلفات. فقد ورد ذكر العمونيين في التوراة بحوالي (١٠٦) موضع (Block 1984: 198) فتحدثت عن أصولهم وحروبهم وأسماء ملوكهم، فدلالة اسم بني عمون الواردة في التوارة هي أثنية ولكنها تمثل دليلا واضحا على دور العمونيين الحضاري في إثبات وجودهم (المومني ١٩٩٦: ١٠). في حين جاءت المصادر الآشورية – البابلية لتلقي بعض الضوء خاصة منذ حكم شلمناصر الثالث ٨٥٨-٨٢٤ ق.م (أبوطالب ١٩٧٨: ٨٠)، إضافة إلى الكتابات العمونية وهي قليلة نوعا ما لكنها سلطت الضوء على تاريخ العمونين.

فالمصادر التاريخية اختلفت حول أصولهم ولكن الشواهد تؤكد بداية استقرارهم حول منابع نهر الزرقاء بعد قدومهم من شمال سوريا هربا من الاضطرابات التي حدثت خلال القرنين الرابع عشر والثالث عشر ق.م، واختيارهم لمنطقة حوض نهر الزرقاء هو دليل على وجود تجارب زراعية وتجارية تمتعوا بها من قبل (Grimal 1995: 222).

جغرافية أراضي المملكة العمونية

إن الأراضي التي امتدت عليها المملكة العمونية كانت متميزة بتنوعها الجغرافي والمناخي كالجبال والوديان والسهول وحتى أجزاء من الأغوار. فحدودها من نهر الزرقاء شمالا وحتى أطراف مأدبا جنوبا إلى تل المزار غربا. إن حدود المملكة العمونية لا زالت غير معروفة فبعض الباحثين يعتقدون بأن الحد الجنوبي وصل إلى منطقة الوالة (Herr 1999: 221) فهي تحوي أراض خصبة كانت مدعاة لاستقطاب العمران (البحيري ١٩٩٤: ٦١) إضافة إلى وفرة الأمطار فقد جرت المياه في بعض أودية المنطقة وأكبرها نهر الزرقاء (البحيري ١٩٩٤: ٦٢). أما عن الحالة المناخية فقد كانت شبه مستقرة منذ العصر الحديدي، فنسب هطول الأمطار تتراوح ما بين ٣٠٠ – ٥٠٠ملم (Herr 1997: 354).

أما التربة الأكثر انتشارا في المملكة العمونية فهي تربة البحر المتوسط الحمراء (Terra Rosa) وهي تتميز بقدرتها على الاحتفاظ بالمياه والرطوبة لأطول فترة ممكنة وتصلح للزراعة (LaBianca 1986: 57).

الحالة السياسية والعسكرية خلال العصر الحديدي الثاني

إن سيطرة الدولة الآشورية وبسط نفوذها على مناطق شاسعة رغبة منها في الحفاظ على محاور المواصلات والطرق التجارية، إضافة لانقسام مملكة إسرائيل الموحدة والتي كانت تشكل عاملا لعدم الاستقرار في المنطقة، فرض هذا نوعا من الاستقرار السياسي والعسكري خلال العصر الحديدي الثاني، فدان ميزان القوى للآشوريين في هذه الفترة، فجاء الازدهار الاقتصادي المربوط دائما بالاستقرار السياسي، وأبلغ دليل على هذا الازدهار هو دفع المملكة العمونية ٢ مينا من الذهب كضريبة للدولة الآشورية (Oppenhiem 1974: 301).

فاستغل العمونيين هذه الحالة المتميزة باتجاهات مختلفة مجملة بما يلي:

- زيادة رقعة الأراضي الزراعية.
- إقامة المنشآت العمائرية بكافة أشكالها.
- الاهتمام بزيادة الإنتاج الزراعي وتربية المواشي.
- زيادة النشاط التجاري.

استغلال الأرضي

جاء استغلال الأراضي في مملكة عمون بأشكال متعددة منها الاستغلال الزراعي والسكني والتجاري والمائي.

فالنمو المفاجئ في أعداد السكان والازدهار الذي شهدته فترة العصر الحديدي الثاني (LaBianca 1990: 137) قد رافقه ازدياد في المنشآت المعمارية بدءا من ربة عمون المدينة الملكية التي ورد ذكرها في التوراة (صموئيل الثاني ١٢:٢٦-٢٧) ومرورا بما عرف بالأبراج العمونية الدائرية والأبنية المربعة والتي أختلف العلماء بتأريخها، فمنهم من أعادها إلى العصور الحجرية (Mackenzie 1911: 38) والآخر إلى العصر الروماني (Condor 1889: 111-112). في حين أظهرت التنقيبات الأثرية التي جرت في عدد من مواقع هذا النمط المعماري أن إطارها الزمني يمتد من نهاية العصر الحديدي الأول إلى العصر الحديدي الثاني (Younker 1989: 196; Yassine 1988: 14-17) و(النجار ١٩٩٢: ٤٢٠).

وجاء الاختلاف الثاني حول ماهية استخدام هذه الأبراج وهل هي عسكرية دفاعية أم سكنية زراعية؟ ولكن الاكتشافات الحديثة في

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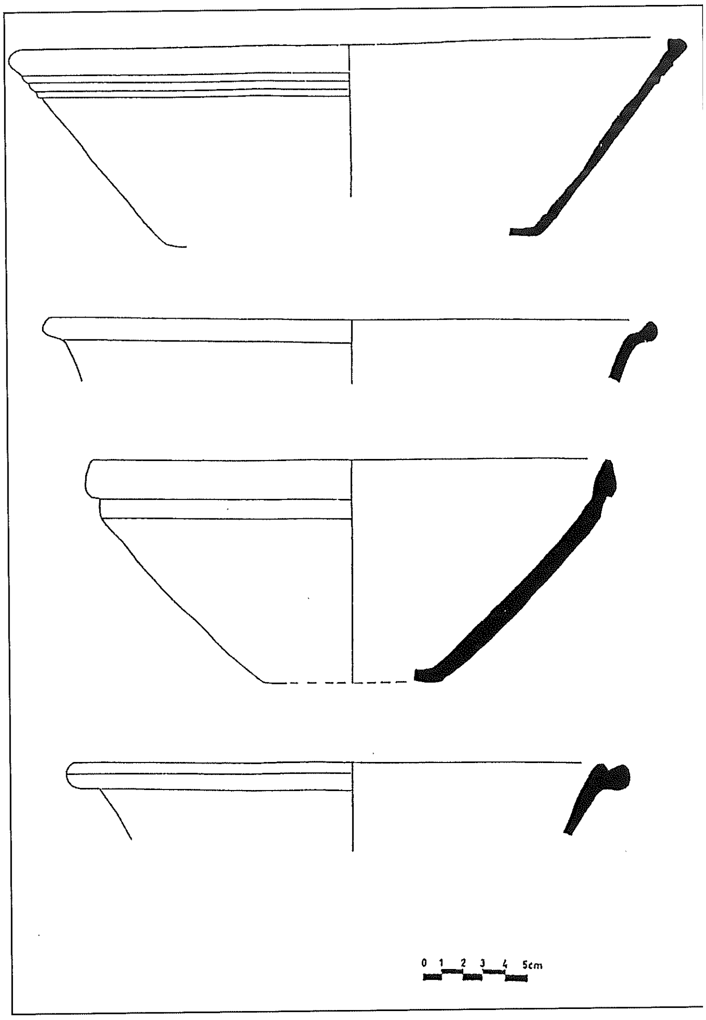

٣. زبادي فخارية متوسطة من العصر الروماني.

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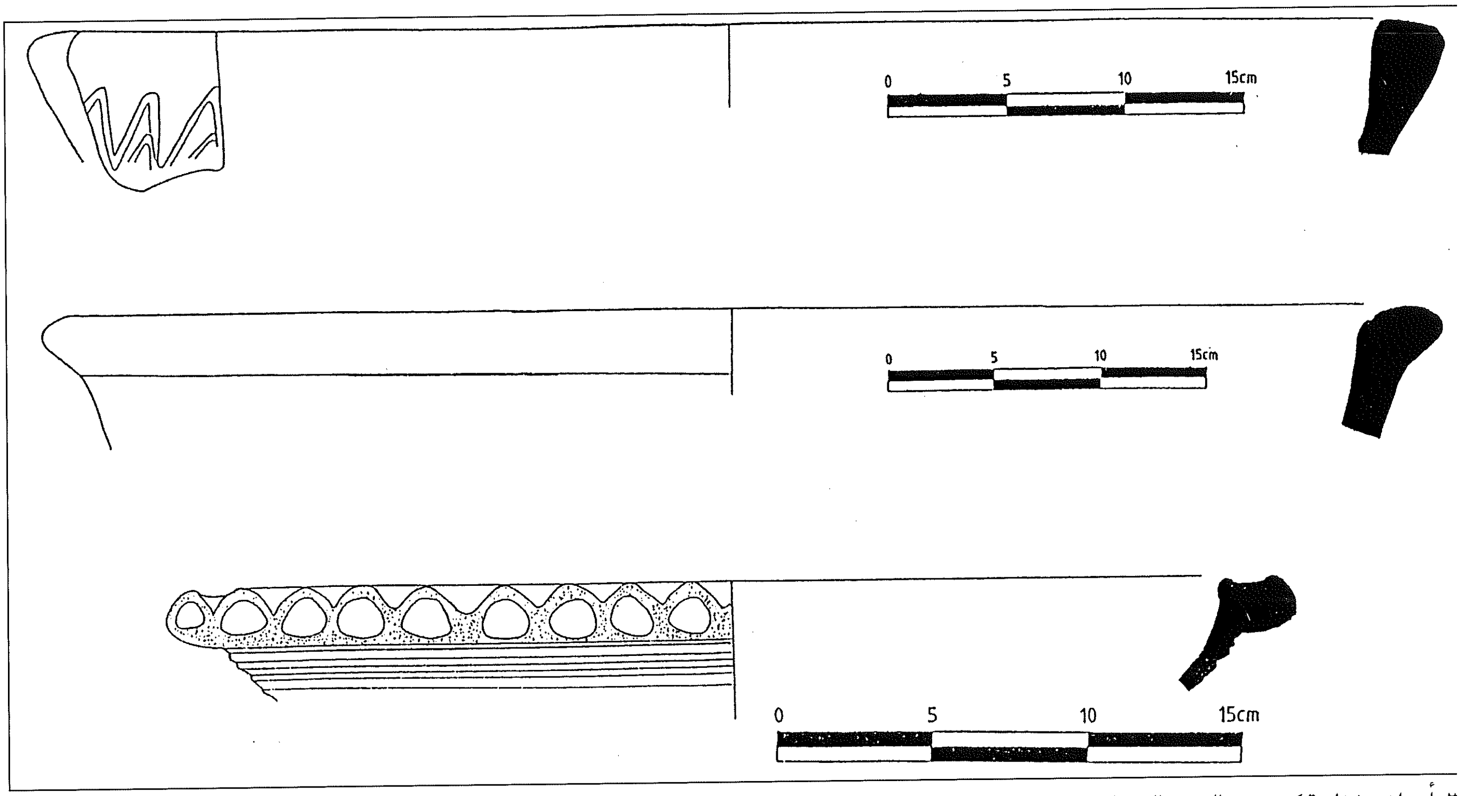
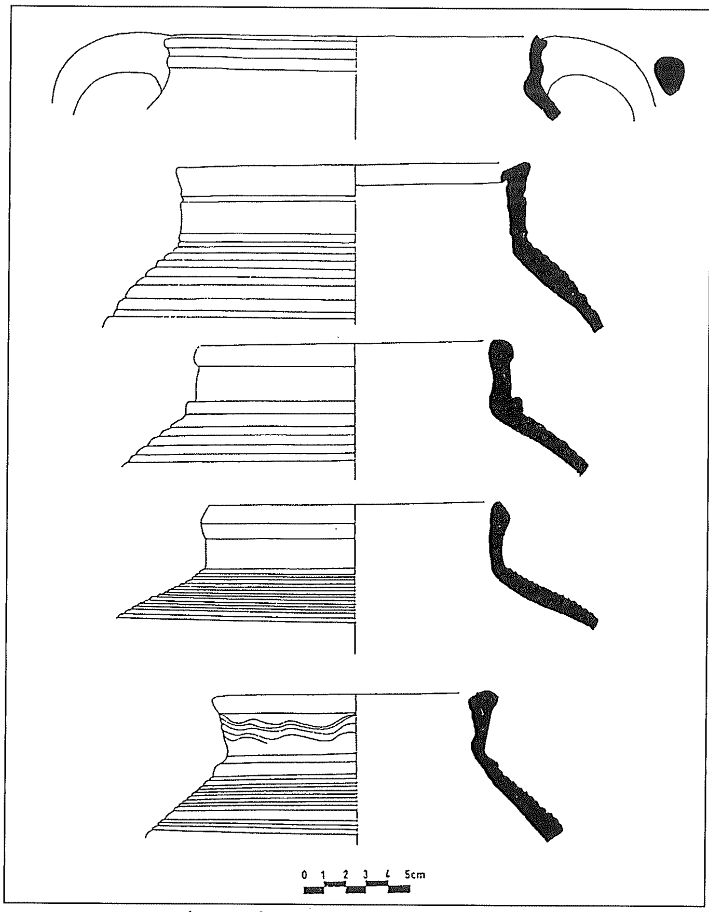
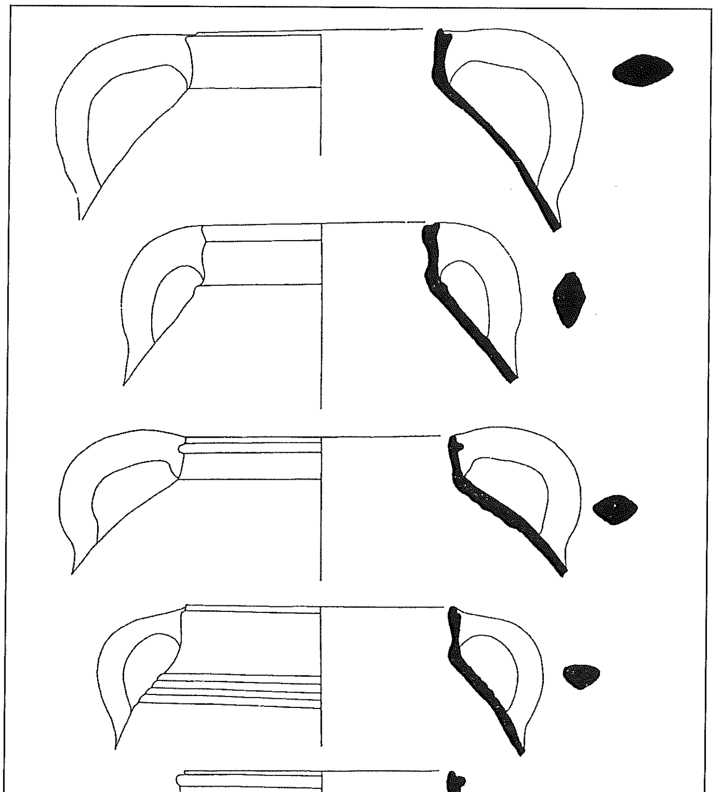


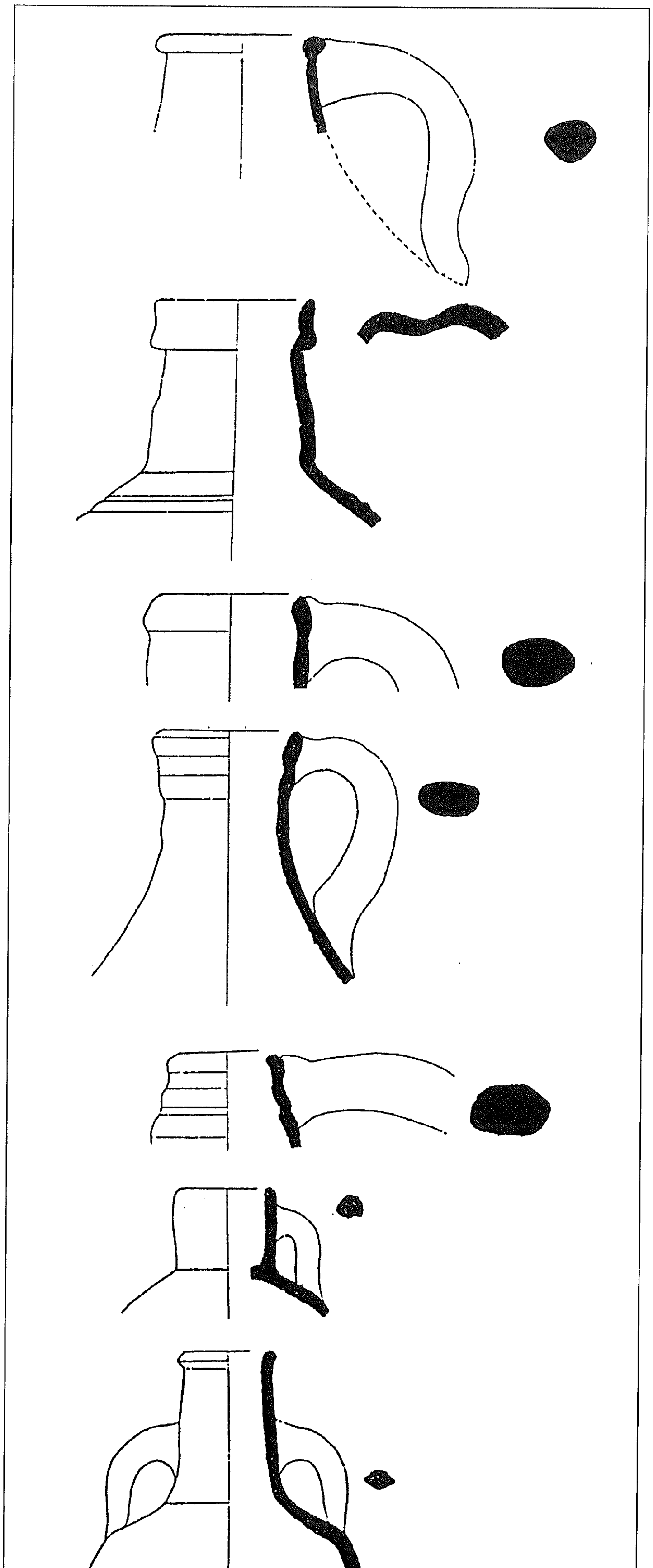
٢. أحواض فخارية كبيرة من العصر الروماني.



٣٣. جرار فخارية كبيرة للتخزين من العصر الروماني بأشكال وأحجام مختلفة.

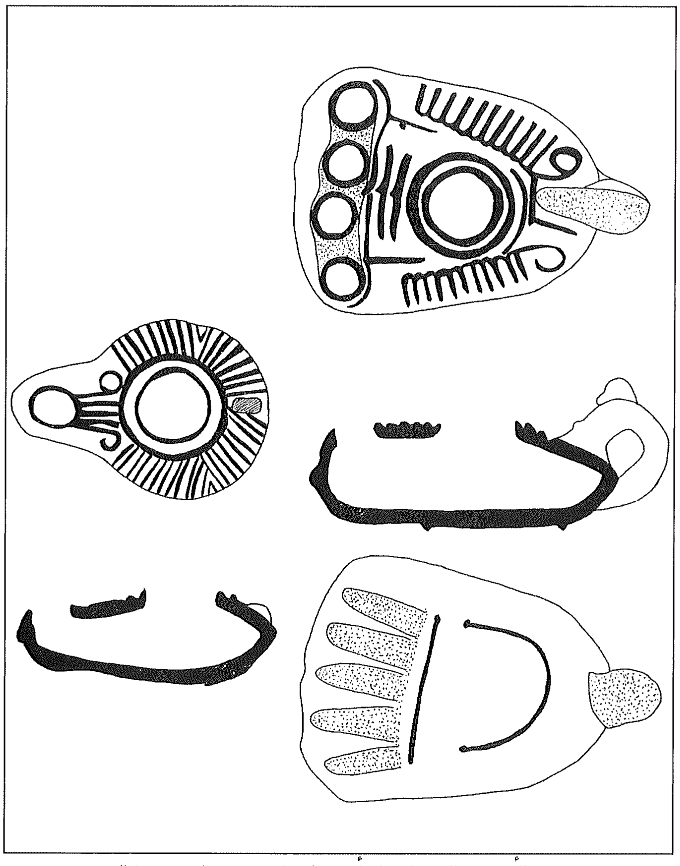


٣٤. قدور فخارية / آنية طبخ من العصر الروماني.

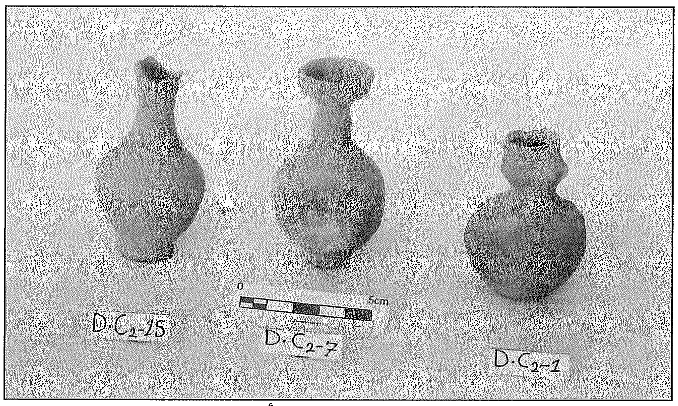


٣٥. أباريق فخارية بأحجام وأشكال مختلفة من العصر الروماني.

٢٩. رسم للمسكوكات البرونزية المكتشفة في موقع الحييض



٣١. نوع متميز من الأسرجة الرومانية المتأخرة التي كشف عنها في خربة الحييض يحتوي على أربع فتحات للفتيل وأسفله زخرفة لشكل يد بشرية بارزة.



٣٢. قوارير فخارية صغيرة تعود للفترة الرومانية المتأخرة.

٣٠. المسكوكات البرونزية المكتشفة في موقع الحييض.

٢٧. أثر الزلزال في موقع الحييض الوحدة السكنية الثالثة الحجرة الثانية الجدارين الشمالي والغربي إذ ينحرفان عن أساس البناء بشكل منحني ومتهدم.

٢٨. أثر الزلزال في موقع أبو النسور الحجرة السادسة وجدت العقود والألواح الحجرية ملقاة على الأرض كما هي بترتيب وانتظام.

وجود دليل مقنع يعلل أسباب الهجران حيث يذكر Fiema إنه منذ القرن الأول قبل الميلاد وحتى بداية القرن الثالث الميلادي كان هناك تطور إداري واضح انعكس على جنوب الأردن من خلال السياسة والاقتصاد، مما أدى إلى ازدهار المواقع الواقعة على شبكة الطرق الرومانية ولكن في القرن الثالث الميلادي بدأ الاهتمام بالمنطقة يقل بالتدريج فانقطع وصول الإمدادات من العاصمة مما أدى إلى تخلي السكان عن مواقعهم شيئاً فشيئاً إلى أن هجرت تماما، ويؤكد أنه مع قدوم الفتح العربي الإسلامي للمنطقة كانت المواقع خالية من السكان (Fiema 1992: 328-330)

فلماذا كانت المنطقة خالية من السكان؟ وللإجابة على الأسئلة السابقة المتعلقة بأسباب هجر المواقع وخلوها من السكان، فإن الحروب البيزنطية – الفارسية كان لها أكبر الأثر في ذلك، ومنذ القرن الثالث الميلادي بدأت التجارة الرومانية عبر البحر الأحمر بالاضمحلال نتيجة ظهور المنافسة الفارسية، وكذلك سيطرة الفرس على اليمن والجزيرة العربية مما جعلهم يسيطرون على طرق التجارة (غوانمة ١٩٨٤: ٦٥)، وبالتالي دفعت هذه العوامل إلى التخلي عن المنطقة والبحث عن طرق تجارية أخرى، فأهملت هذه المواقع بالتدريج إذ كان أهل المنطقة يستفيدون من حركة التجارة المارة من أراضيهم وبعد أن تخلى البيزنطيون عن هذه الطريق غادر السكان المنطقة. وأختلف مع Fiema في أن المنطقة لم تكن مهمة بالنسبة للبيزنطيين وأنها هجرت لضعف وصول الإمدادات وإذا كان ذلك صحيحا فكيف تفقد منطقة حيوية أهميتها بهذه السهولة إذا علمنا مدى الأهمية التى أولاها الرومان ومن بعدهم البيزنطيون لهذه المنطقة.

المكتشفات والمعثورات

لقد عثر على مسكوكات برونزية يعود تاريخها إلى الفترة الرومانية المتأخرة بداية القرن الرابع الميلادي من خلال مسكوكات قسطنطين الأول ٣٠٧-٣٣٧م، وكنستانتيوس الثاني ٣٣٧-٣٦١م، وفالنتين ٣٧٥-٣٩٢م، وأركاديوس من ٣٨٣-٤٠٨م. تميزت المسكوكات بظهور خمس دور ضرب هي إنطاكية وسيساك وسالونيك وأرلس والإسكندرية (الشامي ١٩٩٩: ٤١-٤٥) (**الشكل ٢٩ و٣٠**). امتازت المكتشفات الفخارية بتنوعها فوجدت أسرجة فخارية كاملة يرجع تاريخها إلى القرنين الرابع والخامس الميلاديين أهمها سراج كامل يحتوي على أربع فتحات للفتيل وأسفله زخرفة لشكل يد بشرية بارزة (**الشكل ٣١**) .

وقوارير فخارية صغيرة (**الشكل ٣٢**)إضافة إلى الكسر الفخارية التي تمثل جرار وآنية طبخ وأباريق وزبادي وأحواض (**الشكل ٣٣-٣٧**).

الخلاصة

لقد تميز الاستيطان الروماني في منطقة رأس النقب بنمط سكني / مدني وعسكري، إذ اشتمل الاستيطان المدني أنماط زراعية ورعوية وتجارية / صناعية، صنفت مواقع رأس النقب إلى أنماط استيطانية مركبة نسبيا تعتمد في اقتصادها على موردين الأول رئيسي وآخر مساعد كما الحال في موقعي الحييض وأبو النسور، إذ تعتمد جميعها على الزراعة الرعوية والتجارة الداخلية بسبب قربها من الطريق الروماني. وتبدو بعض المواقع ذات نمط استيطاني مزدوج عسكري ومدني كما في أبو النسور وعين جمام إذ أقيمت فيها عمارة مدنية زراعية سكنية موقعها ذو طابع عسكري، بالإضافة إلى وجود برج مراقبة في كل منهما يشرفان على موقع الحميمة لحماية مصادر المياه في المنطقة مثل عين جمام، عين أبو النسور وعين الشراه.

لقد تعرضت المنطقة لعدد غير قليل من الزلازل التي أثرت على مواقع جنوبي معان فالزلازل التي حدثت في القرن الخامس أدت إلى تدميرها ويظهر ذلك في موقع الحييض وكذلك وجدت بقايا السقف في كافة المواقع ساقطة بانتظام بحيث يسهل إعادة بنائها، يشير ذلك أن هذه المواقع هجرت قبل تدميرها بفعل الزلازل.

أكدت قراءة المسكوكات تأريخ استيطان المنطقة في العصر الروماني إذ يعود تاريخها إلى الفترة الرومانية المتأخرة.

لأمثلة المشابهة للعمارة الرومانية المكتشفة

لقد تم مقارنة عمارة رأس النقب في كل من الحييض وأبو النسور عين جمام مع موقع الزنطور داخل مدينة البتراء، فهو من المواقع شابهة تماما من حيث المخطط والوظيفة السكنية مع الحييض وأبو نسور وعين جمام ٣/٢ فوجد في موقع الزنطور أرضيات مبلطة تلك التي وجدت في الحييض. ويشترك موقعا أبو النسور والزنطور وجود ساحات تقع في أبو النسور أمام الحجرتين (١٠-١١) Stucky *et al.* 1995: fig.3)، ووجد في الزنطور أمثلة مشابهة لطوابين التي وجدت في كل من الحييض وأبو النسور وعين مام /٢ بالإضافة لوجود تشابه في التقسيمات المعمارية لتلك لواقع مع موقع الزنطور أيضا من حيث عدد الحجرات والممرات Stucky *et al.* 1992: fig. 1-2) ويرجع تاريخ البيوت السكنية ي موقع الزنطور إلى بداية القرن الرابع الميلادي، حيث ضم البيت لأول الحجرات ذوات الأرقام (١،٢،٣،٦) والبيت الثاني ضم الحجرات ٥،٧،٨،٩،٢٧) وتشبه هذه المساحة والتقسيمات عمارة الحييض وأبو نسور وعين جمام وأرخت لنفس الفترة استنادا إلى الدليل الأثري من لسكوكات والمخطط المعماري في هذه المواقع المشابهة لعمارة الزنطور اخل مدينة البتراء (Bernhard *et al.* 1993: pl.5-6) وقد تم بليط أغلب الأرضيات في موقع الحييض ببلاطات حجرية كلسية مشذبة أحيانا كانت الأرضية تغطى بطبقة من البلاستر خاصة في الأحواض، بيث وجد مثال مشابه في الزنطور (Stucky *et al.*1995: pl. 1) في الحميمة وجد مثال مشابه للأرضيات الحجرية Oleson *et al.* 1995: 322-327)، وعثر بالإضافة لذلك في حميمة على أمثلة مشابهة للطوابين التي وجدت في الحييض وجمام/٢، رخت في الحميمة للقرن الثالث (Oleson *et al.* 1993: 479).

لطريق الروماني في منطقة رأس النقب

بعد أن ضم الرومان المملكة النبطية عام ١٠٦م، أعيد بناء شبكة لطرق في مستهل حكم تراجان بين العاصمة العربية بصرى في حوران ومدينة العقبة، وانجز المشروع بين عامي ١١١م-١١٤م Graf 1995: 1)، إن امتداد هذا الطريق بين بصرى والبتراء في جنوب لأردن يدل دلالة أكيدة على وجود علاقات بين مدن الولاية الرومانية لشرقية، فكانت القوافل التجارية تمر عبر البتراء إلى غزة وتستمر إلى لشاطئ المصري للاستفادة من البضاعة المصرية ثم تستمر شمالا إلى لبحر المتوسط (Bowersock 1983: 156). يعد هذا الطريق من أهم لعناصر الرئيسية فكان يصل إلى عدد من المدن الرومانية، فازدادت همية هذا الطريق في نهاية القرن الثالث الميلادي، وليس عجيبا أن كون خريطة الطريق الروماني معروفة جيدا في القرن الرابع الميلادي لذي يظهر مبادئ خطوط الاتصالات من العقبة عبر صحراء النقب في لسطين (Aharoni 1954: 9)، حملت حجارة المسافات عبارات تمجد سم الحاكم واسم المقاطعة، واستخدم منها ٢٠٠من حجارة المسافات بين بصرى والبتراء تحتوي على كتابات يونانية تؤرخ هذا الطريق. ومن الملاحظ أن الجزء الجنوبي من الطريق يساوي ٣٠ ٪ من الطريق الكلي، وكشفت حجارة مسافات جديدة زاد عددها على الأربعين عمودا موجودة جنوب الولاية الرومانية من مسار الطريق بالإضافة للكشف عن طرق فرعية ونقاط تفتيش ومراقبة لهذه الطريق، وأرخت هذه الأعمدة ابتداء من عهد تراجان على عهد قسطنطين (Graf 1995: 1) ، لقد تم تتبع الطريق الروماني في جنوب الأردن وتحديدا في منطقة رأس النقب عند خربة طاسان، ثم إلى خربة سويمرة مرورا بخربة القرين وخربة القناة ثم خربة الصدقة باتجاه الطريق المؤدي إلى العقبة (**الشكل ٢**) (Musil 1926: 53)، تتضح أهمية هذه المنطقة من البتراء إلى العقبة في العصر الروماني، إذ أرخت حجارة المسافات في هذه المنطقة إلى القرون الثاني والثالث والرابع الميلادية، تعد الطريق المرصوف في هذا الجزء من أحسن الطرق الموجودة حتى الآن وهذا أدى إلى استمرار العمل على هذا الطريق في الفترة الرومانية المتأخرة والعصر البيزنطي، فطورت ممرات ومسارات فرعية أخرى لهذا الطريق لتتماشى مع حجم نمو الاستيطان البيزنطي في هذه المنطقة (Graf 1995: 12-17) لذلك فانتشار القلاع والحصون ونقاط المراقبة والاستراحات على هذا الطريق التي ارتبطت ببعضها بشبكة من الطرق وتنحدر باتجاه الجنوب من عاصمة المقاطعة بصرى حتى العقبة تعكس مدى النشاطات الاقتصادية بالتجارة والنشاطات العسكرية المتمثلة بحركة تمركز الجيوش على هذا الطريق (Parker 1976: 19).

أسباب هجران مواقع منطقة رأس النقب

أظهرت التنقيبات في هذه المواقع أن هناك طبقة ردم من التراب والحجارة بارتفاع ١م، ويعلوها حجارة العقود والجدران والألواح الحجرية التي كانت تشكل السقف، فالسؤال المفروض كيف دمرت هذه المواقع؟ وهل دمرت ثم هجرت؟ أم أنها هجرت ثم دمرت؟ وللإجابة عن هذا السؤال ينبغي الاستعانة بالدليل الأثري في هذه المواقع. لقد دمرت بفعل عدد من الزلازل التي ضربت المنطقة حيث سجلت شواهد زلزالية في مدينة البتراء في منتصف القرن الرابع الميلادي عام ٣٦٣م (Rassell 1980: 47) وربما أن هذا الزلزال لم يؤثر على منطقة رأس النقب مع وجود الدليل على حدوث زلزال فيظهر ذلك في موقع الحييض الوحدة السكنية الثالثة الحجرة الثانية الجدارين الشمالي والغربي حيث ينحرفان عن أساس البناء بشكل منحن ومتهدم (**الشكل ٢٧**) ويتضح أن هذه المواقع قد دمرت بفعل زلزال ضرب المنطقة ربما بعد القرن الخامس الميلادي، وللإجابة عن السؤال السابق نتناول الدليل الأثري من موقع الحييض الوحدة السكنية الثالثة الحجرة الخامسة، وأبو النسور الحجرة السادسة حيث وجدت العقود والألواح الحجرية ملقاة على الأرض كما هي بترتيب وانتظام (**الشكل ٢٨**)، مما يؤكد أن المواقع هجرت قبل حدوث زلزال، ولم تكن عملية انهيار المباني مفاجئة للسكان إذ لم يعثر على هياكل عظمية أسفل أنقاض المباني، فلماذا هجرت المنطقة؟ لابد من

عددا من الحجرات، فالقسم الجنوبي يشتمل على ست حجرات، أما القسم الشمالي فقد احتوى على ممرات وحجرات عددها خمس حجرات (**الشكل ٢٥**).

القسم الجنوبي: الحجرة الأولى مساحتها ٤,٣٠ × ٤,١٠م، مربعة الشكل، مدخلها بعرض ٧٥سم، سقفت بنظام العقود إذ وجد بقايا عقدين، الأرضية ترابية. الحجرة الثانية مساحتها ٤ × ٣م، مستطيلة الشكل مدخلها بعرض ٨٥ سم، واتبع نظام العقود في تسقيف الحجرة حيث وجد بقايا عقدين كانا يحملان السقف، لم يعثر على أرضية مبلطة بل أرضية ترابية.

أما الحجرة الثالثة فمساحتها ٥,٢٠ × ٤,٢٠م، مستطيلة الشكل واتبع نظام العقود في تسقيف الحجرة حيث وجد بقايا عقدين كانا يحملان السقف ووجدت الألواح الحجرية التي كانت تغلق المسافة بين العقدين وجدران الحجرة، لم يعثر على أرضية مبلطة بل أرضية ترابية. كما عثر على مسكوكة برونزية وبعض القطع الصدفية. أما الحجرة الرابعة فمساحتها ٣,٩٠ × ٢,٦٠م، مستطيلة الشكل مدخلها بعرض ٧٠سم، سقفت بنظام العقود إذ عثر على بقايا دعامة من العقد ما زالت في مكانها، الأرضية ترابية، استخدمت الحجرة للخزين. أما الحجرة الخامسة فمساحتها ٥,٦٥ × ٤,٢٠م، مستطيلة الشكل مدخلها بعرض ٨٥سم، سقفت الحجرة بثلاثة عقود، الأرضية ترابية عثر فيها على طابون قطره ٣٠سم متهدم كليا. أما الحجرة السادسة فمساحتها ٤,٢٥ × ٤,١٠م، مدخلها بعرض ٨٥سم، اتبع نظام العقود في التسقيف فوجد عقدان تقابلان من الحجارة المشذبة ووجدت على الأرضية ألواح حجرية لتغطية السقف، والأرضية ترابية.

القسم الشمالي: يفصل بين القسم الشمالي والقسم الجنوبي ممر طوله ٩م، بعرض متفاوت من الجهة الشرقية ٢,٤٠م، ومن الجهة الغربية ١م، ولا يوجد أي مدخل للحجرات يطل على الممر، أما الحجرة السابعة فمساحتها ٤,٢٠ × ٣,٨٥م، مربعة الشكل، لم يظهر بقايا للعقود التي كانت تحمل السقف ولكن وجد عدد كبير من الحجارة الساقطة بداخلها والتي يمكن أن تكون من حجارة العقود التي كانت تحمل السقف، الأرضية ترابية . وإلى الجنوب من هذه الحجرة وجد ممر يفضي للحجرة الثامنة مغلق من جميع الجهات مساحته٦,٨٠ × ١م. الحجرة الثامنة مساحتها ٥,٥ × ٢م، مستطيلة الشكل، مدخلها ترك بعرض جدارها الجنوبي المفتوح على الممر، لم يظهر بقايا للعقود التي كانت تحمل السقف ولكن وجد عدد كبير من الحجارة الساقطة بداخلها والتي يمكن أن تكون من حجارة العقود التي كانت تحمل السقف، الأرضية ترابية. أما الحجرة التاسعة فمساحتها ٣ × ٢م، مستطيلة الشكل، لم يكتمل العمل بها وهي تمثل خزان ماء، غطيت الجدران بطبقة من الملاط الكلسي، الأرضية مبلطة ببلاطات حجرية كبيرة الحجم مستوية مغطاة بطبقة من الملاط الكلسي لمنع تسرب المياه (**الشكل ٢٦**). أما الحجرة العاشرة فمساحتها ٣,٣٥ × ٢,٢٠م، مستطيلة الشكل، مدخلها بعرض ٨٠سم، لم يظهر بقايا للعقود التي كانت تحمل السقف، الأرضية ترابية

٢٦. الجدار الشمالي لخزان ماء في موقع أبو النسور غطيت الجدران بطبقة من الملاط الكلسي.

عثر فيها على بقايا قمح وشعير متفحم وقشور ثمار اللوز، ربما يكون هذا البناء قد استخدم كبرج مراقبة لأغراض عسكرية فهو يشرف على الوادي المؤدي إلى الحميمة (الشامي ١٩٩٧: ٤٨-٥٧).

مواد البناء

لقد تعددت مواد البناء المستعملة في تشييد هذه المباني وهي كما يلي

١- الحجر: وهو عنصر رئيسي استخدم بشقيه الكلسي والصواني، فالحجارة الكلسية كبيرة الحجم ومشذبة بإتقان استخدمت في بناء العقود والمداخل والأدراج والعتبات، وفي بناء الواجهة الخارجية للوحدة الثالثة في الحييض الحجرات ذوات الأرقام (١، ٢، ٣).

٢- الطين: استخدم لإغلاق المسافات بين حجارة المداميك الداخلية بإضافة الحصوات الحجرية، واستخدم الطين في بناء الطوابين، كما في الحييض وعين جمام وأبو النسور.

٣- الاسمنت: هو مزيج من المونة والصوان والرمل والرماد، كان يستخدم في تثبيت الحجارة عند بنائها وفي الأرضيات إذ تمتاز بصلابتها، مثال ذلك في الحييض الوحدة الثالثة الحجرة الأولى.

٤- الملاط: مزيج من المونة الكلسية بيضاء اللون خلطت بإضافة الرمل واستخدمت في تثبيت حجارة المداميك ببعضها.

٥- البلاستر أو الجص: استخدم في قصارة الجدران الداخلية وبعض الأرضيات خاصة الأحواض، استخدمت بكثرة في الحييض وأبو النسور.

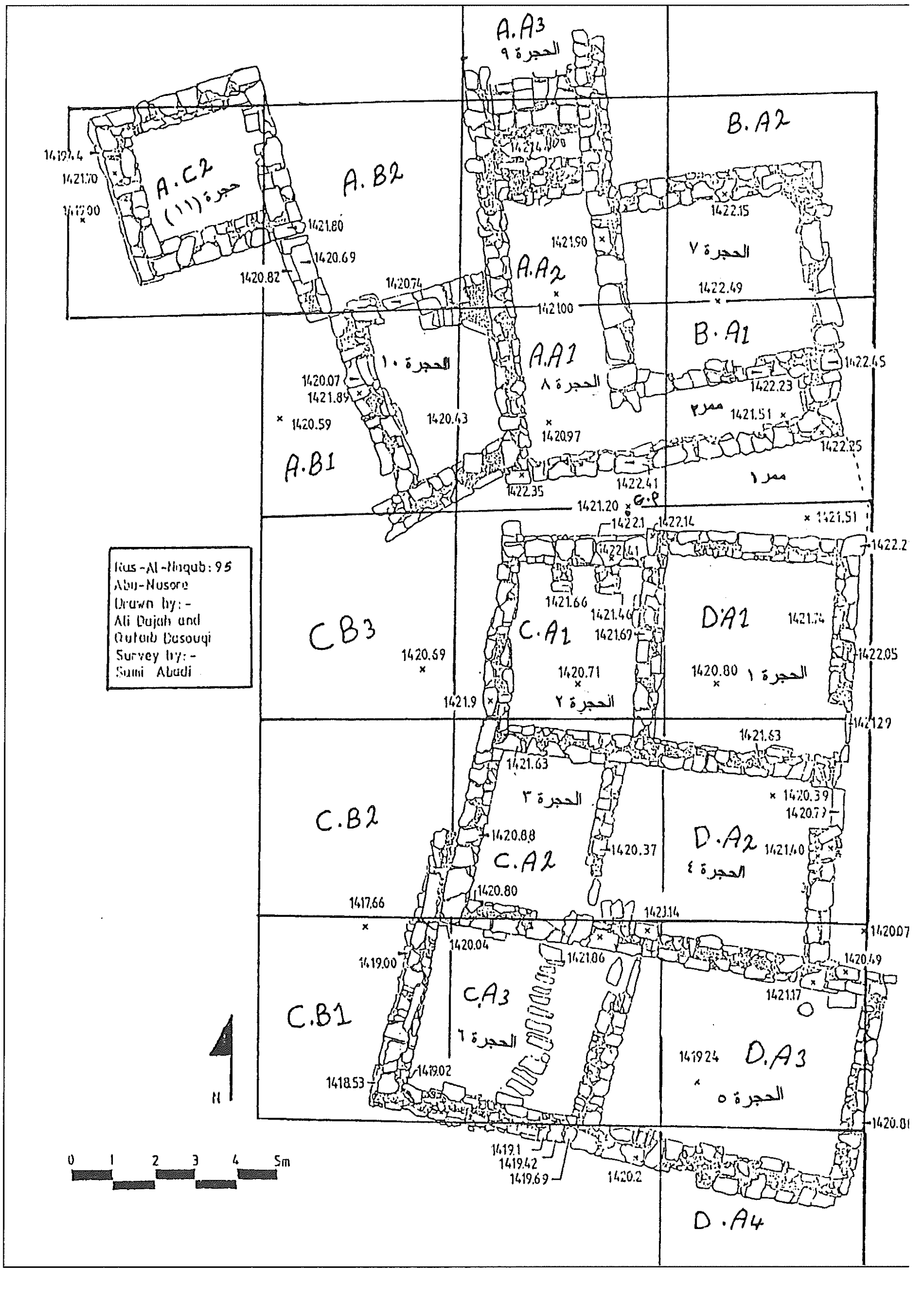
٦- بلاطات فخارية مستطيلة الشكل (Roof Tiles): استعملت كعنصراً زخرفيا وجدت بكثرة داخل الحجرة الرابعة من الوحدة الثالثة في الحييض ربما كانت لتغطية السقف أو الجدران وتثبت بمادة الجير الأبيض.

٧- الخشب: كان يستخدم كبوابات للمداخل يظهر ذلك من وجود التجاويف على جانبي حجارة المدخل الذي كان الباب يثبت بواسطتها، ولم يعثر على أية بقايا من الأبواب الخشبية باستثناء المسامير الحديدية التي كانت تثبت الباب (الشامي ١٩٩٧: ٦٤-٦٥).

٢. موقع أبو النسور بالقرب من طريق رأس النقب — العقبة.

بما يزيد عن ١٤٠٠م، وطبيعة صخور الجبال المحيطة بالموقع من الجهتين الشمالية والشرقية كلسية، وتختلف درجة صلابتها من منطقة إلى أخرى، مما سهّل نشوء حضارة واستقرارها في المنطقة لتوفر العناصر الموجبة لذلك مثل المياه والتربة الصالحة للزراعة وحجارة البناء بالإضافة إلى ملائمة المناخ، وفي الجهة الجنوبية الغربية تمتد السهول التي تتخللها الاودية الصغيرة وجداول المياه التي تتشكل في فصل الشتاء بينما نجد أن موقع أبو النسور يشكل نقطة استراتيجية فهو يشرف على تلك السهول مما يفسر سبب إقامة هذا التجمع الاستيطاني في الموقع الذي توفر له المرتفعات الشرقية حماية وكذلك يشرف على المنخفضات الجنوبية والغربية بشكل مباشر وبخاصة وادي الحميمة.

لقد كشفت التنقيبات الأثرية في الموقع عن مخطط معماري يضم



٢٥. العمارة المكتشفة في موقع أبو النسور بقسميه الشمالي والجنوبي.

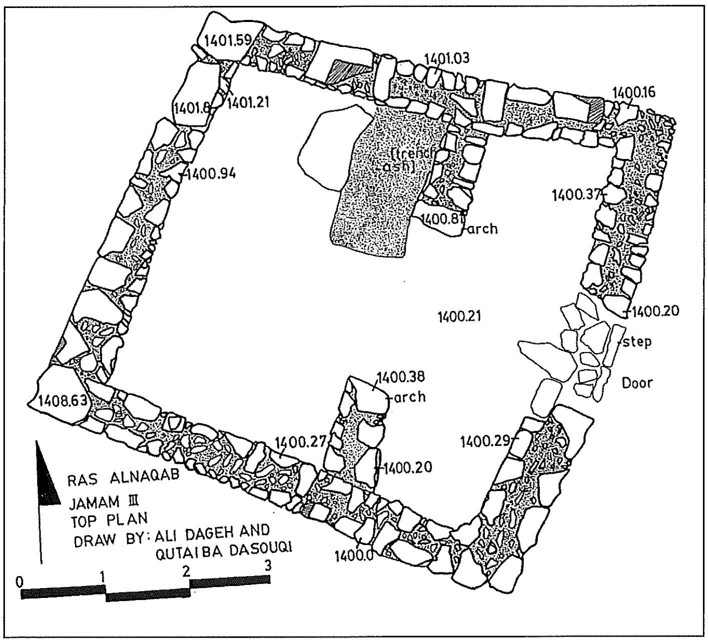
حجرية في بعض أجزاء الحجرة.

رابعا: موقع جمام /٣

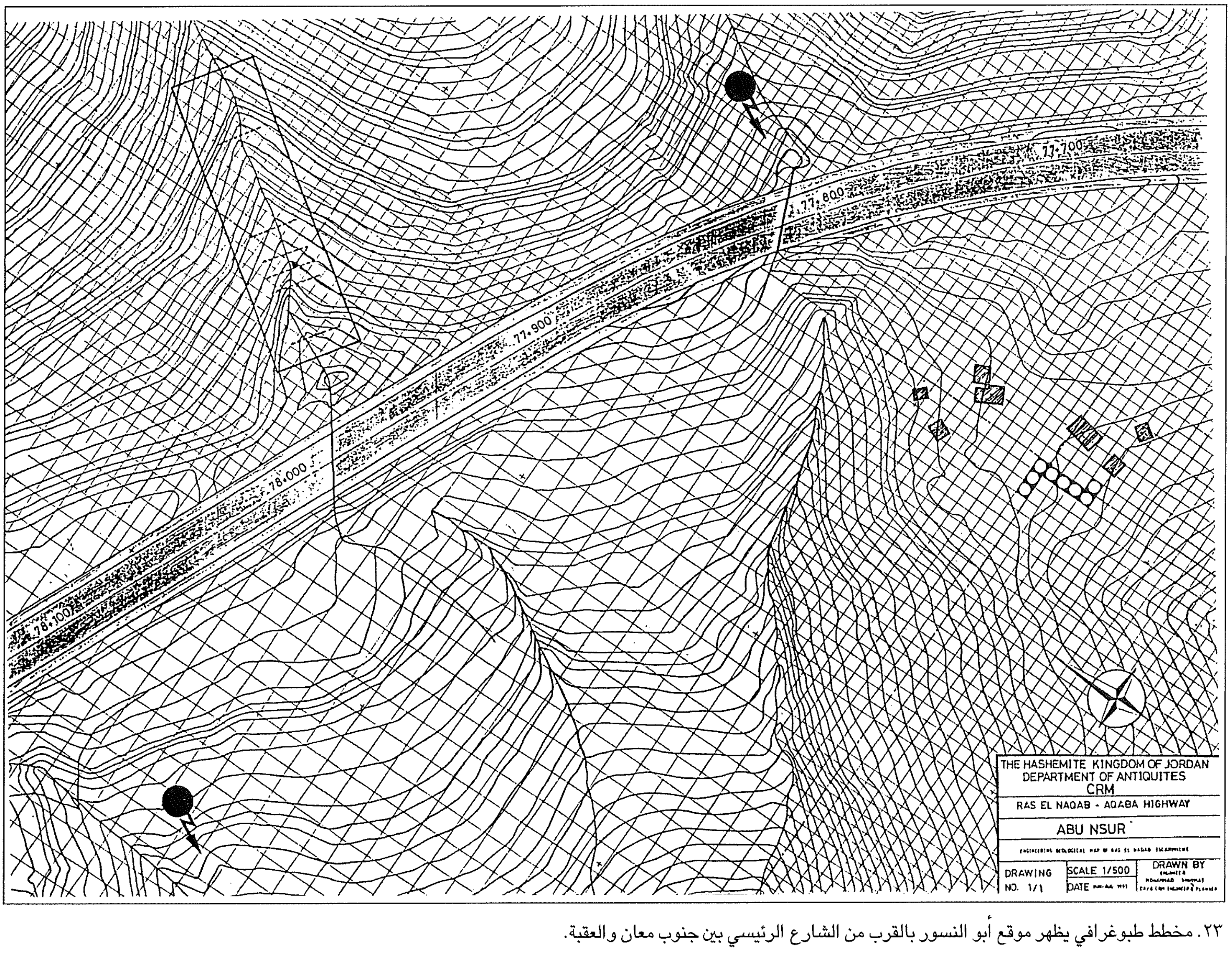
يقع إلى الجنوب الشرقي من موقع جمام /٢ ويبعد عنه ١٠م، وهو بناء صغير مربع الشكل مساحته ٤,٦٠ × ٤,٣٠م، مربع الشكل، مدخله بعرض ١,٢٠م، اتبع نظام العقود في سقف الحجرة إذ لا يزال يظهر بقايا أحد العقود، والأرضية ترابية، استخدمت الحجرة في البداية برج مراقبة فهي تشرف على الوادي المؤدي إلى الحميمة وربما أعيد استخدامها لأغراض تخزين المنتوجات الزراعية (**الشكل ٢٢**) (الشامي ١٩٩٧: ٤١-٤٧).

خامسا: موقع أبو النسور

يقع إلى الجنوب من محافظة معان بـ٣٠كم، حيث تنتشر بقايا الموقع الأثري على جانبي الطريق الرئيسي المؤدي إلى مدينة العقبة (**الشكل ٢٣ و٢٤**)، تمتاز هذه المنطقة بكثرة الينابيع الأمر الذي يشير الى النشاط المائي في المنطقة مع كونها هضبة كلسية ترتفع عن مستوى سطح البحر



٢٢. موقع جمام /٣ بناء صغير مربع الشكل يقع إلى الجنوب الشرقي من موقع جمام /٢.



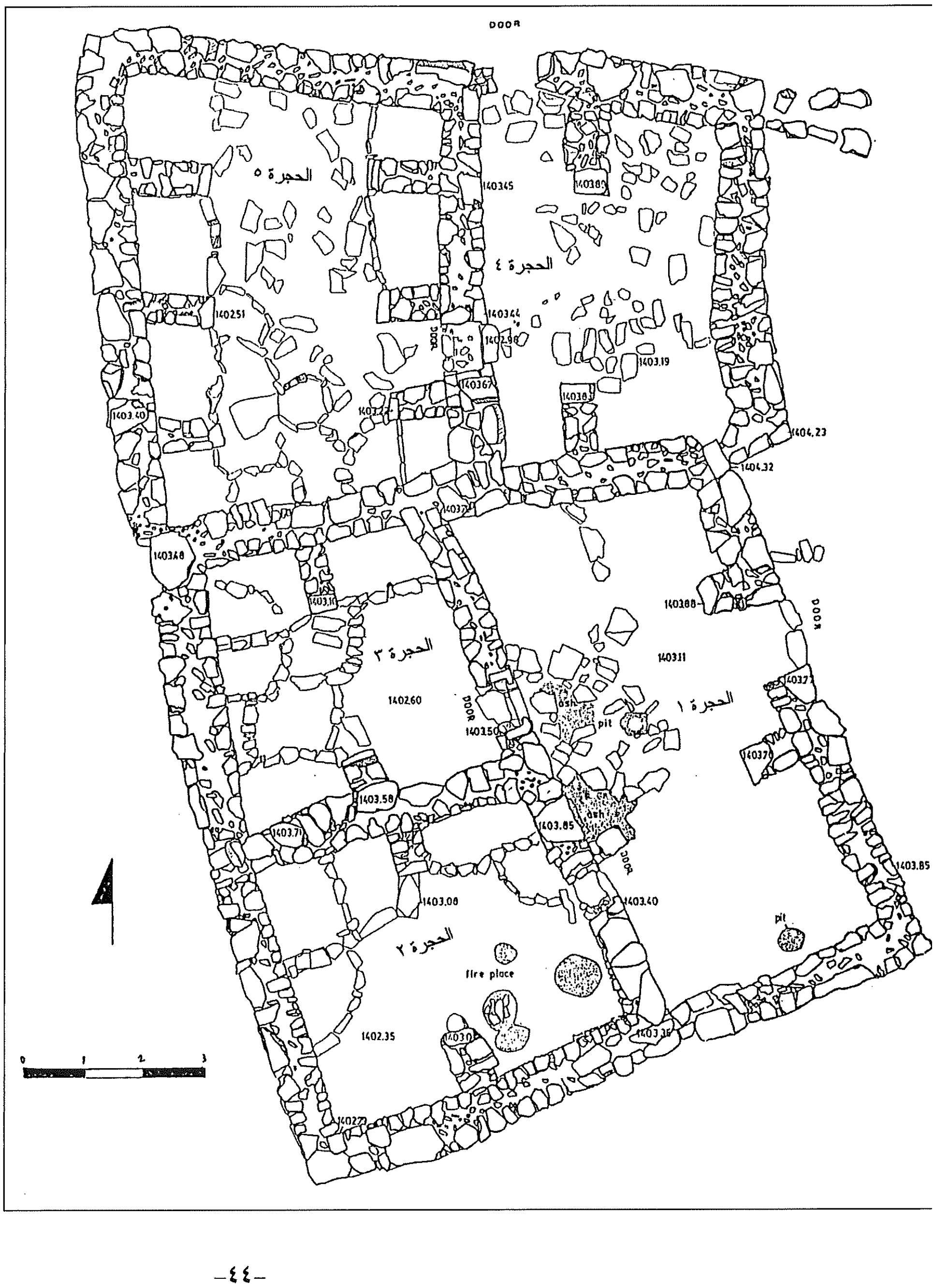
٢٣. مخطط طبوغرافي يظهر موقع أبو النسور بالقرب من الشارع الرئيسي بين جنوب معان والعقبة.

تشر فيها زراعة الأشجار المثمرة كالتين والرمان والكرمة، كما زرعت ضا بالحبوب في المناطق السهلية على جانبي الوادي الذي يجر المياه ساقطة من قمم الجبال في فصل الشتاء، بالإضافة لجريان المياه من عين طوال العام حيث كانت تستغل لري الأراضي. ويقع نبع عين جمام ذي يغذي المنطقة إلى الجنوب الغربي من الموقع في أسفل التلة التي شئت عليها مواقع عين جمام.

لثا: موقع عين جمام /٢ (الشكل٢١)

القسم الجنوبي: يحتوي على ثلاث حجرات، الحجرة الأولى مساحتها ٨,١ × ٤م، مدخلها بعرض ١م، سقفت بعقدين من الحجارة الكلسية شذبة والأرضية ترابية صلبة عثر فيها على رأسان من السهام المعدنية. ا الحجرة الثانية فمساحتها ٥,٨٥ × ٥,٤٠م، ومدخلها بعرض ٥٥سم، قفت بواسطة العقود إذ ما زال يظهر بقايا عقد واحد، والأرضية ترابية صلبة تضم أربعة مواقد صغيرة مدمرة، وكانت الحجرة تضم عددا من التقسيمات البنائية صغيرة الحجم لخزن المنتوجات الزراعية مثل الحبوب. أما الحجرة الثالثة فمساحتها ٤,٦٠ × ٤,٤٥م، مربعة الشكل، مدخلها بعرض ٦٠سم، سقفت بواسطة العقود إذ ما زال يظهر بقايا عقد واحد وتظهر حجارة القنوات التي ربما كانت تحمل المياه من عين جمام إلى الحميمة، يبدو أنه أعيد استخدامها في بناء العقود. أرضية الحجرة ترابية صلبة أنشئ فوقها تقسيمات بنائية صغيرة الحجم لتخزين المنتوجات الزراعية، حيث وجدت رحى لجرش الحبوب.

القسم الشمالي: الحجرة الرابعة مساحتها ٥,٥٠ × ٤,٥٠م، مستطيلة الشكل، مدخلها بعرض ٧٥سم، اتبع نظام العقود في التسقيف إذ عثر على بقايا عقد واحد، والأرضية ترابية صلبة، أما الحجرة الخامسة فمساحتها ٧,٥٠ × ٥,٨٠م، مدخلها بعرض ٦٥سم، سقفت بثلاثة عقود وغطيت الأرضية بالبلاطات الحجرية وذلك من خلال ظهور بلاطات



٢١. العمارة المكتشفة في موقع عين جمام /٢بقسميه الشمالي والجنوبي.

١٨. الحجرة الرابعة من الوحدة السكنية الثالثة في موقع الحبيض.

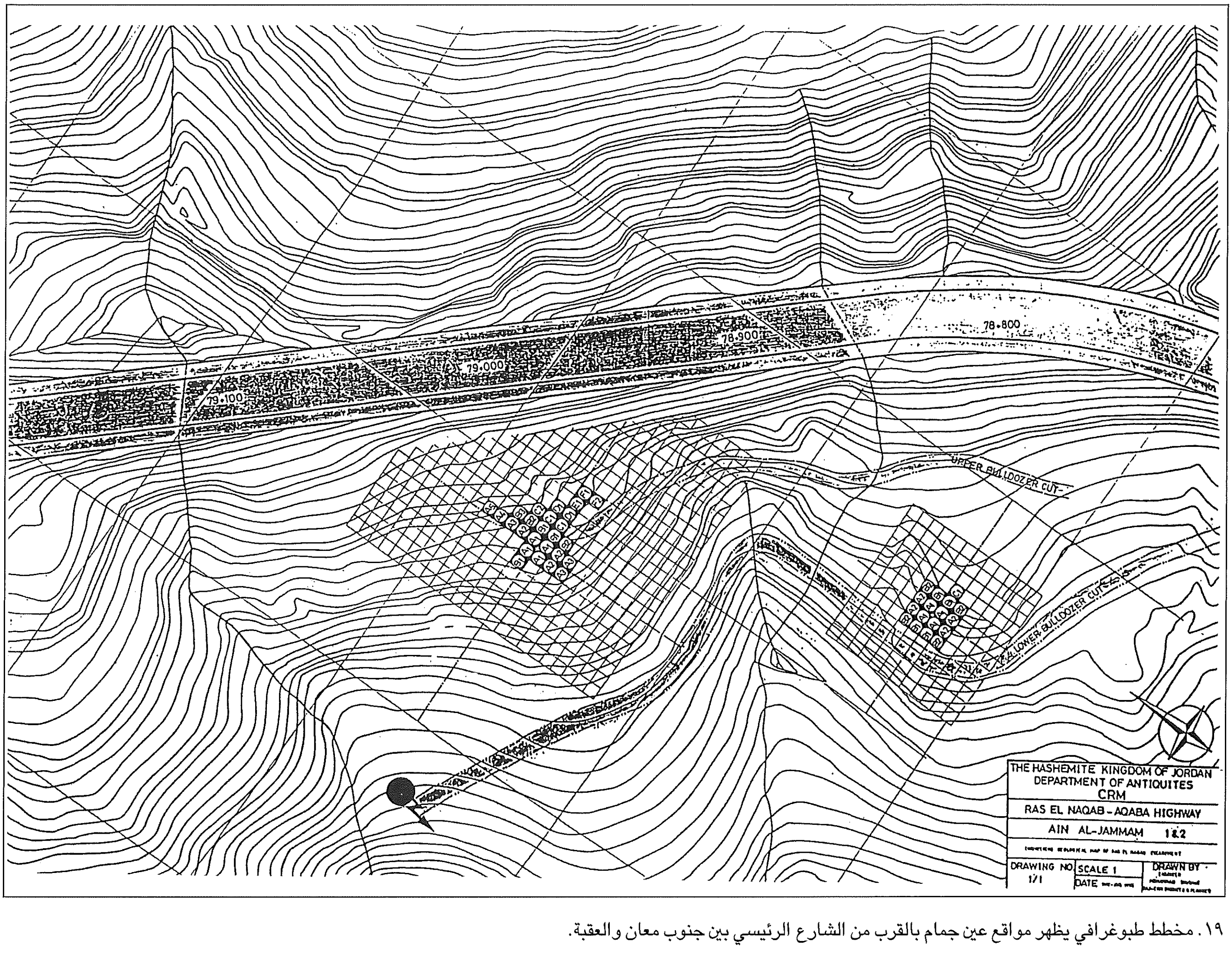
من مسكوكات برونزية وسراج فخاري (الشامي ١٩٩٧: ٣٤-٤١).

ثانيا: موقع عين جمام

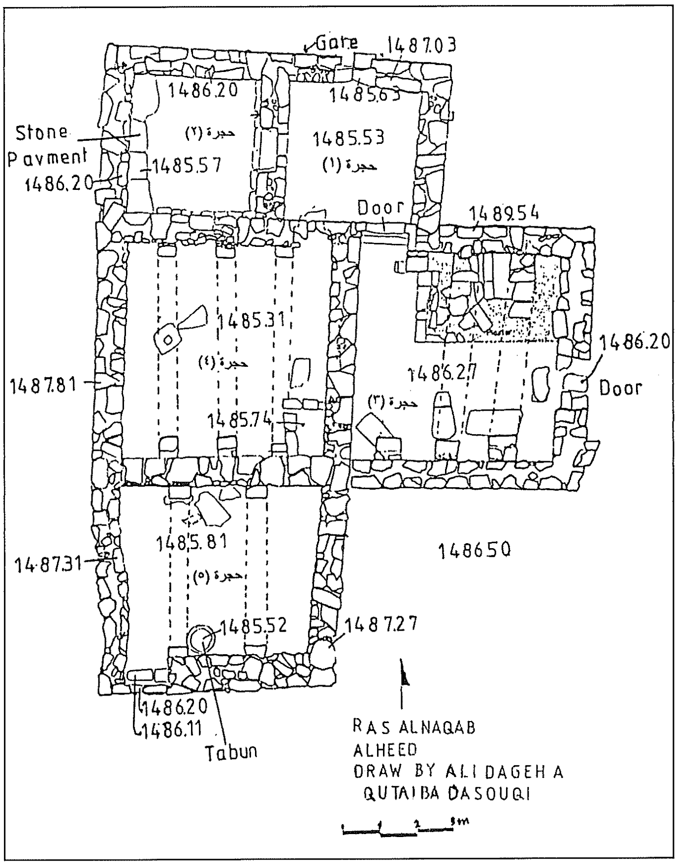
يقع موقع عين جمام إلى الجنوب من محافظة معان بـ ٤٠كم، ويقع الموقع

٢٠. موقع عين جمام/ ٢ أسفل الطريق الرئيسي المؤدي إلى العقبة بعد إحاطته بالسياج.

الأثري جنوب الطريق الرئيسي المؤدي على العقبة (**الشكل ١٩و٢٠**)، حيث استوطنت مواقع عين جمام في العصر الحجري الحديث من خلال مكتشفات عين جمام / ١، وتشرف مواقع عين جمام على الوادي المؤدي إلى الحميمة، حيث يقع على سفح تله مرتفعة مشرفة على منطقة زراعية

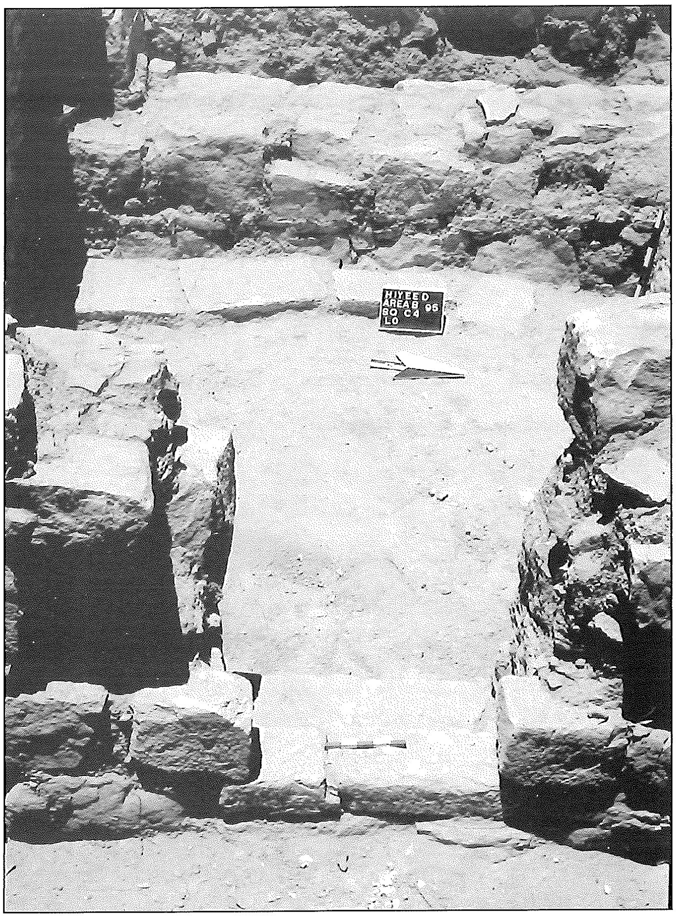


١٩. مخطط طبوغرافي يظهر مواقع عين جمام بالقرب من الشارع الرئيسي بين جنوب معان والعقبة.

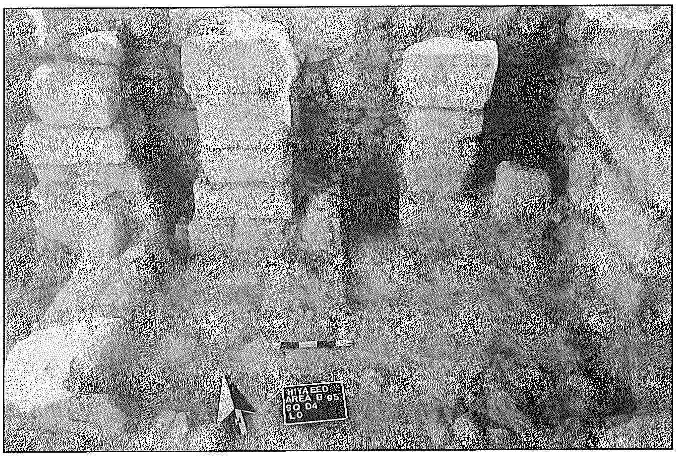


١٤. مخطط الوحدة السكنية الثالثة من العمارة المكتشفة في خربة الحييض.

١٥. منظر عام للعمارة المكتشفة في الوحدة السكنية الثالثة من موقع الحييض.



١٦. الحجرة الثانية من الوحدة السكنية الثالثة في موقع الحييض.

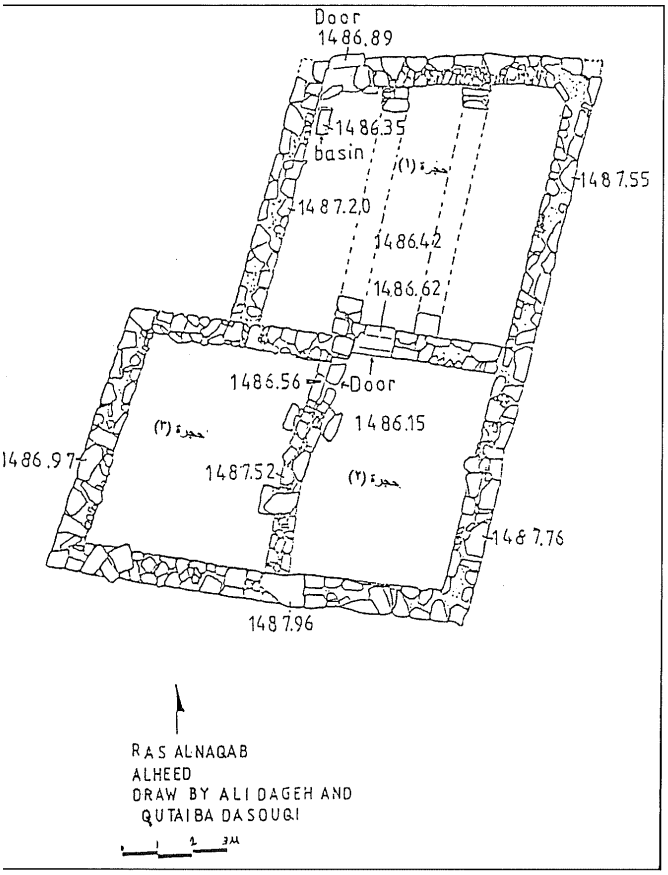


١٧. الحجرة الثالثة من الوحدة السكنية الثالثة وبداخلها حوض مغطى بمادة البلاستر.

٢,٦٠م وعرضه ٢م بعمق ٣٠سم، وجدت بقايا قصارة من الملاط الكلسي كانت تغطي الحوض كاملا (**الشكل ١٧**). وعثر على عددا من الأسرجة الفخارية ربما أن هذه الحجرة قد أدت وظيفة إنتاج مادة سائلة كالنبيذ مثلا. أما الحجرة الرابعة فمساحتها ٤,٦٠×٤م، مستطيلة الشكل مدخلها بعرض ٦٠سم، كشف عن بقايا ثلاثة عقود كانت تحمل السقف بالإضافة لبعض البلاطات الحجرية تبلغ مساحتها ١م × ٣٥سم كانت تغطي المساحة المكشوفة بين العقود وعثر أيضا على بلاطات فخارية مستطيلة مساحتها ٢٢ × ١٢سم عليها بقايا ملاط كلسي ربما استعملت عنصرا زخرفيا لتغطية السقف من الداخل. غطيت الأرضية بالبلاط الحجري وفي الزاوية الجنوبية الشرقية أقيمت مسطبة مستطيلة مساحتها ١ × ١٣٠ × ٤٠سم، قد تكون استخدمت كطاولة أو رف لوضع الأدوات الفخارية المستخدمة بشكل يومي (**الشكل ١٨**). أما الحجرة الخامسة مساحتها ٤,٧٥ × ٤,٤٠م، مربعة الشكل مدخلها بعرض ٨٠ سم، حمل السقف على عقدين وغطيت الأرضية ببلاطات حجرية، وفي الزاوية الجنوبية الغربية عثر على طابون صغير قطره ٣٠سم، ومعثورات أخرى

نظام التسقيف عن الحجرات السابقة إذ وجدت جدران تنحني للداخل مما يعطي مؤشرا إلى اتباع نظام السقف نصف البرميلي، وكشف عن أرضية مبلطة بالألواح الحجرية المغطاة بعدة طبقات من الملاط الكلسي، ويفسر وجود أكثر من طبقة للأرضية بأن بعض الأجزاء تتأثر أثناء الاستعمال المتكرر فيصار إلى إضافة طبقة أخرى، أو أنها استخدمت أكثر من مرة في فترة واحدة. وعثر على الأرضية مسكوكتان برونزيتان وربما تكون هذه الحجرة قد أدت وظيفة المطبخ. أما الحجرة الرابعة فمساحتها ٣,٦٥×٣,٦٠م مربعة الشكل مدخلها بعرض ٨٠سم وكان السقف محمولا على عقود من خلال الكشف على بقايا عقد واحد، استخدمت الحجرة للسكن. أما الحجرة الخامسة فمساحتها ٣,٨٠م × ٢,٢٠م مستطيلة الشكل عرض المدخل ١م، لم يعثر على أية دلائل للعقود التي كانت تحمل السقف أو أنها سقفت بالعوارض الخشبية، وأرضية الحجرة ترابية صلبة. أما الحجرة السادسة فمساحتها ٣,٨٠م × ٢,٣٠م مستطيلة الشكل ولم يعثر على أية دلائل للعقود التي كانت تحمل السقف أو أنها سقفت بالعوارض الخشبية وأرضية الحجرة ترابية صلبة ربما استخدمت للتخزين. أما الحجرة السابعة مساحتها ٣,٦٥م × ٢,٧٠م مستطيلة الشكل مدخلها بعرض ٦٠سم، وكان السقف محمولا على عقود من خلال الكشف على بقايا عقد واحد، وأرضية الحجرة ترابية صلبة كان قد أنشئ فوقها فرن في الزاوية الجنوبية الشرقية ضمن الجدار الشرقي وهو مشابه للفرن الذي وجد في الحجرة الثالثة بارتفاع ١م لكنه أصغر حجما وأقل اتقانا والطابون محطم بداخله وقطر فتحة المدخنة ٣٠سم ربما تكون الحجرة استخدمت مطبخا. أما الحجرة الثامنة فهي ساحة تطل عليها الحجرات (٥، ٦، ٧)، عرض المدخل ٨٠سم ولا تظهر دلائل تشير إلى كيفية سقف هذه الحجرة وهل كان السقف محمولا على عقود أم أنها سقفت بالعوارض الخشبية (الشامي ١٩٩٧: ٢٥-٣٢).

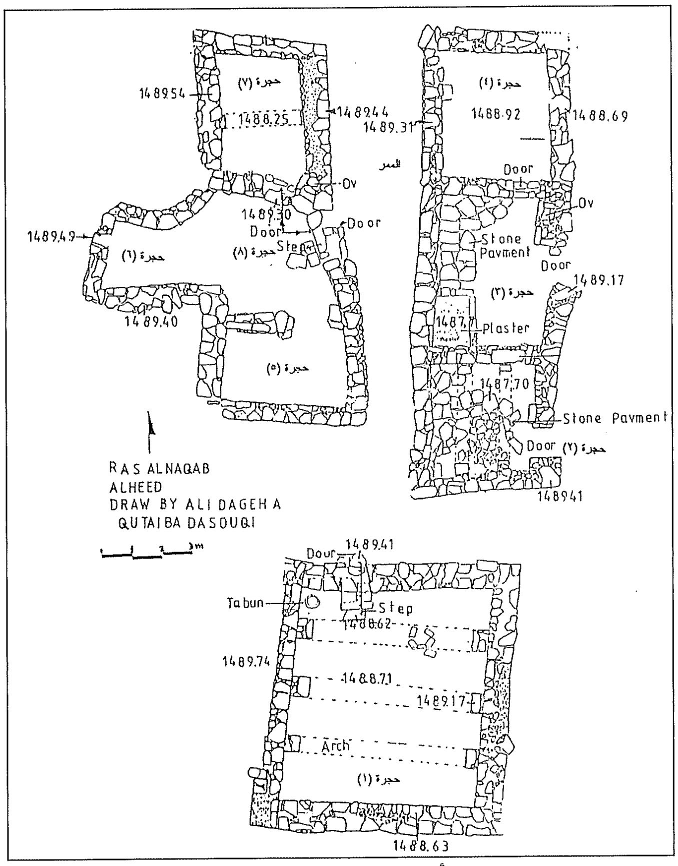
الوحدة السكنية الثانية: وتشتمل على ثلاث حجرات (**الشكل ١٣**) فالأولى مساحتها ٥,٩٠م × ٥,٤٠م، مربعة الشكل مدخلها بعرض ٧٤سم، حمل السقف من خلال عقدين، أرضية الحجرة ترابية كشف فيها عن سراجين فخاريين ومسكوكتين برونزيتين والعديد من الأدوات الحجرية التي كانت تستعمل لطحن وجرش الحبوب ومدقات وحوض حجري مستطيل أبعاده ٦٠ × ٣٢ × ٣٢سم، وربما تكون الحجرة للخزين. أما الحجرة الثانية فمساحتها ٤,٧٠ × ٣,٥٠م، مستطيلة الشكل مدخلها بعرض ٧٠سم، واستخدم نظام العقود لسقف الحجرة ظهر ذلك بوجود بقايا عقدين لحمل السقف. أرضية الحجرة ترابية عثر فيها على أدوات حجرية كانت تستعمل لطحن وجرش الحبوب وربما تكون الحجرة قد استخدمت للتخزين. أما الحجرة الثالثة فمساحتها ٤,٨٠ × ٤,٢٠م مدخلها بعرض ٧٠سم، واستخدم نظام العقود لسقف الحجرة ظهر ذلك بوجود بقايا عقدين لحمل السقف. أرضية الحجرة ترابية عثر فيها على أدوات حجرية كانت تستعمل لطحن وجرش الحبوب وربما تكون الحجرة قد استخدمت للتخزين (الشامي ١٩٩٧: ٢٦-٣٤).



١٣. مخطط الوحدة السكنية الثانية من العمارة المكتشفة في خربة الحييض.

الوحدة السكنية الثالثة: تشتمل على خمس حجرات (**الشكل ١٤-١٥**) فالحجرة الأولى مساحتها ٣ × ٣م، مربعة الشكل، مدخلها بعرض ٧٣سـ بني من حجارة كلسية متوسطة الحجم شذبت بإتقان وأضيفت ماد الملاط الكلسي لتثبيت المداميك، وتظهر التجاويف على جانبي المدخ لتثبيت الباب. لا تظهر آثار تدل على طريقة تسقيف الحجرة، وربم سقفت بجذوع الأشجار، أرضيتها أسمنتية أنشئ عليها موقد صغي شبه دائري قطره ٣٠سم محاط بطبقة سميكة من الرماد، وعثر عل مسكوكات برونزية وسراج فخاري وبعض القطع الحديدية والمسامي والفحم والعظام الحيوانية، وهذه الحجرة تمثل ساحة تطل عليها مداخ الحجرات الأخرى المجاورة (٢، ٣، ٤). أما الحجرة الثانية فمساحتها × ٣م، مربعة الشكل مدخلها بعرض ٧٤سم، لم تظهر أية دلائل لوجو العقود فربما كالحجرة السابقة سقفت بجذوع الأشجار، غطيت الأرضي بالبلاطات الحجرية ما زال جزء منها في الجهة الغربية، عثر بداخل على عدد من الأسرجة الفخارية، استخدمت هذه الحجرة للسكن (**الشك ١٦**). أما الحجرة الثالثة فمساحتها ٤,٦٠ × ٤,٥٠م، مربعة الشك مدخلها بعرض ٧٢سم، وجدت ثلاثة عقود كانت تحمل السقف، وربم أن الأرضية كانت مبلطة بألواح حجرية إذ يظهر بعض البلاطات أسف قواعد العقود التي تحمل السقف. تميزت الحجرة بوجود حوض كبي مستطيل الشكل يقع في الجهة الشمالية تم تقسيمه إلى قسمين طو

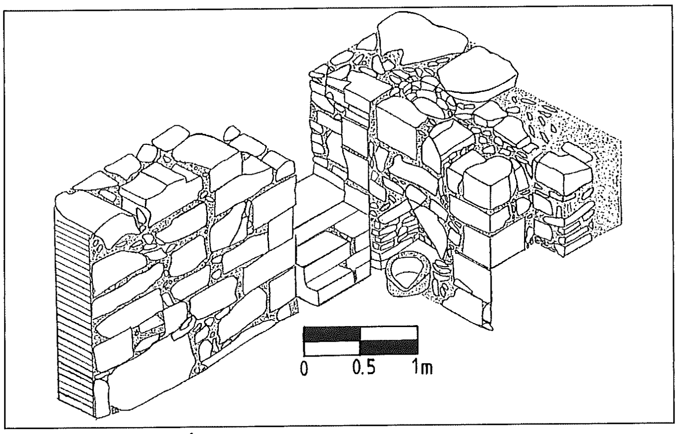
٩. موقع الحييض أثناء التنقيب في الوحدة السكنية الأولى بالقرب من الطريق الرئيسي المؤدي للعقبة.



١٠. مخطط الوحدة السكنية الأولى من العمارة التي كشف عنها في خربة الحييض عام ١٩٩٥.

وهي كما يلي

الوحدة السكنية الأولى: تضم ثماني حجرات (**الشكل ١٠**) فالحجرة الأولى مساحتها ٦,٤٥×٦,٣٠م، مربعة الشكل مدخلها بعرض ١,٢٥م، بنيت الجدران بتقنية صفين متقابلين من الحجارة وغطيت الجدران بطبقة من الملاط الكلسي وأضيفت المونة لتثبيت الدماميك. لقد حمل سقف الحجرة بوساطة ثلاثة عقود باستخدام حجارة كلسية مشذبة أما أرضيتها فكانت مغطاة ببلاطات حجرية ما زال يظهر بعضها في الزاوية الشمالية الغربية، وكشف عن مسكوكات برونزية وحجارة طحن وكسر فخارية، تميزت هذه الحجرة بأتساعها وربما استخدمت للجلوس / مضافة. والحجرة الثانية مساحتها ٣,٦٥ × ٣,٥٠م، مربعة الشكل مدخلها بعرض ٩٠سم، كان يحمل السقف عقدان ما زالت بقاياه ماثلة، وغطيت الأرضية ببلاطات حجرية، وهي حجرة للسكن. أما الحجرة الثالثة فمساحتها ٤,٩٠ × ٣,٥٠م، مستطيلة الشكل ومدخلها بعرض ٩٠سم، يظهر أن هذه الحجرة كانت معدة لتنفيذ بعض الأعمال الصناعية المنزلية فقد كشف بداخلها في الزاوية الجنوبية الغربية عن حوض مبني من الحجر الكلسي المشذب مستطيل الشكل بطول ٢م وعرض ١,٦٥م وبعمق ٤٥سم، غطيت جدرانه بطبقة بيضاء من الملاط الكلسي وأرضيته مبلطة بألواح من الحجر الكلسي تعلوها طبقة سميكة من الملاط الكلسي ربما استخدم لحفظ نوع من السوائل. كما تم الكشف عن مبنى فرن من الحجر الكلسي المشذب في الزاوية الشمالية الشرقية مجاور للمدخل بعرض ١,١٠م وارتفاع ١,٧٠م وعمق ٥٠سم، ووجدت مدخنة بيضاوية في أعلى سطح الجدار الشرقي، كما عثر بداخل الفرن على طابون قطره ٣٥سم وعمقه ١٤سم مكون من طبقتين من الطين المجفف الداخلية رقيقة والخارجية سميكة أنشئ فوق أرضية مرصوفة بالحصى الصغير وتنتشر أمامه طبقة سميكة من الرماد (**الشكل ١١ و ١٢**). لقد اختلف هنا



١١. مخطط لمبنى الفرن في خربة الحييض الوحدة السكنية الأولى الحجرة الثالثة في الزاوية الشمالية الشرقية.

١٢. مبنى الفرن في الحجرة الثالثة من الوحدة السكنية الأولى.

يعود تاريخه للعصرين الروماني والبيزنطي، تقع ضمن الإحداثي العالمي ٧٣٩١٠٠شرق،٣٣٢١٠٠شمال، والإحداثي الفلسطيني ١٩٥,٩شرق، ٩٣٦,٢شمال، ذكره جلوك (Glueck 1935: 65) (**الشكل ٥**).

٢٨- نقب عشتار: يقع على تلة مشرفة على المناطق المجاورة وينتشر حوله عدد من الخزانات وأبنية أخرى تابعة له، البناء الرئيسي مستطيل الشكل، ترتفع أسواره الخارجية ثلاثة مداميك، يرتفع عن مستوى سطح البحر ١٤٢٠م، مساحته ٣ دونمات، يعود تاريخه للعصرين الروماني والبيزنطي تقع ضمن الإحداثي العالمي ٧٤٠٠شرق، ٣٣٢٠٤شمال، والإحداثي الفلسطيني ١٩٥,٧شرق، ٩٣٢,٢شمال، ذكره جلوك (Glueck 1935: 11; Bisheh 1993: 121) (**الشكل ٥**).

٢٩- خربة شديد: تقع على قمة ترتفع عن مستوى سطح البحر ١٦٠٠م، مساحتها ٣ دونمات، يعود تاريخها للعصرين الروماني والبيزنطي، تمثل بقايا معمارية بنيت من الحجارة الصوانية، أحيط البناء بسور خارجي، تقع ضمن الإحداثي العالمي ٧٤٢٠شرق، ٣٣٢١١شمال، والإحداثي الفلسطيني ١٩٨,٨٠٠شرق، ٩٣٤,١٠٠شمال، ذكرها جلوك (Glueck 1935: 60, site 34) (**الشكل ٥**).

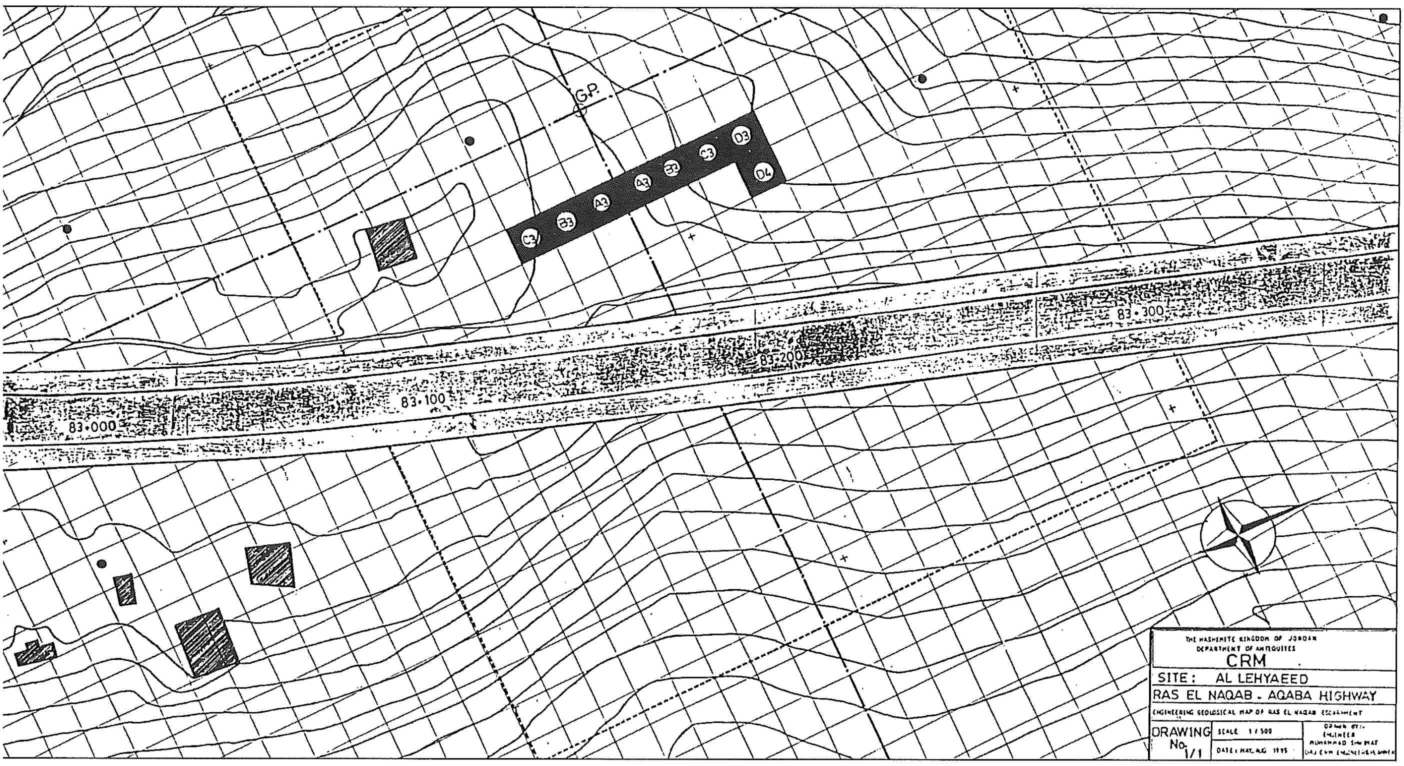
التنقيبات الأثرية

أولا: خربة الحييض

تقع خربة الحييض جنوب محافظة معان بـ٣٠كم، وهو موقع كبير يقع على جانبي الطريق المؤدي إلى العقبة حيث يقع الجزء الأكبر منه غرب الطريق (**الشكل ٨ و٩**)، مساحته ١٥ دونما ويرتفع عن مستوى سطح البحر ١٤٠٠م، محاط بالجبال من الجهة الغربية والشرقية، وتظهر بقايا لبرج مراقبة على الجبال الغربية مشرفا على موقع الحييض وأسفل التلة التي تقع عليها الخربة، كما ويمتد واد يحمل المياه من النبع الواقع بجانب الموقع، حيث تنتشر الأعشاب التي تكسو الوادي في فصل الربيع، وتظهر في الجهة الجنوبية الغربية بقايا قنوات مبنية بوساطة حجارة كلسية صغيرة الحجم تمتد لمسافات طويلة تؤدي إلى خزان ماء كبير مسقوف ببلاطات حجرية محمولة على عدد من العقود، ويعتقد بأن هذه القنوات كانت تجلب المياه من النبع لتجميعها في هذا الخزان. وفي نفس مجرى الوادي في الجهة الشمالية الغربية وجد بقايا بناء حجري شيد باستخدام حجارة كلسية كبيرة الحجم تغلق مجرى الوادي ربما استخدمت لحجز مياه النبع الجارية خلفها لاستخدامها صيفا لري الأراضي المزروعة المجاورة للموقع.

تقع الحييض على تلة قليلة الارتفاع ينتشر حولها في الجهة الشمالية أراض سهلية ما زالت تستغل في زراعة الحبوب والأشجار المثمرة كالتفاح وربما كانت تستغل في الفترة الرومانية المتأخرة لنفس الغاية وذلك بكشف أدوات حجرية متعددة الأغراض كالصحون الحجرية الكبيرة والمدقات والجواريش البازلتية. وتتوافر في المنطقة تربة صالحة للزراعة ومناخ حار جاف صيفا وماطر بارد شتاء بالإضافة للينابيع ومجاري السيول (الشامي ١٩٩٧: ٢٣-٢٤).

كشف عن ثلاث وحدات سكنية بنيت من الحجر الكلسي المشذب



٨. مخطط طبوغرافي يظهر خربة الحييض بالقرب من الشارع الرئيسي بين جنوب معان والعقبة.

والإحداثي الفلسطيني ١٩٥٠٩شرق، ٩٣٩٧ شمال، وذكره جلوك (Glueck 1935: 67) (**الشكل ٥**).

- بئر تركي الغربي: يقع في منطقة سهلية إلى الشرق من الشارع المؤدي إلى منطقة الراجف. تنتشر بقايا الموقع على مساحة واسعة، مساحته ٤-٦ دونمات، يرتفع عن مستوى سطح البحر ١٦٠٥م، يعود بتاريخه للعصر البيزنطي، يقع ضمن الإحداثي العالمي ٧٣٥٤٠٠شرق،٣٣٢٨١٠٠شمال، والإحداثي الفلسطيني ١٩٢٠٣شرق، ٩٤١٢ شمال (**الشكل ٦**) (Glueck 1935: 66, site 49).

١- طور صالح: يمثل مستوطنة صغرى على الجبال المطلة على وادي طاسان، ترتفع عن مستوى سطح البحر ١٥٦٠م، تبلغ مساحته من ٤-٦ دونمات، يعود بتاريخه إلى العصر البيزنطي حيث تظهر بقايا معمارية تمثل عدد من الحجرات المتهدمة، يقع ضمن الإحداثي العالمي ٧٣٦٩٠٠شرق، ٣٣٢٨١٠٠شمال، والإحداثي الفلسطيني ١٩٣,٨شرق، ٩٤١,٢ شمال (**الشكل ٦**).

١- أم زعيريرة: مساحتها دونما واحدا تعود بتاريخها للعصر البيزنطي، تمثل بقايا خربة صغيرة متهدمة ترتفع عن مستوى سطح البحر ١٥٦٥م وتقع ضمن الإحداثي العالمي ٧٣٦٤٠٠شرق،٣٣٢٧٧٠٠شمال، والإحداثي الفلسطيني ١٩٣,٣شرق، ٩٤٠,٨شمال (**الشكل ٦**).

١- ام حواطة: تنتشر بقايا مستوطنة كبيرة على مساحة شاسعة، تحيط بها السهول الزراعية والأراضي الخصبة، مساحتها دونمين ويعود تاريخها إلى العصر البيزنطي، ترتفع عن مستوى سطح البحر ١٥٦٠م، تقع ضمن الإحداثي العالمي ٧٣٧٣٠٠شرق، ٣٣٢٧٩٠٠شمال، والإحداثي الفلسطيني ١٩٤,٢شرق، ٩٤١,٠شمال، ذكرها جلوك (Glueck 1935: 67) (**الشكل ٦**).

١- خربة عطية: تقع على منطقة جبلية مرتفعة تشرف على موقع فجير القناة وترتفع عن مستوى سطح البحر ١٤٨٠م، مساحتها ٤ دونمات ويعود تاريخها للعصر البيزنطي، تقع ضمن الإحداثي العالمي ٧٣٥٤٠٠شرق، ٣٣٢٥٧٠٠شمال، والإحداثي الفلسطيني ١٩٢,٢شرق، ٩٣٨,٨شمال، ذكرها جلوك (Glueck 1935: 68, site 57).

٢- خربة غانم: تمثل بقايا مستوطنة زراعية كبرى تحيط بها السهول والينابيع وترتفع عن مستوى سطح البحر ١٦٢٥م، مساحتها ٢-٤دونم، يعود تاريخها إلى العصر البيزنطي، تقع ضمن الإحداثي العالمي ٧٣٦٧٠٠شرق، ٣٣٢٩٠٠شمال، وضمن الإحداثي الفلسطيني ١٩٣,٦شرق، ٩٤٠,٠شمال، ذكرها جلوك (Glueck 1935: 67) (**الشكل ٦**).

٢- خربة علاوة: تمثل جزءا من مستوطنة كبرى ترتفع عن مستوى سطح البحر ١٥٩٠م، مساحتها ٢دونم، يعود تاريخها للعصر البيزنطي. حيث تنتشر على مساحة واسعة، وتقع ضمن الإحداثي العالمي ٧٣٤٤٠٠شرق، ٣٣٢٧٩شمال، والإحداثي الفلسطيني ١٩١,٢شرق، ٩٤١,١شمال، ذكرها جلوك (Glueck 1935: 68, site 58).

٢٢- خربة القناة :تقع بالقرب من نبع ماء جار ولقد تعرض الموقع للعبث الشديد بسبب القرب من مجرى المياه، ترتفع عن مستوى سطح البحر ١٣٦٠م، تبلغ مساحتها ٢دونم، يعود تاريخها للعصرين الروماني والبيزنطي، تقع ضمن الإحداثي العالمي ٧٣٥٦٠٠شرق، ٣٣١٣٩٠٠شمال،والإحداثي الفلسطيني ١٩٢,٤شرق، ٩٣٧,٠شمال، وجد في المنطقة بعض حجارة المسافات، ذكرها جلوك وجراف (Glueck 1935: 65, no.47; Graf 1995: 246) (**الشكل ٧**).

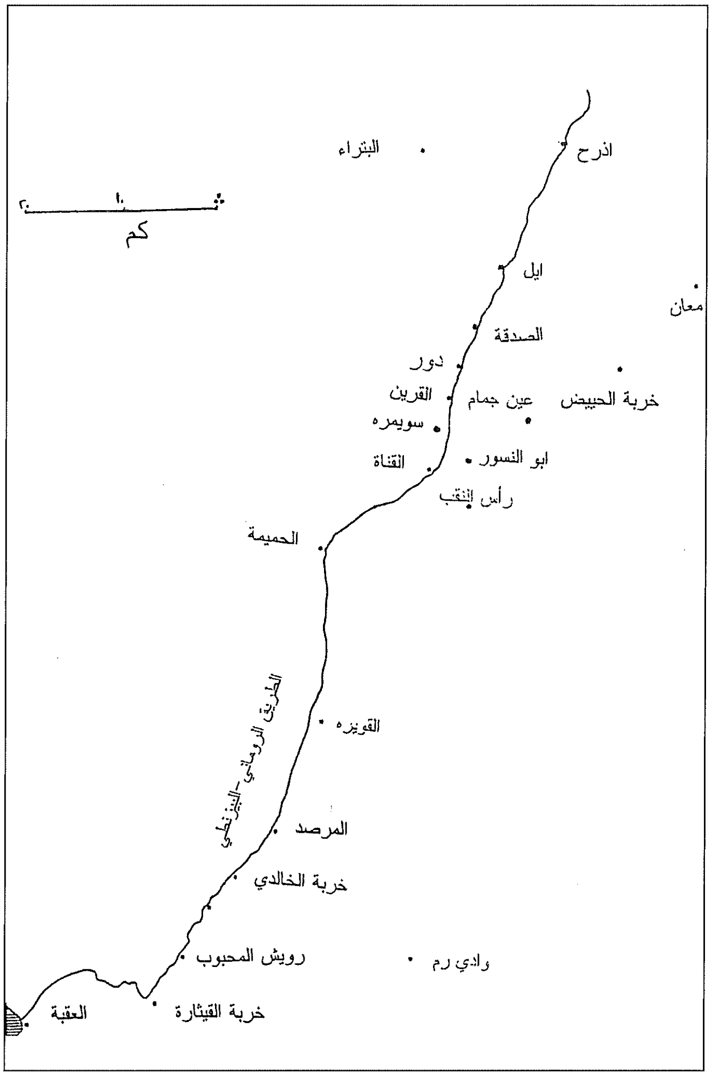
٢٣- جمام /٢: يقع إلى الغرب من الطريق الرئيسي المؤدي إلى العقبة، يرتفع عن مستوى سطح البحر ١٤٧٠م، مساحته ٢دونم، يعود بتاريخه إلى العصرين الروماني والبيزنطي حيث يبعد عن عين جمام /١ ٣٠٠م باتجاه الشرق، يقع ضمن الإحداثي العالمي ٧٣٧٨شرق، ٣٣٢٣٩شمال، والإحداثي الفلسطيني ١٩٤,٨شرق،٩٣٧,٠شمال، ذكرها جلوك وجوبلنج وبيشه (Glueck 1935: 65; Jobling 1982: 199; Bisheh 1993: 121) (**الشكل ٥**).

٢٤- جمام /٣: يقع بالقرب من جمام /٢في الجهة الجنوبية الشرقية ويبعد عنه بضعة أمتار، يرتفع عن مستوى سطح البحر ١٤٥٠م، يعود تاريخه إلى العصر البيزنطي، يقع ضمن الإحداثي العالمي ٧٣٦٩٠٠شرق،٣٣٢٥١٠٠شمال، والإحداثي الفلسطيني ١٩٣,٧شرق، ٩٣٨,٢شمال (Jobling 1982: 199) (**الشكل ٥**).

٢٥- خربة أبو النسور/١: تقع إلى الغرب من الطريق المؤدي إلى العقبة على حافة مشرفة على وادي الحميمة ووادي جمام، ترتفع عن مستوى سطح البحر ١٤٠٠م، مساحتها ١٠دونمات، تمثل مستوطنة رئيسية في منطقة رأس النقب، تقع ضمن الإحداثي العالمي ٧٣٨٦شرق، ٣٣٢٢٦شمال، والإحداثي الفلسطيني ١٩٥,٦شرق، ٩٣٥,٨شمال، ذكرها جلوك (**الشكل ٥**) (Glueck 1935: 65, site 44; Bisheh 1993: 121).

٢٦- أبو النسور /٢: يرتفع عن مستوى سطح البحر ١٥٥٠م، مساحته دونم واحد، تمثل عدد من المصاطب الحجرية التي أقيمت على سفوح الهضاب الواقعة شمال موقع أبو النسور /١، بهدف استصلاح الأرض وتخزين المياه، يعود تاريخه للعصرين الروماني والبيزنطي، تقع ضمن الإحداثي العالمي ٧٣٩٣٠٠ شرق، ٣٣٢٣٠٠٠ شمال، والإحداثي الفلسطيني ١٩٥,١شرق، ٩٣٦,١ شمال، ذكره جلوك (Glueck 1935: 65) (**الشكل ٥**).

٢٧- أبو النسور /٣: يرتفع عن مستوى سطح البحر ١٥٥٠م،



٧. المواقع الأثرية التي جرت فيها مسوحات أثرية في منطقة رأس النقب.

ترتفع عن مستوى سطح البحر ١٤٨٥م، تبلغ مساحتها ٢٠٠ × ١٠٠م، ويعود تاريخها إلى العصرين الروماني والبيزنطي، وتقع ضمن الإحداثي العالمي ٧٣٩١٠٠شرق،٣٣٢٧٤٠٠شمال، والإحداثي الفلسطيني ١٩٦,٠شرق، ٩٤٠,٥شمال، ذكرها جلوك (Glueck 1935: 67, site 55) (**الشكل ٦**).

٨- خربة أم الذياب/ ٢: تقع إلى الجنوب من موقع أم الذياب /١ على سفح تلة وترتفع عن مستوى سطح البحر ١٥٢٠م، تبلغ مساحتها ٤دونمات، ويعود تاريخها إلى العصرين الروماني والبيزنطي، ويلاحظ وجود أساسات أبنية من الحجارة الكلسية بارتفاع أربعة مداميك. ويحيط بها سهول زراعية، وتقع ضمن الإحداثي العالمي ٧٣٨٧٠٠شرق، ٣٣٢٧٠٠٠شمال، والإحداثي الفلسطيني ١٩٥,٦شرق، ٩٤٠٠١ شمال، وقد ذكرها جلوك (Glueck 1935: 67, site 55) (**الشكل ٦**).

٩- خربة طاسان: تنتشر بقايا الموقع بالقرب من التقاء واديين وبالقرب من نبع ماء، ترتفع عن مستوى سطح البحر ١٥٢٠م، تبلغ مساحتها ١٠ دونمات، ويعود تاريخها للعصرين الروماني والبيزنطي، تقع ضمن الإحداثي العالمي ٧٣٧٧٠٠ شرق، ٣٣٢٧٩٠٠ شمال، والإحداثي الفلسطيني ١٩٤,٦شرق، ٩٤١,١شمال، وقد ذكرها جلوك (**الشكل ٦**) (Glueck 1935: 67, site 54).

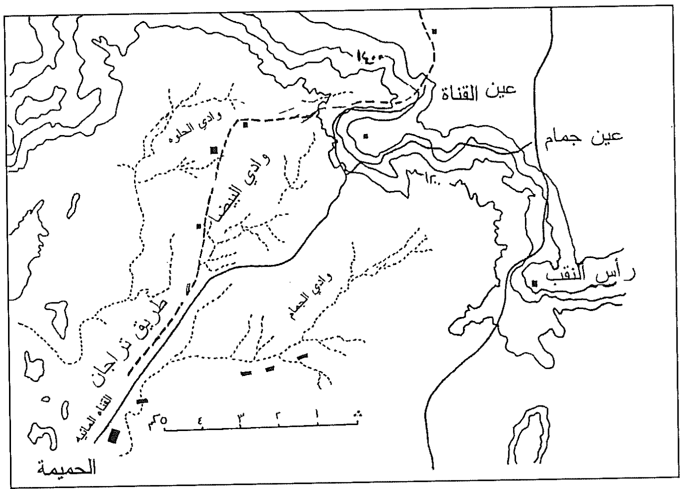
١٠- خربة أبو اللسن: تمثل موقع كبير، تنتشر بقاياه الأثرية على سفح منطقة جغرافية واسعة مطلة على وادي، ترتفع عن مستوى سطح البحر ١٥٠٠م، تبلغ مساحتها ٢٠دونم، يعود تاريخها للعصرين الروماني والبيزنطي، تقع ضمن الإحداثي العالمي ٧٤٠٤شرق، ٣٣٢٦٦شمال، والإحداثي الفلسطيني ١٩٧,٢شرق، ٩٣٩,٧شمال، ذكرها جلوك وبيشة (Glueck 1935: 62, site 39; Bisheh 1993: 126) (**الشكل ٦**).

١١- موقع فويلة الشرقية: يقع بالقرب من خربة أبو اللسن ويرتفع عن سطح البحر ١٥٤٠م، مساحته ١٠دونمات، ويظهر بقايا أساسات وجدران متهدمة من الحجارة الكلسية، يعود تاريخها للعصر البيزنطي، يقع ضمن الإحداثي العالمي ٧٤١٠٠شرق، ٣٣٢٢٣شمال، والإحداثي الفلسطيني ١٩٧٠٨٠٠شرق، ٩٣٦٠٣٠٠شمال، ذكر الموقع كل من جلوك وبيشة وهارت وفالكنر (Glueck 1935: 60, site 33) (Hart and Flkner 1985: 269; Bisheh 1993: 126) (**الشكل ٦**).

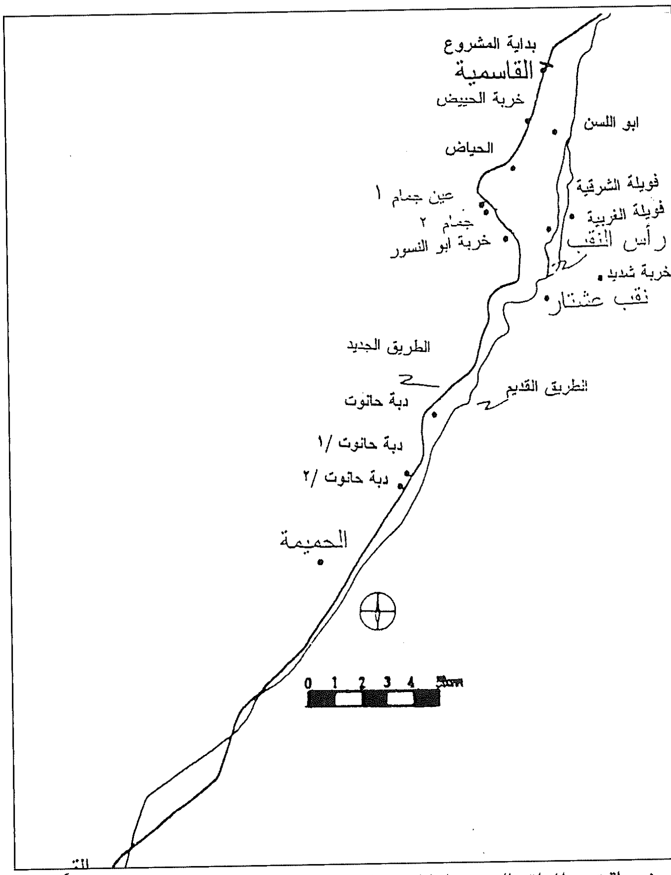
١٢- موقع فويلة الغربية: تقع إلى الغرب من طريق النقب القديم بـ٥٠٠ م فوق تله متوسطة الارتفاع، ترتفع عن مستوى سطح البحر ١٥٣٠م، مساحتها دونمين يعود تاريخها إلى العصرين الروماني والبيزنطي، حيث تظهر بعض الجدران بارتفاع ثلاثة مداميك، يجري بالقرب منها نبع ماء، يقع ضمن الإحداثي العالمي ٣٣٢٣٠شرق، ٧٤٠١شمال، والإحداثي الفلسطيني ١٩٦٠٨٩٤شرق،٩٣٦٠٤٠شمال، ذكرها كل من جلوك وبيشة وهارت وفالكنر (Glueck 1935: 60, site 32) (Bisheh 1993: 126; Hart and Flkner 1985: 269) (**الشكل ٦**).

١٣- خربة الحياض: تقع جنوب غرب الحييض، تعد مستوطنة زراعية كبيرة يجري بالقرب منها نبع ماء، ترتفع عن مستوى سطح البحر ١٤٨٠م، تبلغ مساحتها ٢٠ دونم، تعود بتاريخها إلى العصر الروماني والعصر البيزنطي، تقع ضمن الإحداثي العالمي ٣٣٢٥٣شرق، ٧٣٨٦شمال، والإحداثي الفلسطيني ١٩٥٠٤٤٠شرق، ٩٣٨٠٣٦٨شمال، ذكرها بيشة (Bisheh 1993: 126) (**الشكل ٥**).

١٤- برج الحييض: موقع صغير يقع على تلة مرتفعة إلى الجنوب الغربي من موقع الحييض، يرتفع عن مستوى سطح البحر ١٥٠١م، يعود بتاريخه إلى العصر الروماني والعصر البيزنطي، بني من حجارة كلسية وصوانية، يمثل نقطة استطلاع لمراقبة الطرق المجاورة، يقع ضمن الإحداثي العالمي ٧٣٩٠٠٠ شرق، ٣٣٢٦٦٠٠ شمال،



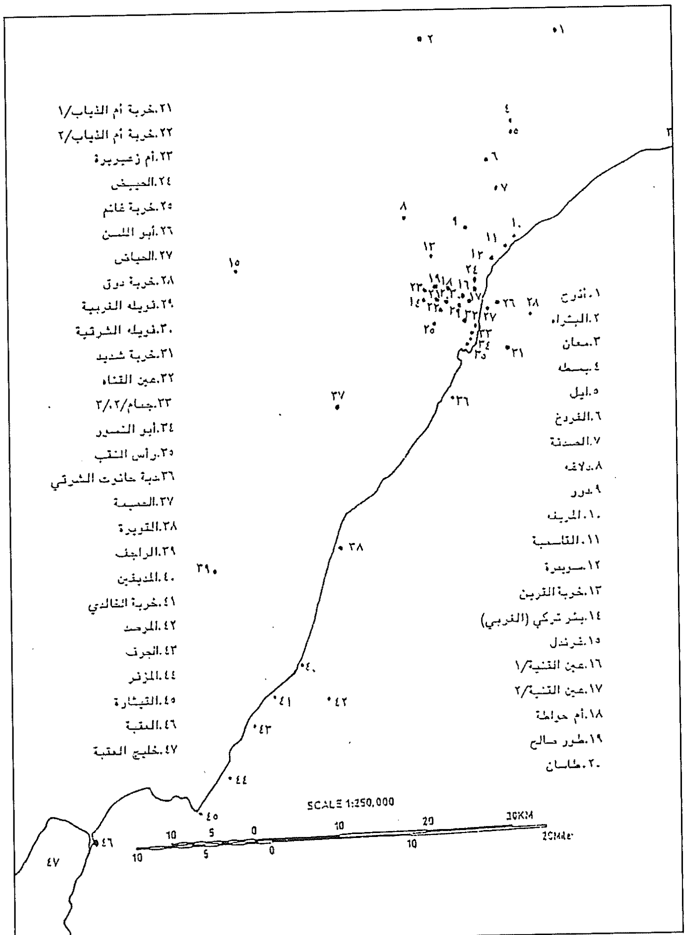
٤. مخطط طبوغرافي يظهر انتشار عيون الماء والارتفاعات التي تقع عليها عن مستوى سطح البحر.



٥. خريطة تبين المواقع التي شملها المسح الذي جرى عام ١٩٩٢ بكوادر من دائرة الآثار.

(Glueck 1935) (**الشكل ٦**).

٤- خربة سويمرة: تقع على الطريق الروماني وترتفع عن مستوى سطح البحر ١٤٨٥م، مساحتها ٢٠دونم، ويعود تاريخها للعصرين الروماني والبيزنطي، وهي موقع كبير تمتد الأبنية لمساحات شاسعة، وتظهر جدران بارتفاع أربعة مداميك. عثر فيها على أرضية فسيفسائية بالإضافة لوجود نبع ماء وقنوات وبرك، تقع ضمن الإحداثي العالمي ٧٣٨٤٠٠شرق، ٣٣٣١٢٠٠شمال، والإحداثي الفلسطيني ١٩٥٠٤شرق، ٩٤٤٠٣شمال، ذكرها جلوك وجراف



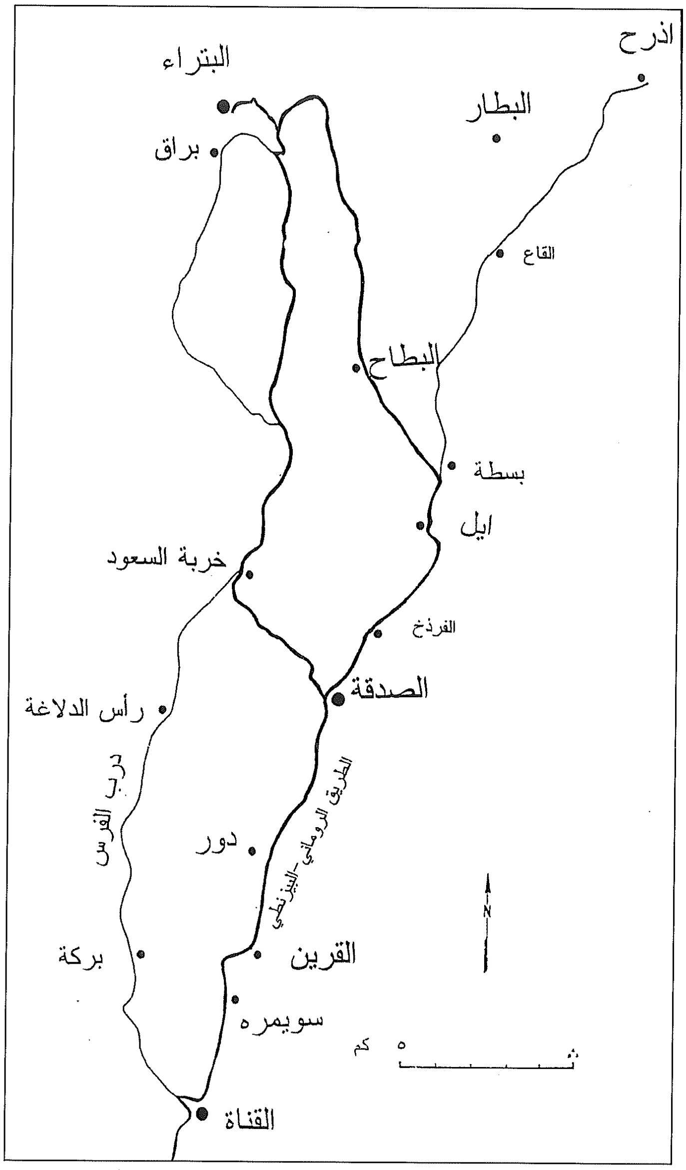
٦. المواقع الأثرية التي جرت فيها مسوحات أثرية في منطقة رأس النقب جنوبي معان حتى العقبة.

(Glueck 1935: 71, no.80; Graf 1995: 252-255) (**الشكل ٧**).

٥- خربة القرين: تعد واحدة من سلسلة المواقع الهامة في منطقة رأس النقب، ويمر منها الطريق الروماني، ترتفع عن مستوى سطح البحر ١٥٠٠م، مساحتها ٢٠دونم، بنيت من حجارة كلسية مشذبة كبيرة الحجم جدرانها مرتفعة تظهر للعيان مكونة من خمسة مداميك، تقع ضمن الإحداثي العالمي ٧٣٨٣٠٠شرق، ٣٣٣٢١٠٠شمال، وضمن الإحداثي الفلسطيني ١٩٥٠٣شرق، ٩٤٥٠٢شمال، ذكرها جلوك وجراف (Glueck 1935: 70, no.73; Graf 1995: 252) (**الشكل ٧**).

٦- خربة المريغة: تعد من المواقع الكبيرة في منطقة رأس النقب، ترتفع عن مستوى سطح البحر ١٤٠٠م، مساحتها ٢٠دونم، يعود تاريخها للعصرين الروماني والبيزنطي، وتضم عددا من الأبنية المتهدمة. تقع ضمن الإحداثي العالمي ٧٢٠٦شرق، ٣٢٨٨٣شمال، والإحداثي الفلسطيني ١٧٦٧شرق، ٩٠١٧شمال، ذكرها جلوك (Glueck 1935: 64, site 43) (**الشكل ٦**).

٧- خربة أم الذياب /١: تقع في منطقة سهلية خصبة بجانب الوادي، تعد من المواقع الزراعية الهامة في منطقة سهول طاسان،

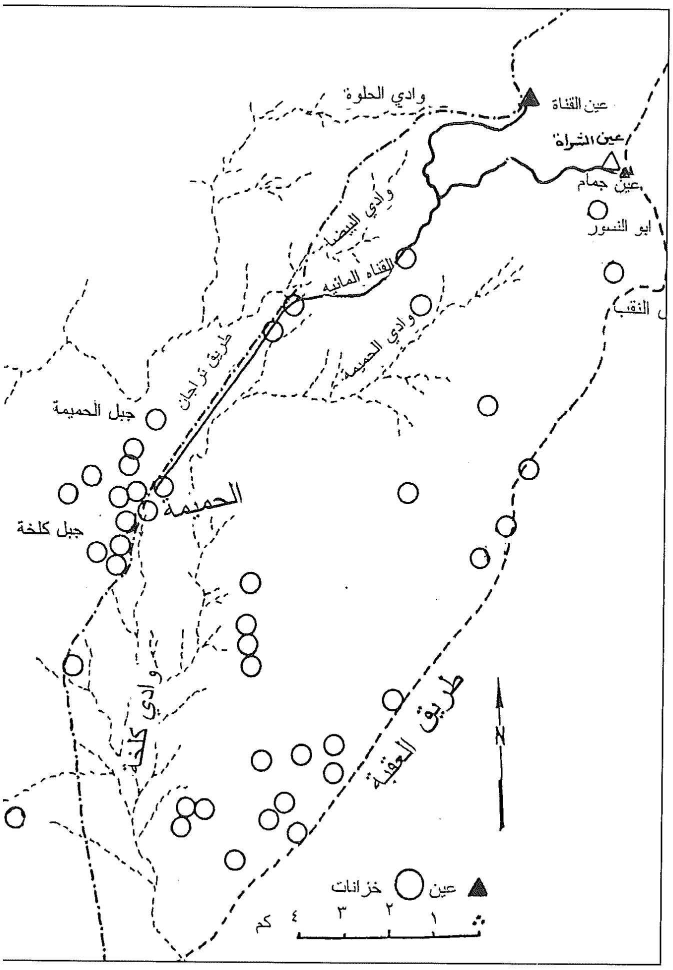


٢. خريطة تبين المواقع التي كان يمر منها الطريق الروماني في جنوبي معان.

شملت مواقع الحييض وأبو النسور وعين جمام عام ١٩٩٥م فكشف في موقع الحييض قرية زراعية كبيرة الحجم تمثل ذلك بالوحدات السكنية التي ظهرت والمعثورات الأخرى من مسكوكات وفخار، وموقع أبو النسور الذي كشف فيه عن عمارة سكنية تمثلت بالبيوت وغرف السكن بالإضافة للمباني ذات الطابع العسكري إذ وجد برج مراقبة يشرف على الحميمة في منطقة صحراء حسمى وموقع عين جمام ٣/٢ الذي يعد موقعا سكنيا يشرف على منطقة زراعية، بالإضافة لاعتباره نقطة مراقبة وحماية لمصادر المياه في منطقة رأس النقب مثل عين جمام وعين الشراة وعين القناة (Waheeb 1996: 339-345) (**الشكل ٥**).

المسح الأثري جنوب معان / رأس النقب

١- خربة الحييض: تقع في منطقة رأس النقب على الطريق المؤدي إلى العقبة، ترتفع عن مستوى سطح البحر ١٤٠٠م وتبلغ مساحتها ١٥دونم، تمثل قرية زراعية كبيرة تحيط بها السهول

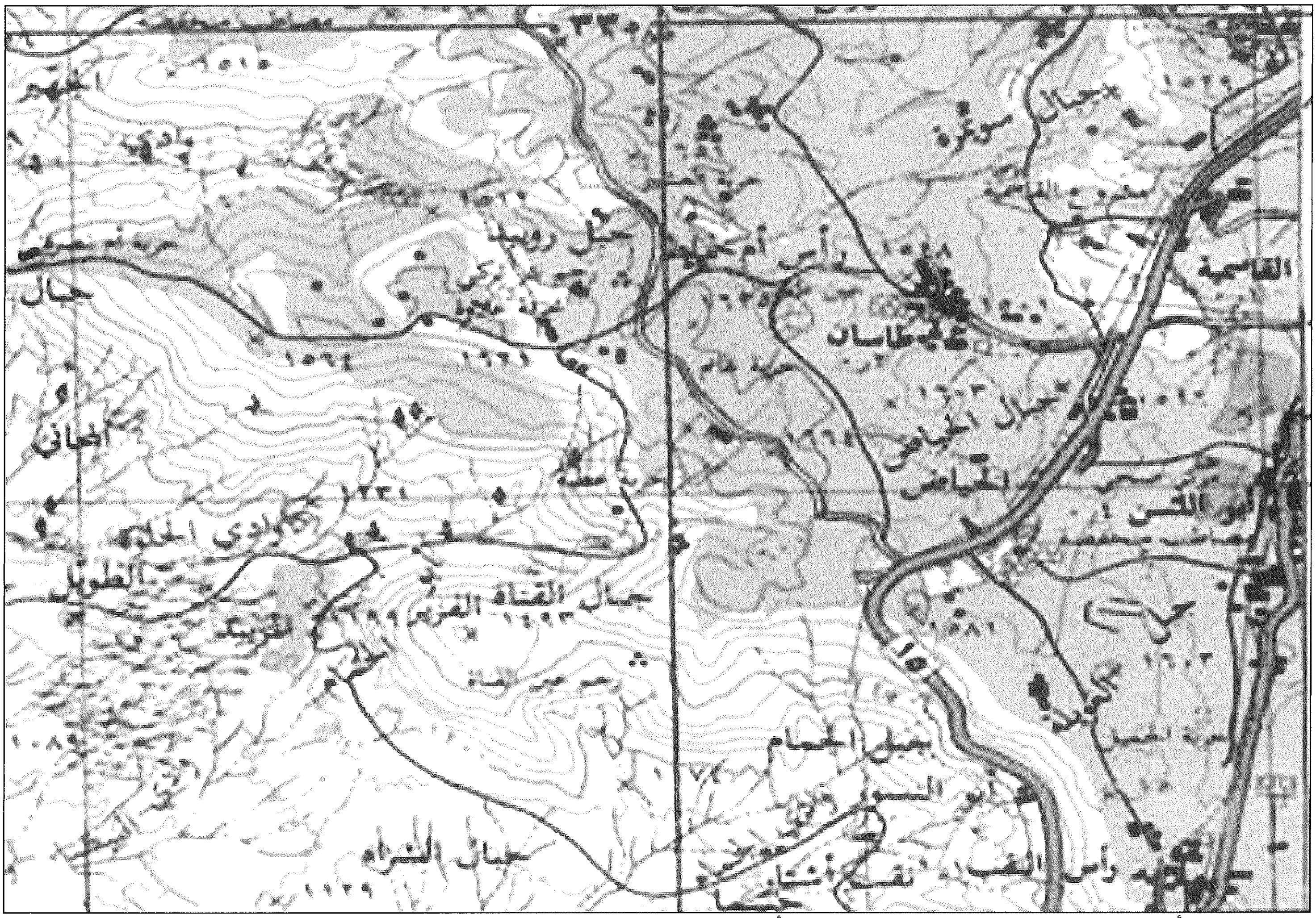


٣. خريطة تبين مواقع عيون الماء التي كانت تغذي المنطقة وتصل إلى الحميمة.

الزراعية، وتنتشر على سطحها بقايا جدران وكسر فخار تعود للقرن الرابع الميلادي، تقع ضمن الإحداثي العالمي ٧٣٩٤٠٠ شرق، ٣٣٢٧٠٠شمال، والإحداثي الفلسطيني ١٩٦،٣٠٠شرق، ٩٤٠،٢شمال. ذكرها جلوك وبيشة (**الشكل ٥**) (Glueck 1935: 67, site 56; Bisheh 1993:121).

٢- عين القنية /١: تقع على الطرف الشمالي للوادي القادم من بلد طاسان، ترتفع عن مستوى سطح البحر ١٤٥٥م وتبلغ مساحتها ٢دونم، تمثل مستوطنة متوسطة الحجم أنشئت بالقرب من عين الما التي جفت في الوقت الحاضر، عثر على ثلاثة مداميك من الحجار الصوانية وأرخت الكسر الفخارية للعصرين الروماني والبيزنط تقع ضمن الإحداثي العالمي ٧٤٠١٠٠شرق، ٣٣٢٧٩٠٠شمال وضمن الإحداثي الفلسطيني ١٩٧،٠شرق، ٩٤١،٠ شما (Glueck 1935: 65) (**الشكل ٦**).

٣- عين القنية/٢: تقع إلى الجنوب من عين القنية /١ ويفصل بينهم الوادي، ترتفع عن سطح البحر ١٤٥٥م وتبلغ مساحتها دو واحد، تؤرخ للعصرين الروماني والبيزنطي، تقع ضمن الإحداث العالمي ٧٤٠٢٠٠شرق، ٣٣٢٧٦٠٠شمال، وضمن الإحداث الفلسطيني ١،١٩٧شرق ٩٤٠،٦ شمال، وذكرها جلوك (6



١. خريطة لمنطقة رأس النقب الواقعة جنوبي محافظة معان والتي جرت فيها أعمال المسح والتنقيب.

والرومانية العسكرية في جنوب الأردن فذكر خربة رأس النقب التي ربما يقصد بها دبة حانوت وموقع البيضا في قاع النقب في الصحراء المؤدية إلى الحميمة ويفيد أنه شاهد حجارة مسافات محطمة وبعض الحجارة التي استعملت في بناء الطريق الروماني، وذكر تلك القناة القادمة من عين القناة التي كانت تجلب المياه إلى موقع الحميمة حيث عثر فيها على كسر فخارية تعود للفترة الرومانية المتأخرة (**الشكل ٣**) (Graf 1979: 125). وأجرى وليم جوبلنج مسحا للمواقع بين معان والعقبة وذلك في عدة مواسم ابتداء من عام ١٩٨٠ وحتى ١٩٨٦م فذكر موقع عين جمام (Jobling 1981: 107-110) وفي أثناء مسحه للمنطقة الجنوبية من معان في منطقة رأس النقب ذكر موقع عين أبو النسور وموقع عين جمام وسيل عين جمام ورجم عين القناة (**الشكل ٣**) (Jobling 1982: 199-200)، وفي المسح الذي أجراه جون ايدي عام ١٩٨٣م كشف عن جزء من الطريق الروماني المرصوف وبعض حجارة المسافات شمال شرق الحميمة (**الشكل ٢**)، وذكر منطقة رأس النقب وموقع أبو النسور وكان الهدف من المسح توثيق منابع المياه التي تغذي موقع الحميمة وعين القناة وتتبع مجرى المياه من القنوات التي نحتت في الصخر الرملي وغطيت بالألواح الحجرية (Eadie 1984: 214-217) وأجرى جون السون مسحا لمنطقة الحميمة تم التركيز على المنشات المائية مثل الينابيع والقنوات والآبار والسدود وعيون الماء مثل عين جمام وعين أبو النسور التي دمرت وتبعد ٢,٢٥كم إلى الجنوب الشرقي عن عين جمام التي كانت تنقل الماء إلى الحميمة عبر قنوات (**الشكل ٤**) (Oleson 1986: 256). في عام ١٩٩٢ قامت دائرة الآثار بأجراء مسوحات أثرية موسعة بدأت من منطقة القاسمية جنوب معان وحتى العقبة مرورا بمنطقة رأس النقب (**الشكل ٥**) فرصدت عددا من المواقع الأثرية وهي الحييض وأبو النسور وعين جمام ٣/٢ وقد أرخ موقع الحييض إلى العصرين النبطي والروماني وهو موقع كبير يقع على جانبي الطريق حيث يقع الجزء الأكبر منه غرب الطريق ومساحته ١٠٠ × ١٠٠م وأرخ موقع أبو النسور إلى العصور النبطية والرومانية والبيزنطية، وقد تعرض للتجريف واستخدم مكبا لمخلفات الطريق الحالي في أثناء عملية التجريف. أما موقع عين جمام /٢ فأرخ للعصرين النبطي والروماني ويقع بالقرب من عين جمام /١ الذي يعود بتأريخه إلى العصر الحجري الحديث ويلاحظ تأثر مواقع عين جمام بشكل عام بأعمال التجريف وتراكم الطمم الناتج عن سقوط مخلفات توسعة الشارع الرئيسي. ويعد موقع أبو النسور برج مراقبة مشرفا على موقع الحميمة (Bisheh 1993: 119-121). لقد حظيت تلك المواقع التي رصدت من مسوحات عام ١٩٩٢م بأعمال تنقيبات أثرية منظمة وموسعة

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الاستيطان الروماني المتأخر في منطقة رأس النقب جنوبي محافظة معان في ضوء الإكتشافات الأخيرة

تمهيد

بدأت السيطرة الرومانية على البحر الأحمر في القرن الثالث الميلادي بالاضمحلال نتيجة الأزمة الاقتصادية والسياسية التي داهمت الإمبراطورية الرومانية، الأمر الذي دعا ديوقليشيان ٢٨٤ - ٣٠٥ م، وقسطنطين ٣٠٧ - ٣٣٧م إلى اتخاذ إجراءات كان من شانها أن توقف هذا التدهور، فقسم ديوقليشيان الولاية العربية إلى أقسام إدارية صغيرة لتقليص سلطة حكام الولايات، وقام بفصل القيادة العسكرية عن الإدارة المدنية، وأنشأ حصون جديدة وقوّى بعض الحصون في المناطق ذات الأهمية الإستراتيجية كما في اللجون وأذرح وتدمر ودير الكهف وقصر بشير (Parker 1985: 21-22, 53-54).

وفي نهاية القرن الثالث الميلادي نقل الفيلق الروماني العاشر من القدس إلى العقبة لحماية هذا الموقع الذي كانت تصل إليه طريق تراجان الجديد الممتد من بصرى الشام إلى البحر الأحمر (Parker 1985: 142) ومع بداية القرن الرابع الميلادي اقتطع من كورة البتراء بعض المدن مثل العقبة وفينان وألحقت بفلسطين، حيث إن الضرورات العسكرية دفعت إلى إجراء هذه التغييرات. فقد كانت الطرق الحربية تصل من إيلانة (العقبة) إلى سوريا وفلسطين (زيادة ١٩٨٦: ١٢٠، ١٩٨٩: ٣٠٥) وفي أواخر القرن الخامس الميلادي ضعفت سيطرة الإمبراطورية على الأجزاء الشمالية من الحجاز وسيناء، مما دفع القبائل العربية إلى التمرد على السلطة (Shahid 1984: 142-143). لقد أصبحت الزراعة في القرن الرابع مصدرا رئيسيا في الإمبراطورية، وكان الجزء الأكبر من الاقتصاد يعتمد على الضرائب التي تجبى من المزارعين، حيث تتحمل نفقات الدولة العسكرية والخدمات الأخرى، وكان القمح وزيت الزيتون والخمور أكثر السلع التجارية التي ترتبط بالزراعة في بلاد الشام، وقد أقبل الناس على زراعة الكرمة لأن غلتها ذات فائدة أكبر من المزروعات الموسمية الأخرى (عباس ١٩٩٠: ١٦٥- ١٦٦) من ناحية أخرى كانت منطقة حضرموت غنية بنباتات مدارية رطبة أهمها البخور، وكانت المصدر الرئيسي له في العالم القديم، ونتيجة للتغيرات المناخية فقد جفت المنطقة في القرن الثالث الميلادي، مما وجه أنظار التجار نحو الهند لجلبه منها في وقت اشتد فيه الطلب على هذه السلعة، حيث أن الدولة الرومانية بعد اعتناق النصرانية كانت طقوسها الدينية في الكنائس تحتاج للبخور، ودخل العرب بأنفسهم في هذه التجارة، وبدءوا البحث عن التوابل والبخور لسد حاجة التجارة الرومانية، حيث كان النشاط التجاري الروماني حتى القرن الرابع الميلادي مقصورا على شرقي البحر المتوسط، وكان العرب إما تجارا أو ناقلين للتجارة أو حماة لقوافل التجارة. وقد وجدت ثلاث مدن صحراوية تتوسط طرق التجارة التي تعبر الصحراء وهي تدمر في الشمال والبتراء وتيماء في الجنوب، حيث كان العرب الأنباط ينقلون تجارتهم من غزة على البحر المتوسط إلى الخليج العربي (غلاب ١٩٨٤: ١٩٤-١٩٦).

الدراسات السابقة

تعد منطقة رأس النقب من المناطق المهمة في العصور التاريخية المختلفة التي مرت عليها هذه المنطقة، فقد حظيت بزيارة عدد من الرحالة والمكتشفين الأوائل وتسجيل ملحوظاتهم عليها بذكر أسماء المواقع ورصد ما يمكن مشاهدته من بقايا أثرية ومعمارية على السطح (**الشكل ١**). وقد أجرى عدد من الباحثين مسوحات وتنقيبات علمية منظمة في المنطقة، ومن أوائل الذين زاروا المنطقة في عام ١٨٩٨م الرحالة النمساوي موزيل الذي ذكر موقع أبو النسور وأشار إلى وجود برج مراقبة، وجاء موزيل على ذكر الطريق الروماني والمواقع التي يمر منها مثل موقع القرين وسويمرة والقناة والحميمة (**الشكل ٢**) (Musil 1926: 53). وفي عام ١٩٣٣م زار الألماني فرتز فرانك المنطقة الممتدة بين معان والعقبة حيث ذكر أن الطريق الروماني تقع بين خربة القناة وخربة الحميمة (**الشكل ٢**) (Frank 1934: 230-240)، ثم جاء بعد ذلك نلسون جلوك الذي زار المنطقة عام ١٩٣٤م وذكر عددا من المواقع جنوبي معان وهي خربة الحييض، فيصف فيها آثار غير واضحة المعالم ويذكر وجود عين ماء في الموقع ويذكر موقع عين جمام واصفا بعض الأعمال الزراعية فيه، والنبع الجاري الذي يغذي المنطقة، وزار جلوك أيضا موقع أبو النسور ووصفه بأنه موقع نبطي صغير وآثاره كاملة بالرغم من الدمار الكلي للموقع، ويذكر وجود نبع ماء صغير يغذي الموقع (**الشكل ٣**) (Glueck 1935: 65)، وفي عام ١٩٦٠م زار لانكستر هاردنج منطقة رأس النقب وذكر أنه لا توجد مواقع تلفت النظر بين معان ورأس النقب لكنه يذكر وجود بقايا قلعة نبطية متهدمة في رأس النقب أنشئت لحماية طريق القوافل من الجزيرة العربية إلى البتراء (هاردنج ١٩٦٥: ١٣٨-١٤٠) وأجرى جراف مسحا للمواقع النبطية

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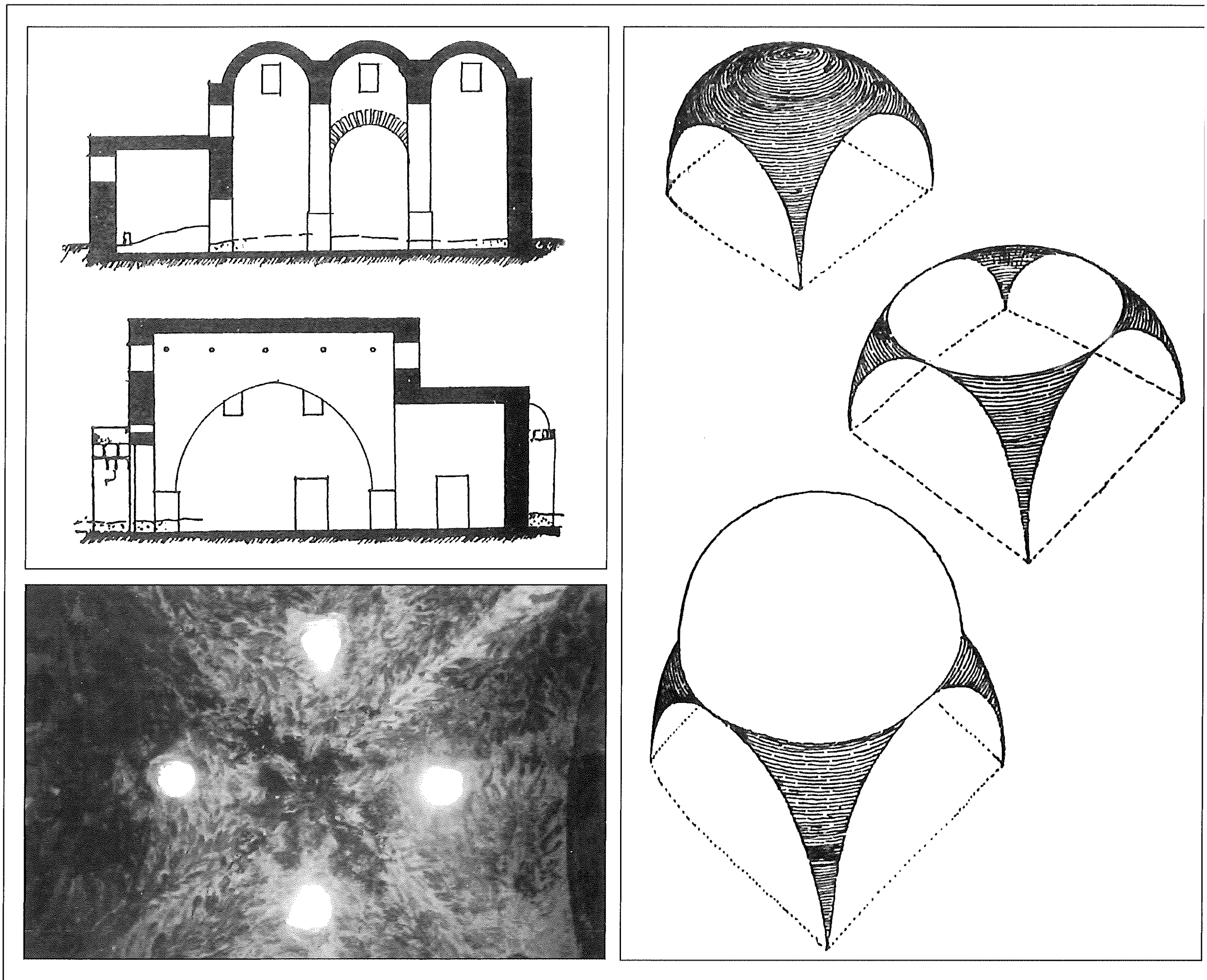


أ، ب، ج. طريقة بناء القباب في قصير عمرة.

سب أهمية القصير إليها لأنها تصور الخليفة وهو جالساً على عرشه نف على جانبه شخصان وتحيط برأسه هالة، فوقها مظلة محمولة على موديين حلزونيين، وصف من الطيور الصغيرة ويبدو تأثير الأسلوب ساساني فيها واضحاً (الشكل ٥) (نعمت ١٩٨٩: ٤٣). وما يميز هذه قاعة أيضاً هو كثافة الرسوم والتصاوير الجدارية التي تعطي معظم جدران بالنصف الأعلى والسقوف المختلفة هذا من جهة وميزة ثانية هو نوع الموضوعات واختلافها في هذه التصاوير.

وقيل فيها أنه لا يوجد مثيل لها من حيث الاتساع في أي بناء (مدني) بل الفن المسيحي في القرن الأول الميلادي. وتمتاز هذه التصاوير يضاً بالقدرة الفنية في تنفيذها والتقنية المتقنة فيها، حتى بلغ سماكة طلاء حوالي ٣سم مستخدماً فيها الألوان الأساسية والمشتقه كالأزرق ـرجاته وبريقه، والأصفر الغامق، والأخضر المائل نحو الزرقة والبني غامق، أما اللون الأحمر لحيطانه ورسوماته الداخلية عكست بأنه كان مصيصاً للخليفة الأموي فظهرت موزعة بشكل متناسق وتوافق لوني

يندر تحقيقه في مثلها (كريزويل ١٩٨٤: ١٢٣). وهي ذات تأثير نفسي وقدرة عقلية تجعل من المشاهد شخصاً قادراً على فهم الفن الإسلامي في بداياته (انتجهاوزن ١٩٧٣: ٣٠) مما يظهر الإحساس بالتصميم اللوني

٥. الحنية في قاعة الإستقبال.

الحلابات. وهكذا إن أكثر القصور العربية الإسلامية في بادية الشام تتميز بجدران قوية وذلك بسبب وجودها في مناطق بعيدة من العمران وتأمينا لسلامة الخليفة والأمراء اللذين كانوا يقيمون فيها (الشافعي ١٩٩٤: ٢٨٥-٢٨٦). كما يعتقد أن بناء هذا القصير وغيره من القصور الأخرى (زيادة ١٩٨٩: ٤٤) كانت من أجل زيادة الخصوبة السكانية في المنطقة وهي فكرة أموية أشاعها الأمويون في صحارى الشام لزيادة الخصوبة فيها (درادكة ١٩٨٩: ٤٤).

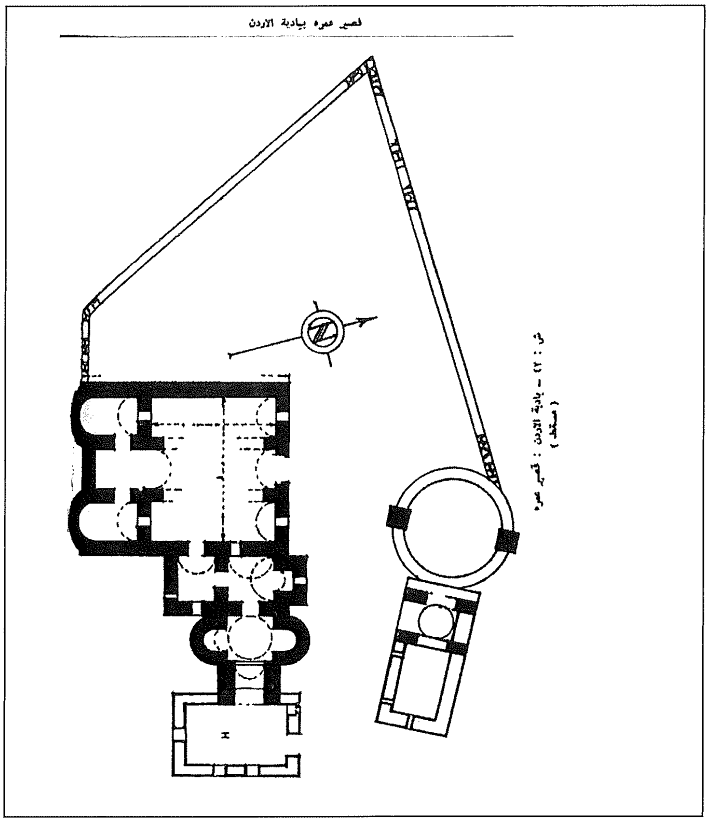
ذاكرة المكان وتقسيمات قصير عمرة

في ذاكرة المكان يقع قصير عمرة على حافة وادي البطم الذي يبعد مسافة ٨٠كم تقريباً إلى الشرق من العاصمة عمان، ويرجع الفضل في اكتشاف هذا القصر إلى الرحالة التشكيلي (لويس موزيل Musil) الذي زاره عام ١٨٩٨ وأقام به لفترة ليست بالطويلة، وعاد إليه مرة أخرى عام ١٩٠١ يرافقه الفنان النمساوي الرسام (ميليخ) الذي قام بنقل ورسم التصاوير والرسوم الفنية في جداريات القصر وسقوفه، وقام بعد ذلك بنشر هذه الرسومات في مجلد طبع في فينا عام ١٩٠٧ (زيادين ١٩٨٨: ٦٥). وفي عام ١٩٠٩ قام العالمان الفرنسيان جوسن وسفيناك بزيارة القصر وأجريا مراجعة للدراسات السابقة محاولين إصلاح بعض الأخطاء المنهجية للدراسة الأولى التي قام بها (موزيل). وقد نشرا ما توصل إليه العالمان من آراء وأفكار في كتاب نشر عام ١٩٢٢ إلى أن تبعهما العالم (كريزول) في دراسته الوافية لهذا القصير معتمداً على دراسة العالمين الفرنسيين السابقة ونشر كريزول آراءه في سباق (كتابة الآثار الإسلامية الأولى) (كريزول ١٩٨٤: ٢٥) ويكاد أن يجمع المؤرخين والباحثين على أن القصير أنشئ في عهد الوليد الأول بن عبد الملك في الفترة ما بين (٧١٢ – ٧١٥) ميلادية استدلالاً من كتابات بالعربية الكثيرة التي وجدت داخل هذا القصر، وبسبب الرسوم للأباطرة والملوك فيه وخاصة الملك روذريق الذي قتله العرب عام ٧١١م (وبوزورث ١٩٨٨: ١١٩)، حيث كان مثل هذا القصير يشكل في ذاكرة المكان عند الحكام مركز استقرار ولقاءات للبدو الرحل في تلك المنطقة. وقد قامت عليها إلى عهد بعيد ثروات الخلفاء الذين كانوا يميلون إلى السكن في مواضع تحيط بها الأعمال الزراعية، وإلى بناء مثل هذا القصير الاموي المتميز باحتفاظه بطابعه أكثر من غيره. وما يؤكد ذلك الأرضية الفسيفسائية، وتصاويره الجدارية، وأعمال الرسوم التي تعكس جمالية خاصة، وقدرة فنية فائقة إضافة إلى إظهار مدى الرغبة لدى الحكام في أن تعكس هذه القصور ماهية الحياة.

إما عن وصف القصير فيمكن القول بأنه بناء صغير نسبياً يتكون من ثلاثة أجزاء معمارية رئيسية إضافة إلى البئر الخارجي (خزان الماء) (**الشكل ٢ و٣**) وهذه الأجزاء الرئيسية هي

أولاً: قاعة الاستقبال

قاعة الاستقبال مستطيلة الشكل مساحتها حوالي ٦٤م^2، يعلوها



٢. مخطط لقصير عمرة.

٣. قصير عمرة.

سقف نصف برميلي يتكون من ثلاثة أقبية ترتكز على الحائطين الشرقي والغربي، وعقدين مدببين مقامان بأسلوب ساساني، يحف بها من الجانبين غرفتان مظلمتان، تستخدمان للقيلولة، وإضاءتهما محدودة من خلال فتحات دائرية صغيرة بالأعلى، وفرشت أرضيتها بالفسيفساء المنفذ بأسلوب جمالي وإتقان فني وتشبه هذه الأرض الفسيفسائية في زخارفها الهندسية والبنائية وسائر موضوعاتها تلك الفسيفساء التي في مادبا (صادق ١٩٩٥: ٤١). وينتهي العقد الأوسط بمقصورة العرش على شكل حنية مليئة بالصور النباتية وهي حنية مجوفة متعامدة الأضلاع وليست مستديرة كالمحراب (الشافعي١٩٩٤: ٦٥٩)، محدثة مثلثات كروية من تداخل القباب وأن هذه المثلثات الكروية في قصير عمرة كان لها وظيفة تحويل المسقط المربع إلى دائرة ترتكز عليه الحافة السفلى الدائرية للقبة (**الشكل ٤أ، ب، ج**) وهي فكرة محلية صناعها من الشاميين وهذا يعني وظيفياً أن يكون البناء متوازن وقوي (الشافعي ١٩٩٤: ٢٠٠). أما الصورة التي في هذه الحنية تعتبر إحدى الصور التي

ية الأمة، وتتطور بتطورها، وتنهض بنهوضها. لذا أن البحث عن ية العمارة هو بحث عن هوية الأمة فقراء تاريخ العمارة يجب أن يبدأ راءة تاريخ حضارة الأمة، فالعلاقة بين الزمان والمكان علاقة وجودته، لا زمان دون مكان ولا حركة للمكان دون زمان ولهذا فان طبيعة زمان تختلف وتتجلى بحسب طبيعة المكان. وقد خلص الشافعي للدلالة ى علاقة الزمان والمكان (ذاكرة) بقوله (أن جوهر العمارة العربية الإسلامية، أي عظامها وما يكسوها لحم عربيا إسلاميا خالصاً. وأما ظهرها وثوبها الخارجي فقد دخل في نسيجه بعض خيوط من طرز ابقة، وسرعان ما أصبح عربياً إسلاميا في سدته ولحمته ووحداته عناصره الزخرفية) (الشافعي ١٩٩٤: ٢٧٧).

خاتمة

أتضح في هذه الدراسة أن المكونات المعمارية بنوعيها: الأساليب بنائية Building Style والنتاجات الفنية Decorative Art صير عمرة، تشتمل على اهتمامات نظرية وعملية من حيث الوصف تكويني لعمارته فجاء ملائما لعمليات التقويم الحديث في العمارة الأساليب البنائية الحديثة، مثلما يعكس حالة من التطور التقني الفكرة نحو الإبداع، فاختلاف الأساليب، والخامات وغرابة المواضيع، التكوينات من حيث النوع والأسلوب هي التي عكست التقويم نوعي فيه، وقد عرف هذا الأسلوب عند النقاد التشكيليين بالأسلوب تأملي وهو الأسلوب الذي يتجنب عنصر المحاكاة ويرفض تقليد واقع فيستبدل بواقع متى يتناول الحقائق والجوهر والروح بتعبير مزي، فأحال الشكل الخارجي والمظاهر العرضية إلى رموز وأسرار، ضامينها تأملية، وأشكالها تعتمد التوازن والتقابل والتناسب والتكرار. استعاضت عن التجسيم بالعمق الوجداني، وما يؤكد استلهام الزمن ن انتقلت هذه الإبداعية إلى فنون الغرب المعاصرة (الصراف ١٩٧٩: ١٦-١٦٣) كعنصر تزويقي وتستلهم الحروف أحيانا.

إن قصير عمرة برسومه التلوينية، وتصاويره، وفسيفسائيته، تخطيطه وتصميمه وبكل أشكال مظهره الخارجي وكتلته وأقسامه ؤكد أنه معلم فني مجسم أنجزته أيدي مهرة وهو عمل إبداعي؛ نفذه كرة هندسي، وقد استوعب جميع أنماط الفن التشكيلي، بمعنى أنه فيه لاقت فيه مفردات لغة الخط واللون مع لغة الكتلة والفراغ، لغة التشكيل ع لغة المعمار (بهنسي ٢٠٠٢: ٩-١٠).

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بين كل عقدين بقبو عريض يسير بين الجدارين الجانبيين ويرفع مركز نصف دائرة فوق قمتي العقدين اللذين يحصرانه فكأن القاعة قد غطيت بقبو طولي كبير ينقسم إلى جملة عقود متوالية تفصل بينها أقبية عرضية (الشافعي ١٩٩٤: ١٦٤-١٦٧)، وبالرغم أن الحمامات الإسلامية ومنها (حمام قصير عمرة) قد اقتبست فكرة الوحدات الثلاث وطريقة اتصالها ببعضها حسب النموذج الروماني ونواته ثلاث وحدات هي باردة (جو عادي)Frigidarium أو Apoditarium والدافئة المعتدلة Topidorium، والحارة (الساخنة) Calidarium إلا أنها قد خضعت للتقاليد الإسلامية الجديدة، وهي مرتبطة مع السكن أي ملحقه بمسكن بعكس الرومانية.

وبالتحليل اتضح النضج المعماري الإسلامي في الصميم من حيث تواصل المباني وصغر الحجم، وقلة الوحدات المعمارية وهذه ميزة معمارية إسلامية (الشافعي ١٩٩٤: ١٥).

ثانياً: مسائل الإبداع الفني والقيم الجمالية

لقد أتضح بالدراسة سمو المستوى الفني والحسن الجمالي فيه من حيث التقنيات واستخدام المواد الأولية من الوان، وفريسكو وحجارة فسيفسائية وغيرها، إضافة إلى القدرة على اختيار الألوان، وتوزيع العناصر والألوان والخطوط، والإشكال وتناسبها، وانسجامها، ورصوف الأرضيات بالفسيفساء، مما دلل على ذوق راق وثقافة فنية ورؤى بصرية، وتذوق جمالي يعكس امتلاك حساسيةً خاصة بقيمة الزمان والمكان. أن قصير عمرة برسومة التلوينية وتصاويرة، وفسيفسائة وتخطيطة وتصميمة وبكل أشكال مظهرة الخارجي أكد على أن القصير هو معلم إبداعي ومبنى يتميز بهندسته وقيمة المعمارية الجميلة بحيث استطاع أن يستوعب جميع أنماط الفنون التكميلية في ميدان العمارة من تشكيل وتصوير ورسم وغيرها وبالتالي يمكن القول انه فيه جرى التمازج والتفاعل ما بين مفردات لغة الخط واللون والشكل مع لغة الحجم والحيز (بهنسي ١٩٧٩: ٩-١٠)، أو الكتلة والفراغ. بمعنى لغة التشكيل مع لغة التكوين والتصميم المعماري. فمثلاً أن التصاوير عكست الإحساس بالزمان في بعض الرسوم الشريطية في قصير عمره، إضافة إلى التعامل اللوني والتحكم بتوزيعه كحال اللون الأزرق الذي بدا في جميع اللوحات متقارب من حيث الارتفاع، مما أعطاها جانباً جمالياً وتشكيلياً يوحي بالزمن (استمرار الزمن) واستمرار الرؤية (التتابع الصوري)، وأيضا تجاور وتمازج اللونين الأزرق والبني في مساحات كبيرة أوجد حالة خلق مكاني يتسم بالاستمرارية والإحساس بالثقل المكاني وكتلته (الربضي ١٩٩٥: ٣٧٨).

ثالثاً: مسائل تتعلق بالمضامين والموضوعات والأفكار

تعتبر الصور والرسوم الجدارية في قصير عمرة من أقدم الصور التي تم اكتشافها وتعكس على درجة عالية من الأهمية في مضامينها في تاريخ التصوير الإسلامي المبكر (الفرغلي: ٥٦) وتتلخص موضوعات الرسوم والتصاوير بمواضيع الكائنات حية ومشاهد حية لحمر وحشية وكلاب سلوقية تظهر طرائق الصيد وأساليب الاقتناص، وهناك مواضيع أدمية إنسانية تعكس مختلف المستويات فمنها صورة للخليفة وملوك وأباطرة فهي تعكس موضوع رسمي وسياسي وتقاليد ومراسيم، وأخرى لنساء عاريات مستحمات وتمتاز الرسوم الخاصة بالنساء من حيث أنها أكثر تحرراً وأكثر طبيعية، وصورا أخرى لجارية ومشاهد طرب ولهو، ومشاهد إنسانية أخرى تعكس الحياة الاجتماعية العامة كعمال الحجارة ونقلها وقطعها وأيضا ملامح لرسوم فلسفية خاصة الصورة التي تعكس مراحل العمر.

إضافة إلى زخارف من التوريق والعناصر الهندسية وفسيفساء ذهبية، ونوافذ ملونة (زغلول وأخرون ١٩٨٦: ٥٠٤) وبذلك يقول المعماريون أن السكن كقصر أو منزل أو غيره هو خلية عمرانية اجتماعية، وليس هو منشأة في فراغ اجتماعي. وهو بذلك يحقق أهدافا ثلاثة:

١. اللقاء مع الآخرين.
٢. التوافق معهم.
٣. تحقيق السكنية والتفرد.

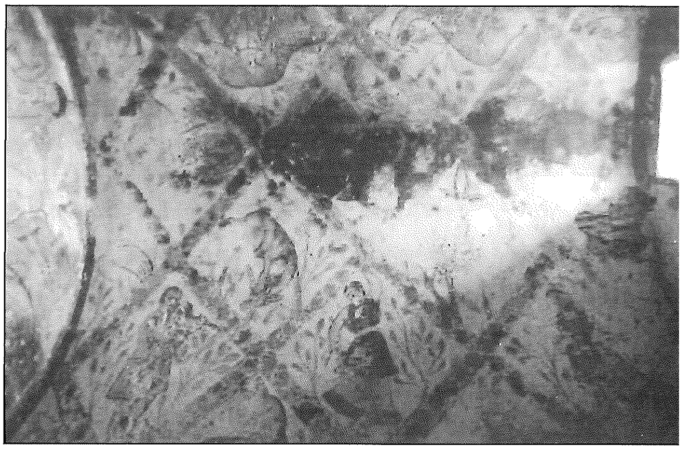
ولغة العمارة هي لغة ذاكرة المكان، والعمارة الأصلية هي التي تمتلك اللغة التاريخية التي تعبر عن الإنسان الذي أنشئت من اجله، إنها العمارة التي تعبر عن الهوية، ولأن اللغة هي المعبر عن الهوية فالعمارة لغة تاريخية واجتماعية ولقصير عمره مكانه خاصة في تاريخ الفن الإسلامي من حيث انه يقدم نماذج تمتاز بالغرابة في تاريخ الفن الإسلامي.

غياب التراث المعماري: غياب الزمان ونسيان المكان

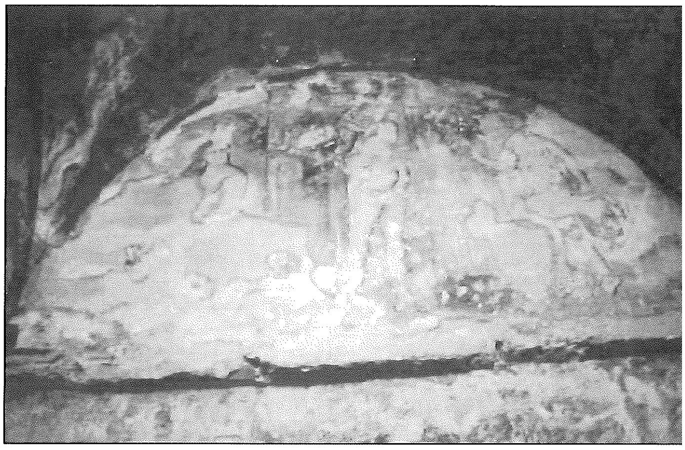
تحت اسم الحداثة وما بعد الحداثة يجب أن يتذكر أيضا أننا شاركنا في ثورة الحداثة على الماضي والواقع والطبيعة والإنسان وهناك كان ثمة مخزون ثقافي موجود وموضوع في أقبية القصور والمكتبات والمتاحف، هذا المخزون هو التراث والذي يخشى عليه ان تتكون قطيعة معه كمخزون لعطاء إنساني الذي لا تتجدد بالزمن الذي انقضى بل بالزمن المستمر، ومشكلتنا في المعمارية العربية أن النفوذ السياسي الغربي على العالم الإسلامي رافقه نفوذ ثقافي في شتى المجالات ونحن معنيين بمجال العمارة الذي فيه جرى انتقال الاساليب المعمارية والأوروبية في قصورنا ومبانينا ومساكننا فأصبحت عمائرنا تخلو من الهوية والأصالة كل ذلك كان تحت عنوان الانفتاح على الغرب والتي نتج عنها مبدأ القطيعة مع التراث.

أن زوال الذاكرة المكانية الحضارية للتراث المعماري في كثير من المدن العربية والإسلامية أفقد الجيل فرصة التعايش مع هذا التراث مباشرة، وأصبح الأمر لا يتعدى زيارات سياحية ورحلات استحمام ولهو فقط، وأصبح الأمر يبحث عن إجابة على سؤال: أين الوظيفة؟ ولم يطرح السؤال الأهم: أين الهوية؟!

أن هوية الأمة تتجلى من خلال وحدة اللغة والثقافة والقصائد وتعكس هويتها على العمارة والفنون والتراث وتستمر هوية العمارة باستمرار



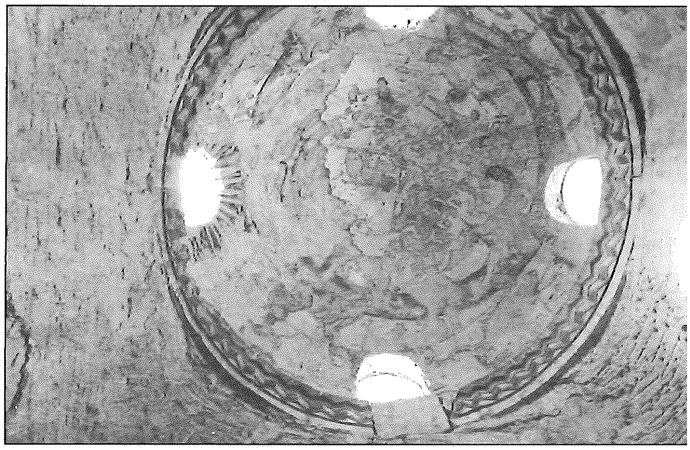
منظر من غرفة الحمام.



قاعة غرفة الحمام.

ل هذه إشارة واضحة على استمرارية الموضوع.

أما الغرفة الثالثة وهي الغرفة الحارّة، وهي مسقوفه بقبة نصف ـوية في نهايتها بقايا الموقد وتساقطت رسومها (**الشكل ١٠**). والجدير ـذكر أن بناء الحمامات الخاصة داخل القصور يرتبط بتأثير العامل ـيني إذ تضمن القران في مواضيع كثيره منها: الأمر بالنظافة الدائمة، لتطهر والاغتسال، وهذا ما جعل الأمويين كمسلمين يهتمون ببناء حمامات داخل القصير (الشافعي ١٩٩٤: ٢٥١). والجديد أيضاً بهذا نظام هو التصاق الحمام بالسكن مباشرة فأصبح جميع البناء كتلة



١. قبة الأبراج السماوية في قصير عمرة.

واحدة وربما أن هذا التصميم كان بفعل وتأثير العامل الديني (الشافعي ١٩٩٤: ١٥-١٦). مما يعني تأثير وفعالية العامل الديني على الدوام وفي كل مكان.

ثالثاً: البئر والخزان

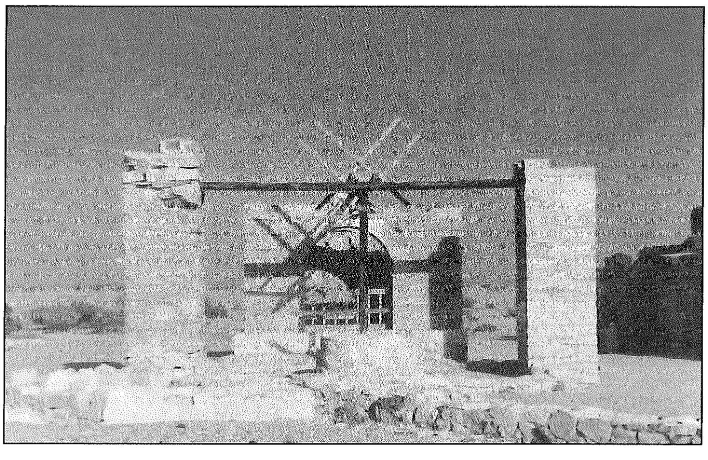
وهما يقعان خارج الغرف في الجهة الشمالية من القصير أمام المدخل الرئيسي (**الشكل ١١**) ويمتاز هذا البئر بعمقه وضخامته، مطوي من الحجارة وقد بلغ طول عمقه ٤٠ متراً، وبالقرب منه خزان الماء الذي يتسع لكمية من الماء تزيد عن ١٤ م^{3} تستخدم في الحمام.

مناقشة ذاكرة المكان وتقسيمات قصير عمـرة

أولاً: مسائل التصميم والتخطيط الهندسـي

يتجلى النضج المعماري الإسلامي في تصميم قصير عمره الذي ينفرد بتخطيط مشترك من حيث تواصل المباني، وصغر الحجم، وثم قلة عدد الوحدات المعمارية. لقد اتضح بالتحليل الروح العلمية، والمستوى الهندسي المتقدم الذي كان يسود في عمارة تلك الفترة، والذي كان بتشجيع من السلاطين والحكام من حيث التخطيط والتقسيمات ونظام التسقيف، ونظام التهوية والإضاءة، ونظام تخطيط الحمامات، والقاعات وتوزيع المساحات، ونظام تدفئة الحمام، ومصادر توريد الماء وحفظها. حتى قيل بأن قصير عمره هو أكثر مبنى اثري في الأردن يحافظ على شكله وتصميمه التي تكشف عن استخداماته من حيث مراسيم الاستقبال والإقامة فيه إضافة إلى مميزاته الهامة أن دراسة مثل هذه الآثار تجعل لدى الإنسان مقدرة خاصة من تفهم وتطور حياة تلك الشعوب والأقوام (بهنسي: ١٧٠). ولما كانت العمارة هي نتيجة كل محاولة قام بها الإنسان وهدف بها إلى أن يوفر لنفسه في معيشته ثلاثة مطالب هي الراحة والأمن و الجمال (الشافعي ١٩٩٤: ٢٠-٤٧).

وفي ظني أن بناء قصير عمرة لا يخرج عن هذه المطالب الثلاثة. ومن جهة ثانية لقد أتضح انه في تسقيف قصير عمرة اتبع أحدى طرق التسقيف الساسانية من حيث تشييد عقود عرضه متساوية توضع بعرض القاعة أو الديوان، وتتوالى وراء بعضها في الاتجاه الطولي ويملأ ما

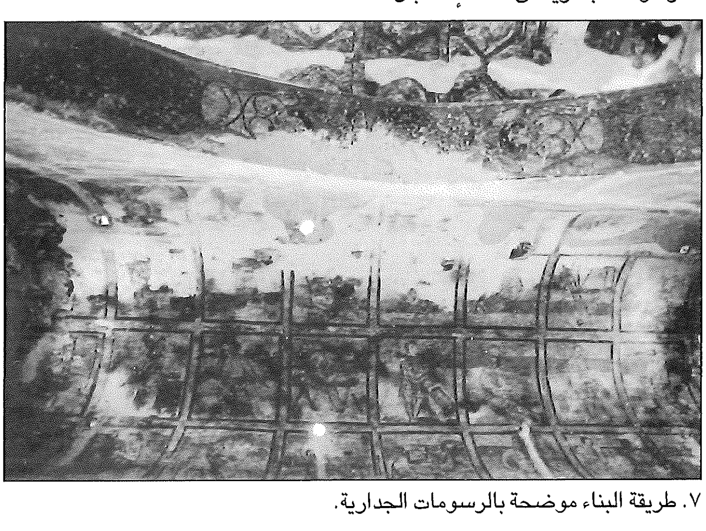


١١. البئر والخزان.

وخلق حالة ذات مزايا مكانية وزمانية تعكس الظروف النفسية ويتفق فيها الإنسان مع الكون (كريزول ١٩٨٤: ١٢٣). وفي الجدار الغربي لهذه القاعة توجد أهم التصاوير وهي الصورة التي يطلق عليها (الملوك الستة)، وصورة (أعداء الإسلام) (علي ١٩٨٨: ٥٠) (**الشكل ٦**) وهي عبارة عن منظر يتألف من رسوم لستة أشخاص يرتدون ملابس جميلة، تعكس رقي مستواهم وسمو طبقتهم الاجتماعية، يقفون في صفين أمام بعضهما البعض يظهر فوق رؤوس بعضهم كتابة عربية وأخرى يونانية تدل على أسماء بعضهم ولا تزال باقية منها فالأول من اليسار بالصف الأمامي فوق كلمة (قيصر) بالعربية واليونانية، والثالث بالصف الأمامي فوق كلمة (كسرى) ملك الفرس والثاني بالصف الخلفي فوق كلمة (روذريق) أخر ملوك أسبانيا والذي قتل سنة ٧١١م من قبل الجيوش العربية، والرابع بالصف الخلفي كلمة (النجاشي) ملك الحبشة (حسن ١٩٨٩: ٤٦) وهو موضوع رسمي وسياسي.

وقد تعددت أراء مختلفة ومتضادة تناقش تفسير وجود هؤلاء الملوك في الصورة وتسمياتهم. ومن جهة أخرى هناك تصاوير لمشهداً حياً لصيد البقر الوحشي بتعبيرية ودقة حركة وحيوية، أضف إليها صور قطع الحجارة صور العمال (**الشكل ٧**) التي تحمل دلالة تشير إلى استمرارية الفن المحلي في الأردن، فصورة العمال وهم يرتدون القصير والمئزر هو موضوع اجتماعي للطبقة العامة.

٦. رسومات جدارية من قاعة الإستقبال.



٧. طريقة البناء موضحة بالرسومات الجدارية.

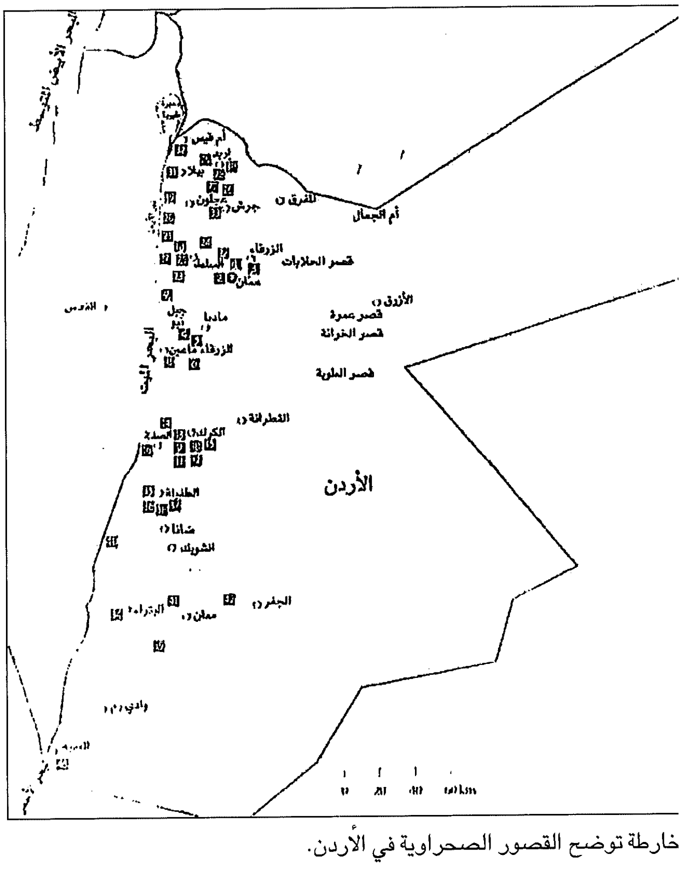
فهذه الاساليب الفنية المدروسة هي دليل واضح على وجود حركة فنية تشكيلية لها رموزها ومعانيها واستمراريتها عبر القرون (صادق١٩٩٥: ٤١)، أن صورة الجمل مع العمال وهو يجلس لحمل الحجارة المقطوعة بها دلالات هامة إذ من المعروف إن من صورة الجمل هي رمز للزمن الصعب والخطير فالجمل يعرف بسفينة الصحراء في مخاطرها وصعوبتها أي في بحر متلاطم مهيب ومفزع! بمعنى ديمومة الزمن في المكان ومن الأمثلة الأخرى والمنفذة بتقنية مختلفة رسوم أرضية المخدعين الغرف المجاورة والمزدانة بالفسيفساء الحجرية بزخارفها النباتية والحيوانية وهي أساليب سابقة للفترة مما يحمل إشارة واضحة على استمرارية الموضوع زمانيا (صادق ١٩٩٥: ٣٩ و٤٧). أي أن هذه الرسوم والتصاوير تدل على أن الفنان الأموي الذي عاش على أرض الأردن كان يقصد أن يترك للفنان التشكيلي المعاصر منهجاً يجمع بين الحداثة والأصالة (صادق١٩٩٥: ٤). وما هذا إلا إشارة واضحة على وجود حركة فنية تشكيلية في تلك الفترة تحمل ملامح مميزة، وتسعى نحو الوجود واستمراريته عبر مراحل تاريخ الفن بشكل عام. من هنا يعتقد أنه باحتضار الزمن من خلال المكان نكون قد أسهمنا في حل إشكالية التلقي الجمالي للمكان هكذا فضلاً عن أنهما يتبادلان التأثر والتأثير، إنهما نتاج بعضهما فجمال الزمن؟ إن جاز التعبير – جمال المكان والارتقاء بمستواه ويجعله شيء محبباً قريباً من المتلقي، كما أن جمال المكان يجعل الزمن سهلاً وقصيراً في الوجدان (قادة ٢٠٠١: ١-٣). أي أن هذه التصاوير الجدارية تحمل دلائل واضحة على استمرار الفن في الأردن عبر العصور (صادق ١٩٩٥: ٤٣).

ثانياً: غرف الحمام

إن حمام قصير عمرة يشكل الجزء الشرقي من القصر ويدخل إليه من باب في الجدار الشرقي لقاعة الاستقبال. يتألف الحمام من ثلاث غرف صغيرة تم تصميمها حسب النموذج والتصميم الروماني والذي في حقيقية يتكون من ثلاث وحدات أو غرف هي الغرفة الباردة وتكون درجة الحرارة فيها عادية وتستعمل لخلع الملابس، وهي مزينة بسقوفها التي على شكل قبو اسطواني **بصور** تمثل مراحل العمر ومناظر اسطورية داخل أشكال أو براويز معينية بلغ عددها حوالي سبعة عشر معينا نتج عنها اثنا عشر مثلثاً وهي أشكال هندسية داخلها صور لإنسان وحيوان وطائر (**الشكل ٨**) (الباشا ١٩٥٩: ٥٥)، إضافة إلى صورة تمثل رجلاً في مراحل العمر الثلاثة من طفولة وشباب وشيخوخة (كريزول ١٩٨٤: ١٢٥-١٢٦).

أما الغرفة الثانية وهي متوسطة الحرارة يدخل الهواء الساخن إليها من خلال فتحات خاصة، وهي مسقوفة بعقد متقاطع، فيشاهد على جدرانها المختلفة رسوم أدمية لنساء عاريات وصورة **طفل (الشكل ٩)** (الباشا ١٩٥٩: ٢٥٥، الفرغلي: ٥٩) تعكس الأسس الجمالية في الفكر العربي ومعاييره بالعقلية العربية وقد أورد بعض المؤلفين هذه الأوصاف العربية في مؤلفاتهم (بهنسي ١٩٧٩: ١٠٧. صادق ١٩٩٥: ٣٩). وتبقى

جتماعية المرتبطة به. اتسمت الشام الأموية التي كانت منطقة استيطان ربي كثيف، بتطوير عدد من المواقع إما في مواضع المدن القديمة، أو ي المناطق الريفية القديمة، التي أعيد استثمارها. كانت هذه المواقع عروفة بفضل آثارها المكتشفة حديثاً تتوزع على طول طرق المواصلات طابقة لبعض الطرق الرومانية القديمة أو لبعض مسالك الصحراء، ني كانت تتمتع بأهمية استراتيجية واقتصادية في الوقت نفسه، ويتميز عظم هذه المواقع بقصور الأمويين التي يسكنها أعضاء الأسرة الحاكمة لأرستقراطية المسلمة. حيث أولى الخلفاء الأمويون هذه المنطقة أهمية اصة، حيث أقاموا فيهما العديد من القصور، كدليل واضح على رخاء والاستقرار اللذين تميز بهما الحكم الأموي (الرشدان ١٩٩٤: ٢)(**الشكل ١**). وإيماناً من الدولة الأموية بدور القبائل في مساندتها عمها قامت ببناء مثل هذه المنشآت كسباً للمواقف، حيث استندت ولة الأموية في قيامها إلى مساندة القبائل العربية التي استقرت في رق الأردن وسوريا وفلسطين والتي كانت تؤلف أفضل الوحدات قاتلة (بيلياف ١٩٧٢: ٢١٢) ومن المرجح أن يكون هذا القصر من قصور التي عنى الأمويون ببنائها لأسباب سياسية واجتماعية (الباشا ١٩٩: ٤٩) ولذلك أن بناء قصير عمرة كان عملاً هاماً في أن ينظر ل المنطقة إلى الحكم الأموي نظرة مودة وتقدير، لأن حكمهم كان عملاً ي تقدم عمران البلاد وزيادة الإنتاج فيها (بيلياف ١٩٧٢: ٢١٥). إذ ن الأمويين يجسدون السيادة العربية في البلدان التي كانت الخلافة موية تتألف منها ـــ كما أشار فلهوزن إلى ذلك ـــ كما أن طبيعة تغيرات الاجتماعية والاقتصادية التي طرأت على الخلافة في عهدهم



خارطة توضح القصور الصحراوية في الأردن.

أسفرت عن انتصار العلاقات الاستراتيجية بين شعوب الدولة العربية؛ كما أن تولي الأمويين السيادة السياسية والعسكرية كان بمثابة مرحلة انتقال في تاريخ المجتمع الذي ضم أمم متعددة في البلدان العربية في العصور الوسطى (بيلياف ١٩٧٢: ٢١٠-٢١٢) فكان قصير عمرة هو واحد من عشرة من المباني الأموية التي توصف بأنها كانت فريدة على أي نحو (وبوزورث ١٩٨٨ : ٣٧٨-٣٧٩).

وحول أهمية هذا القصير يقول وبوزورث: إن تلك المنشآت كانت كلها ذات أنماط متشابهة فإن معرفتنا بها تجمعت من أنواع شتى من الأصول. فلدينا من ناحية قصور بني أمية في بادية الشام، التي لم نعرفها إلا عن طريق الحفائر الأثرية. ولدينا في الطرف المقابل تلك المباني التي أقيمت في بغداد والتي لا يعرفها إلا من النصوص (وبوزورث ١٩٨٨: ٣٨) وهذا يعني أهمية واستراتيجية المكان والزمان معاً، فقصير عمرة بمكانة وزمانه يعني معلماً من معالم الحضر والإقامة فيه تتميز أساساً بالاستقرار الذي يتطلب تنظيم المجتمع بين أفراده (المعتدي ٢٠٠٢: ٢٤-٢٥). أن بناء هذا القصر والإقامة فيه ربما لأسباب مجتمعة يمكن تحديدها بـ

- عدم الفتهم التامة بحياة المدينة التي كانت متأثرة بالحضرية السالفة، وبسبب اشتياقهم وحنينهم إلى حياة البداوة كانوا يحرصون على الإقامة فيها من حين لآخر وهو رأي غير جازم حيث لم تكن صحراء في تلك الفترة (الريحاوي ١٩٩٩: ٤١).
- رغبة الخلفاء في التقرب من أهل البادية وكسبهم على الدوام حيث كان الاتجاه في بناء هذا القصير نحو القرب من السيول والوديان وحول موارد المياه، والبئر العميق في قصير عمرة يدل على ذلك (دومنيك ١٩٨٠: ٤٢). إضافة إلى توفر المواد الأولية من حجارة ورخام دقت بشكل متقن.
- سعى الخلفاء إلى الهدوء والراحة في الأماكن الجديدة، والاستمتاع بالصيد.
- البادية مدرسة مهمة للأمراء الأمويين لتعلم اللغة الفصحى، وابن عبد ربه يقول (..وهكذا ما كانت تفعله زوج معاوية بابنها يزيد ولي العهد الذي تعلم في البادية قرض الشعر والصيد والفروسية...).
- وثمة سبب أخير هو توالي الأوبئة والأمراض على المدن كمدينة دمشق وغيرها. إضافة إلى كون هذا المكان آمن أمام الحملات المختلفة حيث كانت مثل هذه المناطق ملاذ آمن لا يستطيع جيوش الأعداء الدخول إلية، إذ تقع ضمن التقسيمات الإدارية ضمن جند الأردن والذي كان يشمل الأردن حالياً إلى حدود بصرى الشام والذي يمر به الطريق الآمن للاتصال التجاري المألوف مع منطقة دمشق إلى الشمال، وبدون شك أن مثل هذا القصر قد اختير من حيث علاقته بالمناطق العسكرية (الشافعي ١٩٩٤: ٢٦٨-٢٦٩) أو الجند باعتباره المنطقة التي تشكل مناطق تعبئة وتجديد وولاء فهي إذا هامة من ناحية الاستراتيجية السياسية والعسكرية.

وهذا ينطبق على غير مصير عمرة مثل القصور التي كانت تثير الإعجاب كقصر المشتى والموقر، قصر الطوبة وقصر الحرانة وقصر

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إســتراتيجية المكان والزمان في قصير عمـرة

المقدمة

من وجهة نظر علم وعلماء الآثار عامة فإن تاريخ الإنسان الثقافي بدأ من اللحظة التي أستعمل فيها الإنسان أو صنع من مادة خام أداة تعينه على مواجهة متطلبات الحياة الأساسية من سكن أو معيشة أو غيرها، وبقيت هذه المادة بعده لتكون أثراً دالاً على تجربته ومؤرخاً لعصره.

ويشبه الحال في علم الآثار، علم الإنسان الذي يهتم بدراسة الجماعة أو المبنى أو القرية أو المدينة ليس فقط لتكوين المعلومات الأساسية عن هذه الجزيئات ولكن الأهم من ذلك هو الارتقاء إلى بلورة مفاهيم وقواعد ثابتة شبيهه بالقوانين في العلوم الحرة عن أسس وتكوينات تلك الظواهر عامة وعلائم اختلافاتها في المكان والزمان، فالحال في علم الآثار يطبق هذا المنهج في دراسات المجتمعات والثقافات القديمة على أساس الشمولية في التعبير عن استنتاج حقائق هامة من دراسة موقع معين أو بيئة أثرية ما ومثل هذه الدراسات لموقع أو مبنى معماري أو أثر يعني الوصول إلى استنتاجات مفاهيم عامة عن الثقافة والمجتمع في ذلك الوقت (مصري ١٩٨٨: ٨-٩).

لقد جاءت هذه الدراسة من خلال هذه المخلفات بالاستعانة بكل الوسائل والأساليب والعلوم حول (قصير عمره في الأردن) بالاعتماد على آراء المؤرخين والآثاريين والفنانين النقاد وصولا إلى استنتاجات موضوعية، فالمؤرخون من هذه الزاوية يمكن اعتبارهم آثاريون متخصصون في دراسة مخلفات الإنسان المكتوبة، وكذلك الفنانون النقاد فهم يدرسون الشكل والخط واللون والإيقاع والانسجام والتصميم وبالتالي (التكوين) أو ما يسمى بلغة الإبداع الفني بـ(الشكل والمضمون). وتختلف هذه عن غير المكتوبة في أن الأولى هي ما ارتأى أن يقدمه لنا الوسيط الذي هو(المؤرخ) بالشكل والحجم واللون والنوع الذي أراد، بينما الثانية هي شواهد حية وصادقة مباشرة، فالتدقيق في المعلومات قبل جمعها، واستخلاص أكبر قدر من المعلومات، وتحليل المضامين وتفسيرها ومناقشتها وإبراز جمالها وإبداعاتها هي مهام المؤرخ وعالم الآثار والفنان الناقد على التتابع وهذا ما تسعى إليه هذه الدراسة لإستراتيجية المكان والزمان في بناء قصير عمرة بالأردن، إذ أن قصير عمرة هو تاريخ مكتوب، وأثر مبنى ومنقوش، وصرح إبداعي وعمل فني جميل، أنه شاهد حضاري على قيمة المكان والزمان.

وينبغي لدارس آثار وتاريخ البلدان العربية في عهد الخلافة الأموية (٦٦١-٧٥٠) أن يذكر أو يتذكر هذه الحقيقة، وهي أن كتابة التاريخ العربي الطبيعي تعكس في هذه الكتابات التاريخية ميول العباسيين الدينية والسياسية. ففي هذه المصادر موقف متميز مقصود ضد الأمويين، بينما يعتبر المؤرخون العباسيين أسرة حاكمة باركها الله سبحانه، تراهم يرون في الأمويين حكاماً دنيويين.

الا أنه في المصادر الحديثة العهد هناك من حاول إنصاف الخلافة الأموية بموضوعية أمثال الباحث فلهوزن (Welhosen) والأب لامنس، الأول وضع كتابة الدولة العربية وسقوطها رغم ورود بعض الأغلاط في التاريخ الاقتصادي أحيانا. والثاني له كتب قيمة عن الأمويين من أهمها بالفرنسية

- دراسات عن عهد الخليفة الأموي معاوية الأول (٣) مجلدات.
- دراسات عن عهد الأمويين.
- ومجموعة مقالات في الموسوعة الإسلامية.
- وجزء من كتاب تاريخ سوريا- وغيرهم كثير.

وما هذه الدراسة الموضوعية التي أشارك بها عن استراتيجية المكان والزمان في قصير عمره بالأردن إلا إسهاماً متواضعاً في التأكيد على موضوعية البحث ونزاهة التحليل والدراسة لهذا المعلم الهام في أرض المملكة الأردنية الهاشمية والذي يعتبر أكثر مبنى أثري يحافظ على شكله وتصميمه حتى هذا التاريخ والذي يعتبر واحد من عشرة من المباني التي توصف بأنها كانت فريدة على أي نحو (وبوزورث ١٩٨٨: ٣٧٨-٣٧٩). حاولت هذه الدراسة بأسلوب جاد الكشف عن أن المكان أجدى لأنه يعطينا فكرة عن طبيعة البيئة والحياة الاجتماعية والثقافية المرتبطة بذلك المكان على اعتبار أن العلاقة بين المكان والزمان علاقة وجودية فلا زمان دون مكان ولا حركة للمكان دون زمان. واستعملنا كلمة (استراتيجية) للتعبير عن التصور المكاني للزمان باعتبارها مشروع لإيجاد مقياس أكثر تجسيد وتجسيم لزمن يتسم بالتضخم والجمود، فعندها تتضح مسائل التصميم والتخطيط، ومسائل الإبداع الفني والجمالي، ومسائل المضمون والأفكار، ومسائل التقنية والأساليب في عمارة قصير عمرة.

الاكتشاف المكاني لقصير عمرة

إن ذكر المكان أجدى لأنه يعطينا فكرة عن طبيعة البيئة، والحياة

وهو ملحق بمعبد الشهداء، ضمت الحنية الشرقية منه جرن التغطيس والحنيتان الجانبيتان الذخائر المقدسة، والآخر إلى الجهة الجنوبية الشرقية من حنية الكاتدرائية، خصص للعماد بالرش، وتتقدمه قاعدة كبيرة لها مقاعد يجتمع فيها الموعوظون لدى تهيئتهم للعمودية.

أما المعبد الواقع إلى الشمال فهو في الحقيقة مدفن، وقد عثر فيه على ١٣ ضريحا على الأقل، وكان المعبد الجنوبي مكرسا على الأغلب للعبادة، يزينه تبليط فسيفسائي لا يزال القسم الأكبر منه قائما حتى اليوم، ويرى أيضا في ذلك الموضع ركيزة المذبح وبعض أقسام من بلاطات مقاعد الحنية.

وعلى هذا النحو كان مجمع أفامية الأسقفي ومثيلاته في جرش يشكل واحدا من أهم المجمعات الهندسية في الشرق المسيحي.

- الكنيسة ذات الباحة: دعت الحاجة بعد الزلزالين في سنة ٥٢٦ و٥٢٨ إلى ترميم كنيسة أخرى ترميما كاملا في الحي الجنوبي من المدينة. فوسع البناء الوضيع العائد إلى القرن الخامس بإضافة سوقين إلى جانبيه، ورفع مستواه بإقامة شعريات وذلك نادر في الشرق وزيد في طوله ببناء حنية كبيرة طالت الشارع الخلفي، وتتقدمه باحة كبيرة " ومنها جاءت التسمية" وهذا الفن الهندسي النادر في سورية يشير إلى تأثير مهندسي القسطنطينية المباشر وقد أوفدهم شخصيا الإمبراطور "يوستنيان" ليرفعوا من الأنقاض تلك الكنيسة الحاوية ذخائر القديسين: قوزما وداميانوس والقديس ثيودوروس وقديسين آخرين. وكان الحجاج يسكبون الزيت من قمع مثبت فوق غطاء الصندوق، و يجمعونه في قوارير وأنابيب صغيرة من جنب الوعاء بعد مروره على الذخائر.
- الكنيسة المستديرة: تقع هذه الكنيسة المستديرة في وسط المدينة. هنا أيضا باحة فسيحة تحدها أروقة من جهات ثلاث تتقدم البناء، وهي كناية عن كنيسة ذات مخطط محوري، ترقى إلى عهد الإمبراطور يوستنيانوس، إلا أنه لم يبق منها إلا القليل، ومع ذلك يمكن الاطلاع بسهولة على القاعدة المستديرة للأعمدة وعلى مخطط المبنى العام، وهي شبيهة بكنيسة السيدة العذراء في بيسان (سيتوبوليس) في فلسطين. والمعضلة التي يواجهها الباحث هنا، كما في تلك الأبنية من الطراز نفسه، هي كيف كان من المستطاع أن تسقف مساحة مستديرة لا يقل قطرها عن ٢٥ م؟ ومن المعضلات الأخرى وجود رواق مماس للدائرة الوسطى يفصلها عن الحنية المركزية، مشكلا بذلك نمطا فريدا في الهندسة المسيحية القديمة في تلك المناطق. أما قدس الأقداس فكان مرتفعا يرقى إليه بدرجين صغيرين يصعدان من جانبي مقدمة الحنية.
- بازليك: وحيدة في هندستها فهي مربعة الشكل ومحاطة بأروقة وأعمدة، تقع قرب المدرج، فيها فسيفساء بيزنطية جميلة من سنة ٥٣٩ أودع قسم منها المتحف الوطني بدمشق، والقسم الآخر أرسل إلى متحف بروكسيل في بلجيكا.
- كنيسة الشهداء: في موقع كنيس يهودي من نهاية القرن الرابع (فيه فسيفساء من سنة ٣٩١) نهب و حرق وعلى أطلاله شيدت كنيسة في القرن الخامس، عثر فيها على صناديق ذخائر مع كتابات من القرن الخامس والسادس، وصندوقين محفورين في الصخر لعظام القديسين قوزما ودامیانوس، وآخر للقديس ثيودوروس، وآخر لشهداء سبسطية الأربعين، وأخير لشهداء غير معروفين.
- البازليك الشرقية: بنيت في موقع روماني مزين بفسيفساء، حيث وجد صندوق ذخائر من المرمر الوردي.
- البازليك الشمالية: كنيسة كبيرة تقع خارج الأسوار في شمال المدينة على مسافة ٥٠٠م من بوابة إنطاكية في شمال شرقها، لها ثلاث قناطر متلاصقة، منقسمة إلى تسع فتحات، يتقدمها نرثيكس، بقي منها بعض الآثار، وبقربها دير قديم.
- كنائس وأديرة: هناك أولا مصلى خارج المدينة يقع في الحقول وعلى مسافة ٤٠٠م إلى الشرق، له علاقة بالمدافن، بقي منه الحنية فقط. وهناك كنائس أخرى كما تثبت الخرائب في مواقع عديدة من المدينة.

- القناة: طولها ١٢٠كم آتية من بلدة سلمية الحالية تغذي آبار أفامية، وينابيعها مجهولة، تدخل المدينة في نفق مدت فيه اسطوانات حجرية ضخمة قطرها الداخلي ٥٠سم والخارجي ٩٠سم تتفرع منها قساطل فخارية توزع الماء في المدينة.

القلعة: وتعرف دائما باسم "قلعة المضيق" تقع فوق تل كبير تشرف على سهول الغاب ووادي العاصي. كانت تسمى قديما حصن أفامية لقربها من موقع أفامية المدينة المشهورة. وقد شهدت القلعة معارك حامية الوطيس بين الروم البيزنطيين والحمدانيين. وفي عام ٤٢٢هجري استولى البيزنطيون على القلعة وأسروا حاميتها. وفي عام ٤٧٥هجري دخلت القلعة في حوزة الملك السلجوقي "ملك شاه بن ألب ارسلان" وبعد ذلك استولى عليها الإفرنج بقيادة تنكريد أمير إنطاكية.

كان يحيط بالقلعة خندق عظيم وقد رصف منحدر التل بحجارة منحوتة على غرار قلعة حلب، وقد أعاد بناءها نور الدين زنكي عام ١١٥٨م لتشكل خط دفاع على طول وادي نهر العاصي وهي ذات أبراج ضخمة.

الخاتمة

تولي المديرية العامة للآثار والمتاحف في الجمهورية العربية السورية عناية كبيرة للقيام بأعمال الترميم في موقع أفامية، كما تقوم البعثة الأثرية البلجيكية و"سلسلة فنادق الشام" بتقديم الدعم المالي أيضا لأعمال الترميم، وهكذا ترتفع عشرات الأعمدة كل عام.

من الجهة الشرقية المطلة على الشارع الرئيسي بعرض ٤٥ مترا، تمتد الساحة شمالا بطول ١٥٠ مترا ومحاطة بأعمدة جميلة ضخمة طرازها شرقي وعددها ستة أعمدة، بنيت بعد زلزال ١١٥م وانتهى بناؤها في عام ٢١٨م، وجدت فيها كتابة تنص على إهداء إلى جوليا ميزا والدة الإمبراطور الروماني إيلاغابل، لم تكتشف بشكل كامل حتى اليوم، ولكن تبين أنها تنفتح على أكبر معبد في أفامية معبد زفس بيلوس أكبر المعابد وأضخمها علما بأن أفامية كانت تعد "مدينة زفس وحبيبته" وهو رائد الثروة ومعلم الفكر.

ومن الأبنية الهامة-قصر الحاكم؟ Triclinos أوTriclinium، وقد كشفت فيه غرفة لها ثلاث مصاطب حجرية على شكل حذوة فرس، أشبه بالمقاعد أو بالأسرة، والقاعة الرئيسية فيها غرفة طعام أو غرفة اجتماعات.

أما البيت ذي حوامل الإفريز فقد رمم عام ١٩٧٧ ومساحته تقدر ٢٠٠٠ متر مربع، بني في المرحلة التي توسعت فيها مدينة أفامية أي في القرن الثاني الميلادي، رمم بعد الهزات الأرضية في القرن السادس، له مدخل متعرج، وفيه باحة تحيط بها الأعمدة مساحتها ٦ X ٩م مزود ببهو طابقي يشبه إيوان الساسانيين أو بيوت حلب التقليدية، وهناك ثلاثة أبواب تفضي إلى القاعة الرئيسية لاستقبال الضيوف، مبلطة برخام ملون وفيها حوض ماء، لم يستمر هذا البيت أكثر من القرن السابع الميلادي، إذ لم يجد المنقبون فيه نقودا عربية اعتادوا رؤيتها في تلك الفترة (أقيمت أهم الابنية في جرش بين عامي ٧٥-٧٦م ولتكريم الإمبراطورين تراجان ١١٥م وهادريان ١٢٩م علما بان عددا من المعابد كمعبد زيوس في جرش بني بين عامي ٢٢-٢٣م).

أما البيت ذو الأعمدة البارزة فهو بالقرب من البيت السابق جنوباً منه، رمم أكثر من مرة واستمر وجوده حسب اللقى الأثرية المكتشفة فيه حتى القرن العاشر الميلادي، فيه بهو مبلط، إلى شماله قاعة رئيسية بثلاثة أبواب، وعرض منصته ٢٤٥م.

أما المسرح فقد بني قرب السور الهلليني الأول لمدينة أفامية، نموذجه روماني يعد من أكبر المدرجات في الشرق قطره ١٣٩مترا وعرض منصته ٢٤٥م (مسرح أورانج في فرنسا قطره ١٠٣م) (قطر مسرح بصرى ٩٠م) تحول إلى حصن في العصور الوسطى في القرن الثاني عشر كما تدل الكسر الفخارية. وكما جرى في مدرج بصرى الشام لم يكتشف بالكامل، ومن المعروف أن أكثر حجارته قد نهبت وبني منها الخان والجامع في الفترة العثمانية، وقد استعمله نور الدين زنكي قاعدة عسكرية لينطلق منها لمهاجمة القلعة العربية (قلعة المضيق) ويخلصها من أيدي الفرنجة عام ١١٤٩م (بينما حفظ المدرجان في مدينة جرش بحالة جيدة ويدل وجود المدرجين معا على أهمية المدينة).

أما المقبرة فلم يتم حتى الآن سوى اكتشاف مدافن خارج الأسوار، مقابل الباب الشمالي المعروف "باب إنطاكية" وقد حصل المنقبون فيها على عدة تماثيل، وعشرات من شواهد القبور، ويظهر أنها أخذت منها ودعمت بالسور كما ذكرنا أعلاه، وهي تعطينا معلومات تاريخية قيمة عن أفراد الفيلق البارتي الذي كان متمركزا في مدينة أفامية في أوائل القرن الثالث الميلادي، فضلا عن معلومات عن اللباس والأسلحة وغير ذلك.

الآثار المسيحية

- الكاتدرائية: تشبه إلى حد ما كنيسة مار سمعان، أصبحت كاتدرائية في القرن السادس، وغطت بمساحتها البالغة ١٢٠٠٠متر مربع قسمين من مخطط المدينة وتفضي إلى الشمال برتاج ضخم يتقدم حتى الشارع، و يستقبل الزائر للكنيسة بثلاثة أقواس تتقدم النرثكس المبلط. وفي وسط النرثكس نرى كتابة محفورة على بلاط وردي لتدشين التبليط "في أسقفية بولس سنة ٥٣٣" ويلي النرثكس فناء فسيح تحيط به أروقة من ثلاث جهات، يقود إلى الكاتدرائية، ويتميز البناء بأربعة تفرعات يمتد أحدها إلى الشرق مشكلا معبدا طويلا ويدفعنا هذا التصميم الأول الذي يعود على الأرجح إلى القرن الخامس بتفرعاته الأربعة مع قبة في الوسط، إلى اعتبار الكنيسة مقاما أو دارا للشهداء (مارتيرون) شيد من دون ريب ليضم ذخيرة عود الصليب التي كانت تمتلكها أفامية، وقد روعي في تصميمه ما يترتب من خدمات على الكنيسة التي يؤمها الحجاج.

بعد الزلزالين المتعاقبين اللذين ضربا المدينة وكذلك إنطاكية عام ٥٢٦ و٥٢٧ حوّل البناء إلى كاتدرائية تحت إدارة المتروبوليت بولس المثقف والمولع بالفن، و قد تطلب هذا التعديل إصلاحات هندسية هامة، سد التفرع الشرقي الذي كان يشكل معبدا بحنية ضخمة فيها ثلاثة نوافذ مرتفعة، وإلى أسفل الحنية ركزت مقاعد الكهنة على شكل نصف دائرة، يتوسطها مدرج مهيب يقود إلى عرش رئيس الأساقفة، وإلى الأمام قاعدة كبيرة من المرمر الوردي المضلع انتصبت عليها أعمدة القبة التي تعلو المذبح، ثم صفان من أربعة أعمدة تقسم صحن الكنيسة تحت القبة الكبرى إلى ثلاثة أسواق وقد جعلها هذا التغيير كنيسة متروبوليتية، مع الاحتفاظ بالمارتيربون في الوسط وتفرعاته التي استخدمت كأروقة/ أسواق.

كانت زخرفة البناء كلها غنية جدا، وقد أنجزها رئيس الأساقفة بولس، ووجدت هناك كتابات يونانية تدل على أن هذا الأسقف أمر بتيجان أعمدة رواق الكاتدرائية الداخلي وبالتبليط الفسيفسائي الجميل في معظم أرجاء الكاتدرائية وتوابعها، وبالفسيفساء الرائعة ذات الألوان الثرية، وهي مربعة الشكل ضلعها ٦،٣٠م وقطر الصورة في الوسط ١،٢٧م وقد اكتشفت سنة ١٩٧٢ في الزاوية الجنوبية الشرقية من البناء ذي الأذرع الأربعة، وتشير إلى الخلافات اللاهوتية في تلك الحقبة بين القائلين بالطبيعة الواحدة والقائلين بالطبيعتين.

- الدار الأسقفية وملحقاتها: لما كانت الكاتدرائية مركزا لرئيس الأساقفة أيضا، فقد أحاط بها من المباني ما يلزم لإدارة كنسية كبيرة، فهناك قصر أسقفي حقيقي ينبسط إلى شمال الكاتدرائية وغربها، وينتظم حول مجموعة من الباحات والممرات، يضاف إلى ذلك مجمعان للمعمودية، بنيا على الأرجح في أزمنة مختلفة الأول خصص للعماد بالتغطيس،

دى زيارة الإمبراطور هادريان، بينما لا يزال الباب الشمالي قائما في فامية ولكنه أنقاضا بعد الزلازل، بينما زال باب القسم الجنوبي منذ ترة طويلة، أما الأبواب الأخرى إذا وجدت فستكشف ضمن أعمال لترميم المستمرة إلى اليوم.

يتألف الباب الشمالي في أفامية من قوس نصر ذي فتحات ثلاث يعود إلى القرن الثالث للميلاد فقد بني بعد زلزال ١٣ كانون الأول ١١٠ ميلادية، وجدد جزئيا في القرن السادس الميلادي وأضيفت واجهة جديدة إليه على واجهته الجنوبية، لا يزال معظمه حتى اليوم أنقاضا، سيكون المشروع المقبل لأعمال الترميم.

الشارع الرئيسي (الكاردو): ويقدر المنقبون في أفامية طوله حوالي كيلومترين، بعرض ٣٧,٥ مترا، منها ٢٠,٥ للطريق والباقي للأروقة يحلو لبعض الباحثين تشبيهه "بالشانزليزيه". كان عدد أعمدته حوالي ١٢٠٠ عمودا بين العمود والآخر ٣ أمتار، خطط هذا الشارع ليكون لعمود الفقري للمدينة وكأنه موازيا للجبال الساحلية المجاورة، تحيط به مساحات عقارية مستطيلة ناتجة عن تقاطع ١٦ شارعا تتجه من لشمال إلى الجنوب مع ١٦ شارعا تتجه من الشرق إلى الغرب، وهو هلليني التخطيط على طرفيه تقوم الأعمدة، ويأتي وراءها صفوف من لمخازن والمداخل للأبنية العامة القريبة من الشارع والشوارع الفرعية إذ بعد كل ٣٤ عمودا يتفرع شارع جانبي. نجد الأمر نفسه في مدينة جرش وتخطيطها الشبكي وخاصة وجود المصلبات (التترابيل) وهذا لم نكتشفه بعد في افامية.

بعد زلزال ١١٥ ميلادية في أفامية أقيمت الأعمدة على الطراز الروماني في عهد الإمبراطور تراجان ١١٦/١١٧م، أما القطاعات الجنوبية منه فتعود إلى القرن الثاني الميلادي في عهد سبتموس سفيروس، ثم رمم الشارع مرة أخرى بعد زلزالي ٥٢٦ و٥٢٨م، ورمم بلاط الأرصفة أيضا فوق ردميات وصلت إلى سماكة ٣٠ إلى ٥٠ سم خصصت للمشاة. وفي القرن السادس الميلادي منع سير العربات على الشارع الرئيسي واستعيض عنها بالسير في الشوارع المستعرضة. ومن الجدير ذكره أن شارع جرش المتد بطول ٨٥٠م وعرض ٦م وكان فيه ٥٧ عمودا من اصل ٥٢٠، إلى جانب الشارع في أفامية وغير بعيد عنه بنيت الحمامات (أول من حدد شكلها النهائي المعمار ابولودور الدمشقي حين بناها في روما للإمبراطور تراجان) وقد وجد على مدخلها الذي يشكل جزءا من الشارع كتابة مكرسة لصحة الإمبراطور تراجان مقدمة من يوليوس أغريبا سليل الملكات الهللينية [1] ومن المعروف أن أغريبا أول من أنشأ حمامات عامة في روما حملت اسمه والمعروف انه كان وزير أغسطس.

لا تزال بقايا الأقسام الثلاثة للحمام قائمة في أفامية وبعض المغاطس والأفنية من الطين المشوي، كما حفظت الحنية، ولكن نظام Hypocaustes (دورة الهواء الساخن) قد دمر، وبقيت أقنيته في الجدران قائمة، ولم تكشف أقنية إيصال الماء للحمام، ولكن من المعروف أن أفامية التي كانت تعوزها الماء قد عملت على جلب المياه النقية من مناطق بعيدة تتعدى ١٢٠ كيلو مترا رغم وجود نهر العاصي بجوارها، وقد كشف قسم من الأقنية الواصلة إلى الباب الشمالي. لقد تبين وجود أعمدة تذكارية قائمة في عرض الشارع (الكاردو) و قد اكتشف إحداها وأعيد نصبه في عام ١٩٦٩ وهو بارتفاع ١٤ مترا ألحق به رصيف لجلوس المتنزهين Exedra، وقد تبين أن هذا العمود المقام في الربع الأول من الشارع المستقيم (اعتبارا من الباب الشمالي للمدينة ـــ باب إنطاكية) كان يدل على مفصل لشبكة الطرقات، وقد اكتشفت القاعدة فقط لعمود تذكاري آخر وموقعه في منتصف الشارع، ويحيط به رصيف لجلوس المتنزهين، وما يشبه الأعمدة التذكارية فقد وجدت في محيط الشارع دعامات مزخرفة أهمها الدعامة الباخوسية وقد اكتشف في عام ١٨٤٦ من قبل أحد الرحالة واسمه تومسون وهي عضادة لقوس لمنفذ إلى شارع عرضي، عليها نقوش ميثولوجية تمثل عذاب ملك ليكورغوس الذي عارض الإله ديونيسيوس. أخيرا و بالقرب من الشارع العرضي الرئيسي (ديكومانوس) وجدت أطلال أل "نيفة" "سبيل حوريات الماء" (أما النيفة في جرش فقد بنيت عام ١٩٠م زمن الإمبراطور كموديومس وبقربها بنى هيكل مكرس لعذارى فستا)، و يتجاوز قطر حوض حوريات الماء في أفامية ١٥مترا محاط بمحاريب كان فيها تماثيل مرمرية لأثينا وأفروديت وغيرهما، له واجهة من المرمر الأصفر وأرضيتها على شكل الشطرنج مكسوة بمرمر وردي وأخضر وكان عليها قبة تحيط بها ثمانية دعامات كبيرة، وفيها مجاري تغذيها بالماء من حوض مستطيل بجوارها، إلى جانب حوض حوريات الماء كانت توجد المراحيض العامة فيها من ٨٠ إلى ٩٠ كرسي ولها قبة، وحول البناء أربعة أروقة مكسوة بالفسيفساء.

في محيط الشارع المستقيم قامت عدة أبنية عامة هامة في أفامية، ومن أهمها الأغورا أي الساحة العامة أو "الفوروم" مدخلها الرئيسي

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١. نص كتابة لوحة الحمامات باسم اغريبا: "له حقوق أجداده جميعها واستثناء خاص بشأن الطقوس الدينية، وكل الأمجاد الأخرى المسجلة على ألواح البرونز في الكابيتول بروما، لقد أنجز أعمالا هامة من أجل وطنه وطقوسا دينية، كان قسيسا، وكان حاكما مكلفا بمراقبة السوق بشهامة ومرؤة. وأشرف على توزيع القمح خلال ستة أشهر بدفع مبلغ قدره عشرة دنانير فضية. لقد قدم الزيت للدهن به. وأنشا القناطر مسافة عدة أميال. وكان أمين سر المدينة متخذا أسلوبا غير عادي، وطالب بذاته أن تكون الإجازة لمدة عام، واختار بنفسه زملاءه في القضاء، وفي العام ذاته كان مفوضا للسلام، ومسؤولا عن توزيع القمح. وقد أنشأ الحمامات والرواق الذي يتقدمها على الشارع والبازيلكا التابعة لها مانحا الأرض من ماله الخاص، واقفا أعمالا برونزية في هذه الحمامات "مجموعة تيسيوس والمينوتور ومجموعة أبولو وأولمبوس ومارسيا والسيكيتي".

وقد تطوع بالقيام بسفارات لدى الأباطرة والحكام. وكان له من جهة أمه وأبيه أجداد شرفاء وكرماء ورؤساء ولايات وأشخاص لهم نصيب بألقاب الشرف الملكية، ومن بين هؤلاء: ديكساندروس جده الأكبر أول كاهن كبير في الولاية. ونظرا لصداقته ووفائه للشعب الروماني فقد سجل صديقا وحليفا على ألواح البرونز في الكابيتول، من قبل أغسطس المعظم، وعلى هذه الألواح ذكرت أيضا بقية ألقاب الشرف الاستثنائية الممنوحة له ولعائلته. ومن بين هذه الألواح الخلاصة المحفوظة هنا في الوثائق.

"السنة ..... شهر كسانديكوس اليوم ٢٨ من قبل مديننا وطبقا لقرار المجلس والشعب فقد منح ديكساندروس لقب شرف في شهر بيريتيوس-اليوم الثالث قبل نهاية الشهر في هذا القرار"

أهميتها الفكرية

كانت مركزا وثنيا هاما إذ بني فيها معبد "زفس بيلوس" الكبير وجاء الإمبراطور سيتيم سفيروس يستشير كهانته وسدنته، فقد كانت فيها جالية يونانية ضخمة امتزجت بسكانها الأصليين، وتم التزاوج بينهم، و نشأ جيل جديد، كان اقرب إلى السوريين حضارة و لغة، وقد انتشرت بينهم اللغة الآرامية كما في جرش التي حمل بعض سكانها الآراميين أسماء إغريقية ـــ اللغة الدولية آنذاك ـــ وليس اليونانية التي كانت لغة الثقافة والأدب والعلم بينما اللاتينية لغة الحكم و الإدارة. حين جاءت المسيحية، كان المذهب الأفلاطوني الحديث سائدا ومزدهرا في أفامية بفضل "اميليوس" وكان لفلاسفته بتأثي المؤرخ أيضا رلون جين شهرة واسعة كما كانت المدرسة الرواقية منتشرة، ومن أعلامها في أفامية وبوزيد ونيوس.

اشتهر في تلك الفترة "اركاجين" طبيب الأمراض النفسية وعمل في روما خلال حكم تراجان ٩٨-١١٨ و"نومينيوس" أحد فلاسفة مذهب الأفلاطونية الحديثة، وأثره كبير فيما يعرف "بالكتب المقدسة" وكان يعتبر أفلاطون "كموسى يتكلم الإغريقية". وفي معبد أفامية الكبير تنبأ العرافون بمستقبل "جوليا دومنا" والدة إمبراطور روما المقبل "كارا كلا". أما في جرش فقد عرف حتى الآن من مفكريها "نيكوماخوس" وقد نبغ في علم الرياضيات.

في القرنين الثالث والرابع الميلاديين وحين انتشرت المسيحية استمرت الوثنية ونشأ صراع فكري وكارثي أحيانا بين المذهبين. دمر الأسقف مركيلوس معبد "زيوس بيلوس" في عام ٣٨٥م، ثم أعيد ثانية، ثم دمر مرة أخرى، وبنيت الكنائس إلى جانب المعابد القديمة التي اكتشفت في بدء أعمال التنقيب. وشارك أساقفة أفامية في عدة مجامع دينية والتي نوقشت فيها طبيعة السيد المسيح، وساد مذهب المونوفيزيت (الطبيعة الواحدة) في أفامية. ورغم ذلك كشفت الحفريات عن قطع فسيفساء رائعة كفسيفساء (سقراط والحكماء الستة) ويبدو فيها سقراط كأنه المسيح بين تلامذته وحواريه. كما كشفت فسيفساء "آدم" وإلى جانبها رمز المسيحية الممثل بالطير وحوله الهالة المقدسة.

وباختصار سادت المسيحية في المدينة حين اعترف بها تيودوسيوس ديانة رسمية، بينما بقي الريف وثنيا، وكانوا يسمون أفامية "مدينة زيوس المحبوبة". ومن الأهمية بمكان أن ينقب عن فسيفساء في مبنى ديني مسيحي يتم التعبير عن الأفلاطونية الحديثة فيها برموز مسيحية أو رموز وثنية مرتبطة بالمذهب الأفلاطوني الحديث (مثل مسابقة الجمال)، مهما يكن كانت بؤرة نشطة للأرثوذكسية ضد المونوفيزيت، كما كانت مركزا للمونوفيزيت بعد عقد المجامع الدينية وبنيت فيها كنائس متعددة على أنقاض المعابد كما في جرش حيث أصبحت اكثر المعابد فيها كنائس.

أهميتها في العصور الحديثة: بعد زلزالي ١١٥٧م و ١١٧٠م وتدمير أفامية دخلت في طي النسيان ورغم ذلك فقد استمر الموقع في لعب دور هام إذ سكنت القلعة الجاثمة فوق اوكروبول المدينة وبني خان لتأمين المواصلات قرب الموقع القديم للمدينة في بداية الحكم التركي العثماني في القرن السادس عشر أي ١٥٢٥م وبانيه "محمد آغا قزلار" و بنى جامعا بالقرب منه، وتبين أن حجارة المبنيين أخذت معظمها من حجارة المدرج القديم لمدينة أفامية، وحين بدأت أعمال التنقيب وبدأت معالم المدينة تظهر، رمم الخان ومساحته ٨٠×٨٠م وفيه أربعة أروقة مسقوفة وفي وسط الباحة درج يؤدي إلى نبع ماء، جمعت فيه اللقى الأثرية، وخاصة لوحات الفسيفساء الهامة كلوحة سقراط ولوحة مسابقة الجمال ولوحة الامازونات وغيرها، وهي من أهم اللوحات الفسيفسائية المكتشفة في المنطقة وشمال القطر العربي السوري، ويعتبر اليوم اكثر خانات الطرق حفظا في العالم بعد أن رمم جيدا.

٢. أفامية (الموقع)

الموقع: يعود في بدايته للعصر الحجري كما اكتشف في الاكروبول وكذلك موقع جرش الني اكتشفت فيه أدوات صوانية، كما اكتشف فيه خارج أسوار المدينة إلى الشمال سويات عصري البرونز والحديد.

المساحة: تقدر مساحة موقع مدينة أفامية بين ٢٢٠ و ٢٣٠ هكتارا على هضبة قليلة الارتفاع شبه محصنة، يضم المدينة المؤلفة من شارع رئيسي (كاردو) وشوارع عرضية متقاطعة على شاكلة رقعة الشطرنج، وهو التخطيط الهيبودامي المعروف، كما يضم أوابد متعددة يصل تعداد ما اكتشف منها حتى الآن ٢٥ أبدة، تشكل شبه جزيرة بجانب نهر العاصي، وأبرز ما فيها اكروبول المدينة وعليه القلعة العربية ثم المدرج. لقد كانت مدينة كبيرة، وتأتي في الأهمية بعد إنطاكية.

السور: ويحيط بمدينة أفامية بطول سبعة كيلومترات وسبعة أبواب يتجه كل منها إلى مدينة هامة في المنطقة إنطاكية وأوديسا (اللاذقية) ولاريسا (شيزر) وابيغانا (حماه) وتدمر واسريا (سريانا) وخلقيس (قنسرين). حتى أن اوكروبول المدينة (فوقه قلعة المضيق الحالية) كان جزءا من السور، ارتفاع السور ١٠ أمتار وعرضه ٢٤٠ سم يدعمه نحو مائة برج وقد تبين أن أساسات السور هي هللينية، ثم رومانية، و أخيرا في قسمها الأعلى بيزنطية أي في القرن الخامس الميلادي وقد رممت في عهد الإمبراطور جوستنيان وخاصة الأجزاء المجاورة للبابين الشمالي والجنوبي، كشف السور دفعة واحدة من قبل موظفي المديرية العامة للآثار والمتاحف مجتمعين في عام ١٩٨٤، وتبين أن الأبراج العريضة هللينية التصميم و البناء ، بينما الأبراج الأصغر حجما و المدعمة فهي تعود إلى العصر الروماني والمسافات بينها تقدر بنصف المسافات بين الأبراج الهللينية، و لقد بني السور بعد تأسيس المدينة أي حوالي ١٩٩ ق. م. و خلال كشف الأسوار تم الكشف عن ١١٠ نصب وشواهد جنائزية استخرجت من أحد أبراج السور الشرقي أي في البرج رقم ١٥ من بداية الباب الشرقي.

الباب الشمالي: لقد كشف في جرش حتى اليوم البوابة الشمالية في نهاية الشارع الممتد وقد بنيت باسم تراجان عام ١١٥م، بينما بنيت البوابة الجنوبية (بوابة عمان وتدعى قوس النصر في عام ١٢٩-١٣٠

ـصل (من المعروف أن المصلبة الشمالية في جرش بنيت إكراما للأميرة ـسورية عندما تزوجها الإمبراطور السوري الأصل سبتيم شفير ١٩٢- ٢١م)، وهذا الإمبراطور جاء ليستشير الإله زفس بيلوس اله افامية ـكبير. كما زارها كاراكلا وبومبي ونور الدين زنكي والظاهر غازي ابن ـلاح الدين وغيرهم. وهي المدينة الجميلة النائمة على الهضبة والمدينة ـعظمى التي لا تزال تحيا وتستمر.

حملت افاميا عدة أسماء كبيرة وبعضها صغيرة (شيرسونيز chersonnes) و(انطونيو بوليس) و(نيا) التي نشأت فوق سطح ـأوكروبول في فترة عصور البرونز، "فارناكة" كما ذكرها سترابون ـي عهد الفرعون أمنحوتب الثاني، وكذلك في الفترة الفارسية. "رونيا" ـين زارتها كليوباترا "بيلا" بعد معركة إيسوس عام ٣٣٣ ق م تيمنا ـسم موطن والد الاسكندر الكبير المقدوني في اليونان، بطل المعركة المنتصر على الفرس والمتقدم في بلاد الشام حتى أقاصي الشرق.

كما عرفت "افامية" باسم الأميرة الفارسية "أباما" زوجة قائد ـلاسكندر الكبير(وهناك مدينتان أخريان باسم اباما لم يحدد مكانهما) ـلوقس نيكاتور (٣١٢-٢٨٩ ق م) بعد معركة "إبسوس" عام ٣٠١ ـ.م. وسلوقس هو الذي أعطاها وضعا مدينيا ضخما، وبقي هذا الاسم ـموقع حتى اليوم، إلى جانب التسمية الثانية قلعة المضيق، كما بقي اسم ـرشGerasa-الذي أحياه بومبي قائما إلى اليوم.

"قلعة المضيق" هو الاسم الحالي للبلدة الحديثة المجاورة للموقع، ـجاءت التسمية لوجود القلعة العربية فوق المرتفع - اوكروبول المدينة ـقديمة - وكلمة المضيق لان نهر العاصي يمر بجانبها في أضيق مكان ـن مجراه والقلعة تسيطر تماما على مروره.

كانت إحدى مدن "التيترا بوليس" الأربع الكبرى في سورية ـقديمة في الفترة الهلنستية مع إنطاكية ولاوديسة (اللاذقية) وسلوقية ـلى البحر (السويدية)، كما كانت جرش الهللنستية منذ أيام الإسكندر ـكبير المقدوني، إحدى مدن "الديكابوليس" في الجنوب السوري القديم ـقد جعلها أنطوخيوس التقي ثاني المدن ١٣٠-١٨٠ م، مع دمشق وشهبا ـقنوات وغيرها، منذ عام ٢٠٠ ق م في عهد أنطونيوخوس الثالث، كما ـانت أهم مراكز الدفاع عن الدولة السلوقية ضد هجمات البطالمة وبدو ـبادية. وفي العهد النبطي وما بعده بقيت مزدهرة إلى أن احتلها الرومان ـام ٦٤ ق م.

تعود أصولها الأثرية إلى اكثر من سبعة آلاف عام خلت، حسب ـكتشفات آثار العصر الحجري الحديث (النيولتيك) التي وجدت في ـحفريات جرت في المرتفع (الاكروبوليس) الذي تقوم عليه القلعة العربية. ـما تخطيط المدينة الواضح إلى اليوم بشكله الشطرنجي ــ حسب نظرية ـيبوداموس ــ فهو يعود إلى الفترة الهلنستية، في القرن الرابع قبل ـلميلاد وعهد سلوقس نيكاتور وبقي إلى اليوم ضمن أسوار بطول سبعة ـيلو مترات و مساحة تقدر ب٢٥٠ هكتارا، فضلا عن اكتشاف مدافن ـخارج الأسوار، أغنت المتاحف بشواهدها الجنائزية الهامة. واكتشاف ـصب بكتابة حثيه هيروغليفية من القرن التاسع ق م يتحدث عن بناء المدينة من قبل "اورهلينا" ملك "حمات" أي حماة الحالية.

أهميتها الإستراتيجية:

- لعبت دورا كبيرا في الفترة الهلنستية، و منذ توسعها كان دورها الاقتصادي كبيرا بجانب إنطاكية وعلى محاور الطرق كما كانت جرش كذلك مركزا تجاريا هاما ومركزا عسكريا كبيرا، وبالأحرى عاصمة عسكرية كبرى فيها إسطبلات الفيلة (دبابات ذلك الزمان) والخيول المطهمة، وفيها القيادة العامة ومقر وحدة المتفوقين العسكريين، وهي مقر الفيالق اليونانية العاملة في الشرق، وفي الفترة الواقعة بين عامي ١٩٦ حتى ٢٥٢ كانت المقر الشتوي للفيلق البارثي الثاني كما تدل النصب الجنائزية المكتشفة، كما كانت جرش حينئذ.
- العاصمة الثانية بعد إنطاكية، وعقدة المواصلات إليها، و قد بقيت أهميتها تلك في الفترة الرومانية - البيزنطية بعد أن فتحها القائد الروماني- بومبي ٦٤-٦٣ ق.م و دمر قلعتها (؟ !) غير أن الأباطرة الرومان لم يألوا جهدا في الاهتمام بها وخاصة الإمبراطور تراجان ٩٨-١١٧ الذي أعاد أعمارها كما اهتم بمدينة جرش وكذلك هادريان ١١٧-١٣٨ و مارك اوريل ١٦١-١٨١ الذي اعتنى بها و زاد في تجميلها، وخاصة بعد أن ضربها زلزال ١١٥-١١٧م وأعقبتها زلازل أخرى فيما بعد إلى أن قضت عليها زلازل ١١٥٧ و ١١٧٠م نهائيا. لقد أحصى كيرينيوس Quirinius في عهد القيصر اوغست عدد سكانها في العامين السادس والسابع ميلادية فكان ١١٧٠٠٠ نسمة من الرجال الأحرار القادرين على حمل السلاح والقتال، كما كانت الحرب سجالا بين الرومان والفرس للسيطرة عليها (٢٥٦م و٦١٨م، وفي جرش أيضا في عام ٦١٠م تغلب الفرس عليها واستردها هرقل إمبراطور بيزنطة منهم في عام ٦٥٧م وأصبحت من أهم مدن الغساسنة)، وتذكر الروايات التاريخية أن جنرال كسرى "ادارمانيس" اخذ منها ٢٩٢٠٠٠ أسيرا عام ٥٧٣م في عهد الإمبراطور البيزنطي جستنيان الثاني.
- فتحها العرب المسلمون في عام ٦٣٦م وبنو جامعا فيها في عرض الشارع المستقيم (الكاردو) كما سيطروا على جرش أيضا. غير أن نقفورفوكاس أعاد احتلالها في القرن العاشر، وجاء الفرنجة فاحتلوها في طريقهم إلى القدس، و كانت الحرب سجالا بينهم وبين نور الدين زنكي حين كانت تابعة لامارة إنطاكية الصليبية، إلى أن حررها تماماً نور الدين في عام ١١٤٩. أما جرش فقد احتلها في عام ١١١٨-١١٣١ بودوان ملك القدس وبنى حصنا في معبد ارتيمس ثم دمرها حين انسحب منها. وإن ملوك الفترة الأيوبية اهتموا بموقع أفامية فعمروا قلعتها (المعاصرة بعمارتها لقلعة حلب) وقد كانت أيضا موضع قتال مع الفرنجة.

وإذا كانت الأهمية الاستراتيجية تتناول الناحية الاقتصادية والتي لا نعرف الشيء الكثير عنها سوى أن الروايات التي تحدثت عن افامية وعن شهرة نبيذها المعروف ومذاقه المميز حين يخلط مع العسل.

محمود حريتاني
أستاذ محاضر - حلب

محمود حريتاني

أفامية مدينة الخمسة عشر قرنا جرش الأخت التوأم

البادية الأردنية كمعبر للحضارة

من الأمور الغريبة لدى بعض الأوروبيين الذين يقومون بدراسات عادية و خاصة السياحية منها، تسمية "البادية" المشتركة بين سورية والأردن "بالصحراء"، وإن عدم التمييز بين البادية والصحراء يدل على نقص في الثقافة العامة لدى هؤلاء تجاه معلوماتهم عن الشرق العربي.

لعبت بادية الشام التي تقتسمها سورية والأردن دورا حضاريا هاما فقد كانت تتوسط الطرق التجارية الكبرى بين البحر الأبيض المتوسط والشرق البعيد، كما نشأت فيها ممالك وحضارات، أهمها ممالك الآراميين في الشمال السوري مثل حماه ودمشق ودولة تدمر التي مدت سيطرتها في عهد الملكة زنوبيا على مساحات شاسعة. كما ازدهرت فيها مدن في عهود مختلفة حديثة، أهمها في الفترة الهلنستية بعد حروب الاسكندر الكبير المقدوني. فقد نشأت فيها مدينة جرش ومدن أخرى بالقرب منها عرفت "بديكابوليس" المدن العشرة. ثم لعبت دورا في الفترة الرومانية، و بعدها في الفترة العربية، حيث بنيت فيها القصور الرائعة، و منها قصير عمره وغيره.

سوف نتعرض في بحثنا هذا عن أفامية ومن ثم مدينة جرش الأخت التوأم.

يصعب على أي باحث أن يعرض موضوعا متكاملا لموقع افامية، في صفحات، فهو يروي تاريخ خمسة عشر قرنا من الأحداث الهامة، فضلا عن أن البحث والتنقيب فيه مستمر منذ أن لفت الأنظار إليه العالم البلجيكي المعروف "فرانز كومون" الذي زار الموقع عام ١٩٢٨ بعد عودته من زيارة موقع دورا اوروبس المعروف على الفرات. ثم زاره في تشرين الاول١٩٢٨ البروفيسور في جامعة لوفان فرناند مايانس بدعم مالي من "المركز الوطني للبحث العلمي" البلجيكي وبرعاية ملك وملكة بلجيكا، وميزانية مخصصة من قبل الحكومة البلجيكية.

نصب فرناند مايانس والمهندس هنري لاكوست خيامهم بين أنقاض المدينة في بداية تشرين الأول ١٩٣٠ وبدءا التنقيب، وكانت النتائج رائعة جدا. واستمر الدعم المالي حتى اليوم، كما اغتنت المتاحف الملكية البلجيكية للفنون والتاريخ باللقى الأثرية، وخاصة قطع الفسيفساء الرائعة.

في ١٩٣١ قرأ المنقبون الكتابات على حاملات التماثيل على الأعمدة وتضمنت أسماء انطونين التقي ولوسيوس فيروس، وبذلك بدأ تحديد تاريخ الموقع وخاصة الشارع المستقيم "الكاردو" كما زال الالتباس بين الاسمين "أفاميا" باللغة السريانية و"أمبيغانيا" باللغة الإغريقية الرومانية، حيث اختلط الأمر على الرواة المؤرخين بين اسم مدينة حماه واسم أفامية المتشابهان. وتبين الآن أن امبيغانيا هي حماه، و افامية هي مدينة سلوقس نيكاتور المعروفة والتي طواها النسيان بعد تدميرها بزلزالين كبيرين في عامي ١١٥٧ و١١٧٠، فترة سبعمائة و ستين سنة. كما طوى النسيان مدينة جرش بعد زلزال عام ٧٤٧م المدمر.

منذ عام ١٩٣٨ وقع المهندس لاكوست على جزء كبير من الشارع بطول ٣٥ مترا، وتبين له أن طول الشارع يتجاوز ١٦٠٠ مترا وقد صنع شبيها لهذا القسم ووضعه في الصالة الكبرى للمتحف الخمسيني في بر وكسل.

قبل أن انهي هذه المقدمة لا بد من أن انوه إلى أن دراسات الباحثين و قد تناولت المواقع الأثرية، بدأت قبيل انتهاء القرن التاسع عشر وبداية القرن العشرين، فقد زار شمال سورية الباحث بتلر-من جامعات الولايات المتحدة (بيل). و في عام ١٩٠٠ مر على افامية دون تحديد التسمية والتاريخ ووضع لها بعض المخططات. كما زارتها الباحثة الإنكليزية المعروفة جرترودبل في عام ١٩٠٧ وتعرفت على مدرج المدينة.

ومن الجدير بالذكر أن اكتشاف جرش جرى قبل ذلك بكثير فقد ذكرها بطليموس وسترابون والمؤرخ بلينوس، فقد تم التعرف عليها منذ عام ١٩٠٦ م من قبل باحث رحالة ألماني ج. شو ماخر، وبعد ذلك بدأت فيها أعمال التنقيب منذ ١٩٢٣ م من قبل بعثات إنكليزية Garstang، Cruofoot من ليفر بول ثم Fisher-من جامعة (بيل) وقد نقب حول معبد ارتميس. وفي ١٩٣١ تم التنقيب في الفوروم. ومن الجدير ذكره أن أول مخيم كشفي تمت إقامته في جرش في عام ١٩٣٢م وثم بدأ الترميم ولا زالت الأعمال مستمرة إلى اليوم.

١. افامية (المدينة)

مدينة الأباطرة والملوك والحكماء، زارتها كليوباترا وجاءها الإمبراطور سبتيم شفير وربما كانت معه جوليا دومنا الأميرة الحمصية

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كما تشير الكتابة إلى أعمال بنائية قامت بها كتائب من عدة أفواج ومانية في نهاية القرن الثالث الميلادي (Kennedy 1982: 182).

يصنف بويدبارد الطرق الرومانية في المنطقة من حيث البنية إلى . طرق مبلطة كلها مثل طريق تراجان.

ب. طرق من دون تبليط: وهو الصنف الأكثر انتشارا وكان سطح هذه الطرق ينظف من الحجارة، وتؤشر جوانبها بصف من الحجارة في كل جانب، وكانت تبلط في الأماكن الوعرة والسيئة مثل تقاطعها مع الأودية ومن أشهر هذه الطرق طريق ديوكلتيان.

جـ. طرق القوافل: وهي الطرق غير المؤشرة وعرفت من خلال جود أبراج للمراقبة، ونقاط للحراسة، وآبار مياه على امتدادها، غالباً ما تتواجد هذه الطرق في المناطق الصحراوية النائية (Poidebard 1934: 165-167).

يبلغ عرض طريق تراجان الذي لا تزال بقاياه واضحة حتى الآن ا بين ٥,٥-٦ م، ويقسم بشكل متساوٍ إلى ممرين بصف من الحجارة رتفع من ١٥-٢٠سم فوق مستوى الطريق الذي يرصف بحجارة صغيرة غير منتظمة الشكل، وينحدر الطريق بشكل بسيط من المنتصف لى الحواف التي تحدد بصف آخر من الحجارة المشابهة للصف الوسطي تثبت بإحكام في التربة، ويتكون السطح الخارجي للطريق من طبقة ن الرماد البركاني بسمك ١٠ سم تغطيها طبقة من الطين المضغوط، ما الطبقة السفلية من الطريق فتتكون من بلاطات غير متساوية من لحجارة البازلتية الكبيرة بسمك ١٠-٢٠سم. وهذا الطريق مشابه في بنيته لطريق اللجا في حوران (في سوريا) ومن خلال هذين الطريقين مكن أن نعيد تركيب الطرق الرومانية المبلطة كما يأتي

١. طبقة ترابية.
٢. طبقة من البلاط الحجري المرصوف افقياً.
٣. طبقة من الحجارة الصغيرة المرصوفة بإحكام بسمك ١٥-٢٠سم.
٤. طبقة إكساء خارجية من المحتمل أن تكون مؤلفة من الرمل والحصى الصغير بسمك ١٥سم، وتقسم الطريق بثلاثة صفوف من الحجارة (بوزورث ١٩٨٨: ٢٢٠).

يلاحظ على هذه الطرق بأن العربات لم تستخدم عليها إذ لم يلاحظ آثار للعجلات عليها كما هو الحال في مدينة جرش مثلاً، وربما كان النقل يتم بحيوانات النقل وليس الجر، وأعتمد على الجمل بشكل رئيس وقد ظهر الجمل على عملات بصرى كشعار لها (بوزورث ١٩٨٨: ٢٣١).

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(Germer-Durand 1904: 343; Brunnow and Domaszewki: 221-227 and 312-323)
ومنذ مطلع السبعينات كانت هنالك دراسات مستفيضة للطرق في شمال الأردن وحوران ولاسيما طريق تراجان من قبل توماس بوزو (Th. Bauzou) وديفيد كندي (Kennedy 1997: 71-93). يتفرع من طريق تراجان عند العمود الميلي السابع من بصرى في كوم المنارة فرع يصل إلى الفدين (المفرق)، ومن المحتمل أنه يمر ببلدة رحاب (إلى الغرب من المفرق بحوالي ١٢ كم) في طريقه إلى جرش، وهذا الفرع يمكن تتبع آثاره من خلال الصور الجوية حتى شمال شرق الفدين، كما كشف عن أجزاء من أعمدة ميلية في الفدين تؤكد وجوده
(Dussaud and Macler 1903: 145-150)
(Germer- Durand 1904: 12-14)
ويمر هذا الفرع في طريقه إلى المفرق ببلدة أم السرب. هذا فضلا عن فرع آخر يصل إلى أم الجمال من شمال قصر الباعج، ومن المحتمل أنه يتابع مسيره إلى أم السرب.

توجد مع الطريق السابق مجموعة من الطرق حول مدينة أم الجمال حددت من خلال الصور الجوية، أحدها طريق يربط أيضاً بطريق تراجان قرب المحطة الميلية ١٤، وطريق آخر من المحتمل وجوده يسير غرباً من أم الجمال باتجاه الفدين، وربما كان جزءً من طريق يربط ما بين مدينة جرش وبلدة دير الكهف (**الشكل ٢**) (Kennedy 1997: 71-93).

وهنالك طريق يمتد من أم الجمال جنوباً ويمر إلى الشرق من القحاطي، وينقسم على فرعين أحدهما يتجه إلى الجنوب الغربي باتجاه القحاطي وقصر الحلابات، والآخر يستمر بشكل مستقيم ليمر قرب قبر دواس على بعد حوالي ٥كم إلى الشرق من القحاطي، وربما يتابع مسيره إلى واحة الأزرق باتجاه جنوب شرق (Kennedy 1997: 20-21) (**الشكل ٢**).

كشف في أم القطين التي تعد مركزاً لشبكة من الطرق عن العديد من الأعمدة الميلية، وأهم هذه الطرق هو الطريق الواصل إلى بصرى والقادم من تفرع طريق ديوكلتيان، ويحتمل وجود طريق يصل غربا حتى أم الجمال، وطريق ثالث يسير شمالاً باتجاه تل الغارية (في سوريا) إلى صلخد (في سوريا)، وتعود هذه الطرق كما تدل الأعمدة الميلية إلى الحقبة ٢٩٣-٣٢٤م (Kennedy 1997: 9) وجميع هذه الطرق غير واضحة على الأرض في الوقت الحاضر باستثناء الطريق الواصل إلى بصرى، إذ لا تزال بقايا هذا الطريق واضحة إلى الشمال الغربي من أم القطين ويمر بخربة السعادة على الحدود الأردنية السورية.

كما يحتمل وجود طريق يصل أم القطين بدير الكهف لأهمية هذين المركزين ولكن وجود هذا الطريق غير مؤكد (Kennedy 1997: 71-93) (**الشكل ٢**).

يوجد طريق يسير من صلخد إلى أمتان ثم إلى جاوة، وهو مؤكد من خلال الصور الجوية أما امتداده شرقاً إلى قصر برقع فهو غير واضح، إذ يظهر جزء من الطريق في موقع الشبيكة من خلال صورة جوية، ويذكر بويدبارد وجود برج مراقبة وطريق روماني إذ يظهر من خلال الصورة الجوية أطراف هذا الطريق (Poidebard 1934: 97)، كما لاحظ شتين (Stien) من خلال صورة جوية وجود مخفر روماني مربع الشكل، ومن المحتمل طريق روماني يمتد منه بشكل مستطيل إلى الغرب (Stien 1982: 235)، علماً بأن موقع الشبيكة كما هو مفترض هو أحد محطات هذا الطريق، ولكن من خلال مسوحنا الميدانية لم يتأكد لنا هذا الطريق، وما ظهر من خلال الصور الجوية والذي فسر على أنه مخفر أو برج لا يعدو أن يكون مدفناً مربع الشكل يعود في تاريخه إلى الألف الرابع أو الألف الثالث قبل الميلاد، وكذلك لم نتأكد من وجود طريق، والمرجح أن ما ظهر في الصور الجوية هو القنوات المائية في الخربة.

- **طريق ديوكلتيان Strata Dioclitiana (الشكل ٢)**: يسير هذا الطريق من الأزرق بإتجاه الشمال، وبعد حوالي ١٦ كم ينقسم على فرعين الأول منهما يتابع مسيره شمالاً إلى دير الكهف ومنها يتابع سيره إلى أن يرتبط مع الطريق الرئيس الواصل ما بين دمشق وتدمر، والفرع الآخر يتجه إلى الشمال الغربي ليمر بأم القطين في طريقه إلى بصرى (Poidebard 1934: 57-66 and 73-83). والجزء الجنوبي من طريق ديوكلتيان ما بين الأزرق ودير الكهف يمر بالمنطقة، وعرف باسم طريق ديوكلتيان من قبل ديسو وماكلر (Dussaud and Macler 1903: 433). وقد أكدت الكتابات التي ظهرت على الأعمدة الميلية بناء هذا الطريق في عهد الإمبراطور ديوكلتيان في عامي ٢٠٩-٢١٠م (Kennedy 1982: 169-177)، أما فرع هذا الطريق ما بين الأزرق وأم القطين، وامتداده إلى بصرى فهو متأخر في تاريخه ويعود إلى السنوات ٢٨٤-٣٠٥م من خلال الكتابات التي ظهرت على أعمدته الميلية (Kennedy and Riley 1990: 84) . يعد طريق ديوكلتيان امتدادا للطريق الطبيعي الواصل ما بين الجزيرة العربية وسوريا والمار عبر وادي السرحان، المتد باتجاه شمال غرب إلى جنوب شرق، ويمتد الوادي من الأزرق إلى الجوف بطول يزيد عن ٢٠٠ ميل، وبعرض يزيد عن ٢٠ ميل في بعض المناطق، وتقع مجموعة من الواحات على امتداده (Glueck 1944: 7).

كان الطريق الرئيس الذي يصل ما بين الجزيرة العربية وسواحل البحر المتوسط يسير من جنوب الجزيرة العربية إلى البتراء، أو من الجرهاء وميسان في المنطقة الشرقية من الجزيرة إلى البتراء، أو عن طريق البحر الأحمر إلى أيلة (العقبة) ثم إلى البتراء، ومن البتراء يتجه الطريق غرباً إلى غزة على البحر المتوسط، أو أن يتجه شمالاً إلى بصرى فدمشق. ويوجد طريق داخلي يمر بوادي السرحان يصل إلى بصرى فدمشق أو يتجه شمالاً إلى تدمر. ومما يؤكد أهمية هذا الطريق الداخلي في الحقبة الرومانية هو العثور على حجر يمثل نهاية طريق في الأزرق يسجل المسافات من الأزرق إلى مناطق مختلفة منها دومة (Dumat) وهي الجوف حالياً في المملكة العربية السعودية، على بعد حوالي ٢٥٠كم إلى الجنوب من الأزرق (Kennedy 1982: 169-186)، وهذا يعطي تأكيداً مهماً للاهتمام الروماني بطريق وادي السرحان.

لما استولى أردشير بن بابك على الحكم (٢٢٦-٢٤١م) في العراق كره كثير من تنوخ أن يقيموا في مملكته وأن يدينوا له بالولاء فلحق جزء منهم الشام، وكانت مساكن تنوخ بيوت الشعر والوبر غربي الفرات فيما بين الحيرة والأنبار وما فوقها (الطبري: ٤٢-٤٣). وقد تأكد وجود حلف تنوخ القبلي في المنطقة من خلال نقشين؛ الأول هو نقش مزدوج اللغة نبطي – إغريقي من أم الجمال، وهو عبارة عن تذكار لمعلم ملك تنوخ جذيمة الأبرش المسمى فهر بن شلي (Littmann *et al.* :238)، وقد وصف جذيمة في هذا النقش بأنه (ملك تنوخ)، وفهر هذا من المحتمل أن يكون نبطياً عربياً عاش في الولاية العربية، وخدماته إلى ملك تنوخ تعكس تغلغل وتوسع نفوذ الحلف التنوخي في المنطقة الصحراوية العربية ومن المحتمل إلى سوريا كذلك (Bowersock 1983: 133). وتشير المصادر التاريخية العربية إلى مقتل جذيمة على يد زنوبيا ملكة تدمر ثم انتقام ابن أخته عمرو بن عدي من زنوبيا وقتلها في قصة طويلة (الطبري: ٦١٨-٦٢٨).

هذه الأخبار عن الصراع التدمري – التنوخي تأكدت من خلال نقش النمارة المكتوب باللغة العربية وبالخط النبطي، وهو عبارة عن تذكار على قبر أمرؤ القيس بن عمرو بن عدي الذي وصف بأنه "ملك العرب كلهم" ويؤرخ هذا النقش إلى عام ٣٢٨م (ديسو ١٩٥٩: ٣٣-٣٤). ويشير هذا النقش إلى أن أمرؤ القيس قد لبس التاج وهو رمز الملكية، وملك قبائل أسد وملوكهم، وهزم قبيلة مذحج، وجلب النصر إلى أسوار نجران مدينة شمر، وملك قبائل معد، وأمر بنيه على القبائل، ووكلهم فرساناً للروم (ديسو ١٩٥٩: ٣٣-٣٤). وربما أدى التوسع الكبير لهذا الملك إلى الاصطدام بالملك اليمني شمر يهرعش، إذ أن مذحج كانت من بين العشائر الأعرابية المقاتلة في جيش شمر يهرعش (بافقيه ١٩٧٣: ١٥٠).

زيادة إلى ما قام به الإمبراطور ديوكلتيان من تحصين للولاية العربية لا سيما في الأجزاء الشمالية فقد قام بعد عام ٣١٤م بفصل الجزء الجنوبي من الولاية العربية، إلى الجنوب من وادي الحسا، والمتضمن البتراء والنقب، ومن المحتمل الحجاز أيضاً، وأصبحت جزءً من ولاية فلسطين، فيما حافظ الجزء الشمالي على الحدود والتسمية نفسيهما. وهذا الفصل الذي قام به ديوكلتيان يظهر فهماً عميقاً للطبيعة الجغرافية للمنطقة، إذ ترتبط بصرى والمدن الشمالية مثل جرش وعمان ودرعا طبيعيا بطرق مع دمشق وبالطريق الداخلي إلى الجزيرة العربية المار عبر وادي السرحان (Bowersock 1983: 142-143).

الطرق التجارية

لم يكن إنشاء الطرق في الحقبة الرومانية في المنطقة لأهداف تجارية بالدرجة الأولى ولكن كان الهدف الأول منه هو الهدف العسكري، فنلاحظ مثلاً بأن طريق تراجان بني بشكل مستقيم ما أمكن (**الشكل ٢**)، لذا تجنب المرور في بلدة مهمة هي أم الجمال، وإن كانت البلدة قد ربطت مع الطريق من خلال طريق فرعي، وهذا ما كان يميز طريق تراجان بطريق السير السريع لكونه يتيح لقوات بصرى الانتقال نحو الجنوب للتدخل السريع (بوزورث ١٩٨٨: ٢٢٥) في حال وجود أعمال عدائية أو اضطرابات كون هذه المنطقة هي قلب المملكة النبطية سابقاً. زيادة على ذلك كان أفراد من الجيش يقومون بأعمال الطرق وإنشائها وصيانتها كما تشير إلى ذلك بعض الكتابات التي عثر عليها في الأزرق والبتراء (بوزورث ١٩٨٨: ٢٣١)، كما أن الرومان اهتموا بالناحية العسكرية لحماية هذه الطرق متابعين في ذلك الأنباط الذين سبقوهم في المنطقة، ولذلك وضعوا حاميات عسكرية ونقاط مراقبة على طول وادي السرحان (Bowersock 1984: 133-135). وعلى الرغم من هذا الهدف العسكري الذي أنشأت الطرق لأجله قدمت هذه الطرق إسهاما مهما في النشاط التجاري، ونستطيع أن نشدد على أهمية هذا الدور من خلال أن معظم هذه الطرق ولاسيما الرئيسة منها مثل طريق تراجان وطريق ديوكلتيان كانت تقع على امتداد طرق مهمة سابقة لها في الاستخدام، فطريق تراجان يتبع ما يعرف باسم طريق الملوك السابق له والعائد إلى الألف الأول قبل الميلاد في تاريخه، وطريق ديوكلتيان يقع على امتداد طريق وادي السرحان، وكلا الطريقين كانا من الطرق المهمة في عهد الأنباط.

تعد الطرق الرومانية في المنطقة وفي منطقة حوران عموماً من أهم المخلفات الأثرية التي حافظت على بقايا لها ولتجهيزاتها مثل الأبراج والقلاع والأعمدة الميلية وقد تمكن الباحثون من تتبع هذه الطرق من خلال الصور الجوية والخرائط القديمة والمسوح الأرضية، والكتابات التي تحملها الأعمدة الميلية.

سنستعرض فيما يأتي الطرق المارة من خلال المنطقة

- **طريق تراجان Via Nova Traiana** (**الشكل ٢**): أنشئ هذا الطريق الحيوي المهم الواصل ما بين مدينة بصرى في جنوب سوريا، وأيلة (العقبة) على رأس خليج العقبة على البحر الاحمر ماراً بمدن مهمة مثل فيلادلفيا (عمان) والبتراء وغيرها بطول حوالي ٣٥٠ كم في عهد الإمبراطور تراجان (٩٨-١١٧م) إذ تشير الكتابات المؤرخة على أعمدته الميلية إلى أنه أنشئ ما بين ١١١-١١٤م، كما تشير بعض الكتابات إلى أعمال صيانة وترميم لأجزاء من الطريق امتدت حتى عهد الإمبراطور جوليان (٣٦٠-٣٦٣م) مما يشير إلى الأهمية التي أولاها الرومان للطرق وصيانتها (Kennedy and Riley 1990: 77). والاسم القديم لهذا الطريق غير معروف، ويعرف في الوقت الحاضر باسم طريق تراجان (Via Nova Traiana)، وهو يتبع في معظمه طريق الملوك السابقة له، ما عدا المنطقة الشمالية حيث يظهر بأن الطريق إنشاء حديث، أو أنه يتبع طريقاً صحراوياً ثانوياً (Kennedy 1995: 221).

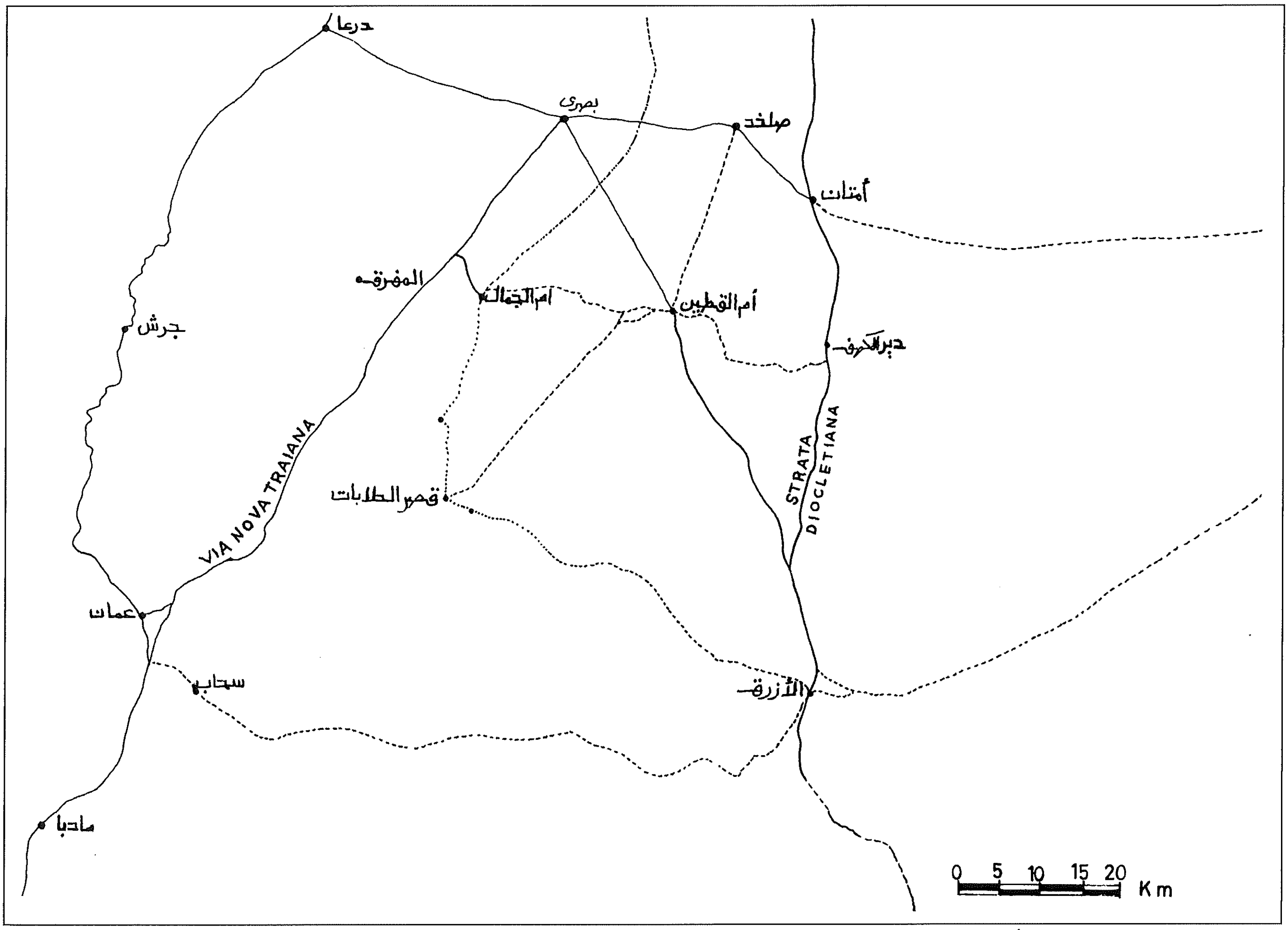
يعد الطريق من أفضل الطرق التي حافظت على بقائها في المنطقة ويمكن تتبع آثاره في شمال الأردن لمسافة عشرات من الكيلومترات، كما كشف عن عشرات من أعمدته الميلية (Thomsen 1917: 1-103). وقد كان هذا الطريق محط أنظار واهتمام الكثير من الباحثين منذ مطلع القرن الماضي في الأقل مثل دوراند وبرونو ودوماسفسكي وبعثة جامعة برنستون الأميركية

ورعاية من ابنها الإمبراطور.

في أواسط القرن الثالث الميلادي حدثت تطورات مهمة في المشرق أثرت بشكل كبير في تاريخ المنطقة إذ حلت قوة جديدة هي القوة الساسانية مكان الاسرة الفرثية في حكم بلاد فارس واحتلت العراق وأقاليم في المشرق (٢٢٦-٦٣٧م). ولم يستطع الرومان الوقوف بوجه هذه القوة الجديدة إلا بمساعدة قوة اخرى هي مملكة تدمر، فقد قام الفرس بقيادة شابور الاول بن أردشير (٢٤١-٢٧٢م) بغزو سوريا وشرق الأناضول في الأعوام٢٤٣ و٢٥٦ و٢٥٩م ولكن لا توجد دلائل حول وصول الفرس إلى الولاية العربية خلال هذه الغزوات (Parker 1986: 131).

تشير العديد من النقوش الصفوية إلى حرب ما بين الرومان والميديين (الفرس) في المنطقة، ومن هذه النقوش (رجع بالغنيمة في السنة التي تحارب فيها الميديون والرومان في بصرى) (CIS 5. 4448) ويذكر نقش آخر (وثار ضد الرومان في السنة التي جاء بها الميديون) (Winnett 1957) وهنالك نقوش مؤرخة في زمن إعادة السيطرة الرومانية على المدينة (بصرى) (Winnett and Harding 1978). وكما أشرنا فإن غزوات الفرس لم تؤثر في المنطقة ولذلك ربط العديد من الباحثين هذه النقوش مع غزوة قامت بها قوات زنوبيا التدمرية للولاية العربية حوالي عام ٢٧٠م، وفيها تم تدمير معبد جوبيتر هامون، ومركز الفيلق الثالث في بصرى وقتل القائد الروماني (Syrig ١٩٤١: ٤٦-٤٧).

كل هذه القلاقل في المنطقة يمكن ربطها مع ما يسمى بأزمة القرن الثالث في الإمبراطورية الرومانية، والتي تمثلت بالحروب الأهلية، والغزوات الاجنبية، والفوضى الإقتصادية لمدة تزيد عن نصف قرن حتى قدوم ديوكلتيان إلى الحكم (٢٨٤-٣٢٤م) (Alfoldi 1981:165-231) والذي قام بزيادة التحصينات في الولاية العربية، وتأسيس سلسلة من القلاع على الطريق المعروف باسم طريق ديوكلتيان (Strata Dioclitiana) (**الشكل ٢**)، وأهم هذه التحصينات هي مدينة أم الجمال، ودير الكهف، وأم القطين، والأزرق، وقد زادت الحصون في المنطقة في حدود عام ٣٠م إلى الضعف تقريباً (Parker 1986). وربما كانت هذه التحصينات الجديدة مرتبطة مع هجرة جديدة للقبائل العربية إلى المنطقة وهم التنوخيون، الذين يذكرهم الطبري بأنهم "جماعة من قبائل العرب اجتمعوا بالبحرين فتحالفوا على التنوخ – وهو المقام – وتعاقدوا على التآزر والتناصر، وضمهم اسم تنوخ فكانوا بذلك كأنهم عمارة من العمائر" (الطبري ١٩٦١: ٦١٠).



٢. الطرق الرومانية في شمال شرق الأردن (Kenndy 1982: Fig.50).

النبطي رابيل الثاني إلى نقل عاصمته من البتراء إلى بصرى (Bowersock 1971: 239-240) وثبت هذا النقل للعاصمة من خلال نقش كتابي يحمل إهداء إلى ذي الشرى أعرا) الإله النبطي، إله سيدنا الموجود في بصرى، مؤرخ في عام ٢٣ لحكم الملك رابيل واهب الحياة والخلاص لشعبه (ستاركي: ٢٦٧).

زاد اهتمام الرومان بالمنطقة الشمالية من الولاية العربية، وذلك لحماية القرى والمناطق الزراعية، وحماية طرق القوافل المتجهة إلى دمشق شمالاً وإلى موانيء البحر المتوسط غرباً، وضبط تحركات القبائل العربية المجاورة (Parker 1986: 15)، ولذلك كانت تحصن القرى أو توضع فيها حاميات عسكرية، وأهمها الفيلق الثالث الذي كان مركزه في مدينة بصرى عاصمة الولاية (MacAdam 1986: 176) كما كان للدولة الرومانية اهتمام كبير بالسيطرة على طريق وادي السرحان الواصل ما بين الجزيرة العربية وجنوب سوريا، وهو الطريق الطبيعي لهجرة القبائل العربية ولذلك تم وضع العديد من القلاع للسيطرة على الجزء الشمالي الغربي من الوادي (Parker 1986: 15).

من أجل تنشيط الحركة التجارية تم إنشاء طريق إستراتيجي مهم يصل ما بين بصرى والعقبة على البحر الأحمر بطول حوالي ٣٥٠ كم، وهو يتبع الطريق المعروف باسم طريق الملوك في معظمه عدا في المنطقة الشمالية حيث يظهر بأنه حديث الإنشاء أو يتبع طريقاً صحراوياً ثانوياً، والاسم القديم لهذا الطريق غير معروف، وأصطلح عليه الباحثون باسم طريق تراجان (Via Nova Traiana) نسبة إلى الإمبراطور تراجان الذي تم إنشاء الطريق في عهده، إذ تشير الكتابات المؤرخة على أعمدته الميلية إلى أنه أنشئ في المدة من (١١١-١١٤م) وهنالك بعض التجديدات في القرون اللاحقة (Kennedy 1995: 103).

لحماية هذا الطريق الحيوي المهم إضافة إلى حماية حدود الولاية العربية كانت توجد مجموعات من المشاة أو الفرسان، أو راكبي الجمال في مناطق إستراتيجية في الأماكن الأكثر عزلة من الولاية العربية، في حين توجد قوات رئيسية في أماكن الاستقرار والمناطق الزراعية، زيادة على شبكة معقدة من أبراج المراقبة والحصون (Bowersock 1983: 103)، وهذا الشكل من الحصون هو ما عرف باسم التخوم العربية (Limes Arabicus) ويشير مصطلح ال (Limes) إلى الحدود المحصنة للولاية العربية في القرنين الثاني والثالث الميلاديين، والكلمة في الأصل تعني الطريق، ومع نهاية القرن الأول أصبحت بمعنى الحدود ما بين الإمبراطورية الرومانية والأقوام الأخرى التي سموها البرابرة، وفي القرن الثاني أصبحت الكلمة تعني سلسلة من الحصون التي ترتبط بطرق فيما بينها بشكل منظم (Parker 1986: 1). ولعل معظم الأعمال البنائية التي تمت في المرحلة اللاحقة تصب في هذا الاتجاه الدفاعي عن حدود الإمبراطورية الرومانية الشرقية في وجه الأخطار الخارجية المتمثلة بالفرس والقبائل البدوية العربية، وهذا ما يمكننا استنتاجه من خلال النقوش سواء التذكارية أو البنائية في الولاية العربية كلها أو في منطقة حوران بخاصة، ومعظم التحصينات الرومانية المعروفة في شرق الأردن تقع إما بالقرب من طريق تراجان مباشرة أو ضمن مسافة ٢٠-٣٠ كم إلى الشرق منه (Parker 1986: 127).

إن طريق تراجان وكما هو معروف جيداً يتبع طريقاً نبطياً، لذا يقدم الفخار الذي جمع من السطح في العديد من المواقع استيطانا نبطياً من القرن الأول إلى القرن الثاني فما بعد، لذلك يحتمل أن الحاميات الرومانية حلت محل الحاميات النبطية في العديد من هذه المواقع، ومن جهة اخرى فليس هنالك أية شواهد مؤكدة على أن هذا الاستيطان كان عسكرياً بطبيعته (Parker 1987: 153).

يوجد في القرن الثاني القليل مما أمكننا معرفته عن التحصينات في المنطقة، فالفيلق الثالث متمركز في بصرى وهنالك كتائب منه نشرت خلال الولاية، وهنالك قلعتان استوطنتا في هذا القرن تقعان إلى الشمال من الأزرق هما قصر الحلابات وقصر الأصيخم وهما يتحكمان في المخرج الشمالي الغربي لوادي السرحان (Parker 1986: 126).

مع قدوم ماركوس أورليوس (Marcus Aurlius) إلى الحكم في عام ١٦١ م إستؤنفت الحرب مع الفرثيين، وقد لوحظ في الأعوام الاولى من حكمه أعمال بنائية في نظام الطرق، ومن المحتمل أن هذه الأعمال ترتبط مع الحرب الفرثية فهنالك على الأقل ١٨ عموداً ميلياً مؤرخاً إلى الأعوام ١٦١-١٦٤م وجدت في الولاية العربية لوحدها، وهنالك تجديدات مهمة لطريق تراجان في الجزء الشمالي ما بين بصرى وعمان (Parker 1986: 128). ومن الشواهد البنائية أيضاً بوابة كومودوس في الجهة الغربية من سور أم الجمال والمؤرخة إلى ١٧٧-١٨٠ م (Littman *et al.* 1913: 232). في نهاية القرن الثاني الميلادي (١٩٨م) وسع الإمبراطور سبتموس سفيروس (١٩٣-٢١١ م) الولاية العربية إلى الشمال، وقد أصبحت مدن وقرى كانت تابعة لولاية سوريا تابعة للولاية العربية في مناطق إلى الشمال من بصرى (Bowersock 1983: 114) والتخوم العربية تحت حكم الأسرة السفيرية معروفة بشكل أفضل عن ما كان في السابق فهنالك العديد من النقوش البنائية العسكرية، أعمدة أميال، وبعض المصادر التاريخية؛ فهنالك نقشان لاتينيان من قصر العويند مؤرخان إلى ٢٠٠-٢٠٢ م، ونقش في النمارة شرق بصرى ، ونقوش أعمدة أميال لطريق الأزرق- دير الكهف لنفس الفترة، ونقش بنائي من قصر الحلابات (Parker 1986: 129). ويبدو أن هذه الأعمال التحصينية مرتبطة بشكل رئيس بالحروب مع الفرثيين في الاعوام ١٩٥-١٩٦ م و١٩٨-١٩٩م و٢١٦م (Kennedy and Riley 1990: 29-35).

هنالك صيانة لطريق تراجان من خلال وجود أعمدة أميال تعود للأباطرة ماكسميانوس (Maximinus) (٢٣٥-٢٣٨ م) وغورديان الثالث (Gordian III) (٢٣٨-٢٤٤م) (Parker 1986: 131).

في الأعوام ٢٤٤-٢٤٩م تولى الإمبراطور فيليب العربي عرش الإمبراطورية الرومانية حيث قام بإعادة بناء قريته شهبا الواقعة في حوران وسماها باسمه فيلبوبولس، كما أن المنطقة عموما لقيت عناية

إشارات مباشرة لمنطقة الدراسة أو منطقة حوران ضمن الوثائق الكتابية، علماً أن الكلديين قاموا بالعديد من الحملات الحربية على بلاد حتي (سوريا) وبلاد مصر، ومن ضمنها حملات على مناطق شرق الأردن عمون ومؤاب (محمد ١٩٨٣: ٧٥)، ومن المحتمل أن البابليين قد مروا في المنطقة في طريقهم إلى هذه المناطق إذ أن هناك إشارة في التوراة إلى اتخاذ ملك بابل طريقين أحدهما إلى القدس والآخر إلى عمون (عمان حالياً) (حزقيال ٢١ : ١٨-٢٤). وفي السنة السادسة من حكم نبوخذ نصر الثاني (٦٠٤-٥٦٢ ق.م) أي في عام ٥٩٩ ق.م توجهت قوات هذا الملك إلى بلاد حتي (سوريا) وأرسل بعض قواته لضرب القبائل العربية في البادية (Wiseman 1956: 71)، ومن المحتمل أيضاً أن نبوخذ نصر في حملاته هذه قد واجه القبائل العربية في منطقة ما من البادية السورية، ومن المحتمل أيضاً أن تكون منطقة بادية شمال شرق الأردن جزءً من مسرح عملياته العسكرية.

يوجد في الحقبة الأخمينية (٥٣٩-٣٣٢ ق.م) وثيقة إرشام الآرامية التي تعود في تاريخها إلى نهاية القرن الخامس قبل الميلاد، والتي نظمت لرحلة من بابل إلى مصر لموظف يعمل لدى مرزبان مصر المدعو أرشام. وهي تعطي سير الرحلة ما بين بابل عبر بلاد الرافدين وسوريا حتى مدينة دمشق (Driver 1954: 6)، ويحاول جراف (Graf) تتبع هذه الطريق في الحقبة الأخمينية في شرق الأردن حيث توجد مكتشفات أثرية جديدة لبقايا أخمينية في مواقع على طول هذه الطريق مثل عمان وطويلان وبصيرا والعقبة، وهذه المكتشفات تشير إلى أنه ربما كان لطريق تراجان الممتد من البحر الأحمر إلى سوريا أصل آشوري أخميني، إذ يعد هذا الطريق المسلك الرئيس عبر شرق الأردن، ولذلك يحتمل وجود استيطان في المنطقة في الحقبة الأخمينية لحدوث الإتصال من مدينة دمشق مرورا بشرق الاردن كونها تقع في منتصف هذا الطريق (Graf 1992: 459)، كما كشف عن مجموعة من المجوهرات ذات النمط الأخميني بالإضافة إلى ختم ومجموعة من العملات التي تعود في تاريخها إلى عام ٤٤٥ ق.م وجدت بالقرب من الحدود الأردنية السورية إلى الغرب من مدينة بصرى وهي تؤكد وجود استيطان يعود للحقبة الأخمينية (Kraay and Moory 1968: 181-210).

تتمثل الشواهد الكتابية التي تعود للمرحلة الهلنستية وهي قليلة في المنطقة ببرديات زينون أحد الموظفين الإداريين البطالمة. والتي تعود في تاريخها إلى حوالي عام ٢٥٩ ق.م، وهي عبارة عن مذكرات إدارية وتجارية لهذا الشخص وجدت في مصر. فإحدى الوثائق تشير إلى الوجود النبطي في المنطقة من خلال تعامل وكلاء زينون مع الأنباط في تجارة العبيد (Edgar 1925) فيما تذكر بردية أخرى شخصاً اسمه رابيل (Edgar 1925: 27-29)، وهو اسم نبطي معروف، وأحد أسماء ملوك الأنباط فيما بعد. ويبدو أن المنطقة في هذه المرحلة بدأت تدخل تحت السيطرة النبطية تدريجياً، كما بدأت ترتبط بتاريخ الأنباط فقد عثر على نقش كتابي نبطي غير مؤرخ، موجود حاليا في متحف دمشق يرجح ميليك (Milik) عودته إلى القرن الثالث قبل الميلاد (ستاركي ١٩٨٨: ٢٥٢).

من المصادر التي تحدثت عن المنطقة في المرحلة النبطية مصدران مهمان: الأول هو أسفار المكابيين، والثاني هو كتابات المؤرخ اليهودي جوزيفوس في كتابيه (حروب اليهود) و(عاديات اليهود). وهذه المصادر لا تتحدث عن المنطقة بشكل مستقل ولكن في إطار علاقتها وصراعها مع اليهود، ومع أن هنالك بعض الشواهد القليلة التي تشير إلى وجود اليهود في مناطق حوران عموما إلا أنه يجب أن نأخذ هذه الكتابات بحذر كونها تقدم تاريخاً منحازاً ومليئاً بالفجوات.

في عام ١٦٣ ق.م سار يهوذا المكابي وأخوه يوناثان وصادفا الأنباط .... (المكابيين الأول ٥: ٢٤-٢٦) ويمكن أن يفهم من خلال النص أن موقع اللقاء كان في حوران على أساس أنهم ساروا ثلاثة أيام في البرية (Graf 1992: 461) إضافة إلى أنهم تجاوزا الجلعاديين في شمال الأردن. وفي عام ٩٣ ق.م تقريباً اصطدم الأنباط مع اليهود في الجولان واستطاع الأنباط بقيادة ملكهم عبادة الأول الانتصار على اليهود (Josephus 1928).

بدأت المنطقة بالازدهار السريع والتوسع الاستيطاني في القرنين الأول قبل الميلاد والأول الميلادي تحت حكم الأنباط، ولعل أهم أسباب هذا الازدهار هو استتباب الأمن في المنطقة، زيادة على أن الأنباط أدخلوا تقنياتهم الرائدة والفعالة في الاستفادة من الثروات المائية في المناطق ذات المياه السطحية القليلة مثل بادية النقب في جنوب فلسطين، وكذلك في حوران (دانتز: ٣٢٣).

وهذا التقدم السريع في المنطقة تعزز بشكل كبير بالأعمال البنائية الكبيرة التي قام بها الملك النبطي رابيل الثاني (٧١-١٠٦م) والتي أثبتتها أعمال التنقيب في بصرى وسيع (Dentzer et al. 1982: 177-190; Dentzer and Dentzer-Feydy 1983: 15-25; Dentzer 1984: 163-174) وأسباب هذا التوسع غير معروفة ويمكن عدها جزئياً رد فعل من الملك النبطي رابيل الثاني على ثورة قادها (داماسي) وهو أحد أفراد عائلة نبطية بارزة من الحجر (مدائن صالح) في الحجاز، ويوجد عدد من النقوش الصفوية تشير إلى أن قبائل ضيف وماسكة ومحارب كانت ضمن القوات المتحالفة التي دعمت ثورة داماسي في منازعة للملك النبطي الجديد (Berthier 1985: 5-46). ويبدو أن رابيل الثاني بعد قضائه على هذه الثورة اتخذ لقباً جديداً بدأ يقترن باسمه بانتظام بعد عام ٧٥/٧٦ م وهو (واهب الحياة والخلاص لشعبه) (Winnett 1973: 54-57). كما يمكن أن يفسر التوسع العمراني في عهد رابيل الثاني لمحاولة الأنباط ترسيخ وزيادة السيطرة على المنطقة لا سيما وأن طرق التجارة الدولية تحولت من البتراء إلى تدمر مع منتصف القرن الأول الميلادي، وأصبحت البادية السورية هي الطريق الرئيس المؤدي إلى الرافدين والجزيرة العربية، والذي أدى هو أيضاً إلى تدهور الطريق التجاري النبطي من البتراء إلى غزة (Graf 1992: 463). ولذلك زادت أهمية المنطقة مما دفع بالملـ

من الهضبة البازلتية الشمالية الشرقية، ويبلغ أقصى ارتفاع لها حوالي ١٢٠٠م فوق سطح البحر في شمال الأردن.

٢. البادية الشمالية الشرقية: وتغطيها طبقة من الصخور الجيرية والصوانية تعود للزمن الجيولوجي الرابع، وترتفع ما بين ٦٢٥ – ٨٠٠م فوق سطح البحر (Bender 1974: 8) .

ب. هضبة البادية الوسطى (أرض الحماد): وتقع بين منطقتي الأزرق ووادي السرحان شمالاً وحتى رأس النقب جنوباً، وتغطيها طبقة من الحجارة الصوانية مما أعطاها اسم أرض الحماد (Bender 1974: 8) .

ج. حسمى: وتشمل منحدرات رأس النقب وجبل رم، وهي منطقة صحراوية تتخللها مجموعة من المرتفعات ذات الصخور الرملية أعلاها جبل رم الذي يرتفع حوالي ١٧٥٠م فوق سطح البحر (Bender 1974: 9) .

ما يهمنا من هذه التقسيمات الجغرافية هو منطقة الهضبة البازلتية الشمالية الشرقية (الحرّة)، والتي يعلو سطحها الصخور البركانية السوداء.

تتميز منطقة الدراسة جغرافياً بالارتفاع التدريجي الذي يبدأ من حوالي ٦٠٠م فوق سطح البحر في المفرق غرباً ويستمر حتى يصل إلى حوالي ١٢٥٠م فوق سطح البحر إلى الشمال الشرقي من دير الكهف قرب الحدود الأردنية السورية، حيث الامتداد الجنوبي لجبل حوران أو جبل العرب، والمعروف أيضاً باسم جبل الدروز والممتد شمالاً في سورية، ويصل ارتفاعه إلى أكثر من ١٦٠٠م فوق سطح البحر، وتبدأ المنطقة بالانخفاض تدريجياً إلى الشرق والجنوب.

يخترق المنطقة العديد من الأودية التي تسير في أغلبها من الشمال إلى الجنوب، ومن هذه الأودية وادي العاجب، وهو عبارة عن واد سيلي تجري فيه المياه أثناء نزول الأمطار، ويعمل هذا الوادي على تصريف مياه الأمطار الساقطة على الواجهة الجنوبية الغربية من جبل العرب، يسير الوادي باتجاه شمال جنوب ثم باتجاه شرق غرب وبعدها باتجاه شمال شرق – جنوب غرب حتى بلدة صبحا، وبعدها يتخذ اتجاه شمال شرق – جنوب حتى يلتقي بوادي الضليل الذي يصب في نهر الزرقاء، أحد روافد نهر الأردن، ويلحظ أن للوادي التواءات كثيرة على امتداده بسبب التضاريس (العجلوني ١٩٧٤: ١٠)، وقد قامت على ضفاف هذا الوادي حضارات مهمة لاسيما في العصر البرونزي المتوسط (Betts *et al.* 1996: 27-40).

ومن الأودية المهمة الأخرى وادي راجل الذي يعمل على تصريف مياه الأمطار الساقطة على الواجهة الجنوبية الشرقية لجبل العرب، ويمر من مدينة جاوه ثم يسير باتجاه شرقي حتى يصل إلى مرب الشبيكة، ثم يتجه جنوباً حتى يصل إلى واحة الأزرق، وقد قامت على ضفاف هذا الوادي حضارات مهمة أيضاً أبرزها تعود للألف الرابع قبل الميلاد (Betts 1991). ومن الأودية الأخرى في المنطقة ووادي سلمى، ووادي الحشاد، ووادي الجثوم، بالإضافة إلى أودية الزعتري، واللّص، والدفيانة وغيرها. وجميع هذه الأودية شكلت مناطق زراعية صغيرة على حوافها نتيجة ترسبات التربة الخصبة التي تجرفها مياه الأمطار في جريانها.

إن أعمال المسح والتنقيب الآثاري والتي بدأت منذ مدة قريبة فقط، ومعظم معلوماتها غير منشورة حتى الآن لا تمكننا بشكل مفصل من التعرف على المراحل التاريخية التي مرت على المنطقة، والتي تسبق الاحتلال الروماني لها، فالوثائق التاريخية تكشف عن وجود استيطان مكثف شهدته المنطقة. ففي عام ٨٤١ ق.م وهي السنة الثامنة عشرة من حكم شلمنصر الثالث (٨٥٨–٨٢٤ ق.م) عبر هذا الملك نهر الفرات لمحاربة حزائيل ملك دمشق الذي هرب وتحصن في مدينته وقام شلمنصر بمحاصرته فيها، ويشير إلى أنه توغل بعيداً حتى جبل حوران، ودمر أثناء ذلك العديد من القرى وحرقها وقطع محاصيلها (Luckenbill 1975: 243) وفي كتابات هذا الملك يذكر أسماء العديد من المواقع من ضمنها حوران (Luckenbill 1975: 294) كما تشير كتابة على تمثال لهذا الملك إلى وصوله إلى جبل حوران بعد حصاره لمدينة دمشق (Wilson 1962: 95).

من المعروف أن بلاد الشام خضعت للسيطرة الآشورية لكونها ذات أهمية كبرى لبلاد آشور ذاك أنها مصدر للحرفيين المهرة، ومصدر للأخشاب من جبال لبنان وهي طريق المواصلات بين بلاد آشور والبحر المتوسط (Saggs 1984: 81) ولذلك وجه تيجلاتبلسر الثالث (٧٤٤–٧٢٧ ق.م) حملة على بلاد الشام للقضاء على المشاكل الداخلية التي أثارتها دمشق بحلفها الجديد الذي كونته، وكان مسرح عمليات هذه الحملة الحربية الأجزاء الساحلية، وبلاد فلسطين، وشرقي الأردن، واتصل هذا الملك في أثناء حملاته على بلاد الشام ببعض القبائل العربية، وجاء في أخباره أن الملكة العربية شمسي أدت له الجزية، وقد فتح دمشق عنوة وأزال الدولة الآرامية فيها من الوجود في عام ٧٣٢ ق.م (باقر ١٩٧٣: ٥١٠) ويبدو أن منطقة البادية بقبائلها العربية إلى الشرق والجنوب من مقاطعات شرق الأردن عمون ومؤاب وأدوم التي كانت تحت السيطرة الآشورية هي ذات أهمية كبيرة لآشور لسببين الأول أن العرب يتحكمون بتجارة مهمة هي تجارة اللبان والبخور من جنوب الجزيرة العربية؛ والثاني أن هؤلاء العرب هم وحدهم الذين يتمكنون من عبور سيناء ما بين جنوب فلسطين ومصر بسلام، ولذلك كان الآشوريون على صلة بالقبائل العربية منذ حكم تيجلاتبلسر الثالث على الأقل، وقد واصل أسرحدون هذه السياسة بزيادة السيطرة الآشورية من خلال التدخل في منافسات قادة هذه القبائل (Saggs 1984: 107-108).

بعد عام ٧٣٢ ق.م أنشئت المقاطعات الآشورية في جنوب سوريا: حاورينا (Hawrina) للنصف الشرقي من حوران، وقرنيني (Qarnini) للنصف الغربي من حوران (Pitard 1987: 148, 189)، وهاتان المقاطعتان الآشوريتان هما من ضمن ثلاث عشرة مقاطعة أسسها تيجلاتبلسر الثالث في سوريا (Forrer 1920: 62-63).

لا توجد في الحقبة البابلية الحديثة (الكلدية) (٦٢٦–٥٥٦ ق.م)

يونس الشديفات
جامعة مؤتة

يونس الشديفات

الأهمية التجارية لبادية شمال شرق الأردن في العصر الروماني

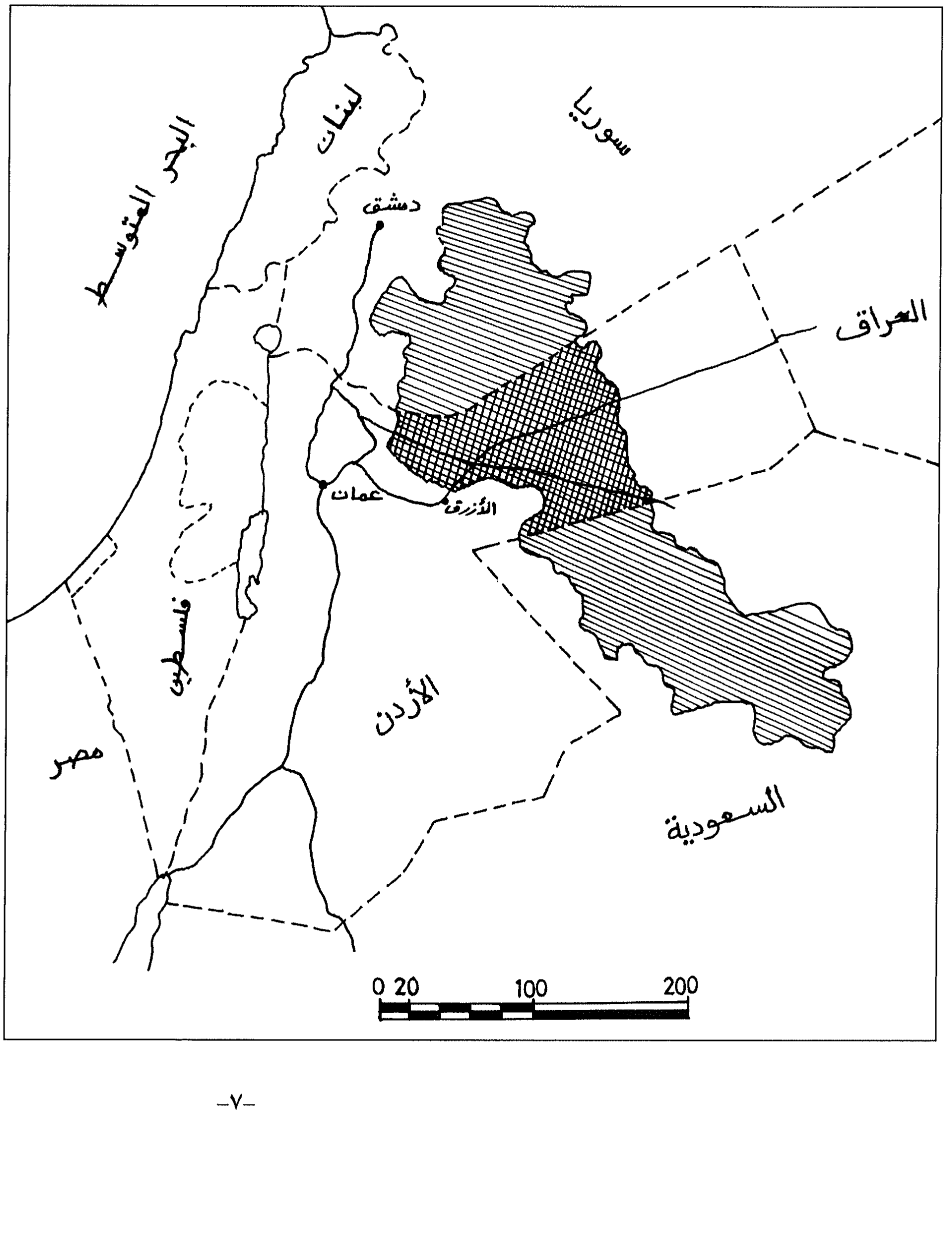
يقع الأردن في الجزء الشمالي الغربي من شبه الجزيرة العربية بين خطي عرض ٢٩،٣٠° و ٣٢،٣١° شمالاً (Baly 1985: 22) (الشكل ١). وهذا الموقع المهم ما بين الجزيرة العربية وسورية وموانئ البحر المتوسط، أتاح له دور مهم في حركة النقل والتجارة.

تعد منطقة بادية شمال شرق الأردن ذات موقع إستراتيجي إذ كانت وعلى مدى حقبها التاريخية وما تزال موئلاً للقبائل العربية، ومعبراً لهجرتها إلى سوريا وبلاد الرافدين، كما عبر منها العديد من الطرق التجارية، لاسيما الطريق الواصل ما بين الجزيرة العربية وسوريا.

تقسم منطقة البادية الأردنية والهضاب الشرقية حسب تكوينها الجيولوجي إلى

أ. البادية والهضاب البازلتية الشمالية الشرقية وتتكون من

١. الهضبة البازلتية الشمالية الشرقية (الحرّة) والحرّة هي أرض ذات حجارة سود نخرة كأنها أحرقت بالنار، والحرار في بلاد العرب كثيرة، أكثرها حول المدينة المنورة والشام، ومن هذه الحرار حرّة راجل في بلاد عبس بين السر ومشارف حوران (الحموي ١٩٧٩: ٢٤٥-٢٤٦) وحرة راجل هذه التي يذكرها ياقوت تقع في الجزء الشمالي الشرقي



١. بادية شمال شرق الأردن.

الأهمية التجارية لبادية شمال شرق الأردن في العصر الروماني

يونس شديفات ٧

أفامية مدينة الخمسة عشر قرنا

جرش الأخت التوأم

محمود حريتاني ١٧

إستراتيجية المكان والزمان في قصير عمرة

إحسان عرسان الرباعي ٢٣

الاستيطان الروماني المتأخر في منطقة رأس النقب جنوبي محافظة معان في ضوء الإكتشافات الأخيرة

أحمد جمعة الشامي ٣٣

العمونيون: استغلال الأراضي في العصر الحديدي الثاني

جهاد اسماعيل هارون ٥٧

مؤتمرات «دراسات في تاريخ وآثار الأردن»

المؤتمر	العنوان	المكان	الفترة
المؤتمر الأول	دراسات في تاريخ الأردن واثاره منذ أقدم العصور وحتى العهد العثماني	جامعة أكسفورد / بريطانيا	٢٥-١٩٨٠/٣/٣١
المؤتمر الثاني	جغرافية البيئة الأردنية وتاريخها منذ أقدم العصور حتى يومنا هذا	فندق عمره / عمان	٤-١٩٨٣/٤/١٦
المؤتمر الثالث	صلات الأردن التجارية وعلاقاته الخارجية إلى نهاية العهد العثماني	جامعة توبنجن / المانيا	٦-١٩٨٦/٤/١٢
المؤتمر الرابع	المواقع الأثرية وأنماط الاستقرار فيها عبر العصور التي مر بها الأردن	جامعة ليون / فرنسا	٥/٣٠ - ١٩٨٩/٦/٤
المؤتمر الخامس	الفن والتقنية في الأردن عبر العصور	جامعة العلوم والتكنولوجيا الأردنية / اربد	١٢-١٩٩٢/٤/١٧
المؤتمر السادس	مصادر البيئة الطبيعية والاستيطان الانساني في الأردن عبر العصور	مركز الأبحاث والدراسات الأثرية جامعة تورينو / ايطاليا	٥-١٩٩٥/٦/١٠
المؤتمر السابع	الحقب الألفية التي مر بها الأردن من أقدم العصور وحتى نهاية الحقبة العثمانية	جامعة كوبنهاجن / الدنمارك	١٢-١٩٩٨/٦/١٩
المؤتمر الثامن	الحضارة والهوية في الأردن عبر العصور	جامعة سدني/ استراليا	٧-٢٠٠١/٧/١٥
المؤتمر التاسع	التفاعلات الحضارية عبرالعصور	جامعة الحسين بن طلال / البتراء - الأردن	٢٣-٢٠٠٤/٥/٢٧
المؤتمر العاشر	الأردن عبر العصور	جامعة جورج واشنطن/ الولايات المتحدة الأمريكية	٢٣-٢٠٠٧/٥/٢٨

دراسات في تاريخ وآثار الأردن

تصدر عن دائرة الآثار العامة، ص.ب. ٨٨، عمان ١١١١٨ - المملكة الأردنية الهاشمية

رقم الايداع في المكتبة الوطنية: (٢٠٠٤/٥/١١١٩)

الطبعة الأولى ٢٠٠٧

مطبوعات دائرة الآثار العامة، عمان - الأردن

تصميم

ماجدة ابراهيم

طباعة: المؤسسة الصحفية الأردنية (الرأي)

المملكة الاردنية الهاشمية

دراسات في تاريخ وآثار الأردن

المجلد التاسع

دائرة الآثار العامة - عمّان