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Editorial Secretary
Annual of the Department of Antiquities of Jordan
Department of Antiquities,
P.O. Box 88
Amman 11118, Jordan
E-mail: publication.doa@nic.net.jo
Fax: +962-6-4615848

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System of Transliteration from Arabic

Consonents

ء	' (except where initial)	ض	ḍ
ب	b	ط	ṭ
ت	t	ظ	ẓ
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	ه	h
ش	sh	و	w
ص	ṣ	ي	y
ة ـة	a or at	ـه ه	a or ah

Long Vowels

ا ى	ā
و	ū
ي	ī

Short Vowels

ـَ	a
ـُ	u
ـِ	i

Common Nouns

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

List of Abbreviations

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

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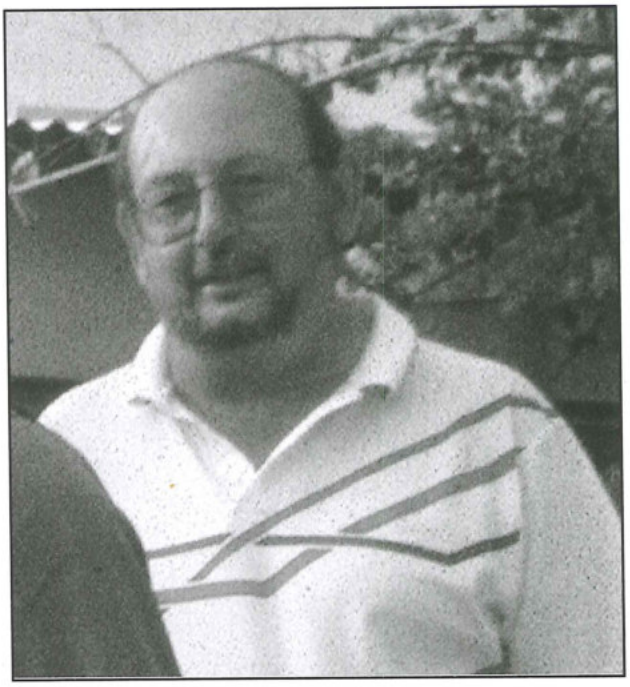
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OBITUARY
JOHN HEAD (1943-2003)

John Head, who passed away suddenly on July 11, 2003, was a pioneer in the development of techniques of radiocarbon dating. He helped to build chronological frameworks for prehistoric Jordan, as well as in his native Australia. Working with geological colleague Phillip Macumber, and indeed with many archaeological staff of the University of Sydney's Pella team, he specialised in the dating of small freshwater gastropods in the Jordan Valley margins. John was instrumental in devising the chronological framework of the well-known Pleistocene archaeological sequence in Wādī al-Ḥimmah, and he contributed to many articles on the archaeology and geology of Jordan. John also carried out fieldwork in other regions of the world, including Western China.

John Head was born in Whyalla, South Australia, on February 14, 1943. After serving his apprenticeship in the mining industry in his native state, he was educated at the University of Adelaide. Later he took higher degrees at the Australian National University (ANU), a path which lead to his long association working at the ANU's radiocarbon facility. John also worked in dating laboratories at the University of Wollongong in New South Wales, and further afield in Beijing, China.

John loved to travel and share in fieldwork experiences. He accumulated more frequent flyer points than anyone I have ever met, and his family joked that his address was "c/- Qantas". Though John was a shy and modest colleague, he had a



ready and quick wit. His was a congenial companionship around the dig table, or the fireside, after a hard day's fieldwork. He had the knack of inserting one of his instructive and good-humoured correctives into any discussion, always preceded by a hearty chuckle. His gentle camaraderie will be missed by many.

Phillip C. Edwards

OBITUARY
BASTIAAN VAN ELDEREN, 1925-2004

Our friend and colleague Bastiaan Van Elderen passed away on Sunday, August 8, 2004. He had been under treatment for a recurrence of cancer, which had weakened him, though his condition was not 'terminal'. He died of a heart attack, but nevertheless peacefully, at home, 79 years old.

A graduate of Calvin Theological Seminary, with advanced degrees from the University of California at Berkeley and the Pacific School of Religion (Th. D. 1961), Dr. Van Elderen was world-renowned for his expertise in New Testament. In his impressive teaching career as Professor of New Testament, which included tenures at Calvin Theological Seminary (1958-1984, Grand Rapids, Mich., USA) and the Free University of Amsterdam (1984-1990, Nederland), he inspired a generation of students to pursue scholarly careers, especially in early Christian manuscript studies. His keen interest in early Christianity governed his choices of archaeological field work.

Dr. Van Elderen's career in field archaeology spanned over forty years. He began with two seasons as area supervisor on the Wheaton College excavation at Dothan on the West Bank (1962, 1964) and one season on the British Institute of Archaeology Excavations at Alahan, Turkey (1965). After 1967 he served as an area supervisor for the Andrews University Excavations at Tall Óisbån (four seasons, 1968-1974), where his main assignment was the excavation and preliminary publication of the acropolis church.

Concurrently he served two terms as director of the American Center for Oriental Research (ACOR), in 1970 and 1972-1974, at a time when the center was located in a home near the Third Circle on Jabal 'Ammān where he resided with his wife (Vivolyn Van Elderen) and daughter (Anita Eerdmans). As ACOR director he availed himself to the Department of Antiquities on numerous rescue excavations at churches, like those at Māsūḥ, Kufr Abū Ṣarbūṭ and aṣ-Ṣwayfiyya. His fluency in Koine Greek was applied to excellent epigraphic work on Byzantine mosaics and other inscriptions. One especially memorable achievement is the decipherment and translation of the duplicate dedicatory inscriptions of the Jarash South Theater, which attributed construction patronage to the Emperor Domitian.

In the mid-seventies his focus shifted to Egypt's early monastic communities. He directed the Nag Hammadi Excavations from 1975-80, and served as principle investigator of the Wadi Natrun Excavations from 1992 to the present. But even Jordan drew him back, he served on the senior staff of the Abila Excavations for six field seasons from 1986-1996.

Notably, much of this active field work continued after his retirement from teaching at the Free University. Moreover, after he and his wife Vivolyn returned to Michigan in the nineties, he developed a mini-career in museum-related jobs. First he served as director of the Scriptorium in Grand Haven (1996-2001), then as program director of the Dead Sea Scroll Exhibit at the Grand Rapids Public Museum (2002-2003). His scholarly writing, which included numerous articles and field reports, reflect his passion for the history of early Christianity, and continued into the final year of his full life.

Those of us who sat in his classes were served up a smorgasbord of archaeological landscapes, backed with slides of the hundreds, if not thousands, of sites he knew intimately and loved deeply from over forty years of travel, excavation and residence in the East Mediterranean.

Bert de Vries
Calvin College

TWO NEW DOLMEN FIELDS IN THE ASH-SHAWBAK AREA

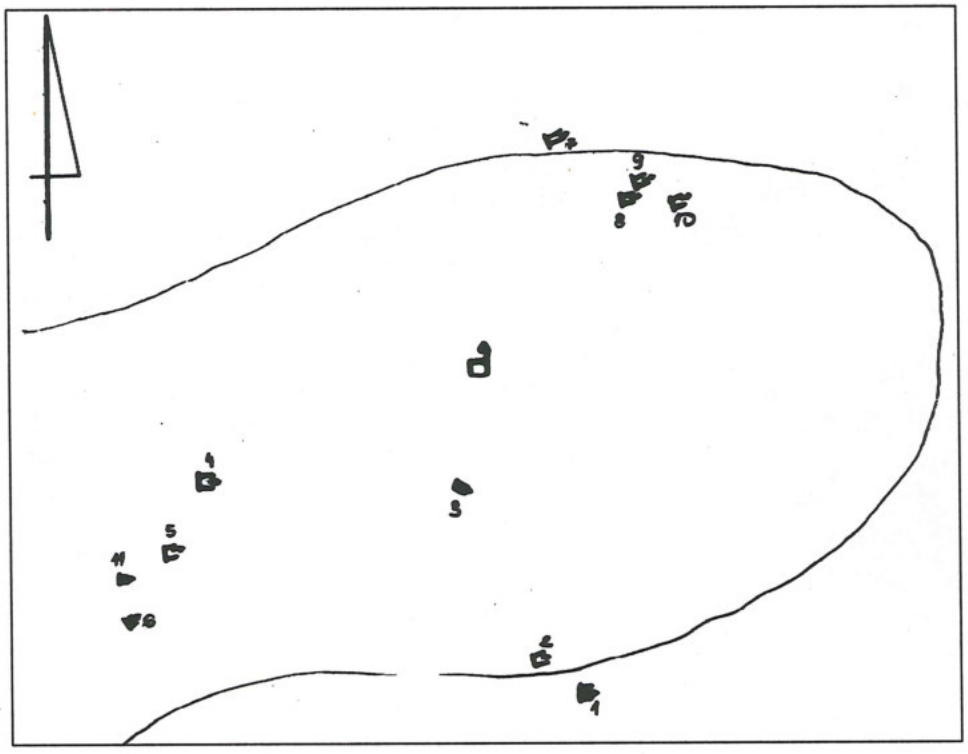
Elzbieta Dubis, Mohammad Marahleh, Sami Nawafleh

Over the ages, dolmens have attracted the curiosity and interest of almost everyone who has seen them. Travelers around the Levant in the eighteenth, and the nineteenth centuries made frequent mention of them. Since the end of the nineteenth century dolmens have made their way into the reports of geographers and more systematic surveyors. Even the fairly isolated ash-Shawbak (الشـوبك) area was visited several times by different researchers, but the majority of them were attracted by the ash-Shawbak castle, and they failed to mention any dolmens in this area. Nelson Glueck conducted a detailed survey of the ash-Shawbak area in May 1934 (Glueck 1935: 88-94). He noted many Nabataean and Edomite sites in the area, but he did not mention any megalithic structures there. Neither Umm Ṭuwayrāt nor any site in vicinity of Umm Ṭuwayrāt appeared in his notes.

Umm Ṭuwayrāt (أم طـويـرات), situated 2km south-east of ash-Shawbak castle, 1km south off the ash-Shawbak-Petra road, is mostly devoid of dolmens. Umm Ṭuwayrāt Site 1 was first seen and photographed by Mohammed Marahleh and Sami Nawafleh in 2000, and the current authors surveyed it in August 14-21, 2002. The primary goal of the survey was to make a detailed study of this dolmen field, its arrangement and type of structures. They also excavated a small sondage in order to learn about the origin, use and construction of the dolmens. All sites are located in UTM (Universe Transverse Mercator) zone 36, on the map. 3151.III (Shaubak).

Umm Ṭuwayrāt Site 1

Site 1 is located on a small spur overlooking the plain to the east, isolated from the surrounding higher hills by wadis. On the slopes of this spur 11 dolmens were found (**Fig. 1**), some in good condi-



1. Dolmen fields of Umm Ṭuwayrāt 1.

tion, some collapsed. There is also a water reservoir on the top.

Hilltop

Water Reservoir

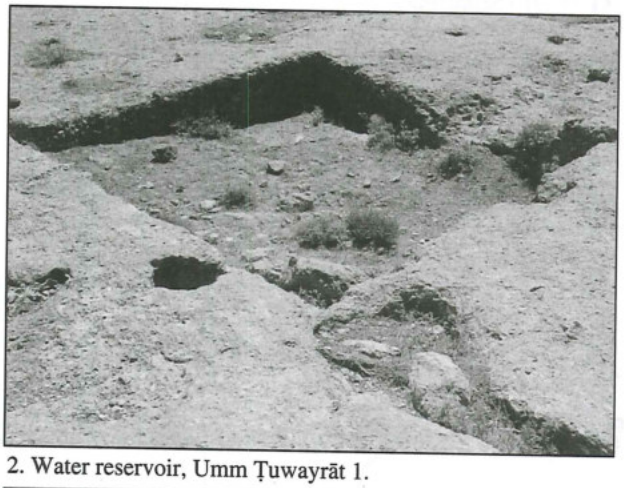
UTME: 744609
UTMN: 3378598
Elevation: 1413m

The structure cut into the bedrock on the hilltop is almost rectangular (3.12 x 2.79 x 2.92 x 2.73m) with the longer sides orientated south-north, to a depth of 0.45m (**Fig. 2**). In the north side, 1.2m from the NW corner, is cut a small round niche (12 x 21cm). In the east side, 46cm from the NE corner, is a second niche (34 x 40cm).

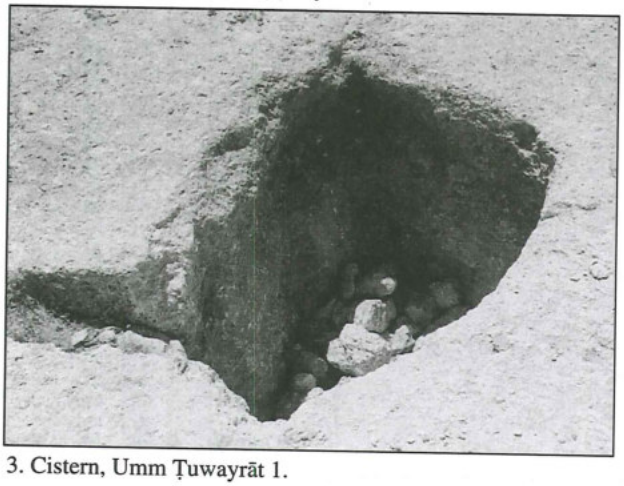
12cm from the NE corner starts a water channel. There is a small round pit at the beginning of the channel (62cm wide, but it is difficult to determine the depth — the bottom is unreachable). The channel is 161cm long, 24cm wide and 77cm in depth, running directly to the *cistern* (**Fig. 3**), the opening of the cistern is 153 x 102cm and its visible depth 115cm (cistern is filled by the cobbles).

No pottery or other artifacts were found in these structures or in the immediate surrounding area.

They are the only structures on the spur-top.



2. Water reservoir, Umm Ṭuwayrāt 1.



3. Cistern, Umm Ṭuwayrāt 1.

South Slope of the Hill

Dolmen # 1

UTME: 744 551
UTMN: 33 78 538
Elevation 1406m
Orientation: 90o WE

Type 1b (according to Epstein typology — Epstein 1985: 23) or Zohar Type B (according to Zohar 1992: 45). There are two upright slabs, southern slab broken into two parts, and one collapsed outside the dolmen. The structure is closed by a third slab from the west and covered by the flat capstone. The entrance is from the east side, blocked by the one bigger slab on the right side and a few smaller ones. The upright slabs are situated directly on the bedrock, there is no floor slab. On the north side of the dolmen there is a kind of stone fence made out of two slabs. The dolmen, oriented east-west, is about 3m long, 2m wide and 1.6m high. The interior chamber is 1.64 x 1.39m, 0.77-1.10m high.

Dolmen # 2

UTME: 744 549
UTMN: 33 78 568
Elevation: 1407m
Orientation: 78o WE

Collapsed, only the broken capstone and a few collapsed side slabs are visible.

Dolmen # 3

UTME: 744 528
UTMN: 33 78 599
Elevation: 1413m
Orientation: 130o NW-SE

Type B (according to Zohar typology — Zohar 1992: 45). Two uprights on the north and one on the south are partly covered by a fragment of the capstone another fragment is resting on the backside of the dolmen. The entrance from the southeast is blocked by the one bigger long slab on the left side and a few smaller ones, and a kind of the stone threshold-horizontal slab, upright slabs are situated directly on the bedrock, there is no floor slab. On the north side of the dolmen, outside, is a kind of stone fence made out of two slabs. The dolmen is about 2.9m long, 2.58m wide and 1m high, oriented east-west.

Dolmen # 4

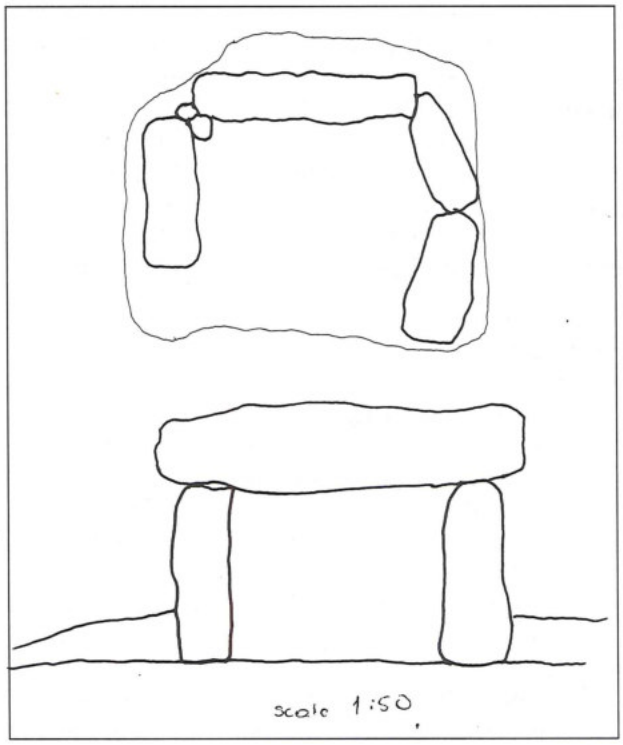
UTME: 744 551
UTMN: 33 78 538

Elevation: 1408m
Orientation: 90o W-E

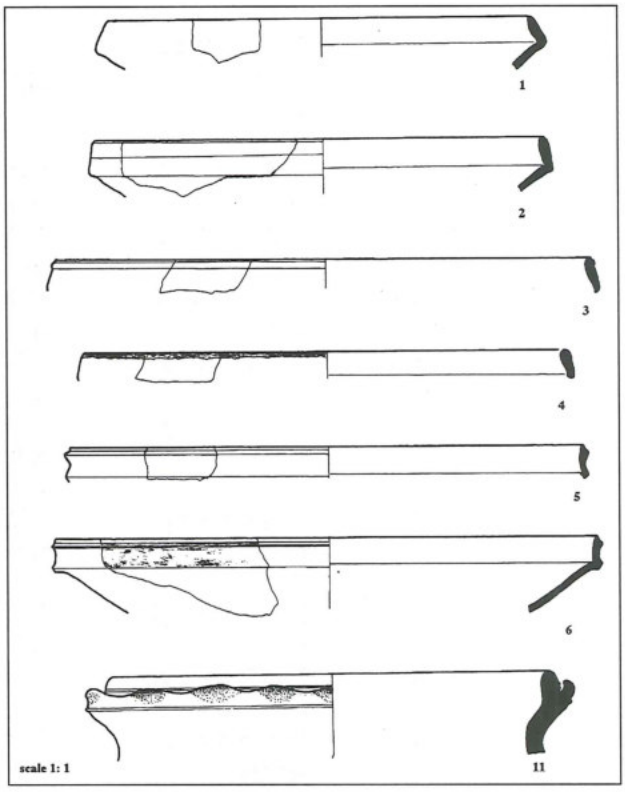
Type 1b (according to Epstein typology — Epstein 1985: 23) or Type B according to the Zohar typology (Zohar 1992: 45). There are two upright slabs creating the north side, one upright for the south side and is closed by a third from the west. There is a flat capstone lying on the uprights. The entrance from the east side is blocked by the one bigger slab on the left side and a few smaller ones, back slabs are situated directly on the bedrock, north side slabs are lying on the small stones, there is no floor slab, but bedrock is cut out creating a kind of the small basin in the front side. On the north side of the dolmen, outside, is a kind of the stone fence made out of two slabs. The dolmen is about 2.7m long, 3.2m wide and 1.3m high, oriented east-west (**Fig. 4**). This dolmen was examined in order to learn more about its construction. Nabataean pottery (**Fig. 5**, **Table 1**) and a coin were found. Probably the dolmen was reused in the Nabataean period. But there were also flints from the Chalcolithic/Early Bronze Age (**Fig. 6**) in the same stratum as Nabataean pottery.

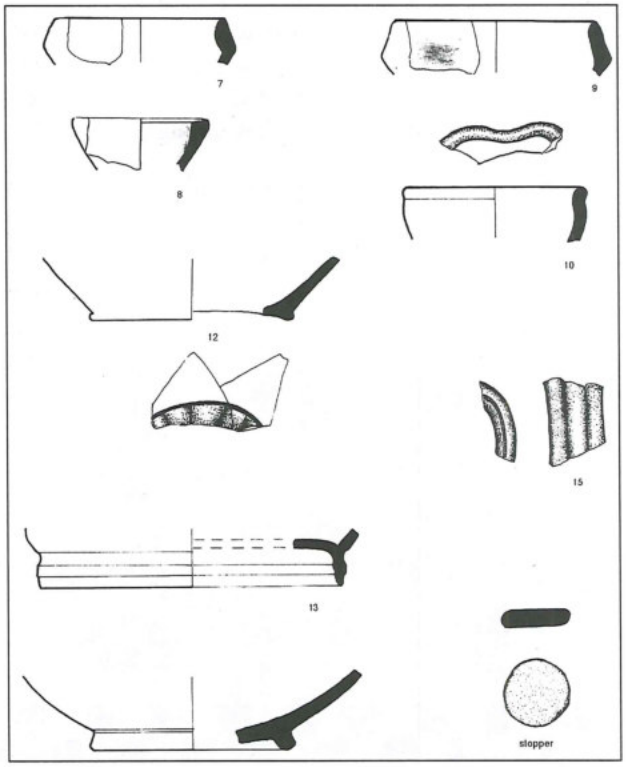
Dolmen # 5
UTME: 744 467
UTMN: 33 78 579
Elevation: 1407m
Orientation: 80o W-E

This is a new type not mentioned in the Epstein typology (Epstein 1985) or in Zohar 1992. This could be a variation of the Zohar type B "four or more uprights, forming a closed rectangular or



4. Dolmen No. 4, Type B, Umm Ṭuwayrāt 1.





5. Pottery from dolmen No. 4, Umm Ṭuwayrāt 1.

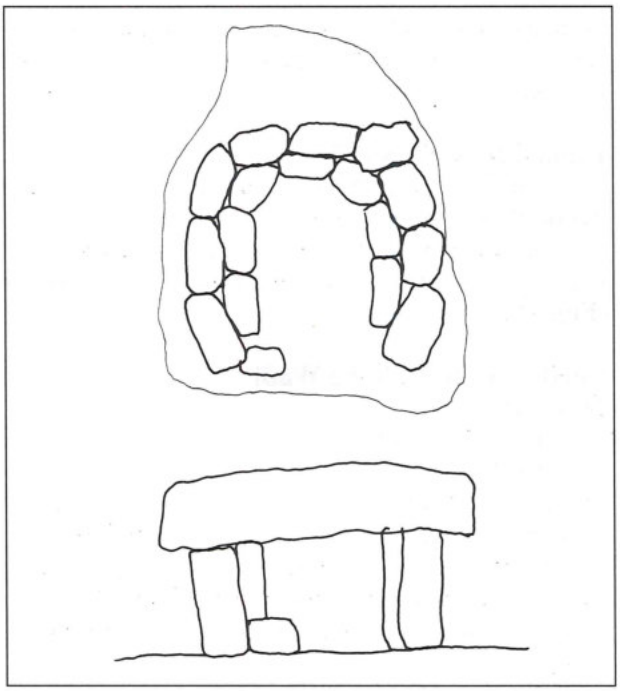
Table 1: Description of the pottery sherds

Dolmen	Reg No	Exterior	Core	Interior	Surface Treatment
4	S1.4.1	7.5YR 6/4 light brown	7.5YR 6/4 light brown	7.5YR 6/4 light brown	-
4	S1.4.2	5YR 6/6 reddish yellow	5YR 5/3 reddish brown	5YR 7/6 reddish yellow	-
4	S1.4.3	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	-
4	S1.4.4	5YR 6/8 reddish yellow	5YR 6/8 reddish yellow	5YR 6/8 reddish yellow	ext. slip 7.5YR 8/2 pinkish white
4	S1.4.5	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	ext. slip 7.5YR 6/2 pinkish gray
4	S1.4.6	5YR 6/8 redish yellow	5YR 6/8 redish yellow	5YR 6/8 redish yellow	ext. slip 7.5YR 6/2 pinkish gray
4	S1.4.7	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	-
4	S1.4.8	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	ext. and int. slip 7.5YR 8/2 pinkish white
4	S1.4.9	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	black 5YR2.5/1 strip along carinated neck
4	S1.4.10	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	-
4	S1.4.11	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	slip 5YR 7/8 reddish yellow
4	S1.4.12	5YR 6/8 reddish yellow	5YR 6/8 reddish yellow	5YR 6/8 reddish yellow	
4	S1.4.13	5YR 6/8 reddish yellow	5YR 6/8 reddish yellow	5YR 6/6 reddish yellow	
4	S1.4.14	7.5YR 7/6 reddish yellow	7.5YR 7/6 reddish yellow	7.5YR 7/6 reddish yellow	slip 7.5YR 8/4 pink
4	S1.4.15	2.5YR 6/8 light red	2.5YR 6/8 light red	2.5YR 6/8 light red	slip 7.5YR 8/4 pink
7	S1.7.1	2.5YR 6/6 light red	2.5YR 5/1 reddish gray	2.5YR 6/6 light red	slip 5YR 6/8 reddish yellow
7	S1.7.2	7.5YR 7/6 reddish yellow	7.5YR 7/6 reddish yellow	7.5YR 7/6 reddish yellow	slip 10YR 8/3 very pale brown



6. Flints from dolmen No. 4, Umm Ṭuwayrāt 1.

sub-rectangular room with one or more capstone" Zohar 1992: 45). We have preliminarily described) it as a Type G (**Fig. 7**). The half-round plan is created by three rows of the uprights, each side consists of 3 slabs in three rows, and the back is made out of the 5 slabs in three rows. The capstone is resting on some of the slabs in the outer row some in the inner row — it is difficult to say which row has a structural function. The one bigger slab on the right side blocks the entrance from the east side, upright slabs are situated directly on the bedrock, and there is no floor slab. Dolmen is 3.3m long, 3m wide and 1.5m high, oriented east-west.



7. Dolmen Type G, Umm Ṭuwayrāt 1.

Dolmen # 6

UTME: 744 464
UTMN: 33 78 569
Elevation: 1411m
Orientation: 80o W-E

This is another of our new type-Type G. The half-round plan is created by two rows of uprights, each side consists of 3 slabs in each row, and the back is made out of the 5 slabs in three rows. The capstone is resting on some of the slabs in the outer row some in the inner row—it is difficult to say which row has a structural function. The entrance is from the east side, and is blocked by the one bigger slab on the right side, upright slabs are situated directly on the bedrock, and there is no floor slab. Dolmen is 3.3m long, 3m wide and 1.1m high, oriented east-west.

Dolmen # 11

UTME: 744 472
UTMN: 33 78 582
Elevation: 1409m
Orientation: 90o W-S

Collapsed, only the capstone and a few collapsed side slabs are visible.

North Slope of the Hill

*Dolmen # 7 (***Fig. 8***)*

UTME: 744 524
UTMN: 33 78 668
Elevation: 1406m
Orientation: 60o NE-SW



8. Dolmen No. 7, Umm Ṭuwayrāt 1.

This is the new type-Type G. The half-round plan is created by two rows of the uprights. The south side of the dolmen consists of 4 blocks in two rows, and the north side collapsed. The back-side from the west consists of one large inner slab and two additional outer rows of stones. A very long capstone (5.86m) is resting on the south and west slabs. The entrance from the east side is not blocked. Upright slabs are situated directly on the bedrock and there is no floor slab. This dolmen was also examined in order to learn more about its construction. Early Bronze I-II pottery was found (**Fig. 9**, **Table 1**), a globular form flint core and two fragments of human bones.

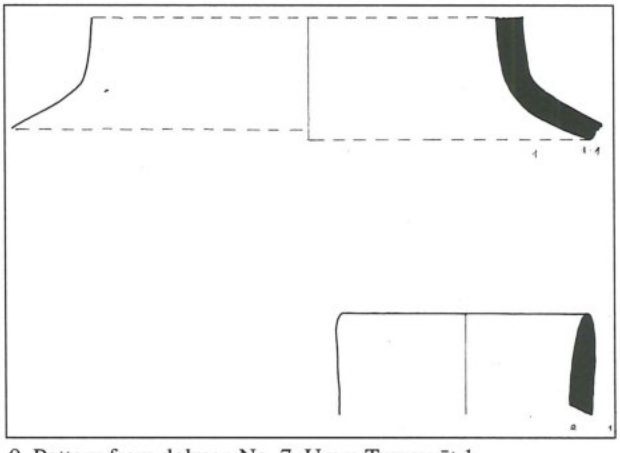
Dolmen # 8

UTME: 744 550
UTMN: 33 78 662
Elevation: 1408m
Orientation: 80o EW

Collapsed, only the capstone lying on three collapsed small side slabs is visible.

Dolmen # 9

UTME: 744 558
UTMN: 33 78 659



9. Pottery from dolmen No. 7, Umm Ṭuwayrāt 1.

Elevation: 1408m
Orientation: 80o EW
Collapsed, only the capstone lying on three collapsed small side slabs is visible.

Dolmen # 10
UTME: 744 566
UTMN: 33 78 657
Elevation: 1412m
Orientation: 55o SW-NE
New type-type G. The half-round plan is created by two rows of uprights: each side consists of two slabs in each row, and the back is made out of four slabs in three rows. The capstone is resting on some of the slabs in the outer row some in the inner row — it is difficult to say which row has a structural function. The entrance from the east side is blocked by small stones, upright slabs are situated directly on bedrock, and there is no floor slab. Dolmen is about 3.4m long, 2.5m wide and 1.26m high.

During the 2002 survey season a second dolmen field was found nearby, 2km south-west from the first one.

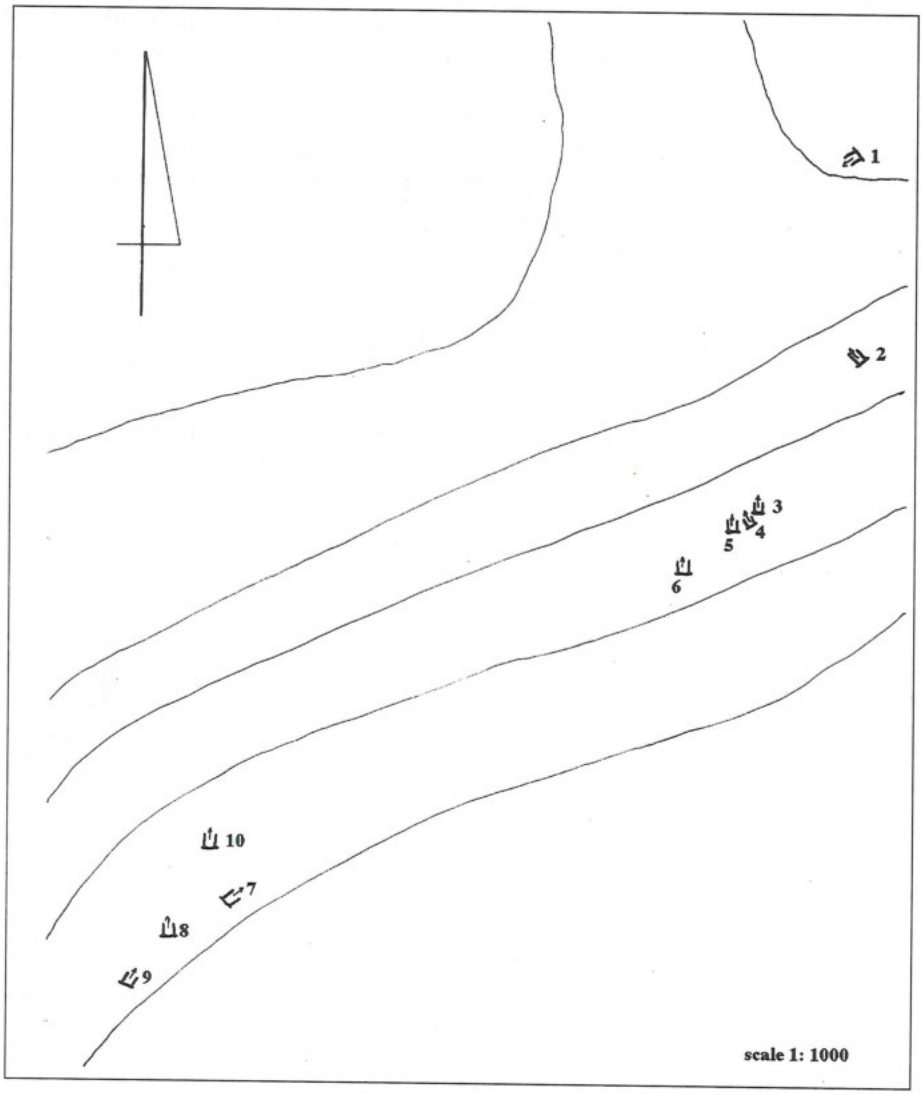
Umm Ṭuwayrāt Site 2

Umm Ṭuwayrāt Site 2 is located on a hillside overlooking the convergence of two wadis.

One additional dolmen is situated across the wadi system opposite the main group of dolmens (**Fig. 10**).

North-East Side of the Wadi

Dolmen # 1
UTME: 744 344
UTMN: 33 78 650
Elevation 1405m
Type B (according to the Zohar typology — Zohar 1992: 45). Two upright slabs are on the right side (one small *in situ*, one larger collapsed), three on the left side (one large collapsed) and closed by



10. Dolmen fields, Umm Ṭuwayrāt 2.

the two from the north-west, and a collapsed flat capstone. There are some remains, a few smaller stones, from the blockage of the entrance from the south-east side. Upright slabs are situated directly on the bedrock, and a floor is covered by the capstone. This dolmen is located on the north-east side of the wadi on the lower slope, opposite to the other dolmens.

South Side of the Wadi, lower Slope

Dolmen # 2

UTME: 744 336
UTMN: 33 77 616
Elevation: 1408m
Orientation: SE-NW-336o

This is the eastern most dolmen on the south part of the wadi. Probably type B, collapsed. Visible: back stone *in situ*, on the east side there are two slabs (one collapsed). On the west side slabs are not visible, and is covered by capstone. Also the entrance blockage stones are cover by the collapsed capstone. Floor consists of soil and small cobbles. No floor slab is visible.

Dolmen # 3

UTME: 744 329
UTMN: 33 77 607
Elevation: 1414m
Orientation: 0o S-N

Probably type B. Collapsed. Visible: back two rows of the single slabs *in situ*. Side slabs collapsed and not visible (covered by capstone). Also the entrance blockage stones are covered by collapsed capstone. Floor consists of soil and small cobbles. No floor slab is visible. The entrance, looking to the wadi, is from the north side.

Dolmen # 4

UTME: 744 344
UTMN: 3377 650
Elevation: 1415m
Orientation: 324o SE-NW

Probably type B. Collapsed. East side consists of two collapsed stone slabs, and the back block is *in situ*. West side: two stones—one *in situ*, and a second collapsed. Floor consists of soil and bedrock. The capstone is collapsed, lying NE from the structure. The entrance is on the north side facing towards the wadi.

Dolmen # 5

UTME: 744 344
UTMN: 3377 650
Elevation: 1414m
Orientation: 0o S-N

Construction type unknown, most probably type B. Collapsed, east side and west side covered by the collapsed capstone, and the back block is *in situ*. West side: two stones—one *in situ*, and a second collapsed. A floor is not visible. The entrance is on the north side facing towards the wadi.

Dolmen # 6

UTME: 744 344
UTMN: 3377 650
Elevation: 1416m
Orientation: 12o S-N

Probably type B. Collapsed, east and west side covered by a collapsed capstone. The two back slabs are *in situ*. A floor is not visible. The entrance is on the north side facing the wadi.

South Side of the Wadi, Upper Slope

Dolmen #7

UTME: 744 224
UTMN: 3377 520
Elevation: 1427m
Orientation: 50o SW-NE

This is the best-preserved dolmen in this site. Type B. North side consists of two uprights, the southern upright is visible only from inside, from outside the soil covers it almost to the capstone level, backside consists of at least two slabs, but there are a lot of smaller stones—it is difficult to recognize their function. The entrance from the north-east is blocked by smaller stones. On the entrance side inside the dolmen one long slab is lying parallel to the axis of the dolmen. This dolmen needs to be examined in order to understand better the construction and function of dolmens. This season was not long enough to complete this task.

Dolmen # 8

UTME: 744 213
UTMN: 3377 510
Elevation: 1428m
Orientation: 0o S-N

Probably type B with a stone circle around it. Collapsed. East side consists of two collapsed slabs. The west side slab is covered by the collapsed capstone. One of the back slabs is *in situ*. A floor is not visible. The entrance is on the north side facing towards the wadi.

Dolmen # 9

UTME: 744 203
UTMN: 3377 500
Elevation: 1429m
Orientation: 54o SW-NE

Very small one, capstone is not present and only

a little fragment inside the structure. Probably type B with stone circle around it. Collapsed, east side consists of two collapsed slabs, north-west side probably consists of two rows: one inner upright *in situ*, and an outer line *in situ*. There are also one inner back slab and two outer is *in situ*. A floor is not visible, because fragments of the capstone cover it. The entrance is on the north-east side facing the first dolmen. This dolmen has a different orientation than the others, it is located parallel to the slope.

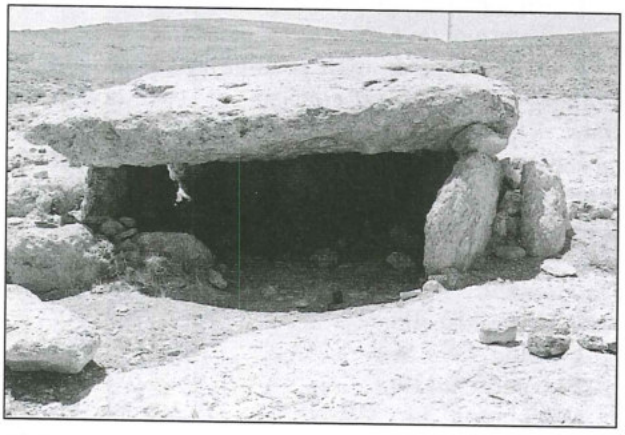
Dolmen # 10

UTME: 744 196
UTMN: 3377 511
Elevation: 1425m
Orientation: 0o S-N

Collapsed. The backside consists of 3 cobbles. Side slabs have collapsed and are covered by the capstone. The entrance faces towards the valley.

The ash-Shawbak region dolmens are of two types. The first type is a variation of Zohar type B (Zohar 1992: 44-45) or Epstein type 1b (Epstein 1985: 23-25). This type of dolmen consists of two or more upright slabs along the side, one or more back slabs and a covering capstone (**Fig. 11**). The average measurements of the dolmens are: 1-1.6m in height, 2-4m in length and the slabs are 0.25-0.4m thick. As with all the other dolmens seen by the authors until now, there are no traces of mortar, but spaces in-between the slabs are often filled with small cobbles or by small slabs lying one on the top of the other. Stone slabs used in the construction appear to be naturally broken with the breaks occurring along pre-existing fractures called joints, which are geological in origin.

There are a few dolmens constructed according to another plan. There is a new type not mentioned before in Epstein's typology (Epstein 1985: 23-25) or in Zohar (Zohar 1992: 44-45). This could be a variation of the Zohar type B "four or more uprights, forming a closed rectangular or sub-rectangular room with one or more capstone (Epstein's Types 1b, 2, 3, 4 and 5)") Zohar 1992: 45). We have described it as Type G. It consists of a round plan created by two or three rows of uprights: each side consists of 3 slabs in each row, the back is made out of 3-5 slabs in two or three rows. The capstone rests on some of the slabs in the outer row some in the inner row—it is difficult to say which row has a structural function.



11. Dolmen Type B, Umm Ṭuwayrāt 1.

Most of the dolmens are covered by capstones. All of the capstones are flat slabs made of the naturally broken unmodified blocks. Most have a length only slightly longer than the dolmen but the capstone covering dolmen No. 7 is 5.86m long. Only capstones of two dolmens (dolmen 4 and 7) appeared to have cup-holes (about 10cm in diameter), hollows or channels carved in the surface, which were probably contemporary with their construction. They were probably made artificially or the natural holes were deepened.

Most of the dolmens are open at one side. But there are remains of blockages, which usually consisted of one bigger and a few smaller stones. Dolmens found on the other sites were blocked by a different way: by so-called "porthole" — the front side of dolmens were closed by upright slab, in which the regular rectangular one or sometimes two holes were hewn, like it was in Dāmiyah (Yassine 1988: 47-54). The other kind of blocking is so-called dry walls (for example this kind of blocking on the dolmen from Tall al-'Umayrī (Dubis and Dabrowski 2002: 172), or by organic material, for example wood, which has not been preserved. But even then the entrance side is very clearly visible.

The orientations of the dolmens and megaliths, in general to the cardinal points, have often been regarded as being very important. Most of the Umm Ṭuwayrāt 1 dolmens are orientated E-W with the entrance to the E or orientated to the NE-SW with the entrance to the NE. But this is not the case for the Umm Ṭuwayrāt 2 dolmen field. The dolmens there are oriented NS, NW-SE, or NE-SW with the entrance facing to the open space at the crossing of two wadis.

No floor slabs were found in the Umm Ṭuwayrāt dolmen fields, they are constructed directly upon the bedrock. There are also no traces of subterranean chambers. At Dāmiyah below the floor of one of the dolmens were thick slabs covering a second small burial chamber, which contained the remains of an EB I burial (Yassine 1988: 49). In the 'Irāq al-Amīr the floor of one of the dolmens was sunk into the ground (Chang-Ho. Ji

1997: 50), but no burial remains were found. Mortensen reported that the dolmens found around Mount Nebo had burials lying below the floor stones in the chamber cut into the bedrock (Mortensen 1998: 90, Fig. 22). Also the dolmen field at al-Murayghāt had one similar feature (Dubis and Savage 2001: 95).

Many of the dolmens found in Levant were built on a round or oval platforms made of unhewn stones of approximately same size. But often instead of the terraces or platforms dolmens were surrounded by one or few stone circles. This is the case with the ash-Shawbak dolmens. Some of them are surrounded by one stone circle. But there are features that are also not full circles but a kind of stone fence consisting of one or two slabs. Zohar suggests that: "small circles may indicate a restricted area around the tomb, signifying sacred ground comparable to a *temenos* surrounding a temple") Zohar 1992: 47).

Pottery found at ash-Shawbak in general dated to the Early Bronze Age (found in dolmen 7), Iron Age and Roman/Byzantine (from the surface collection) and Nabataean sherds (found in dolmen 4). There are also lithics, mostly typical of a Chalcolithic/ Early Bronze Age assemblages.

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The authors want to express sincere thanks to several people without the help of which this project would not be possible. First of all we would like to thank the Director General of the Department of Antiquities for his permission. Drs. Patricia and Pierre Bikai also helped us a lot. In addition we would like to thank Yaser Rawashdeh for showing us Site 1 and Abu Qasem for showing us Site 2. Finally, we are grateful to David Berge who helped us to map both sites with a total station.

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ḤARRAT AL-BURMA CAIRN LINE, WĀDĪ BURMA SOUTH CAIRN FIELD, AND ḤARRAT AS-SAYIYYA K-LINE: A PRELIMINARY REPORT OF THE 2003 SUMMER SEASON OF THE JAFR BASIN PREHISTORIC PROJECT, PHASE 2

Sumio Fujii

Inroduction

The second operation of the Jafr Basin Prehistoric Project Phase 2 (JBPP-2), headed by the author in co-operation with the Department of Antiquities of Jordan, was conducted from 17 August to 31 September, 2003. The specific goal of this season was identical to that of the spring season. That is to bridge the chronological gap between the Layer 4 Late Neolithic (LN) entity and the Layer 3 Early Bronze Age (EBA) entity at Qā' Abū Ṭulayḥa West (قاع ابو طليحة) (QATW), our main concern in JBPP-1 conducted from 1997 to 2002 (Fujii 1998, 1999, 2000, 2001, 2002a, 2002b, 2003).

For this goal, the following three sites were excavated in the northwestern part of the basin: Ḥarrat al-Burma Cairn Line 1 (حرّة البرمه) (HB-CL1), Wādī Burma South Cairn Field (وادي برُمـــه) (WBs-CF), and Ḥarrat as-Sayiyya K-line 1 (حـرّة السـيّـيّـه) (HS-KL1). In addition, some other relevant sites and features were briefly examined in order to supplement basic information on the general occupational history of the al-Jafr basin.

The excavations showed that: 1) HB-CL1 is a linear, intermittent combination of pseudo-wall burial cairns (BC-700s) and bridges the chrono-typological gap between QATW BC-600s and the K-line; 2) Wādī Burma South cist enclosures, which stemmed probably from the proto-type in the lower Jordan valley, triggered the appearance of pseudo-wall cairn enclosures in the al-Jafr basin; 3) Wādī Burma South Kite-site 2 (WBs-KS2), another component of WBs-CF, provides the first key to the subsistence of the al-Jafr basin cairn entity and can probably be dated to the EBA on the basis of typological affinities with contemporary kites in Negev and Sinai, 4) HS-KL1, one of several K-lines (or locally called *Khaṭṭ Shabīb* خط شبيب) thus far identified in the al-Jafr basin, is partly disturbed by a QATW Layer 3 type of large enclosures and, therefore, assignable to a period prior to the EBA III, probably the EBA I-II.

These results, together with a series of surface examinations at other relevant sites, have enabled us to fill most, if not all, of the hiatus in the QATW chronological sequence. The following is a brief summary of these investigations.

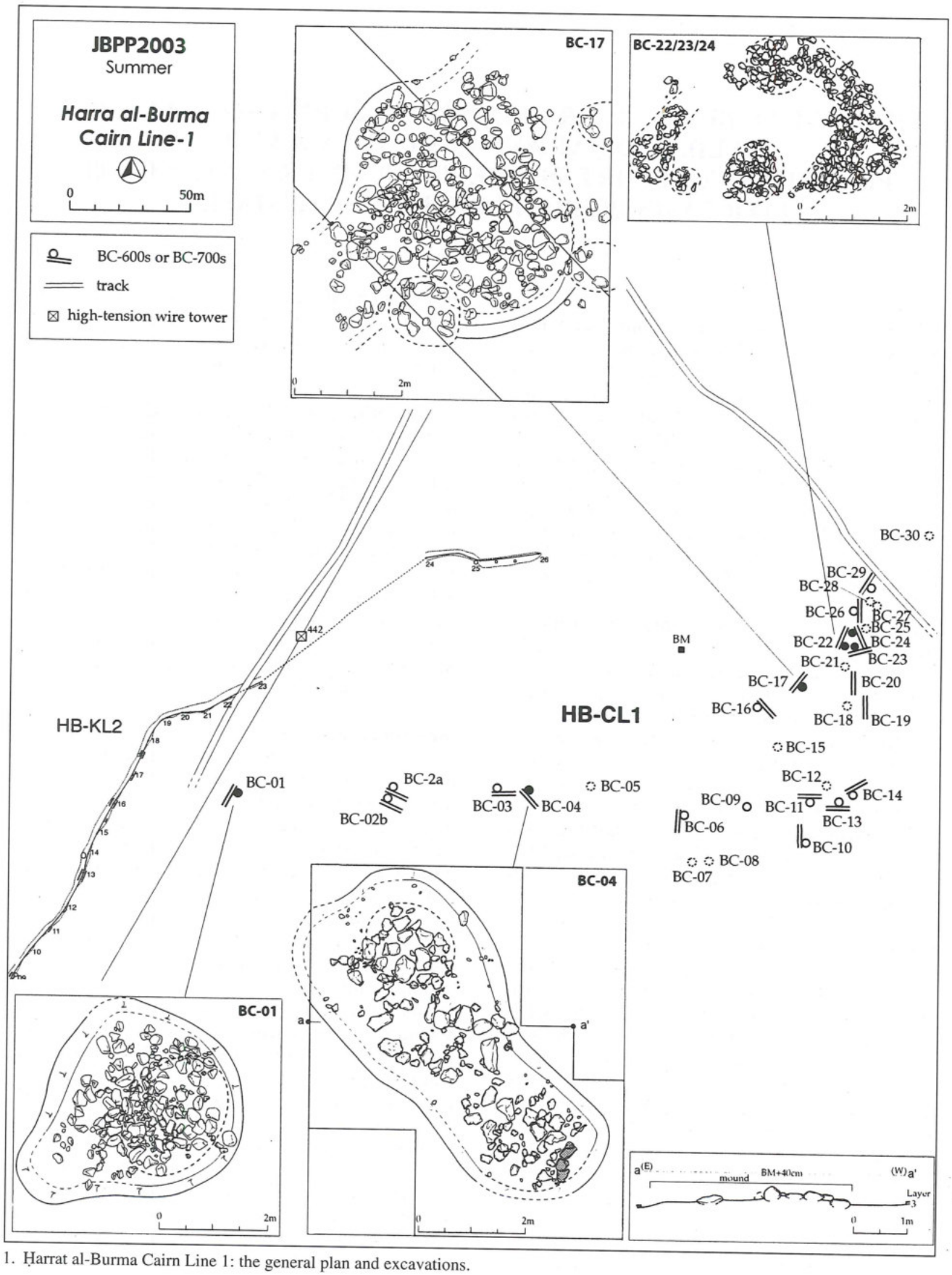
ḤARRAT AL-BURMA CAIRN LINE 1

HB-CL1 is located on a basalt plain west of Tall Burma, a small volcanic hill ca. 5km northeast of al-Ḥusayniyya, and adjacent to Ḥarrat al-Burma K-line 2 (HB-KL2) that was excavated in the spring season (Fujii 2004a). It consists of a total of thirty pseudo-wall cairns that are aligned in a gentle curve over ca. 300m in total length (**Fig. 1**). In order to examine the general character of this cairn line, three of them - BC-01, BC-04, and BC-17 - were excavated. In addition, BC-22/23/24, a small cairn complex near the northeastern end of this cairn line, was surface-examined.

Structural Remains

The excavations showed that: 1) because of the unique site setting, only basalt cobbles were used for the construction material; 2) the cairns are based on a low mound ca. 5-10 cm high that overlies the upper surface of Layer 3 of the site stratigraphy; 3) they consist of a circular stone concentration ca. 1-2m in diameter, the main body of a cairn entity, and a straight pseudo-wall ca. 3 - 10m in total length, 4) they were sometimes accompanied with a few small stone concentrations around them.

With respect to the site formation process, one should note the gradual change in size balance between the two major components that constitute a cairn complex. Overall, a cairn loses this balance as it goes eastward; at BC-01, for example, the main body ca. 2m in diameter is paired with a pseudo-wall ca. 3m long, whereas at BC-04, a cairn ca. 100m east of the former, the key feature ca. 1m in diameter is coupled with a pseudo-wall ca. 6m long (**Fig. 2**). What is important here is that the former cairn can be identified as an example of BC-600s, the final form of the Layer 4 cairn com-



1. Ḥarrat al-Burma Cairn Line 1: the general plan and excavations.



2. Ḥarrat al-Burma Cairn Line 1: the general view of BC-04 (from S).

plex at QATW (Fujii 2003). Given this, one may define the latter as BC-700, a subsequent form to BC-600s. These identifications, if acceptable, would suggest that this cairn line was developed from the west to the east. Consistent with this view is the gradual reduction in intervals between any two cairns, which may serve as another support for the intra-site, horizontal stratigraphy from the west to the east.

This site holds a key to the formation of the K-line in various aspects. First, the one-sided extension of a pseudo-wall at BC-700s is the first step to the formation of the K-line, a long chain of pseudo-wall cairns. Second, in contrast to BC-600s, which often leave the narrow space between the two-rowed foundations hollow, BC-700s fill it up with rubble and, in this sense, proceed further to the formation of the K-line. Third, as opposed to the clustering nature of BC-600s, BC-700s are arranged roughly in a line, thus being qualified as a proto-type of the K-line. Fourth, the combination of plural cairns seen at BC-22/23/24, though not linear but at random in connection, is another sign of the appearance of the K-line.

It is therefore reasonable to suppose that BC-600s at QATW were transformed into BC-700s at HB-CL1, which in turn, being connected with each other, led to the formation of the K-line. In this light, small stone concentrations attendant on BC-17 and BC-22/23/24 may be taken for an intermediate form between small mourning pits at QATW BC-600s (Fujii 2003: Fig. 11-14) and small stone concentrations at Ḥarrat al-Burma K-lines (Fujii 2004a).

The Finds

Unfortunately, no *in situ* finds were recovered from the three excavation sectors. To make matters worse, the finds either on the ground surface or from fill layers were also too exiguous to be a reliable chronological marker. Thus, no clues to the dating of this cairn line can be sought in the finds at the moment.

However, as noted above, a few lines of circumstantial evidence – the appearance of BC-700s, their linear arrangement, and the gradual reduction in intervals between any two cairns – strongly suggests that this cairn line occupies an intermediate position between BC-600s at QATW and the K-line. Highly suggestive in this respect is the inconsistency in cairn orientation at HB-CL1. Importantly, this inconsistency still survives at HB-KL2 but completely disappeared at HB-KL2 (Fujii 2004a). This contrast probably means that HB-CL1 was followed by, first, HB-KL2 and, then, HB-KL1. In this connection, one may also note that these three features are aligned in this order from the north to the south and, at the same time, they increase in total length again in this order. Thus, given that BC-600s is assignable to the later half of the Chalcolithic (Fujii 2003), the next form, HB-CL1, can be dated to the final phase of the Chalcolithic or the beginning of the EBA and the third form, the K-line, to a subsequent period, probably to the early half of the EBA.

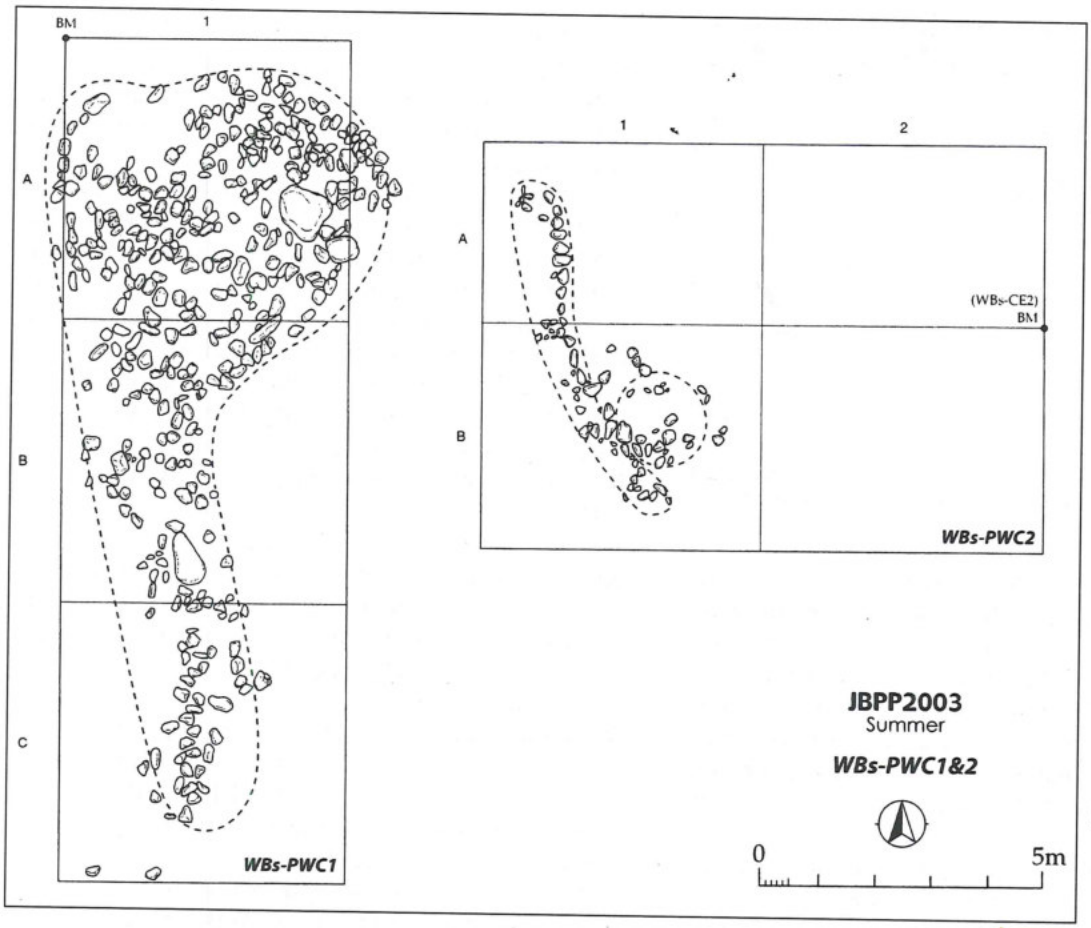
Incidentally, two isolated examples of BC-700s were found in close vicinity to WB-KS2 and WBs-CE2, both mentioned below (**Fig. 3**). In light of the typological sequence suggested above, both examples seem to bridge the minor gap between BC-600s at QATW and (linearly arranged) BC-700s at HB-CL1.

WĀDĪ BURMA SOUTH CAIRN FIELD

Wādī Burma is one of the uppermost tributaries of Wādī al-Ḥasā and drains northwards encompassing Tall Burma. To date, a few dozen structural remains have been confirmed on its beds and sandbanks (**Fig. 4**). Topographically (and possibly chronologically), they can be divided into the following two clusters: Wādī Burma North (WBn) and Wādī Burma South (WBs) with WB-KS1 in between. Wādī Burma South, our present concern, includes a total of eight cist enclosures, two of which, WBs-CE1 and -2, were excavated in this season. In addition, WBs-CE4 and -7 were surface-examined.

Wādī Burma South Cist Enclosure 1

WBs-CE1 is a large, stone-built structure constructed on a flat sandbank of Wādī Burma and measures a little more than 30m long in the W-E main axis. Owing to the unique site location, vari-



3. BC-700s in the vicinity of WB-KS2 (left) and WBs-CE2 (right).

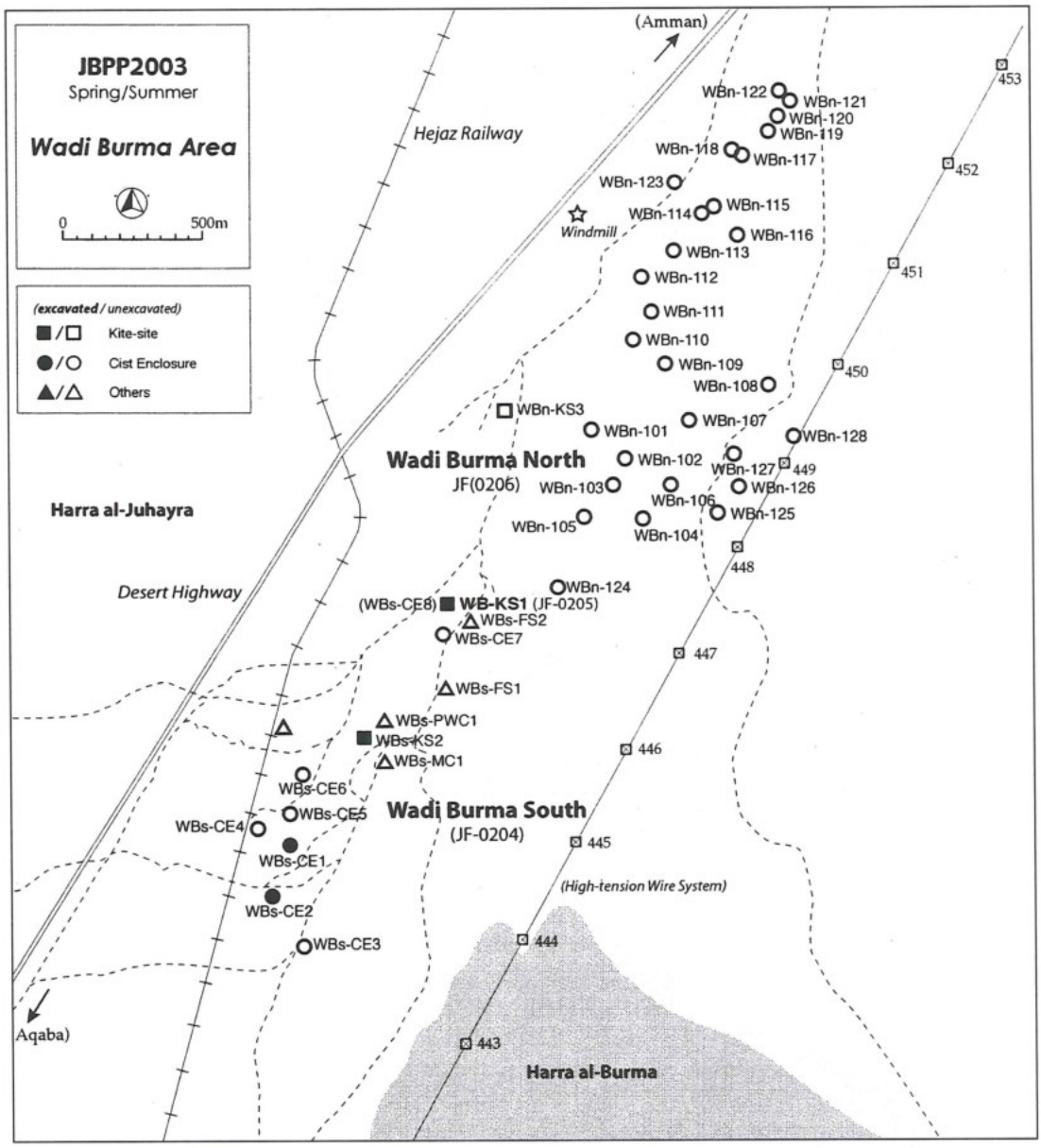
ous stones are used for the construction, including limestone, flint, and basalt cobbles with the former two being predominant. The construction material is put in horizontal, or sometime upright positions, on the upper surface of Layer 3 of the site stratigraphy. The excavation, which focused on the western half of this structure, showed that it consists of the following three major components: to list from the west to the east, an oblong cist tomb protected with a large pebble mound ca. 8-10m in diameter, a rectangular platform attached to the cist, and a large, oblong or semi-quadrilateral, walled courtyard with sides ca. 10-15m long (**Figs. 5, 6**).

Structural Remains

Before excavation, this structure looked like a natural mound associated with a large enclosure in front of it, but, unexpectedly, it turned out to be an elaborate structural complex. What interested us most is a compact pebble mound up to ca. 1m high, which buries the cist and platform walls nearly to the top course. It is for this reason that this mound gave the impression of a natural rise without any conspicuous features.

On the basis of excavated evidence, the formation process of this large cist enclosure can be reconstructed as follows: first, the cist tomb and the platform was built on the ground surface of those days; then, both of them were covered with the pebble mound nearly up to the top course of the walls; finally, the large enclosure was attached to them partly running up the mound. This construction order, most likely, mirrors the order of significance of each component. The quality of construction material also follows this order; stones used for the cist tomb, especially those for the foundations, are larger and more standardized than those for the platform, which in turn surpass in quality those for the courtyard wall. From the priority of the cist in every respect and the large-scaled construction of the enclosure comes the nomenclature cist enclosure.

Following the supposed path of flow, a brief description will be made about each component. First comes an entrance to this large structure, which can be sought in a small wall break at the north-eastern part of the walled courtyard. The existence of a pair of short windbreak walls corroborates this identification. What is important here is that the entrance is slightly offset from the W-E main axis of this structure, a trait still inconspicuous until the



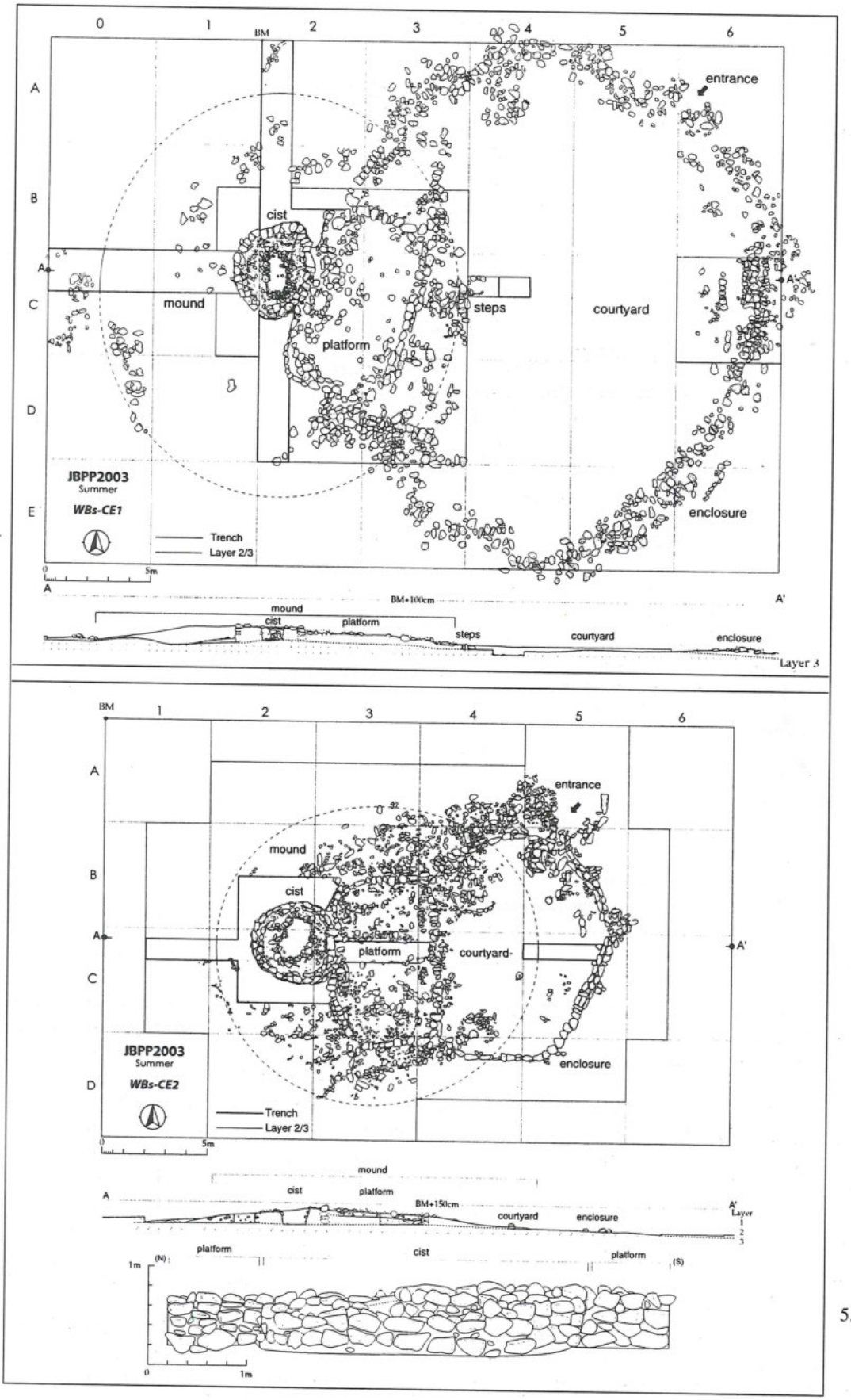
4. Site map of the Wādī Burma area.

early half of the EBA but further emphasized after the end of the EBA III under the influence of Syrio-Mesopotamian culture (Kempinski 1992: 53, 59).

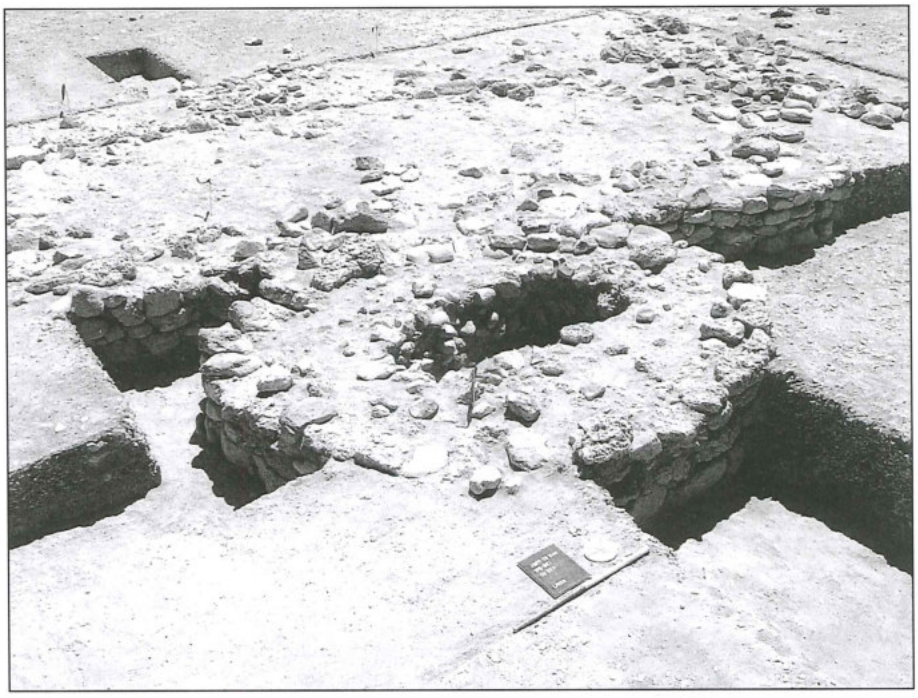
Next comes the large courtyard with the area of ca. 300 square meters. It is noteworthy that, despite the vast area, no remarkable small features are equipped, with the exception of small steps leading up to the platform. What should not be overlooked is that no burial cairns are incorporated into the courtyard wall, a contrast with pseudo-wall cairn enclosures at QATW.

From this courtyard, the small steps guide us up to the platform. It is interesting to note that, unlike the entrance, these steps are in line with the W-E main axis of this structure. In comparison with the courtyard, this platform is much smaller in size, measuring ca. 8m wide and 5m deep, about one tenth in area. However, an array of traits - the quality of construction material, the elaboration in its arrangement, and the higher location leading to the cist - highlight the significance of this space.

Located behind this platform is the cist tomb, the key feature of this structure. No clear evidence for steps were found, probably because no conspicuous elevation gap exists between the two. Nevertheless, one may note that a narrow gap at the eastern part of the outer wall of the cist might have been used for a small, crouching entrance or an opening for light. Buried with the pebble bank, this cist is still preserved to a height of up to four courses or ca. 1m. It is a double structure, con-



5. Wādī Burma South Cist Enclosure 1 (above) and -2 (below): the plan and elevation/section.



6. Wādī Burma South Cist Enclosure 1: the cist and platform (from NW).

sisting of a small, roughly rectangular cist ca. 1m and ca. 2m in both sides and an oblong outer wall ca. 4m and ca. 5m in both axes, with loose rubble filling in between. In comparison with the outer wall, the cist wall is much less elaborate in construction and built in a simple heaping method using smaller, less standardized cobbles. It appears that the outer wall was built first and then the inner cist wall was additionally constructed, a construction process feasible only for non-corbelled cist tombs.

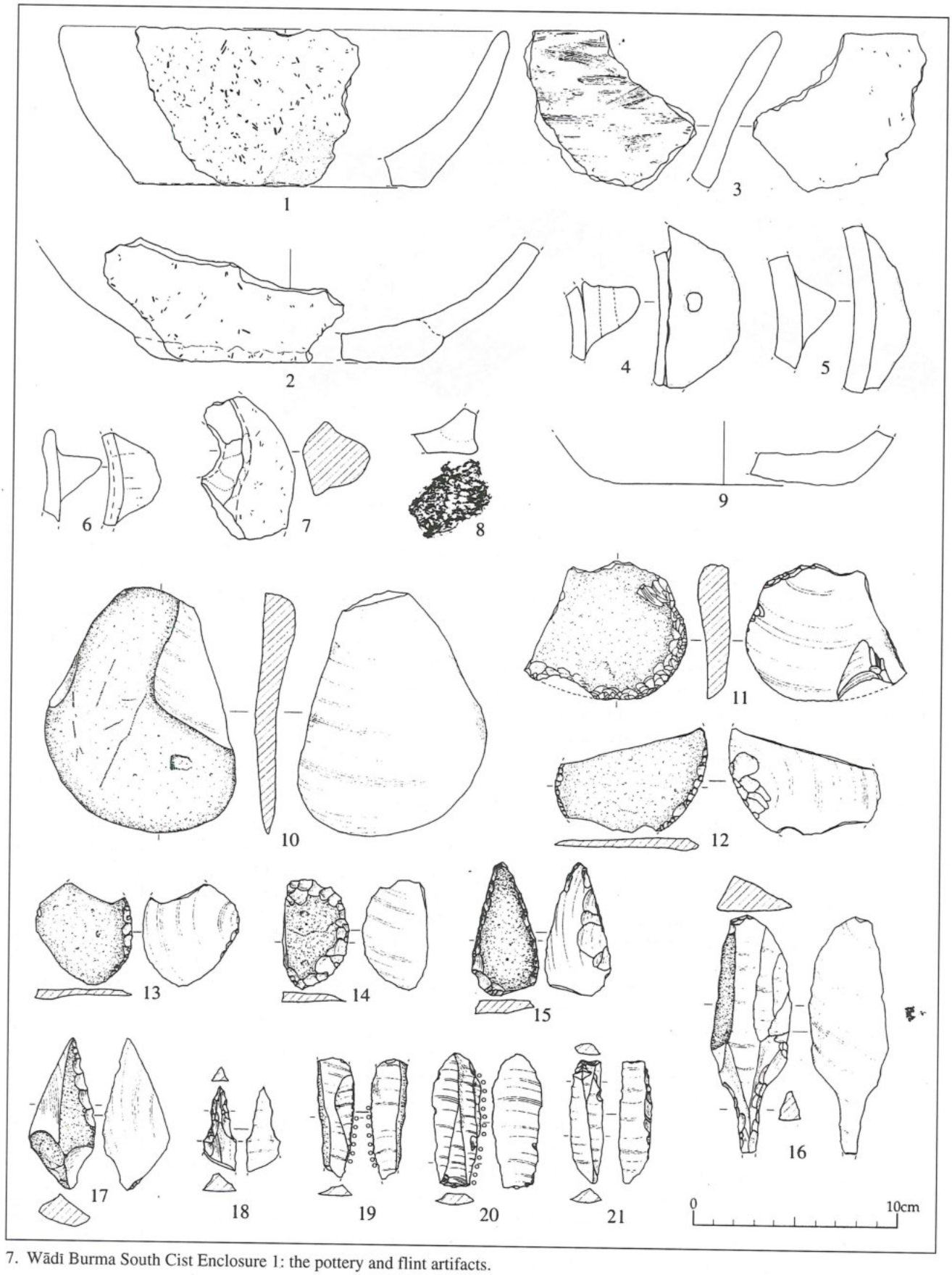
No clear evidence for an upper structure was found, although rubble and loose soil filling up the cist space might include its remnant. A dozen pottery sherds and several animal bone fragments were recovered from lower fill layers of this cist, but no human skeletal remains were found. It is noteworthy, however, that a small hearth, ca. 20cm in diameter, and a large number of charcoal remains were found nearly at the bottom. Both of them might suggest that some burning ritual had taken place within this cist.

The Finds

The finds from WBs-CE1 are relatively rich in both quality and quantity for a desert site, comprising dozens of coarse ware sherds, a few dozen flint artifacts including some tabular scarpers, a few fragments of stone macehead, several basalt vessels, and a handful of animal bone fragments. It is important to note that most of them occurred from the pebble bank, besides the cist tomb in particular. This might mean that these finds, being mixed with wadi pebbles used for the construction of the protection mound, were collected by chance. However, both the sharp condition of their edges and the sooted state of their surfaces casts doubt on this view in favor of intentional discarding after some funerary ritual that had taken place in advance of the construction of the mound. The uniformity of the finds also supports this assessment.

The pottery sherds bear many technological affinities with samples from QATW enclosures, including poorly controlled firing, heavy tempering of grit and chaff, relatively thick walls, rough surface treatment, dark surface color, and essential lack of surface decoration (Fujii 2002a: 33, Fig. 19). To date, the following two pottery shapes have been identified: shallow bowls with a slightly incurving wall (**Fig. 7: 1, 2**) and a bowl with a large flat base and a slightly flaring wall (**Fig. 7: 3**). In addition, several ledge handle and base fragments have been found (**Fig. 7: 4-9**), the latter of which include a unique sample bearing a wicker print on its lower surface (**Fig. 7: 8**). These sherds were often found in sooted condition, suggesting that they were subject to fire in use.

The flint artifacts are relatively small in number, including some tabular scrapers (**Fig. 7: 10 - 15**), a tanged knife (**Fig. 7: 16**), a QATW point made on a cortical, split blank (**Fig. 7: 17**) (Fujii 2000: Fig. 10), a distal fragment of a drill bit (**Fig. 7: 18**), and some blades with or without sickle sheen (**Fig. 7: 19 -21**). It is important to note that

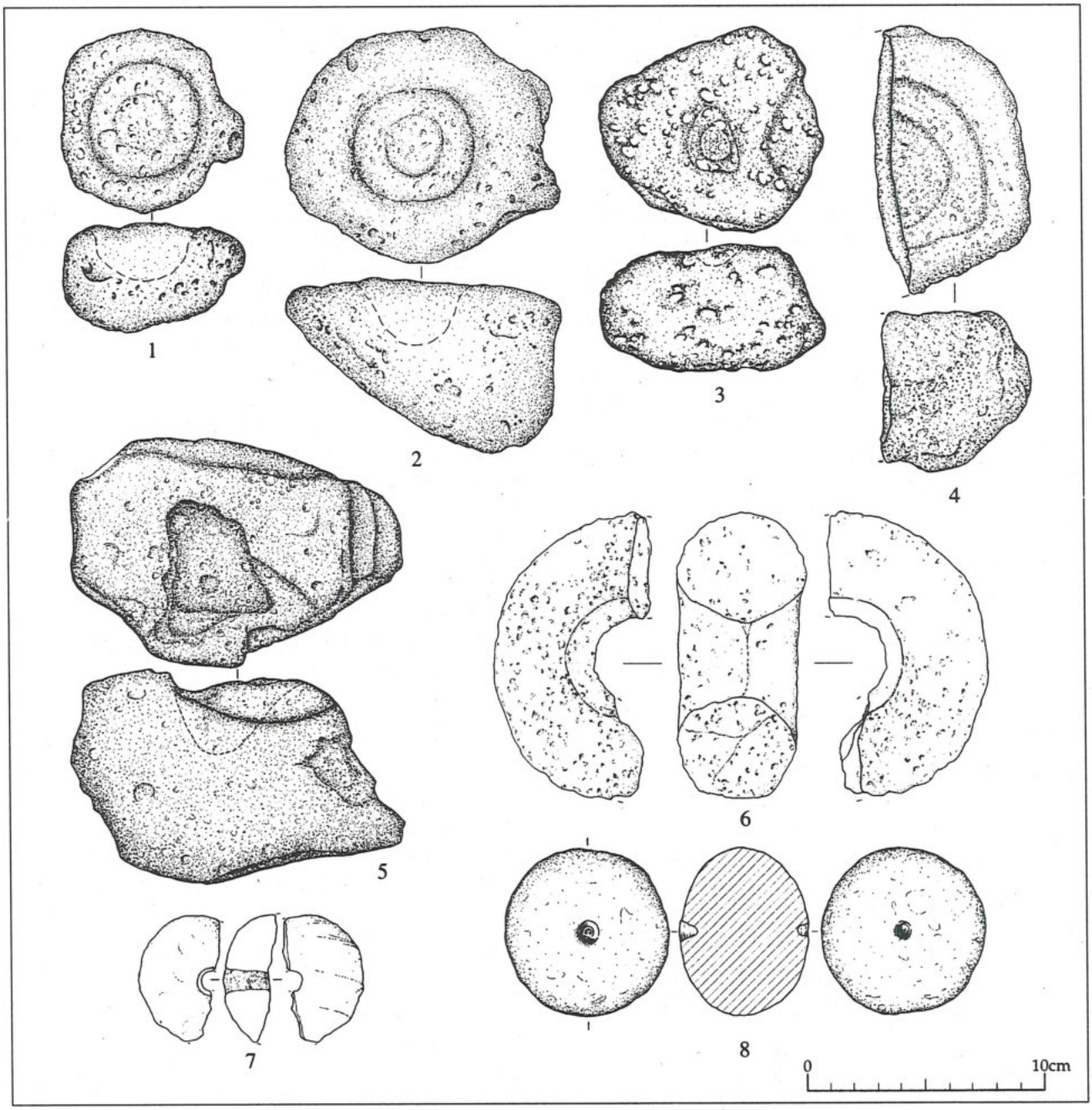


7. Wādī Burma South Cist Enclosure 1: the pottery and flint artifacts.

this flint assemblage bears two distinct aspects. The occurrence of some tabular scrapers and a QATW point attests to the close relation to the flint assemblage from pseudo-wall cairn enclosures at QATW. On the other hand, the occurrence of slender sickle blades contrasts well with the QATW assemblage, suggesting some contact with the Canaanean blade technology.

What marks the finds from this cist enclosure most is small vessels made of porous basalt pebbles (**Fig. 8: 1-5**). They have a relatively deep depression in the center of the flat upper surface and a single, small knob handle at the rim. As is the case of pottery sherds, they were often found in sooted condition, possibly implying their use as lamps for funerary ritual. Parallel examples can be seen at Jāwā, for example, although they are usually larger in size and higher in quality than our samples (Helms 1981: Fig. B10; Betts 1991: 154-156, Fig. 187).

The macehead forms a minor class, consisting merely of a half fragment made of porous basalt (**Fig. 8: 6**), a half fragment made of limestone (**Fig. 8: 7**), and a complete, but half-finished prod-



8. Wādī Burma South Cist Enclosure 1: the groundstone artifacts.

uct made of limestone (**Fig. 8: 8**). It seems that the absence of complete products, or rather the presence merely of half fragments and unfinished products, is rather the norm for maceheads from burial installations in southern Levant (Fujii 2002a: 33).

In addition, a handful of animal bone fragments were found. Since the examination is still in progress, no specific comments can be made, except that most of them derive from small- to medium-sized animals and were often found in heavily fragmented and sooted condition.

Wādī Burma South Cist Enclosure 2

WBs-CE2 is located ca. 250m SSW of WBs-CE1 with a few small wadis in between (**Fig. 4**). It is smaller in size, measuring ca. 20m long in the W-E main axis. This cist enclosure was fully excavated.

Structural Remains

WBs-CE2 shares many basic traits with WBs-CE1, including the location at a sandbank, construction material, tripartite constitution, W-E general orientation, and slightly offset location of the entrance (**Figs. 5, 9**). There is no doubt that both structures followed the same standard.

What differentiates the two is the proportion among the three major components; it is extremely imbalanced at WBs-CE1 but well balanced at WBs-CE2. This, coupled with the westward retreat of the cist tomb within the pebble mound, causes the compact appearance of WBs-CE2. Another contrast is the general plan of the courtyard; while it is semi-quadrilateral at WBs-CE1, it is pentagonal at WBs-CE2. However, this does not seem to make any essential difference, because the courtyard plan depends partly on the way it is connected with the platform. In this respect, it is important to note that the courtyard wall of WBs-CE2 terminates halfway and is joined to the facade of the platform. It is merely for this reason that this courtyard has a pentagonal plan.



9. Wādī Burma South Cist Enclosure 2: the general view (from W).

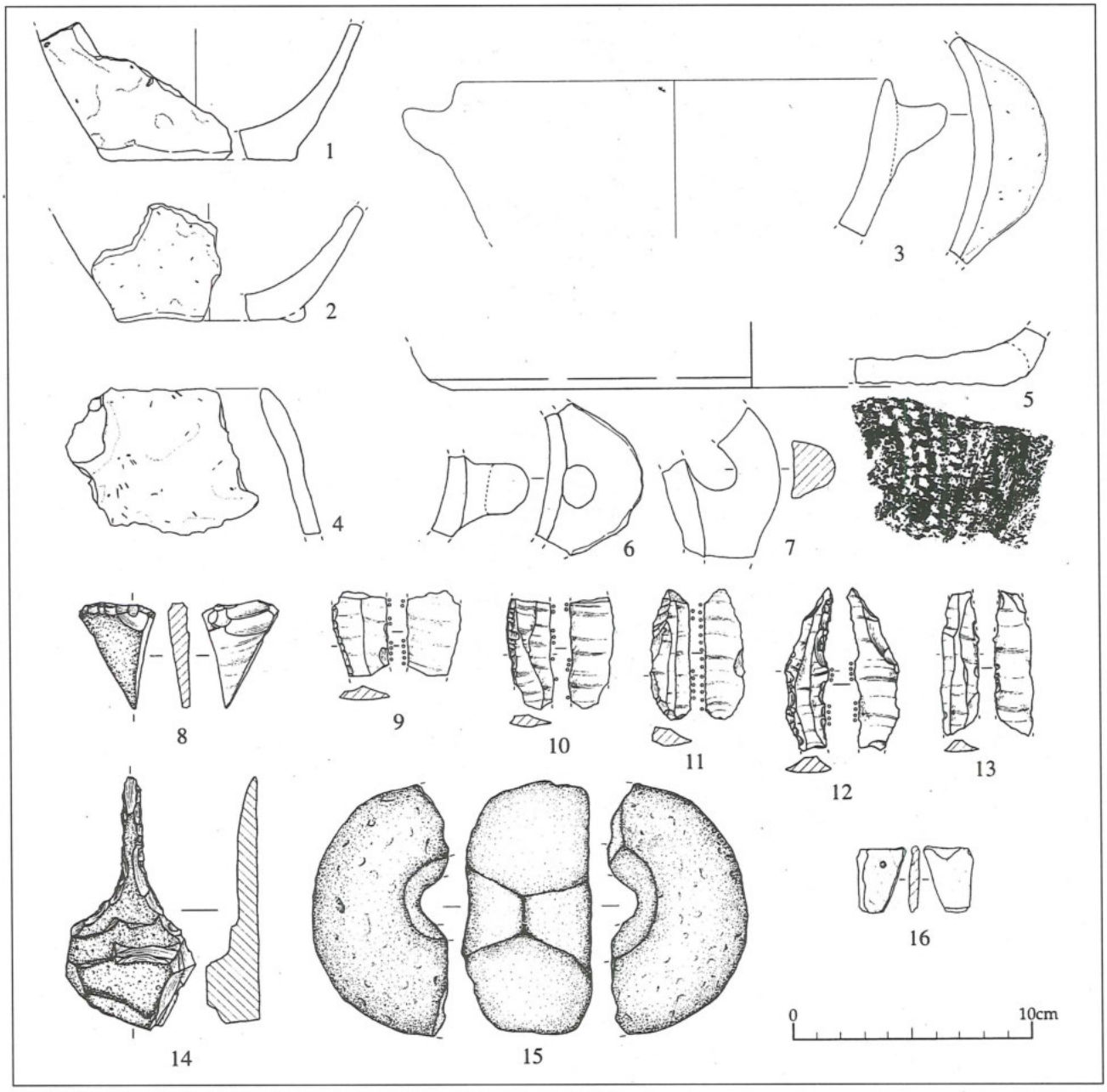
What matters is rather that four corners (or three corners and one side) of these quadrilateral (or pentagonal) courtyards are oriented to the cardinal points of the compass. This practice dates back to the open sanctuary excavated at Biqat 'Uvda 6, a LN ritual site in southern Negev (Avner 1984: 120, Fig. 3: 8; Yogev 1983; Goring-Morris 1993: 81-82, Fig. 12). This structure can be taken for a proto-type of Wādī Burma cist enclosures in the sense that it has not only a large, quadrilateral courtyard with four corners being aligned with the cardinal directions but also a platform and cist at its western corner. In light of this proto-type, there is no essential difference between WBs-CE2 and WBs-CE1 and both of them follow the same standard. The difference in courtyard plan is merely an expression of the extent to which they were faithful to this proto-type. It should be kept in mind, however, that this typological difference might have some chronological significance.

In addition, a few minor differences exist between the two. First, unlike WBs-CE1, WBs-CE2 is equipped with longer windbreak walls at the entrance. Second, this entrance is paved with limestone slabs and cobbles. One may also note that a larger volume of rubble is used for both the filling of the platform and the coating of the mound.

The Finds

Overall, the finds from WBs-CE2 are analogous to those from WBs-CE1, containing coarse ware sherds (**Fig. 10: 1-7**), flint artifacts (**Fig. 10: 8-14**), basalt and limestone vessels (**Fig. 11: 1-8**), and a half fragment of a limestone macehead (**Fig. 10: 15**). What characterizes the finds from WBs-CE2 is that: 1) a ledge-handled bowl (**Fig. 10: 3**), a flat basin (**Fig. 10: 5**), and a holemouth jar (**Fig. 10: 4**) are added to the pottery shape repertoire; 2) the flint tool kit includes a triangular TSTE (Tabular Scraper Trimming Element) (**Fig. 10: 8**), another hallmark of the QATW flint assemblage (Fujii 2000: Fig. 10); 3) the basalt vessels are generally larger in size and higher in quality; 4) they include a finely-made bowl (**Fig. 11: 7**) and a miniature bowl (**Fig. 11: 8**) as well as the standardized products (**Fig. 11: 1-6**); 5) these artifacts are less frequently sooted.

In addition to these major classes, the finds also include a limestone quern (**Fig. 11: 9-10**) and a trapezoidal shell pendant (**Fig. 10: 16**). The oc-



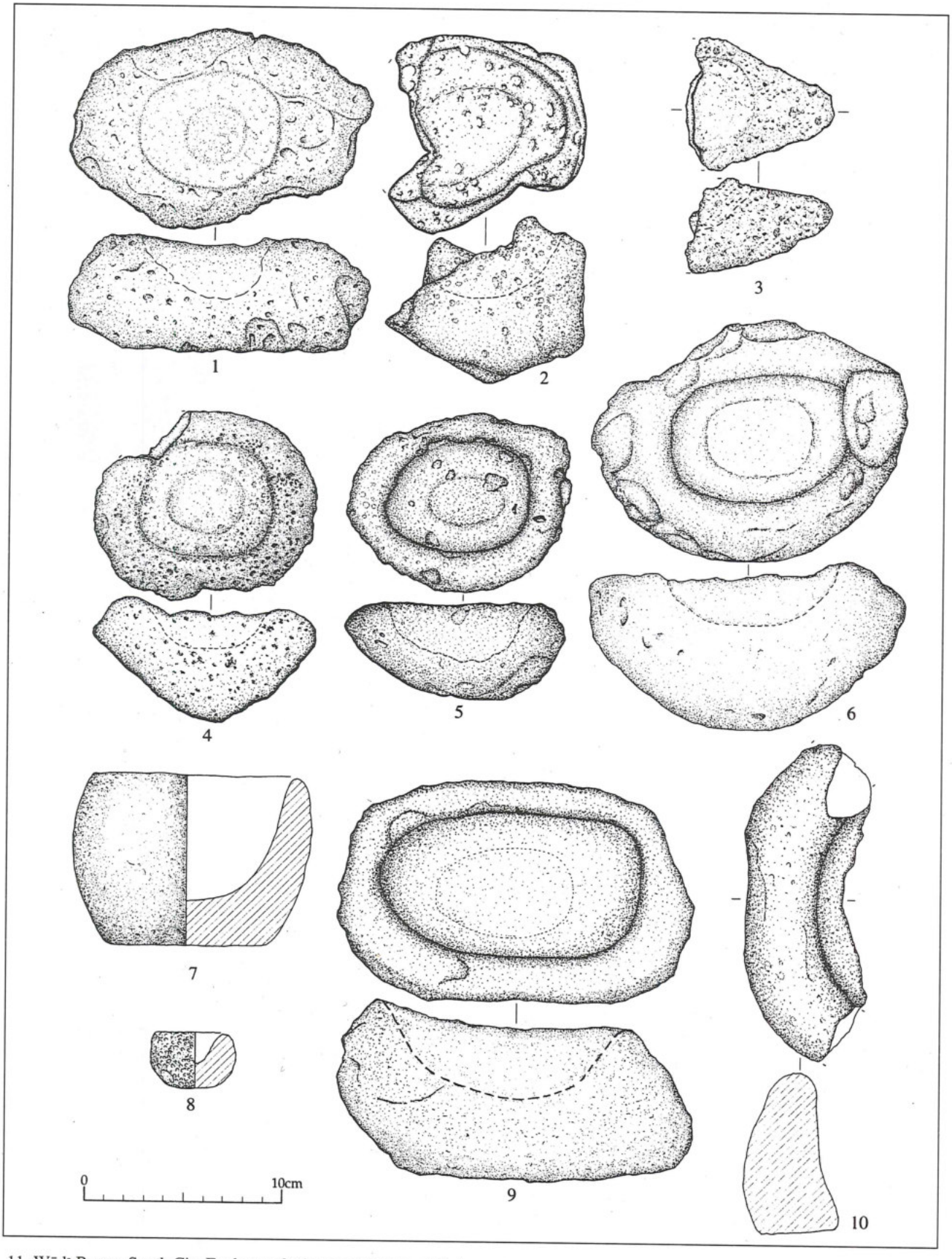
10. Wādī Burma South Cist Enclosure 2: the pottery, flints, and other finds.

currence of the pounding tool is in line with that of sickle blades (**Fig. 10: 9 -13**), suggesting some relation with agro-pastoral societies to the west. The occurrence of a shell pendant, on the other hand, is indicative of some contact with coastal regions to the south, although, in light of the existence of an unfinished hole on one surface, this pendant might have been worked at this site using imported raw material. Parallel examples are seen, for example, at Mesad Aluf, a Chalcolithic site in the northern Negev desert (Levy and Alon 1982: Fig. 10). In addition, a rotary quern was found on the floor, roughly in the center of the courtyard, but it seems to represent a later contamination.

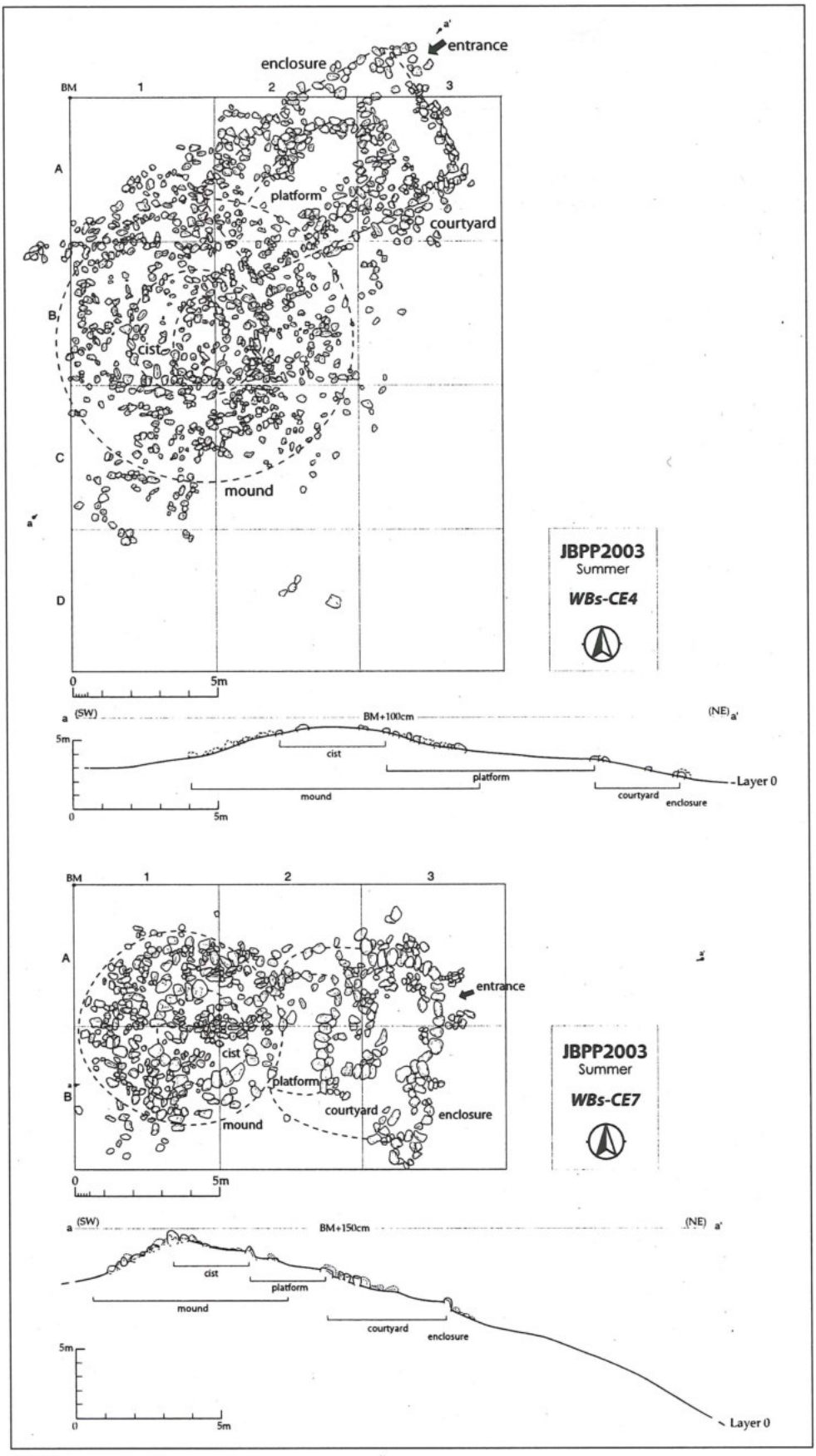
Wādī Burma South Cist Enclosure 4 and -7

In addition to the excavations mentioned above, WBs-CE4 and -7 were surface-examined so as to supplement basic information on the Wādī Burma cist enclosure (**Fig. 12**).

WBs-CE4 is located ca. 150m northwest of WBs-CE1. The surface examination suggested that: 1) it is relatively small in size, measuring ca. 15m long in the SW-NE major axis; 2) the cist tomb is located nearly in the center of the mound and connected with the southwestern corner of the



11. Wādī Burma South Cist Enclosure 2: the groundstone artifacts.



12. Wādī Burma South Cist Enclosure 4 (above) and Wādī Burma South Cist Enclosure 7 (below): the plan and elevation.

rectangular courtyard ca. 5m and 10m long on both sides; 3) the four corners of this courtyard, the northern and southern corners in particular, are offset from the cardinal directions to some extent; 4) the courtyard contains a curvilinear wall, which might be a deteriorated form of a platform. Overall, this cist enclosure appears to be a deteriorated form of the two excavated examples. In this sense, the typological changes noted above may provide a key to the intra-site chronology of this cairn field. It is my tentative view that the Wādī Burma cist enclosure entity was developed from the south to the north.

WBs-CE7 is a small cist enclosure beside WB-KS1 that was excavated in this spring season (Fujii 2004a). It is still smaller than WBs-CE4, measuring ca. 12m long in the W-E main axis. Here again, the tripartite constitution that characterizes Wādī Burma cist enclosures was attested. It is interesting to note, however, that the courtyard turned by an angle of 45 and, consequently, abandoned the original orientation inherited from Biqat 'Uvda sancturary, through WB-CE1 and -2, down to WBs-CE4. Overall, this cist enclosure appears to be a still more deteriorated form than WBs-CE4.

Wādī Burma Kite Sites

To date, the following three kite-sites have been found at the Wādī Burma area: WB-KS2 at Wādī Burma South, WB-KS3 at Wādī Burma North, and WB-KS1 in between (**Fig. 4**). They are arranged roughly in a straight line along the main stream of Wādī Burma at intervals of ca. 600-700m. WB-KS1, the largest of the three, was excavated in the spring season of this year (Fujii 2004a). The summer season was concentrated on the other two, WB-KS2 in particular.

Wādī Burma Kite-Site 2

WB-KS2 is a large-scaled structure extending over wadi beds and sandbanks ca. 600m southwest of WB-KS1. Unlike WB-KS1, it is a typical kite-site that consists of an enclosure and a few long guiding walls converging on it (**Figs. 13, 14**). Because of the unique site location, the construction material is heterogeneous, including limestone, flint, and basalt cobbles. In order to examine the key feature of this kite-site, a large square was opened at the converging point. In addition, three small trenches were opened along the guiding walls.

Structural Remains

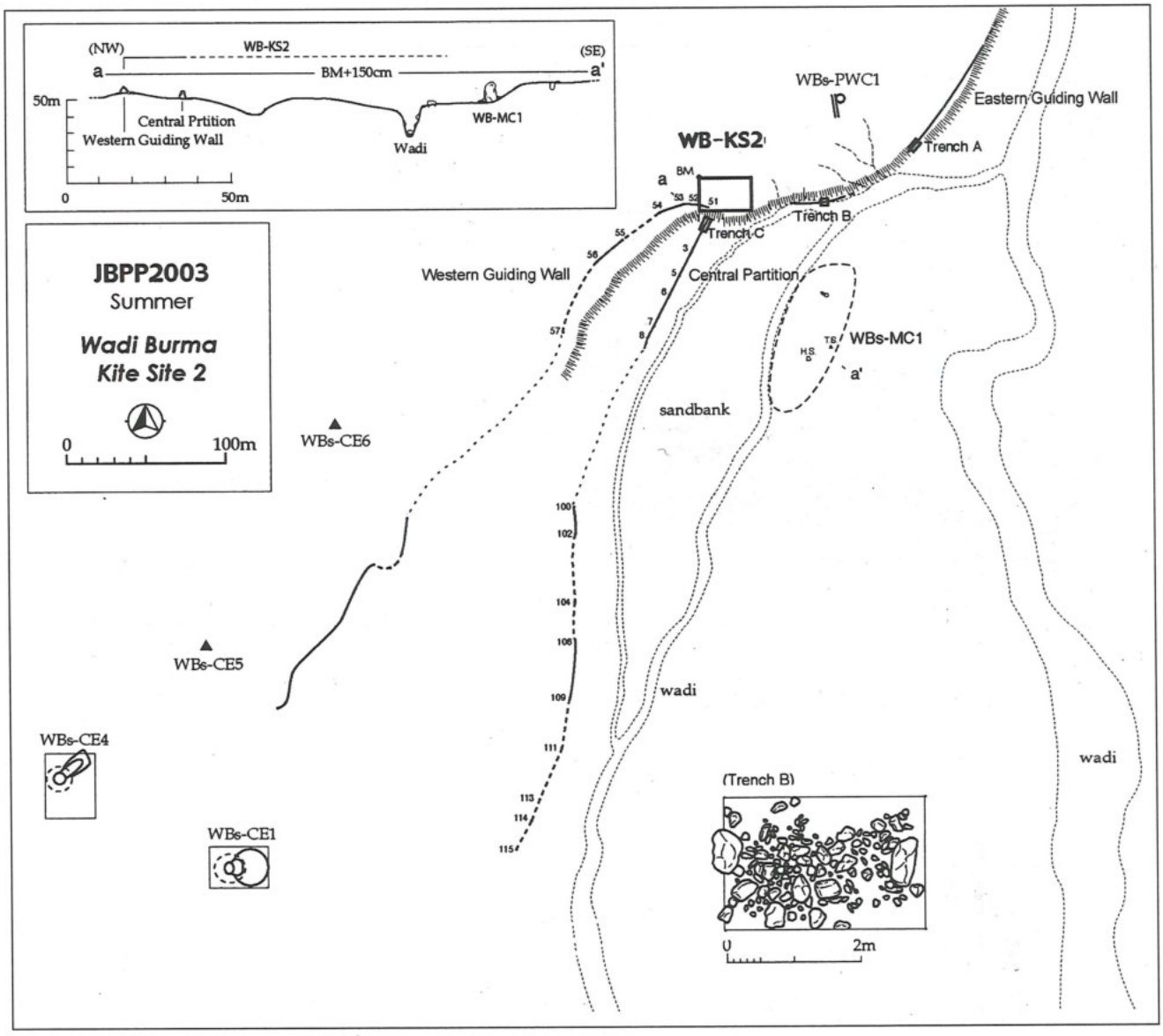
This kite has three intermittent guiding walls that open at an obtuse angle along wadi streams. Techno-typologically, they are divided into the following two types. First, the eastern and western walls (ca. 200m and ca. 400m in total length, respectively) are based on the two-rowed cobble foundations and, consequently, relatively large in width (ca. 1-2m). The central wall (ca. 400m long), on the other hand, is less solidly constructed and narrower in width (ca. 0.5m wide). Consistent with this contrast is the volume of fallen stones, which is larger around the former two walls and much smaller around the latter. Another contrast can be seen in the fact that, while the former two walls are located at the edge of a sandbank, the latter alone at a flood plain along a small wadi. All these contrasts strongly suggest that the eastern and western walls were used for the guiding walls in the narrow sense of the word and the central wall functioned as a kind of partition to facilitate the control of a herd driven into the wide-angled hunting ground.

Unfortunately, no clear evidence was found about the key installation on which these three walls are supposed to converge, with the exception of a short wall stretching from the eastern end of the western guiding wall and two narrow corridors, probably hunters' hides, behind the latter wall (**Fig. 15**). The poor preservation state of the key feature was strange, all the more because the three guiding walls, though intermittently, are relatively well preserved. Suggestive in this regard are several semi-megalithic cairns dotted both in the eastern half of this excavation sector and on the opposite bank (WBs-MC1). The construction of these cairns might account for the disappearance of the original walls of the enclosure. Alternatively, the possibility cannot be ruled out that, as was the case of the capture gates of WB-KL1 (Fujii 2004a), no substantial installations existed here from the beginning.

Whatever the case, the less elaborate construction of the enclosure is noteworthy in that it is rather the norm of the kite-sites in Negev and Sinai in the EBA (Meshel 2000). Both the smaller size and isolated location of this kite also argue for this correlation. In addition, the probable absence of hunters' niches around the enclosure also implies the close relation between WB-KS2 and the EBA kite-sites in Sinai and Negev.

Finds

A handful of pottery sherds and flint artifacts were found from questionable archaeological contexts. Although the pottery finds include some coarse ware sherds similar to the samples from WBs-CE1, most of them are ambiguous in date. The flint artifacts are also heterogeneous in their



13. Wādī Burma Kite Site 2: the plan and elevation.

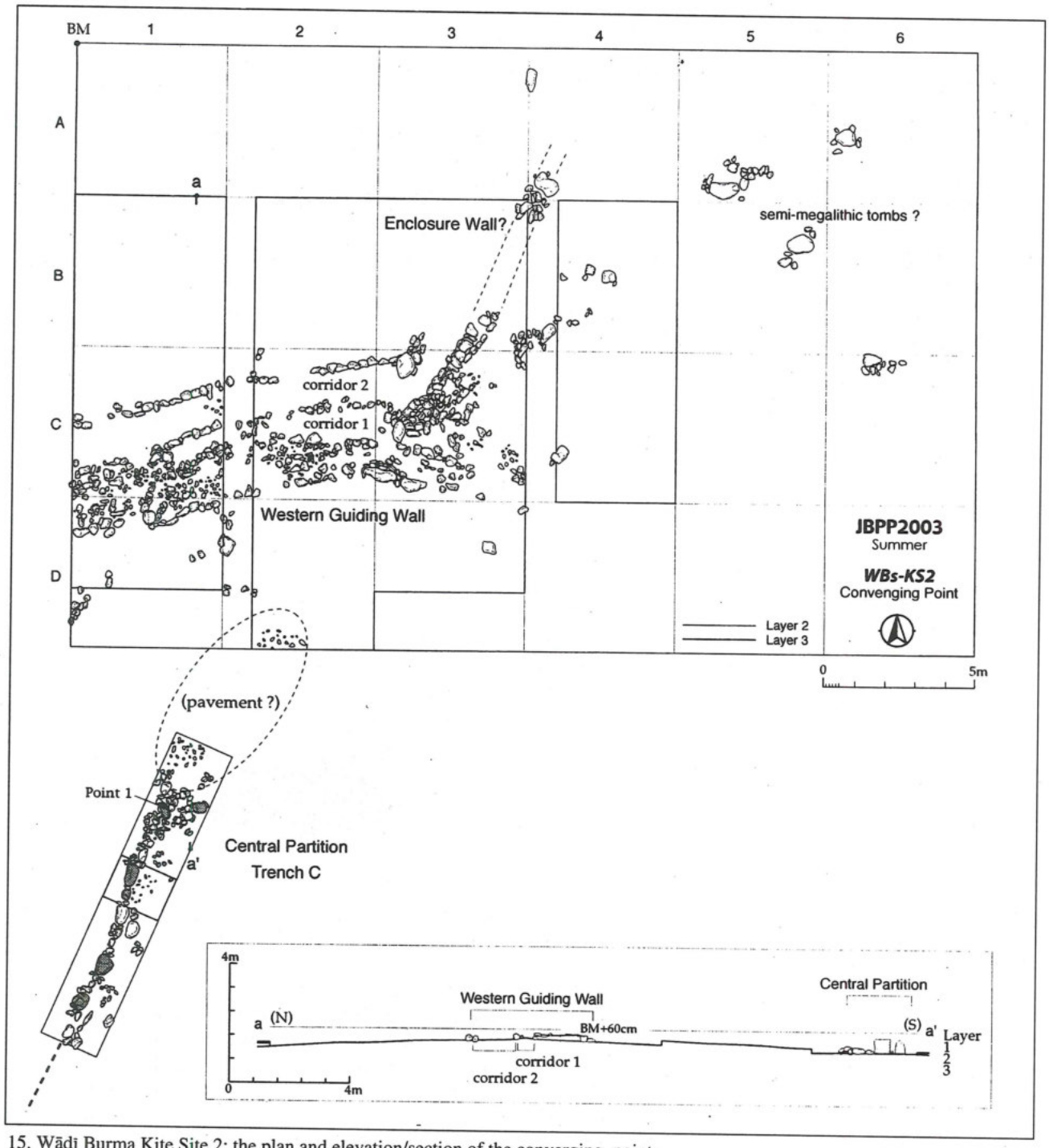


14. Wādī Burma Kite Site 2: the general view (from NE).

content, but the occurrence of a few robust stone hoes is noteworthy in that the frequency of *ad hoc* heavy-duty digging tools was the norm of the EBA sites in the al-Jafr basin (Fujii 2002: Fig. 18). In addition, the finds include a unique artifact made of limestone, which is reminiscent of stone stoppers from Ṭawīlān, the type-site of the Iron Age in southern Jordan (Bennett and Bienkowski 1995: Fig. 9. 24).

Wādī Burma Kite-site 3

WB-KS3 is a poorly preserved kite located ca. 700m NNE of WB-KS1. A few, intermittent, curvilinear guiding walls have been confirmed (**Fig. 16**). The walls contain upright boulders at roughly regular intervals, a common trait to the guiding walls of WB-KS2. Here again, no clear evidence was found



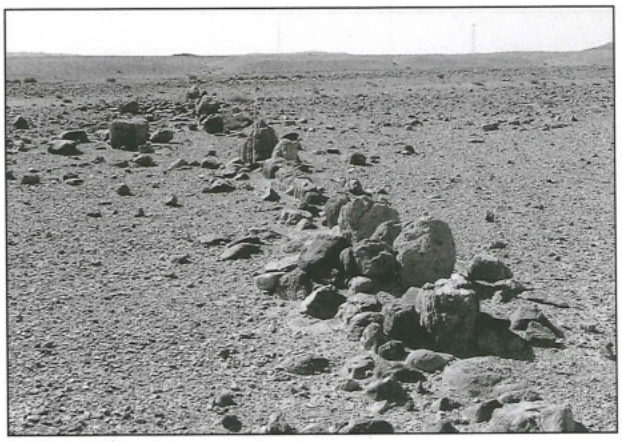
15. Wādī Burma Kite Site 2: the plan and elevation/section of the converging point.

for an enclosure on which these guiding walls are supposed to converge.

ḤARRAT AS-SAYIYYA K-LINE 1

HS-KL1 is one of the K-lines, or locally called *Khaṭṭ Shabīb*, thus far identified in the al-Jafr basin. It extends from the north to the south crossing the peak of Ḥarrat as-Sayiyya, an isolated limestone hill ca. 8km west of al-Ḥusayniyya. The total length thus far confirmed is ca. 7km. (The previous report mentioned that this K-line begins from the southern flank of the hill (Fujii 2002c: 47), but a later reexamination has confirmed that it extends further to the north beyond the hilltop, towards the Jabal Juhayra.)

Topographically, HS-KL1 can be divided into five from Segment A to Segment E (**Fig. 17**). Segment A covers the northern and southern flanks of



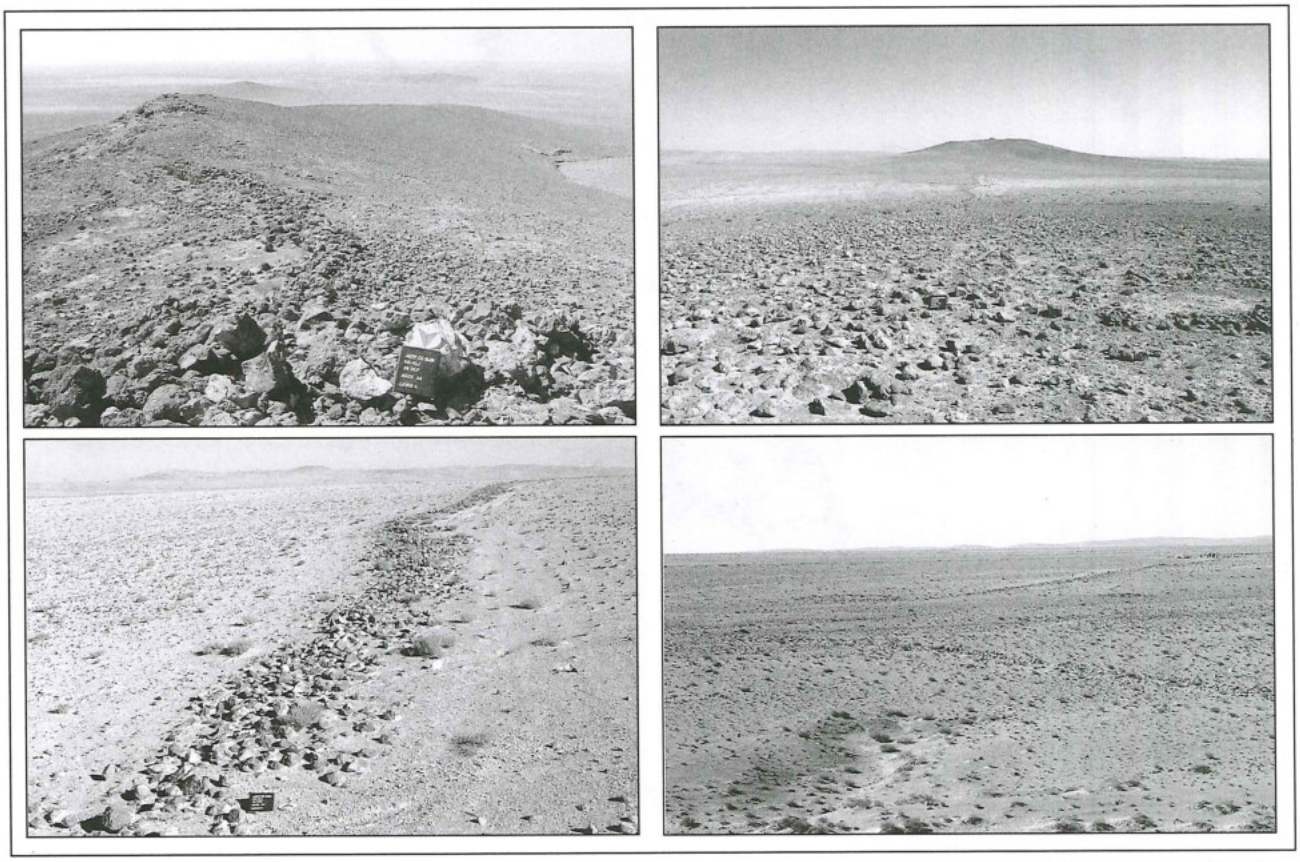
16. Wādī Burma Kite Site 3: the general view of a guiding wall (from NW).

Ḥarrat as-Sayiyya, measuring ca. 2km in total length. Its southward extension is Segment B (ca. 1km long) and Segment C (ca. 1km long), both of which pass through limestone hilly country south of Ḥarrat as-Sayiyya. Segment D is short range (ca. 0.5km long) between a small wadi to the north and Wādī ash-Shawbak to the southeast. Segment E, the southernmost part, stretches over ca. 2km following the southern bank of Wādī ash-Shawbak. Overall, HS-KL1 is oriented NNE-SSW between Segment A and Segment C. It suddenly changes course in Segment D toward the SE, but returns to the original orientation in the northern half of Segment E. However, at the southern half of Segment E, it is further bent and oriented to the E-W following the course of Wādī ash-Shawbak.

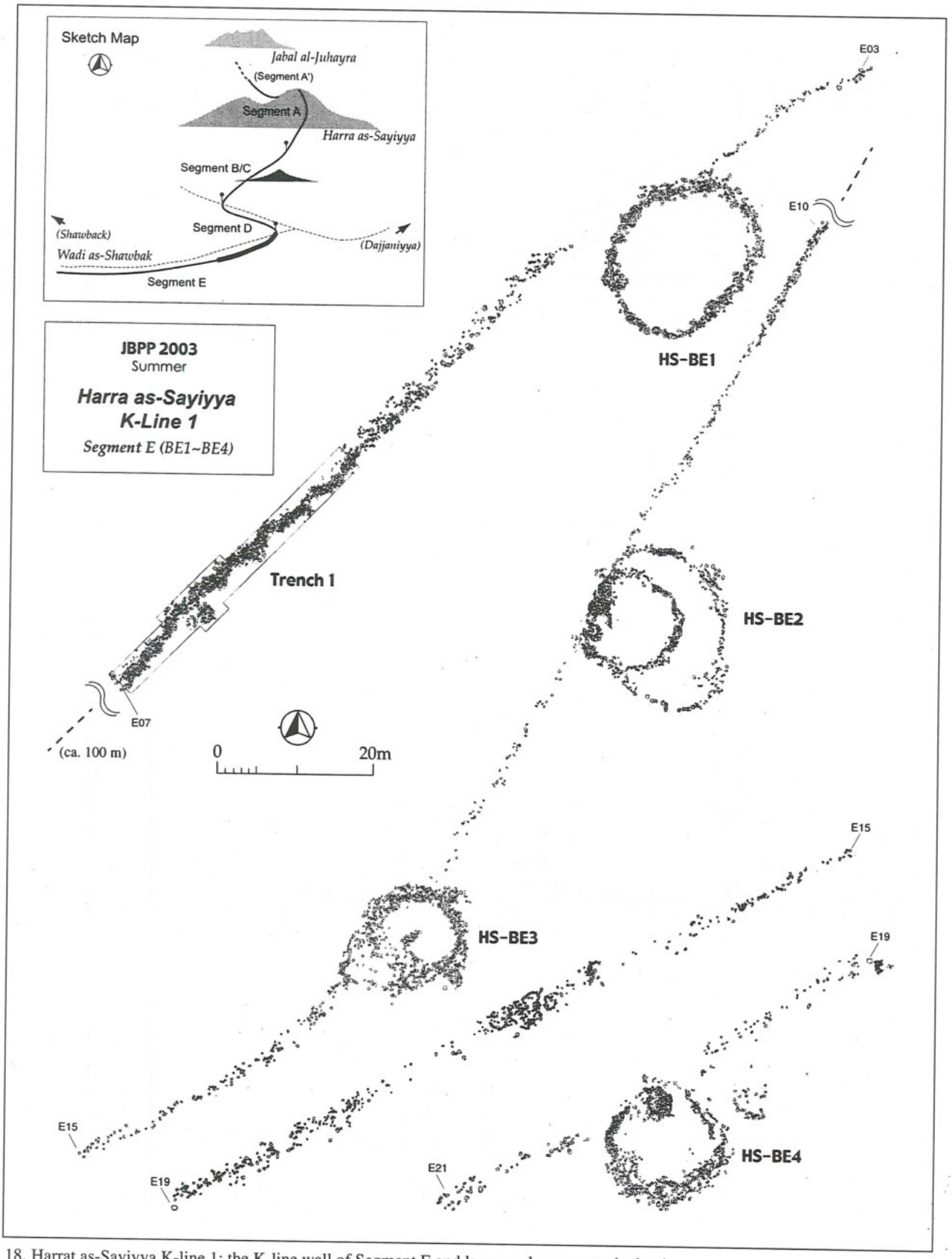
Our investigation was focused on Segment E where several structural remains adjoin the K-line wall (**Fig. 18**). It was our aim to clarify the order of construction between the two and, on this ground, explore the relative chronology of this K-line. For this goal, two of the four large enclosures, HS-BE2 and -4, were partly excavated focusing on the joint to the K-line wall. In addition, HS-BE2 and -4 were surface-examined to supplement basic information related to the goal. The K-line wall, on the other hand, was examined with a 40m long trench that was opened nearly at the northern end of this segment.

The K-line

This K-line uses limestone and flint cobbles as construction material, but, unlike Ḥarrat al-Burma K-lines, basalt cobbles are rarely found. The ex-



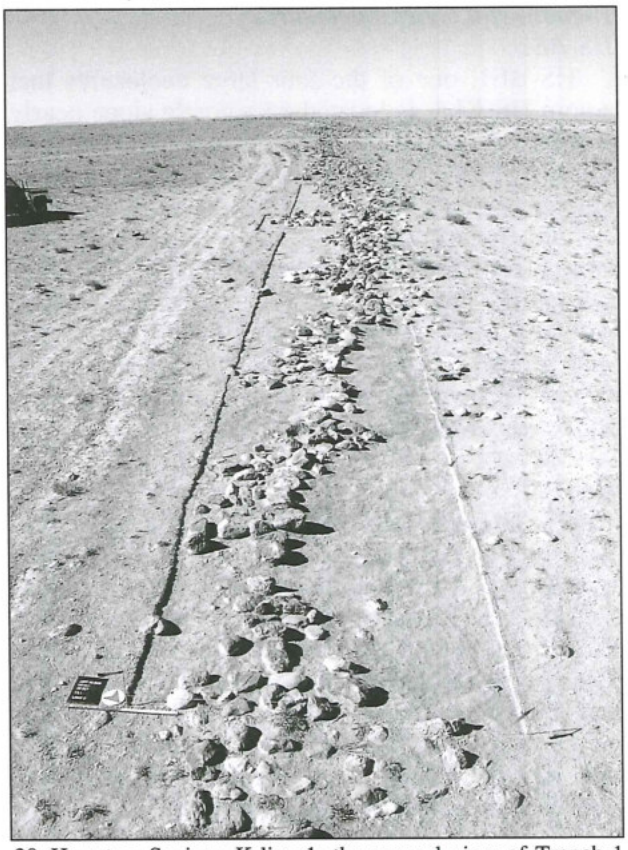
17. Ḥarrat as-Sayiyya K-line 1: 1. Segment A (from N); 2. Segment B (from S); 3. Segment C (from S), 4. Segment D and E (from N).



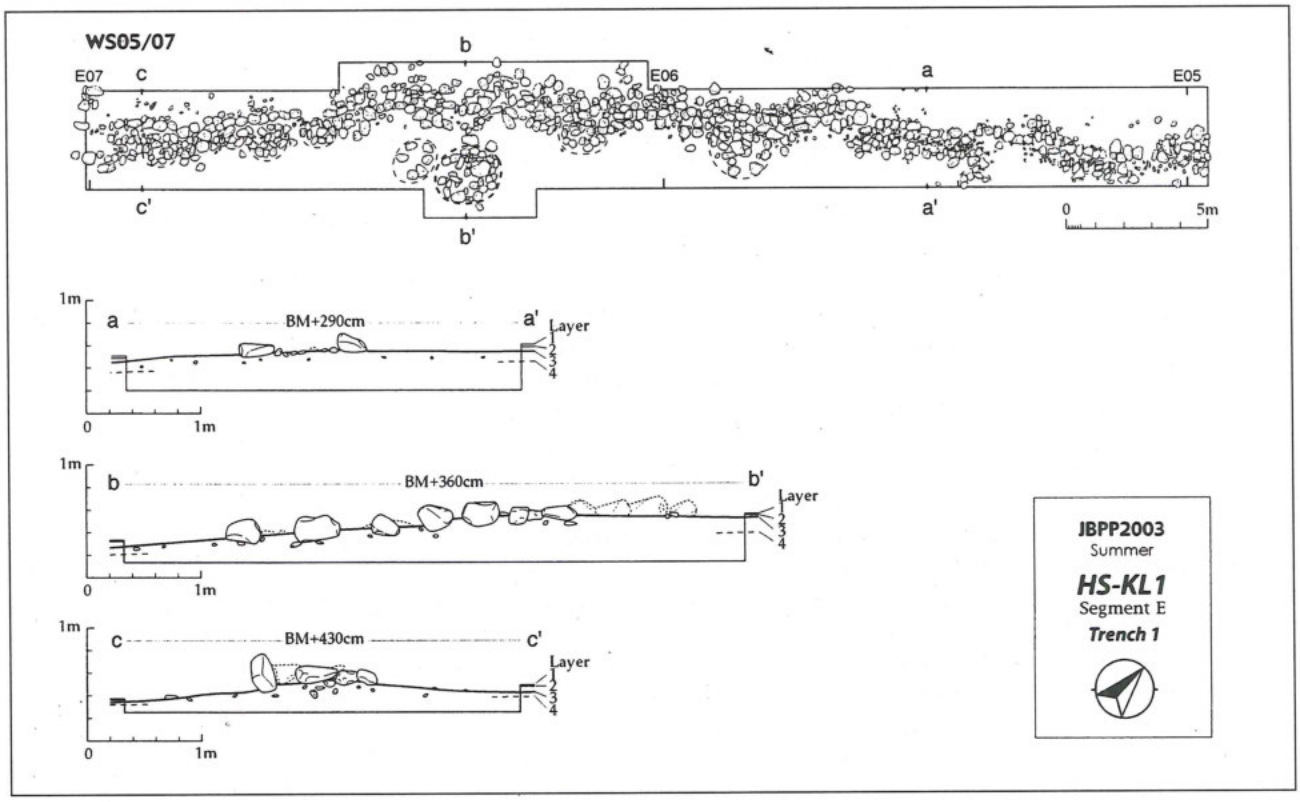
18. Ḥarrat as-Sayiyya K-line 1: the K-line wall of Segment E and large enclosures attached to it.

cavation at Trench 1 showed that HS-KL1 has much in common with Ḥarrat al-Burma K-lines (**Figs. 19, 20**). First, the K-line wall is based on two-rowed cobbles foundations with rubble being filled in between. Second, the wall is accompanied with a large cairn and various stone concentrations. Third, it makes a slight detour around a larger cairn. Fourth, the volume of fallen stones around the wall suggests that the original wall was low in height, probably not more than 1m high. All these traits are common to Ḥarrat al-Burma K-lines, indicating that these three K-lines were constructed following the same standard.

Of particular relevance is the difference in quality and arrangement of construction material among units, which provides further evidence for the gradual, unit-by-unit development of the K-line. In light of the formation process of the K-line suggested elsewhere in this volume, it is likely that HS-KL1 was developed from the north toward the south. What is important here is that a single unit of this K-line is much longer than that of Ḥarrat al-Burma K-lines, probably measuring not less than 30m. This probably explains the reason why this K-line is several times longer than Ḥarrat al-Burma K-lines, although it is needless to say that the other factor, namely, the total number of units, also concerns the whole length of a K-line.



20. Ḥarrat as-Sayiyya K-line 1: the general view of Trench 1 (from NE).



19. Ḥarrat as-Sayiyya K-line 1: the plan and section of the K-line wall at Trench 1.

Pseudo-wall Cairn Enclosures
HS-BE1

HS-BE1, one of the four large enclosures that adjoin HS-KL1, is located on a gentle slope nearly at the northeastern end of Segment E (**Fig. 18**). The surface examination suggested that it is a simple, oblong or semi-quadrilateral, stone-built structure ca. 20m long in the NE-SW longer axis and contains a few large stone concentrations, probably burial cairns, along the western wall (**Fig. 21**). Of particular interest is the fading-out of the K-line wall around this enclosure, which implies the diversion of construction material from the original wall of this K-line to this enclosure.

HS-BE2

HS-BE2 is located ca. 200m southwest of HS-BE1 with a small cairn just in between. It is slightly oblong or semi-quadrilateral in general plan and measures ca. 15m long in the E-W shorter axis and ca. 20m in the N-S longer axis (**Figs. 21, 22**). Here again, as in the cases of HS-BE1 and Wādī Burma cist enclosures, the key features proved to be located to the west, thus facing east, despite the restriction caused by the orientation of the K-line wall to which this enclosure is attached.

This structure appears to be an intermediate form between Wādī Burma cist enclosures and QATW pseudo-wall cairn enclosures (Fujii 1998: Fig. 8; 2001: Fig. 8). With respect to the basic structure of this enclosure, both the tripartite constitution and the absence of burial cairns along the courtyard wall are common to the Wādī Burma cist enclosure, whereas the lack of a cist tomb and a protection mound around it (and, consequently, the flat appearance of the whole structure) are in line with the QATW pseudo-wall cairn enclosure. The eclectic nature of this enclosure can also be sought in the typology of the key component. Neither cist tomb (which marks the Wādī Burma cist enclosure) nor upright stone wall (which characterizes the QATW pseudo-wall cairn enclosure) exists there; instead, some pit-type burial cairns are aligned at small intervals. Although the presence of pit-type burial cairns is common to the QATW enclosures, yet their concentration on the western corner has something to do with Wādī Burma cist enclosures. The techno-typological eclecticism of this enclosure implies that it is assignable to an intermediate stage between the two.

With respect to the relative chronology of the K-line, a few lines of circumstantial evidence were retrieved. First, as was the case of HB-BE1, the K-line wall fades out around this enclosure, attesting the diversion of construction material from the former to the latter (**Fig. 18**). Furthermore, construction material becomes poorer in quality as it goes away from the supposed, original wall of the K-line, another support for the material diversion. Of further significance is the remnant of limestone pebble fillings confirmed along the cairn concentration, which clearly shows that the original wall of this K-line was erased by a later population who were concerned with the construction of this enclosure.

HS-BE3

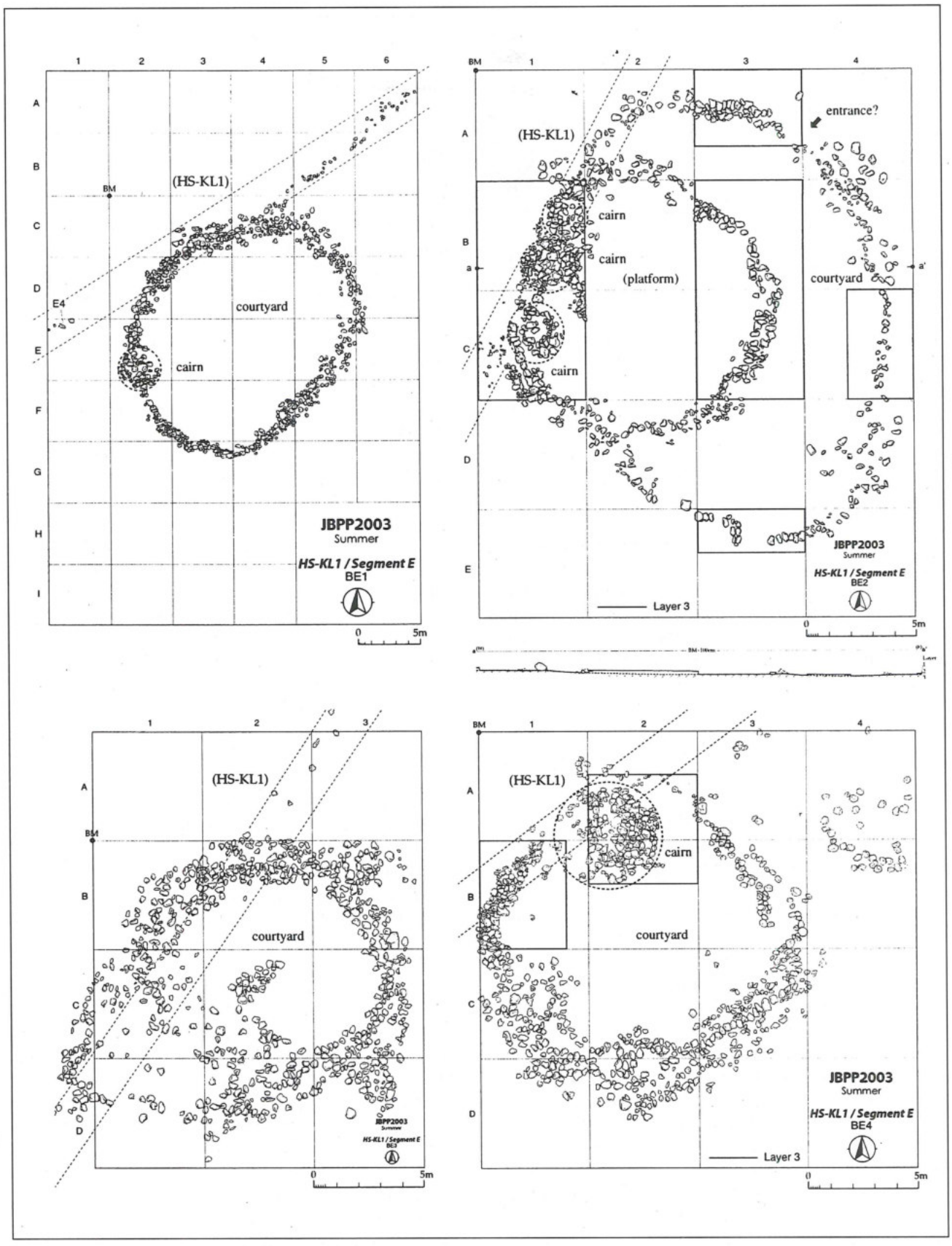
HS-BE3 is located ca. 40m southwest of HS-BE2. It is much smaller in size than HS-BE1 and HS-BE2, measuring ca. 10m long on the NE-SW longer axis (**Fig. 21**). No clear evidence for the tripartite constitution was found, but this structure proved to contain a semi-quadrilateral courtyard with four corners oriented to the cardinal points of the compass. The surface examination confirmed that, here again, the K-line wall fades out around the enclosure (**Fig. 18**).

HS-BE4

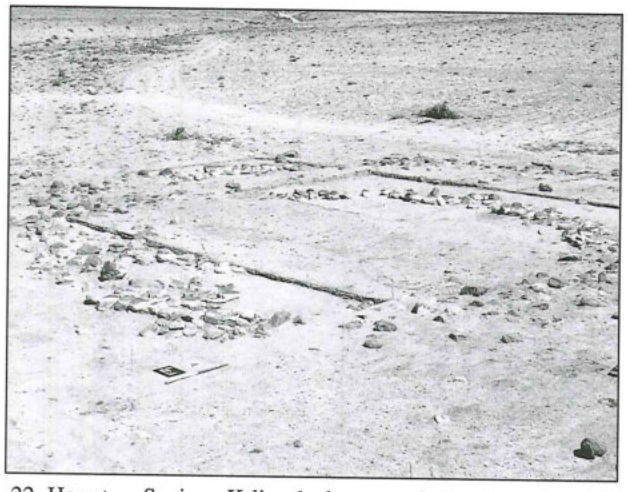
HS-BE4 is the westernmost enclosure thus far identified along HS-KL1, being ca. 150m apart from HS-BE3 with a few stone concentrations in between. This structure proved to consist of a cairn ca. 3m in diameter and a quadrilateral courtyard with four corners oriented to the cardinal directions (**Fig. 21**). However, no clear evidence for a platform, or an inner courtyard, was found. It is important to note that, unlike the case of HS-BE1 and Wādī Burma cist enclosures, the key feature, the large cairn in this case, is located at the northern corner of the courtyard, thus facing to the south, not the east, a phenomenon suggestive of the oblivion or abandonment of the long-inherited tradition. Here again, it was confirmed that the K-line wall fades out around the enclosure (**Fig. 18**). Furthermore, a faint remnant of the original K-line wall was also found at the two excavation sectors.

Other Features

A rectangular, single-roomed structure ca. 10m wide and ca. 15m deep was found at the western end of this K-line, near Point E-79. The presence of a small, outward protrusion at the southeastern wall probably suggests that this structure was used for an open-air mosque of Islamic age. In light of the sudden termination of the K-line wall beside this structure, it is reasonable to suppose that it was built diverting the construction material from the original wall of the K-line. Further to the west, ca. 1.2km apart from this structure, lies Khirbat al-



21. Ḥarrat as-Sayiyya K-line 1: the plan of Burial Enclosure 1 (above left) - 4 (below right).



22. Ḥarrat as-Sayiyya K-line 1: the general view of Burial Enclosure 2 (from SW).

Qannāṣ, a well-known Roman/Nabatean site in this region. The construction of this small town and surrounding cemeteries may also be responsible for the disappearance of this K-line.

The Finds

The finds from HS-KL1 and the pseudo-wall cairn enclosures attached to it are quite scarce, consisting merely of a dozen pottery sherds, several undiagnostic flint artifacts, and a pierced stone pendant. To make matters worse, no *in situ* finds are included with the exception of a single, coarse pottery sherd from HS-BE2 that is suggestive of the date of the EBA. Therefore, no reliable clue to the dating of both the K-line and the enclosures is available with respect to the finds.

SUMMARY AND DISCUSSION

As mentioned at the beginning, the objective of this season was to bridge the gap in the chronological sequence at QATW. The focal point was the millenary hiatus between the Layer 4 (LN) entity and the Layer 3 (EBA) entity. From this point of view, a series of excavations reported above will be reviewed, and, on this base, the comprehensive chronology of the al-Jafr basin cairn entity will be briefly discussed below.

Summary of the Excavations

WB-CL1

This cairn line proved to consist largely of BC-700s, a subsequent cairn form to QATW BC-600s and, therefore, be assignable to the end of Chalcolithic or the beginning of the EBA. Typologically, the linear, but intermittent arrangement of BC-700s at this site seems to represent a transitional stage between the dotted arrangement of BC-600s at QATW and the linear combination of BC-700s at Ḥarrat al-Burma K-lines. The minor gap between the former and the linear, intermittent arrangement of BC-700s at WB-CL1, if any, can be bridged with two isolated examples of BC-700s that were identified in close vicinity to WBs-CE2 and WB-KS2.

WBs-CE1 and -2

A line of evidence suggests that there are close genealogical relations among the three large enclosure entities in the al-Jafr basin: Wādī Burma cist enclosures, Ḥarrat as-Sayiyya eclectic enclosures, and QATW pseudo-wall cairn enclosures. The cist tomb of Wādī Burma enclosures, for example, is equivalent to the cairn concentration of Ḥarrat as-Sayiyya enclosures, which, in turn, is a probable proto-type of the upright boulder line of QATW enclosures.

Interestingly enough, these key features are usually located at the western or northwestern corner of the enclosures and, as a consequence, face east or southeast. This phenomenon is important not only in that it provides another support for the correlation among the three large enclosure entities but also in that it is reminiscent of a general trait shared among many mortuary features in the arid peripheries of southern Levant, including masseboth (Avener 1984: 117, 1990: 133) and various open sanctuaries (Avner 1984: 120; Eddy *et al.* 1999: Fig. 3-33; Rosen and Rosen 2003). (It should be noted, however, that, especially in connection with the summer solstice sunset azimuth, more emphasis has been put on the orientation of the key feature seen from the courtyard. Of particular relevance is the westward opening of the entrance of *Nawāmīs*, pseudo-domed mortuary structure thus far identified only in southern Sinai, which might suggest that our examples should also be viewed from the courtyard (Bar-Yosef *et al.* 1977, 1983, 1986; Hershkovitz *et al.* 1985)).

Another link among the three can be sought in the gradual deterioration of the platform. The platform is one of the key features at Wādī Burma enclosures, whereas it is reduced to either an inner courtyard at HS-BE2 or a simple appendage at QATW enclosures. The same is roughly true of the pebble mound, which distinguishes Wādī Burma enclosures but completely disappears at Ḥarrat as-Sayiyya and QATW enclosures. Taken together, it is now evident that the three types of large enclosures correlate with one another.

The question is the chronology of the three. To date, no specific evidence is available, but the typological sequence note above and the difference

in distribution range mentioned below strongly suggest that the appearance of Wādī Burma cist enclosures was responsible for the formation of Ḥarrat as-Sayiyya eclectic enclosures, which, in turn, led to the occurrence of QATW pseudo-wall cairn enclosures. This chronological sequence, if acceptable, would lead to the conclusion that Wādī Burma cist enclosures and Ḥarrat as-Sayiyya eclectic enclosures are a little earlier in date than QATW enclosures which can be dated radiometerically to the EBA III.

Thus the next question is where the supposed trigger, Wādī Burma cist enclosures, derived from. Suggestive in this regard are the results of our survey, which showed that cist enclosures are concentrated on the northeastern corner of the al-Jafr basin including the Wādī Burma area (Fujii 2002c; 2004b). This means, most likely, that cist enclosures are related more closely to the Wādī al-Ḥasā drainage system rather than the al-Jafr system. In this connection, it is noteworthy that Wādī Burma cist enclosures bear many techno-typological affinities with large enclosures found at some lower Jordan valley sites including Ala-Safat (or ad-Damieh) (Stekelis 1961: Fig.4, 10), the Arab Potash Company township near Bāb adh-Dhrā' (McCreery 1977/78; Clark 1979), el-Adeimeh (Stekelis 1935: Fig. 15), and Nahal Mishmar (Bar-Adon 1980: 12). It is needless to say that the quadrilateral sanctuary at Biqat 'Uvda referred to above is also included in these proto-types. Further evidence for the west-oriented connection of Wādī Burma enclosures can be sought in the occurrence of sickle blades and querns. It seems therefore reasonable to assume that Wādī Burma cist enclosures stemmed from the lower Jordan valley large enclosure entity. On the other hand, Ḥarrat as-Sayiyya eclectic enclosures and QATW pseudo-wall cairn enclosures can best be understood as local imitations of these proto-types that expanded their distribution up to the northwestern corner of the al-Jafr basin probably via the Wādī al-Ḥasā drainage system (MacDonald 1988: Fig. 42) and Wādī al-Karak system (Worshcech 1985, 2002: Abb. 23.1, 23.2).

Returning to the issue of the chronology, this scenario suggests that Wādī Burma cist enclosures can be assigned to an intermediate stage between the lower Jordan valley large enclosure entity (which has long been dated to the Chalcolithic) and the QATW pseudo-wall cairn enclosure entity (that can be dated radiometrically to EBA III). Taking into account some doubt on the dating of the former entity based on obscure evidence (e.g. the proximity of el-Adeimeh to Tulaylāt al-Ghassūl), on one hand, and the typological affinities between the Wādī Burma cist enclosure and the QATW pseudo-wall cairn enclosure, on the other, the most likely date of the Wādī Burma cist enclosure seems to be a later stage within this chronological framework, namely EBA II or the early half of EBA III, although the final conclusion must await further studies including the radiometric dating now under progress.

WB-KS2

The total absence of datable *in situ* finds and the heterogeneous nature of the surface finds make it difficult to date this kite-site. However, the typological affinities with the EBA kites in Negev and Sinai, along with the general occupational history of the al-Jafr basin, probably argue for the dating to the EBA, although it is impossible at the moment to be more specific about the date within this framework.

This kite-site is important in that, first, it provides the first clue to the subsistence of the EBA pastoral population in the al-Jafr basin and, second, unlike the west-oriented connection suggested by Wādī Burma cist enclosures, it is indicative of some contact with the southwestern drylands, namely, Negev and Sinai.

HS-KL1

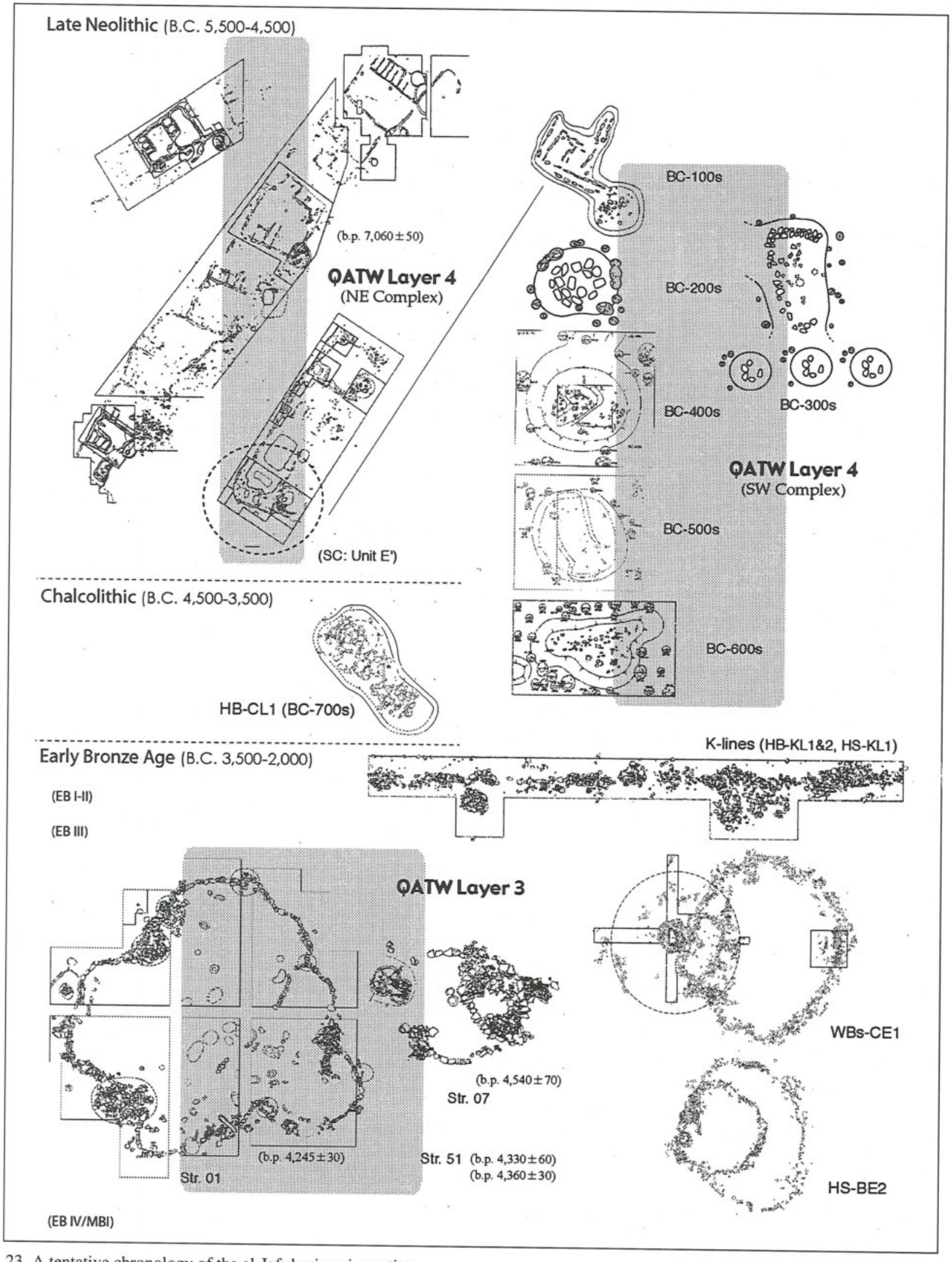
The excavation at this K-line has corroborated the results of the excavations at Ḥarrat al-Burma K-lines (Fujii 2004a). It is now evident that the K-line is a linear combination of pseudo-wall cairns, BC-700s in particular, and therefore of non-daily function related to mortuary ritual.

The question is the date of the K-line. Since no direct evidence is available, the only way left for us is to narrow it down with circumstantial evidence.

In light of the intra-structure of the K-line noted above, the chronological upper limit can be defined with BC-600s, the final cairn form of the QATW Layer 4 (LN) entity. The lower limit, on the other hand, can be sought in the order of construction between HS-KL1 and four large enclosures attached to it. It follows then that the K-line is assignable to the intermediate period between the two, namely the EBA I-II.

Chronological Overview of the Jafr Basin Cairn Entity

Integrating these results into the QATW sequence, the overall picture of the cairn entity in the al-Jafr basin from the LN to the EBA will come into sight (**Fig. 23**). The transition can be summarized as follows.



23. A tentative chronology of the al-Jafr basin cairn entity.

The al-Jafr basin cairn entity began with the LN pseudo-house cairn at the NE structural complex of QATW, probably as a remnant of under-floor, wall-side burial at PPNB agro-pastoral settlements to the west. Then, with the last unit (Unit E') of this pseudo-settlement as a turning point, they were transformed into independent, pseudo-wall cairns (BC-100s to BC-600s) at the SW complex. It is BC-700s identified in this season at the north-eastern part of the basin that succeeded to BC-600s, the last form of the QATW Layer 4 cairn entity. Of particular interest are BC-700s at HB-CL1 that are arranged roughly in a line. A line of evidence strongly suggests that their linear connection led to the formation of the K-line.

The next turning point was the appearance of cist enclosures that expanded probably from the lower Jordan valley, via the al-Ḥasā drainage system, up to the western edge of the southern Transjordan plateau. It seems that the appearance of this newly-introduced funerary practice induced the dissolution of the K-line and, consequently, led to the formation of pseudo-wall cairn enclosures first, though eclectically, at HS-KL1 and, then, in a fully localized way, at QATW. It should be emphasized, however, that what changed under the influence of the appearance of cist enclosures is merely the way in which pseudo-wall cairns were connected. The local tradition that burial cairns should be accompanied with a pseudo-house or its successive form, a pseudo-wall, and, at the same time, that they should be arranged in a straight line either intermittently or continuously was long inherited among the al-Jafr basin cairn entities.

The mass-production of tabular scrapers, another trait of the al-Jafr basin EBA cairn entity (Abe 2004; Abe and Fujii 2003; Fujii 2003; Quintero *et al.* 2002), can best be understood within this framework. The chronological sequence suggested above implies that the semi-nomadic cist enclosure population, who expanded eastwards under the influence of the urbanization in the contemporary Cisjordan, came into contact with local pastoral nomads in the al-Jafr basin and, as a consequence, incorporated them into the extensive trade network established in the latter half of the EBA. The mass-production of tabular scrapers, which was based on a rich occurrence of raw material in the al-Jafr basin, probably forms a part of this trend. Taking into account the fact that the appearance of middlemen at the Ḥasā area and the establishment of urban customers further to the west triggered off the reactivation of the al-Jafr basin, one may further say that the florescence of tabular scraper production in the EBA al-Jafr basin represents an aspect of inter-regional specialization as well as the establishment of a wide-ranging trade network including arid peripheries. Likewise, the aforesaid expansion of large enclosure entities over the dry lands in southern Levant, including the al-Jafr basin, seems to be one of specific representations of this far-reaching social reorganization.

Concluding Remarks

The second operation of the JBPP-2 2, combined with the first operation in this spring season, has enabled us to bridge most, if not all, of the chrono-typological gaps of the QATW sequence. This in turn has made it possible to sketch the development process of the early pastoral nomadism in the al-Jafr basin. It is needless to say, however, that further investigation is still needed to fully understand these intricate dynamics. The third operation is due next summer, focusing on the QATW Layer 4 problem, namely, the origin of early pastoral nomadism in the al-Jafr basin. Two relevant sites, Jabal al-Juhayra PPNB small settlement (JF-0116) and Ḥarrat al-Juhayra Late Neolithic pseudo-settlement (JF-0202), are to be excavated.

Acknowledgements

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Sumio Fujii
Faculty of Letters
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, JAPAN

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THE ARCHAEOLOGICAL SURVEY FOR THE REGION OF UDHRUḤ, 2003 (PRELIMINARY REPORT)

Fawzi Abudanh

Introduction

The author is currently a second-year PhD student in the University of Newcastle Upon Tyne, England. The survey was conducted to reveal the archaeological data, which is necessarily required to support the author's thesis. The settlement patterns and the military arrangements in the region of Udhruḥ (اذرح) during the Roman and Byzantine periods is the key subject of my thesis.

Having obtained the official permission from the Department of Antiquities of Jordan, the fieldwork continued from the 15th of October till the 15th of December. Unfortunately, due to the limited resources and lack of financial support, the team consisted only of the author and the hired car driver. Sometimes two or three volunteers joined the team; however, though none of them an archaeologist. Much appreciated logistic support was offered by the Ma'ān Antiquities Office.

Previous Studies

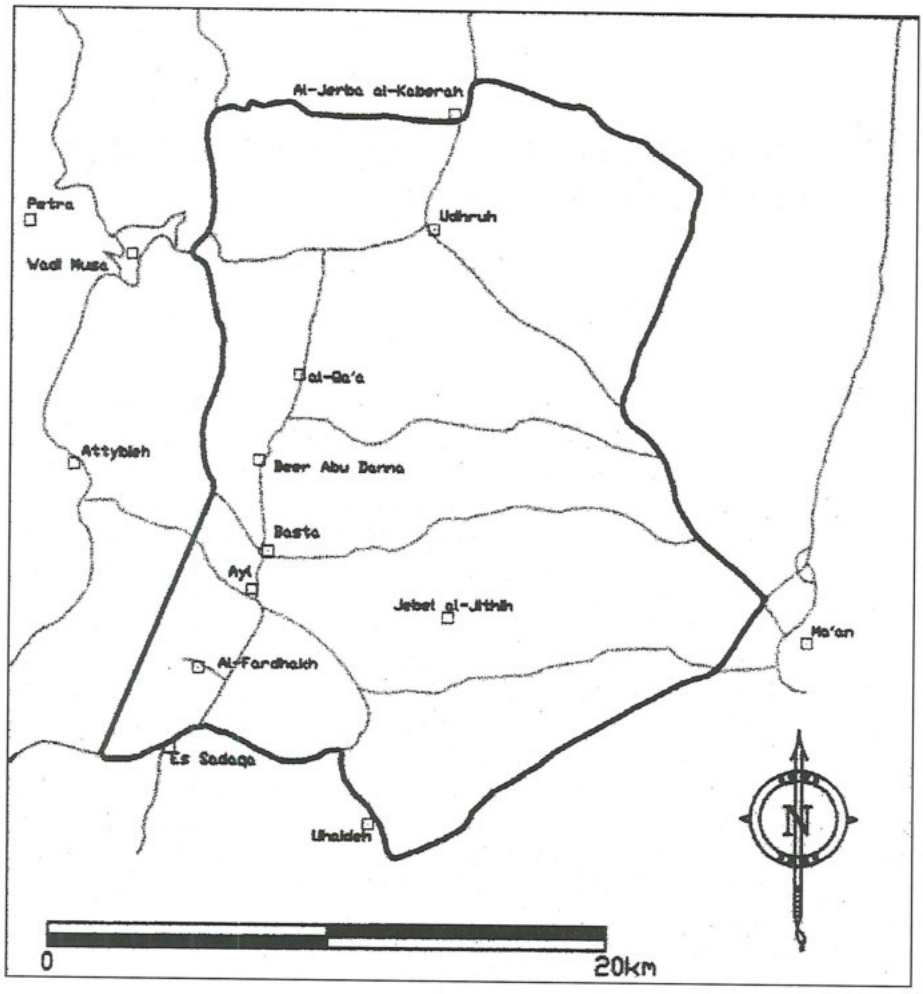
The history of fieldwork in the region of Udhruḥ is very short and poor. In other words, large-scale projects are very rare in the region of Udhruḥ. Most of the projects are undertaken in Petra; the most important site in southern Jordan. Alistair Killick's study (1983; 1986; and 1987) and this study are the only field research which systematically covered the whole region. Other studies considered the importance of the region through the process of investigating certain questions such as the Roman frontier in Arabia (Parker 1979; 1986; Bowersock, 1971; 1976) and the Via Nova Traiana in Arabia Petraea (Graf 1995). Nonetheless, a handful of sites, especially these which are relevant to both fields, such as Udhruḥ, Ṣadaqa, al-Jarba and Ayl, received closer investigations. The region was first considered by Brünow and Domaszewski in their work *Die Provincia Arabia* (1904, 1905, and 1909). In addition to valuable information, including photographs and plans, about archaeological sites in the region, the study recounts the earlier explorers who personally visited the area (Brünow and Domaszewski 1904: 433-479). Travelers like Doughty (1888: 35-38) visited and described Udhruḥ.

The following studies have revealed fairly important data from the region under investigation: Glueck 1935; Stein 1940; Parker 1979, 1986; Graf 1979, 1995; Fiema 1991, 2002; Kennedy 2000; 'Amr *et al* 2001, 1998 and Tholbecq 2001. The last two studies have investigated sites recorded and studied by the present author. Dr. Khairieh 'Amr (2001, 1998) recorded about thirty sites in the area during her survey which was associated with the process of constructing pipelines in three sectors in the district of Ma'ān (معان). The three sectors: al-Qā' (القاع), Ayl (أيل) and al-Jiththa (الجثة) lie within the study area.

The Area of Survey (Fig. 1)

According to the recent administrative changes in the district of Ma'ān, the area of survey lies within the borders of four governmental and administrative regions: the Municipality of al-Ash'ari, Ma'ān, the Petra Regional Authority and the Municipality of Ayl. Archaeologically, the survey area is better known as the region of Udhruḥ (Killick 1987: 175), however, we might tentatively refer to it as Udhruḥ and its environs.

The modern road network in the regions mentioned above was used as border lines, which means that in many cases we did not go beyond the asphalt roads to find out what is there. Although this strategy might seem weak in terms of losing the geographical cohesion and the similarity in archaeological data, it was virtually the sole way to finish the work according to the schedule. Moreover, some areas were previously surveyed, especially the area west of the Shawbak-Wādī Mūsā road and the Wādī Mūsā-Baṣṭa road (Graf 1995) and the area north of Udhruḥ (Findlater 2002). However, in some cases we had no choice but to cross a road either to record ruins not recorded or visited before, or to find the end (start) of an ancient road, or to keep a straight border line.



1. Map shows the area of survey (encircled by the contiguous black lines) (ref. map Ma'an 1:250000 A GH 5. in Arabic).

A modern road, vertically (E-W) connecting the Shawbak-Udhruḥ-Ma'ān road with the Shawbak-Wādī Mūsā road, represents the north-western line of the survey area. This road starts at the southern edge of al-Jarba al-Jadīda and has a length of roughly 10km. An imaginary (E-W) line which starts just a few meters to the north of al-Jarba's Fire Station and heads eastward along a desert road for 10km deep into the desert representing the north-eastern line. From the wells of al-Burayka (البـــريكة) another imaginary line was drawn to be part of the eastern bordering line, and it extends south/southwest from al- Burayka until it intersects with the Shawbak-Udhruḥ-Ma'ān road at the permanent location of al-Hussein bin Talal University. From there down to Ma'ān the modern road completes the rest of the eastern line. Most of the area (eastward) beyond our line and road is occupied by modern quarries, the buildings of al-Hussein Bin Talal University, and the city of Ma'ān.

The western border line is represented by the Shawbak-Wādī Mūsā road (1) and the Wādī Mūsā-Basṭa road (2). From a point where the Wādī Mūsā-Basṭa significantly turns southeast to Basṭa, an imaginary line was drawn to form the remaining part of this border line south/southwest until it reaches Ṣadaqa (صـــدقـــة). This line crosses the aṭ-Ṭayba-Ayl road and runs horizontally to the west of Basṭa, Ayl and al-Fardhakh (الفـــرذخ). The southern border line of the survey area extends vertically from Ṣadaqa and it runs along a recently constructed road down to the village of al-Wahīda (الوهيـــدة), the Ma'ān-'Aqaba road; from Ma'ān to al-Wahīda interchange is the south-eastern end of this line.

Methodological Approaches

Due to the relatively huge area the survey intended to cover, it was highly unlikely to cover the region as one geographical unit. Therefore, dividing the region into small areas was very necessary to finish the work according to the schedule, and to systematically cover each area by looking at small geographical units. The survey area is horizontally and vertically divided by modern road networks. These roads were utilized to identify the borders of each area and within each area there are too many vertical and horizontal agricultural or

desert roads. The frequency of the latter differs from area to area. However, they were employed practically and made a vehicular survey very effective. In other words, there was a relatively easy access to every hill, mountain and valley.

In terms of the topography factor, it is worth pointing out that the survey region can be noticeably divided into two zones. Each zone has roughly the same topographic and climatic features from north to south. A demarcation line can be easily drawn due to the significant change when we move from west to east in the survey area. However, most of the survey area is part of the Jabal ash-Sharā (a series of mountains). The common topographic feature is a series of contiguous hills that run N-S; most of them are at least fourteen hundred metres above sea level. Hundreds of small valleys running vertically, west-east and southeast interrupt these hills. Thousands of square metres of agricultural fields seem to have been cultivated in antiquity; today barley and wheat and other cereals are the common crops grown in those regions.

The rest of the survey area, particularly the areas on other side of the Shawbak-Udhruḥ-Ma'ān road and the south-eastern part around al-Wahīda with the elevation of less than 14 hundred metres have a relatively different topography. The presence of separate hills is the prominent element of this area; moreover, it is the area where large valleys are formed by the gathering of many small valleys. And due to the roughly flat landscape of this part, the visibility is enough to observe any sizable archaeological material.

Having divided the survey region into eight areas, interviewing some of the elderly people in each area was a necessity to visit and record as many archaeological sites as we could. This strategy was an attempt to compensate for the lack of the 10,000 scale aerial photographs taken in 1978 for most of the country; unfortunately, the 1978 survey did not cover the region of Udhruḥ, or the survey area (according to the RJGC archives). The 30,000 scale aerial photographs taken in1992 are available but not effectively useful due to the difficulty in identifying any archaeological site through the photographs. However, more than twenty people were interviewed during the survey period; some of them kindly and voluntarily joined and guided us to important archaeological material.

Due to the significant similarity in the topography of the survey region, the same strategy was applied in most of the areas. The topography was a key factor in changing the survey methodological approaches. The intensive presence of horizontal and vertical agricultural road networks made the work much easier since exploring any hill and valley was a matter of time. Accordingly, we have been vertically surveying each hill and valley starting from the eastern horizontal border line up to the western border line, and then going down towards the eastern border line, and so on until we finished the whole area. This process was very successful due to the fact that most of the sites were located on hilltops or on upper and lower slopes of hills from west to east, moreover, the gradual increase of elevation, from east to west, made any archaeological site easily recognizable from a distance. In some cases, we had to survey horizontally, particularly when there were ancient tracks and roads heading north to south. Many sites were recorded along ancient tracks and roads.

Surveying horizontally into transects, identified by certain landmarks, and was the strategy applied to the easternmost areas of the survey region. This approach was preferred due to the nature of the terrain there. Shallow, flat and smooth hills in addition to wide valleys are the common features of that landscape. This was practically vital in the areas to the east and south/southeast of Udhruḥ in the light of the high visibility one can get in that area. What is finally worth mentioning is the fact that the surveyor, as one of the local people, has a good experience in the survey region.

Once an archaeological site was found the following steps were taken:

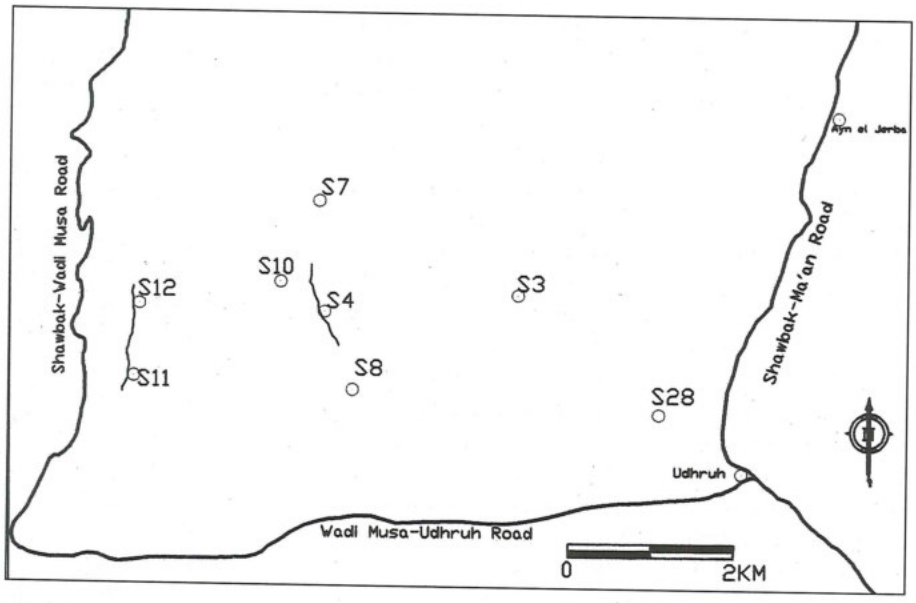
1. Taking GPS reading for every site.
2. Producing sketch plan if possible.
3. Measuring the architectural remains at each site.
4. Measuring the cisterns and reservoirs.
5. Collecting pottery sherds from every site if available.
6. Describing the archaeological components of the site.
7. Taking photographs by compact and digital cameras.
8. Investigating the whole area around the site.

The Archaeological Finds

Two hundred ninety-one sites were recorded in the region under investigation. And because there is not enough room in this report to mention every single site recorded during the survey, the more significant finds will be briefly cited in each area.

Area I (**Fig. 2**)

This area is enclosed by four modern roads; three of them are major whereas the fourth road is secondary. The latter is the northern line of this area that vertically connects the Shawbak-Wādī Mūsā road to the west with the Shawbak-Udhruḥ-

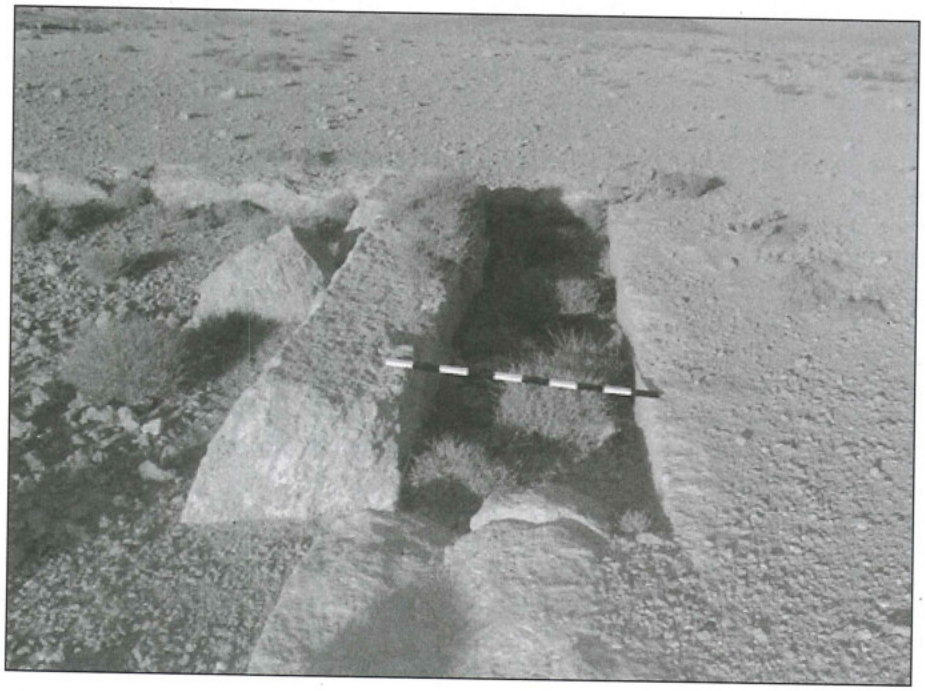


2. Map shows the sites recorded in Area I (ref. map Jordan 1:50000 Bir Khidad 3150IV K737).

Ma'ān road to the east. It starts at the south-eastern corner of the al-Jarba (the new) and heads westwards for almost ten kilometres in a zigzag direction. The southern line is represented by part of the Wādī Mūsā-Shawbak road. The western and eastern lines are respectively parts of the Wādī Mūsā-Shawbak road and the Shawbak-Udhruḥ-Ma'ān road. Both roads are roughly aligned north-south.

Very important archaeological sites were recorded in this area. The quarry of Udhruḥ (site no.28) occupies its south-eastern corner. A huge and exposed limestone layer was most likely seized to build the legionary fortress at Udhruḥ. The traces of the cutting tools can be seen on the rocks, and interestingly some of the quarried blocks were left in the site (**Fig. 3**). The quarry covers a huge area, probably 1200m N-S and 700m E-W (Killick 1983: 127, 131).

An ancient road network was the prominent discovery in this area. Well preserved stretches of an ancient road which (site no.4) heads south/southeast from 'Ayn Malghān (عين ملغان), probably towards Udhruḥ were recorded (**Fig. 4**). Secondary roads were also built from this road. Three T-junctions were seen on this road. Two of them head westward to Khirbat Qumayd قـمـيـد (site no.10), and the third heads eastward, most likely to az-Zaḥāqiyyāt الزحاقيات (site no.3). However, the



3. Quarried blocks in the Quarry of Udhruḥ.



4. Site no.4, Ancient road heads south from Khirbat Malghān.

main road does not have the same characteristics everywhere, near 'Ayn Malghān for example it is bordered and has a 4m width, and no traces of pavement were noticed, whereas in other parts only a single stone wall was found. However, we have been able to track it continuously from Khirbat Maghāyir Zayd مغاير زيد (site no.8) to Malghān (site no.7).

In fact, Malghān is a central site in this area. A complex structure on a hilltop known as Khirbat Malghān (site no.7) is overlooking the spring down in the wadi. Another structure on the upper slope of a hill facing the khirbah was located to oversee Wādī Malghān. A small structure was built on the northern upper slope of the hill that includes Khirbat Malghān. The hilltop has extensive ruins; 350m east-west and 200m south-north. A complex structure must have been the centre of the site since some exterior walls and internal divisions are still preserved (**Fig. 5**). The site is highly disturbed by modern agricultural and pasturing activities. Five caves on the southern slope and three threshing floors to the west of the structure are associated with the site. Pottery sherds are abundant particularly outside the structure. And the site was occupied from the Edomite through the Byzantine period.

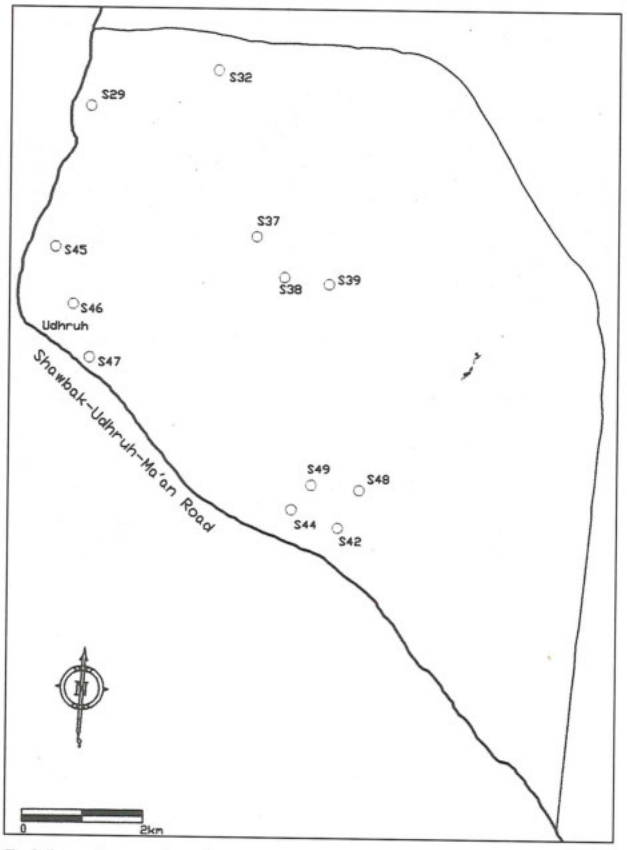
Khirbat Du'ayj خربة دعيج (Site no.12) is a very significant site in terms of the location and function. It lies just on the edge of a hill about two kilometres to the east of the Wādī Mūsā-Shawbak road, and overlooks the entire region westward



5. Site no.7, Khirbat Malghān, view to the west.

down to the mountains of Petra and Wādī Du'ayj to the east. The main feature at the site is destroyed to the extent that no architectural elements could be recognized. It is merely a huge circular mound of stones standing +2m above exposed bedrock. Accordingly, a high building probably circular was standing there, and it might have collapsed due to natural causes. A well-preserved structure beside two caves or cisterns was found just about sixty metres to the south of the main feature. The structure is roughly square (19x18m) and seems to have been connected with the main feature from the south-eastern corner by a short walkway, 66m long.

An ancient road (Site no.11) passes the western edge of Khirbat Du'yaj, and it could be tracked over the hills down to the Wādī Mūsā-Udhruḥ road to the south. Nevertheless, it does not have the same characteristics everywhere, it is very clear, well-preserved and bordered by stone walls near Khirbat Du'ayj (**Fig. 6**), elsewhere only stone walls (not curbstones) and traces of the road itself without curbstones were seen. According to the local people, this road heads also north from Khirbat Du'ayj up to Nijil at ash-Shawbak. It is noteworthy that this road is probably part of the road (site no.154) recorded on the hills to the west and southwest of Bīr Abū Dannah (بير أبو دنّة).



7. Map shows the sites recorded in Area II (ref. map Jordan 1:50000 Bir Khidad 3150IV K737).

Area II (**Fig. 7**)

This area is less well defined in comparison with the other areas. Its northern and eastern borders were drawn as imaginary lines on the ground. The first extends for nearly ten kilometres along a desert track eastwards to the modern wells of al-Burayka. We should mention that this line starts just about twenty metres to the north of the al-Jarba's Fire Station and is not straight, from al-Burayka a south-southwest line was also drawn to be the eastern border of this area. It intersects with the Shawbak-Udhruḥ-Ma'ān road at the permanent location of al-Hussein bin Talal University. In fact, the whole area eastwards down to the desert high-



6. Site no.11, Ancient road near Khirbat Du'ayj (the khirbat appears in the photo's background).

way, was intended to be investigated but the presence of industrial activities, mainly modern quarries, was a real obstacle. The Shawbak-Udhruḥ-Ma'ān road forms its western fringe.

Khirbat al-Jarba (خربة الجربة) is a unique site in this area (site no.29). Massive ruins occupy a hilltop for approximately 700m N-S and 300m E-W (**Fig. 8**). Most of the ruins are the remains of a complex structure consisting of many contiguous rooms. The spring of al-Jarba lies just on the western base of the hill. The spring provided the khirbah with water and many agricultural fields or farms seem to have been irrigated by the spring. Many field walls are still visible in Wādī al-Jarba below the spring. The pottery sherds collected from the site reflect a continuous settlement at al-Jarba; Nabataean/Roman (first-second century AD), Late Roman, Late Byzantine, Early Islamic, Ayyubid/Mamluk and Ottoman sherds confirm the importance of the site. Al-Jarba as well as Udhruḥ and Aila ('Aqaba) submitted to Prophet Muhammad and paid the poll tax in 630 AD, the three towns must have flourished during the Late Byzantine and Early Islamic period (Schick, 1994: 149).

Not far south of Khirbat al-Jarba lies another important site known as Jabal at-Taḥkīm (جبل التحكيم) or al-Ash'arī (الأشعري) (site no.45). Two well-preserved and contiguous structures built of large blocks occupy the hilltop with a clear view in all directions. Both structures have the same length (40m) and width (10m), and no internal divisions were observed. Due to the considerable width of the walls, they have been reused as graves. Nabataean, Roman, Late Byzantine/E. Islamic and Ottoman sherds were collected from the site. The strategic location of the site and the thickness of the walls leave no doubt that it was used for defensive purposes.

Moving to the south towards Udhruḥ there are two hills; the first is known as Tall Jurayda تل جريدة (site no.46) and the second is Tall Dubays (تل دبيس) or Udhruḥ (site no.47). Many natural caves with archaeological deposits occupy most of the area of Tall Jurayda, and a structure was built on its southeastern edge. Tall Dubays was excavated by Alistair Killick (1983: 127). Although most of this area is within the desert zone, many archaeological sites were recorded, and some dated to the prehistoric periods. From Tall ar-Ruz تل الرز (site no.37) for instance, Upper Palaeolithic pottery sherds were collected, and Chalcolithic pottery sherds were also found at Ṣufr al-Burayka صُفر البريكة (site no.39).

Finally, is the site of Khirbat al-Fiqiyy خربة الفقي (site no.44), a few kilometers southeast of Udhruḥ. The site seems to have been a centralized agricultural complex, an aqueduct connects the site with Birkat Udhruḥ (reservoir) (site no.48) about kilometre northeast of the site. A wall was built to carry the aqueduct (site no.49) in Wādī al-Fiqiyy, and well-preserved parts of it are still standing for a considerable height (**Fig. 9**). Another reservoir was found about five hundred metres southeast of Khirbat al-Fiqiyy. Many vertical and horizontal field walls were seen in the wadi below this reservoir. Therefore, the people who cultivated the fields, operated the water system and protected this important area must have occupied the site. The pottery sherds reflect the long history of the area (al-Fiqiyy) from the Nabataean/Roman period up to the late Islamic period. It is attested that the area between Ma'ān and Udhruḥ flourished during the Byzantine period. Udhruḥ itself paid the second largest tax among the towns of southern Palestine



8. Site no.29, Khirbat al-Jarba, view to the west.



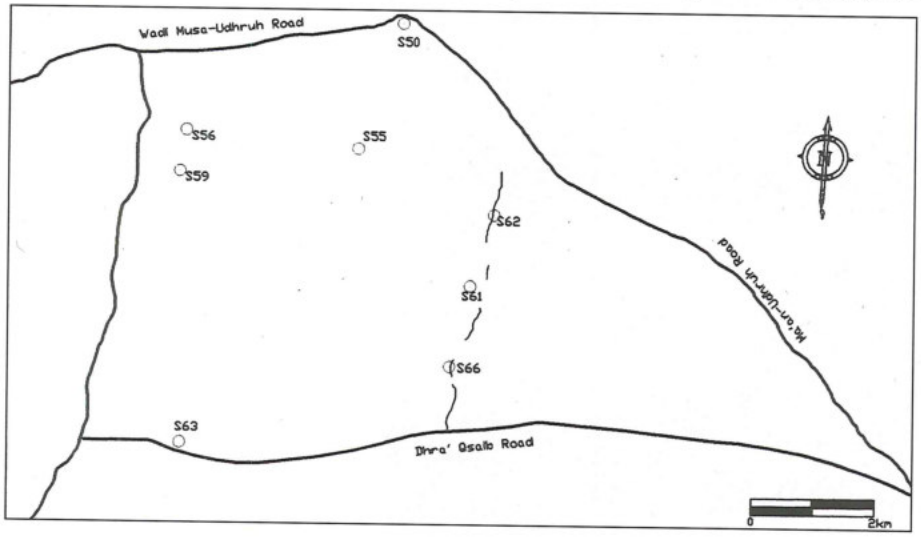
9. Site no.49, the aqueduct's wall in Wādī al-Fiqiyy, view to the east.

in the sixth century according to Beersheba Edict (Killick 1983: 110).

The security of this area seems to have been taken into account, most likely in later periods (Byzantine/Islamic?). Three square structures, site no.32, site no.38 and the one near Khirbat al-Fiqiyy (site no.44) seem to have been built, in order to keep an eye on the settlements, agricultural fields and water resources west at al-Jarba and Udhruḥ and southeast at al-Fiqiyy. The architectural materials at the first two structures are very similar, and consist of small limestone blocks, and a roof tile was found at site no.32. The blocks of the structure near Khirbat al-Fiqiyy are very similar to those at the fortress of Udhruḥ; therefore it might be tentatively supposed that these blocks were brought from the fortress in the later periods.

*Area III (***Fig. 10***)*

Area III is well defined by four modern roads, two vertical and two horizontal encircle it. The two verticals are respectively the Wādī Mūsā-Udhruḥ road to the north and the Dhrā' Qaṣīb road to the south and southeast. From the west is the Udhruḥ-Rāshid-Abū Dannah-Basṭa-Ayl road, while the Shawbak-Udhru'-Ma'ān road is from the east and northeast. Starting from the north-eastern corner of this area the legionary fortress (site no.50) at Udhruḥ is the most momentous site within our area. The site is well known to the scholars of the Roman period (Bowersock, 1971, 1983; Parker, 1979 and 1986; Kennedy 2000), and it has been excavated by Alistair Killick (1983, 1986, and 1987). Although the excavator believes that the fortress was Trajanic (second century AD) (Killick, 1983: 125), many



10. Map shows the sites recorded in Area III (ref. map Jordan 1:50000 Bir Khidad 3150IV K737).

scholars still disagree with him (i.e. Bowersock 1976: 226-227), particularly Parker who prefers a Diocletianic date (third/fourth century AD) and based his argument on the comparison with the fortress at Lajjūn (Parker 1986: 98). A Byzantine church lies just about thirty metres to the south of the south-western tower outside the fortress wall. The exterior walls of the fortress and most of the projecting towers are still well preserved.

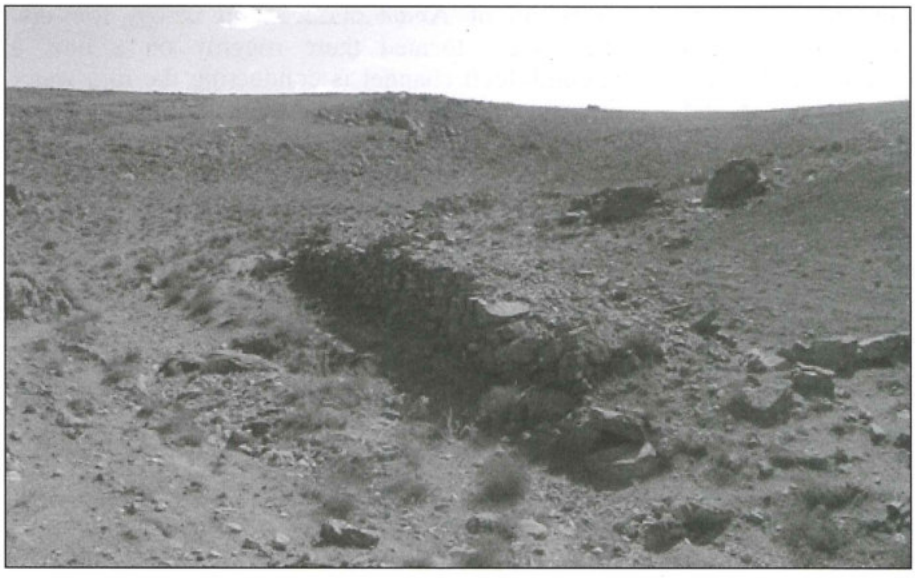
A few kilometres to the southwest of the fortress lies Tall Abū ar-Ru'a ابو الرعـة (site no.55). A stone wall or an enclosure surrounds the hill, and it is very clear on the western upper slope. Killick identified this enclosure as a temporary Roman camp (Killick 1986: 436-438; Kennedy, 2000: 170). Separate hills in a smooth terrain are the main topographical feature of the eastern half of area III. Most of them have archaeological material, either a small structure, probably a watching tower, like that at the top of Tall aṣ-Ṣafiyya تل الصفية (site no.66), or a group of stones and pottery sherds which indicate that the hilltop was temporarily being used as a watch point due to the clear view one can get from there. A long stretch (5km) of the so-called Khaṭṭ Shabīb خط شبيب (site no.62) was tracked in this area. The khaṭṭ was tracked by the present author until Khirbat Likah (site no.288), the southernmost recorded site in the survey area. It was first believed that the khaṭṭ does not extend northward and heads southward twelve kilometers to the west of Ma'ān (Kirkbride 1948: 151-154).

Moving westward into transects, many archaeological sites were also visited and recorded. Two traditional houses named after their owners, Khirbat Rubayy' خـربة ربيّع (site no.56) and Khirbat Ibn Rajā خـربة ابن رجـا (site no.59) seem to have overlapped ancient structures. Natural caves are significant there, at least three caves at each site. Some of these caves were converted into cisterns to collect the rain water after having plastered their walls and dug a channel or ditch into the ground along the lower slope of the hill, the same system was applied in other areas where no natural water sources are available. Agriculture seems to have been the main economic factor in the life of the people in antiquity in that area. Pottery sherds, particularly handles of storage jars, are abundant in the cultivated fields, and many threshing floors have also been seen. Nabataean/Roman (first-second century AD), L. Roman and L. Byzantine sherds are significant in the sites mentioned above.

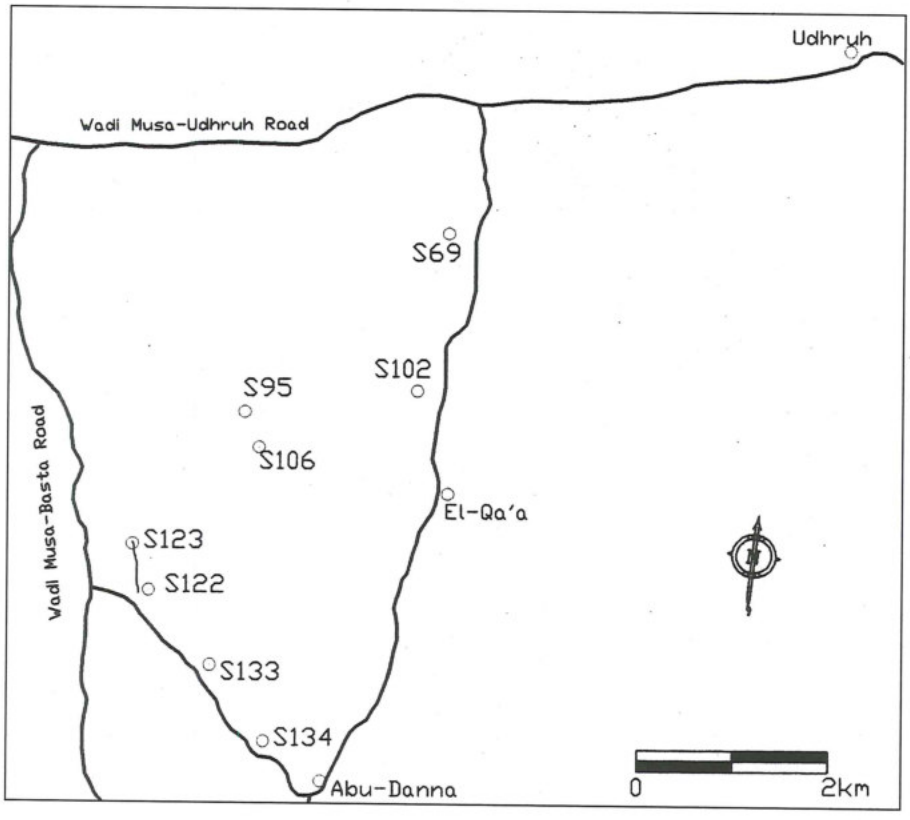
Two Rujums have also been recorded in this area. Rujum al-Ghurāb رجم الغـراب (site no.61) lies to the northwest of Tall aṣ-Ṣafiyya, and Rujum 'Abid رجم عـبـد (site no.63) to the southeast of Rawḍat al-Amīr Rāshid روضـة الأمـيـر راشـد (al-Qā'). Both seem to have probably played a defensive role as watching towers due to their strategic locations. The latter was probably located on the road between Udhruḥ and Ayl, a stretch of this road associated with a thick wall (site no.204) has been recorded in Wādī al-Bīr or Abū Dannah, a few kilometers to the southwest (**Fig. 11**). The author believes that this stretch was reported by Brünow and Domaszewski (1904: 467, fig. 541). Nabataean/Roman sherds were found at Rujum 'Abid whereas few Byzantine sherds were collected from Rujum al-Ghurāb.

*Area IV (***Fig. 12***)*

As a matter of fact, this area was heavily settled



11. Site no.204, the road and wall in Wādī al-Bīr.



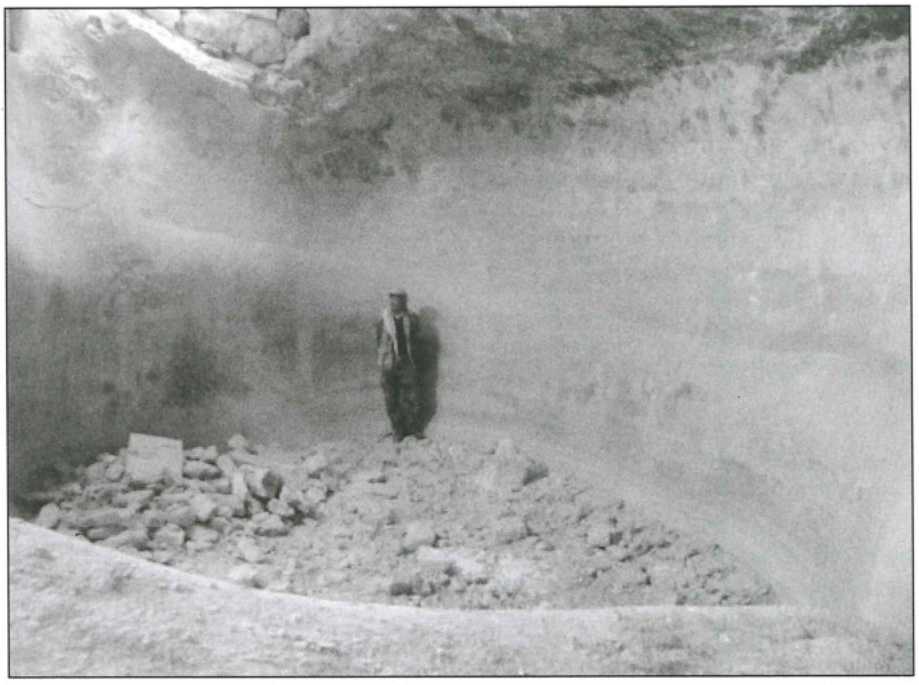
12. Map shows the sites recorded in Area IV (ref. map Jordan 1:50000 Bir Khidad 3150IV K737).

from the first century AD onwards. Many structures were recorded in the area; however, only some of them were recorded by Dr. Khairieh 'Amr ('Amr *et al* 2001, 1998) during the survey which accompanied the process of constructing the water pipeline between al-Qā' and Wādī Mūsā via Bīr al-Biṭār. Therefore, those sites will not be mentioned here. The modern settlements at Rashid (al-Qā') and Abū Dannah lie within this area. This area is encircled by four roads; the Wādī Mūsā-Udhruḥ road to the north, the Wādī Mūsā-Basṭa road to the west and northwest, the Udhruḥ-al-Qā'-Abū Dannah-Basṭa-Ayl road to the east and southeast, and the Umm Hilāl road (ام هلال) to the south. The latter heads west to northwest from Abū Dannah and intersects with the Wādī Mūsā-Basṭa road.

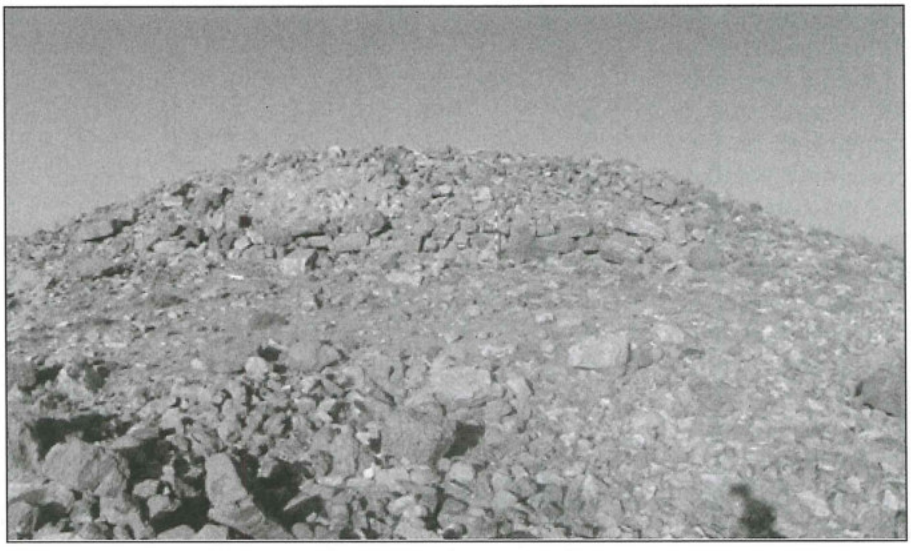
Stretches of an ancient road (site no.123) running north to south, over the hills just parallel to the Wādī Mūsā-Basṭa road, are still amazingly well preserved. The road does not have the same features in all the stretches; its width, for example, ranges from four to eight meters, in some places there are no curbstones at all due to the hard terrain existing there. Many structures were built on the slopes to the east of the road, some of them just on the edge of the road, and secondary routes connect these structures with the main road. A good example is site no.122 where the main road is intersected by a secondary one connecting the site with the road, and it is interesting enough to know that the modern road between Basṭa and Wādī Mūsā probably overlapped parts of this road.

Apart from the abundant presence of structures in this area, the existence of many rock-cut cisterns is the most significant phenomenon at this area. Most of them were originally natural caves converted into cisterns after they were improved and plastered. About thirty cisterns were recorded there. The lack of natural water sources must have been the reason behind this technique. A good case is the site of 'Abdāt عبدات (site no.69), four cisterns were located there roughly on a line, a ground-ditch channel is conducting the rain water into them. They also have the same depth of 6m, and probably the same diameter (3-4m).

Another case is the cistern at Umm al-'Awsaj ام العوسج (site no.95). It was located on the upper slope of a hill. A rectangular settling basin was connected to a small channel to run the water inside the cistern. A small door enables a slim person to enter the cistern, and seventeen rock-cut steps lead to the floor of the cistern (**Fig. 13**). The measurement of its interior is 9.4m-8.5m, and the diameter of its floor is 7m, and finally its depth is 6.5m. No structure was built close to this site but a cave exists down on the lower slope of the opposite hill. Two important Rujums, Rujum al-Biṭār رجم البيطار (site no.102) (**Fig. 14**) and Rujum al-Kha-



13. Site no.95, interior of rock-cut cistern, Umm al-'Awsaj.



14. Site no.102, Rujum al-Biṭār, view to the west.

ībiyya رجم الخطيبية (site no.134) must have had a defensive role to play. Both have strategic locations on very high hilltops, 1500m at least above sea level, and this evidently means that they have a very clear view over the surrounding landscape in all directions. In terms of the dimensions and architecture material, Rujum al-Biṭār is 19m SN and 17m EW whereas Rujum al-Khaṭībiyya is 5mx5m, both were built of large and very large blocks of flint stones, the walls at Rujum al-Biṭār cannot be easily traced due to the considerable stones covering the structure. At Rujum al-Khaṭībiyya the plan is very clear, as a single row of walls still stand for a considerable height, buttress walls however, were built on the external sides of the walls.

The remains of two complex structures with internal divisions are worth mentioning. The first is known as Khirbat al-Hazāhza خربة الهزاهزة (site no.106), and the second is Khirbat Umm al-Jarād خربة أم الجراد (site no.133). The former rests on a hilltop about 500m to the west of al-Qā' Pump Station. The archaeological remains including the structure cover an area of 150m EW and 70m NS, although the structure was affected by later agricultural activities, some of the original walls are *in situ*.

Many exposed and walled bedrocks and paved floors occupy the western and south-western part of the site, a cistern lies outside the north-western corner. Nabataean (first century BC-second cen-

tury AD) and L. Roman-Byzantine (fourth/fifth-sixth centuries AD?) sherds were collected from the site. Khirbat Umm al-Jarād lies about three hundred metres to the east of Wādī Mūsā-Baṣṭa road on a flat hill. The main body of the structure measures 47x40m, however, stone circles or probable external courtyards were built on the southern wall. Nabataean, L. Roman and L. Byzantine sherds were found on the site. If we take into consideration the huge area of agricultural fields surrounding them, such sites were most likely flourishing small settlements dependent on agriculture.

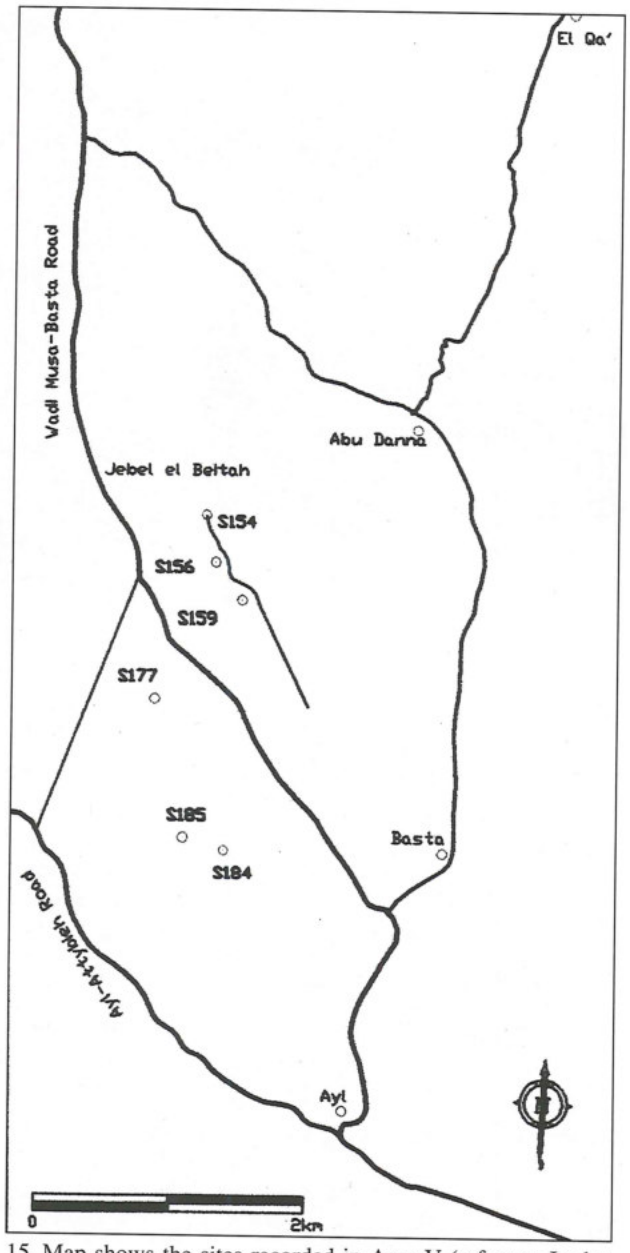
*Area V (***Fig. 15***)*

This area is bordered by Udhruḥ-al-Qā'-Abū Dannah-Baṣṭa-Ayl road to the east, Wādī Mūsā-Baṣṭa road to the west, aṭ-Ṭayyiba-Ayl road to the south, and Umm Hilāl road to the north. From the point where the Wādī Mūsā-Baṣṭa road significantly changes its direction to intersect Udhruḥ-al-Qā'-Abū Dannah-Baṣṭa-Ayl road at Baṣṭa, a virtual line was drawn to form a straight end for this road.

Well preserved parts (site no.154), probably of the ancient road recorded in Area IV (site no.123) were also found in this area on the hills west and southwest of the village of Bīr Abū Dannah, and it was traced until it completely disappeared on the edge of Baṣṭa. Secondary roads were built parallel on other side of this road, and road junctions were seen along the road (**Fig. 16**). The road is bordered by stone walls on both sides, 3-4m wide and pavement was seen. However, due to the hard terrain in some parts of the area the road's features change significantly. In some parts it is merely a wide track or a rock-cut exit.

Two structures seem to have been simultaneously built with the road on the hills southwest of Abū Dannah, the first structure (site no.156) consists of two parts: a two-row wall measures 14.3x13m and the remains of a square structure measures 6x6m inside the wall. This structure was probably a reservoir providing the passers-by with water. The second structure (site no.159) is most likely a watch tower to protect the main road and the secondary road which heads eastward to Rās Zahāra (راس زهارة). The tower is a simple square structure (4.3x4.3m) built of large and very large limestone blocks.

This area seems to have been intensively settled in antiquity. Architectural remains of at least twenty buildings were recorded there. Most of them were located either on hilltops or lower slopes and surrounded by agricultural fields and, more importantly, they were served by secondary roads. The existence of natural water sources and the fertile soil were decisive factors behind the concentration of settlement in the region in general and in this area in particular. A good example is the area around 'Ayn al-Mu'īn (عين المعين) where many structures encircle the spring. Two structures lie respectively to the northeast and north of the spring, three more structures lie to the northwest/west, and a complex structure was located on a hilltop to the southeast of the spring. A flint stone quarry was also recorded on a hilltop to the north of 'Ayn al-Mu'īn.



15. Map shows the sites recorded in Area V (ref. map Jordan 1:50000 Bir Khidad 3150IV K737 and Ma'an 3150III K737).

Another important settlement cluster was observed around Wādī and 'Ayn Muḥaydhrāt north-



16. Site no. 197, Tall Qaṣīb, terracing walls.

west Basṭa. Many architectural features and caves were recorded in Wādī Muḥaydhrāt (وادي محيظرات), archaeological material including pottery sherds and ash layers were seen outside two caves, and this might indicate that these caves were settled. Threshing floors are also abundant, they were found in groups, three or more to each group (**Fig. 17**). 'Ayn Muḥaydhrāt (site no.184) was evidently intended to cultivate the fields below the spring, a reservoir was constructed a couple of hundred metres to the east of the spring, and a ground-level aqueduct was most likely used to bring the water from the spring. Traditional houses were built northwest of the reservoir fifty years ago.

On a hilltop to the northeast of the spring, Khirbat Muḥaydhrāt (site no.185) was strategically located with a clear view over the valley north and the agricultural fields to the south and southeast. The *khirbah* is a rectangular structure built of flint stone blocks. Four internal divisions were built on the north wall, two in the middle and two on the south wall. Edomite and Nabataean pottery sherds were found at the site.

The security of an important agricultural area such this seems to have been taken into consideration. A rectangular structure identified as a tower was located on the ridge of a hill on the left side of Wādī Muḥaydhrāt **(Fig. 1**8). The tower (site no.177) consists of two parts: a square base measures 18x18m over bedrock, and a rectangular structure (5.3x6.3m) built above the base. A rectangular stone wall (10x4m) lies just outside the eastern wall of the base. The tower walls were built of large and very large limestone blocks, and they have a considerable thickness (1m). Late Roman pottery sherds were collected from the site.

*Area VI (***Fig. 19***)*

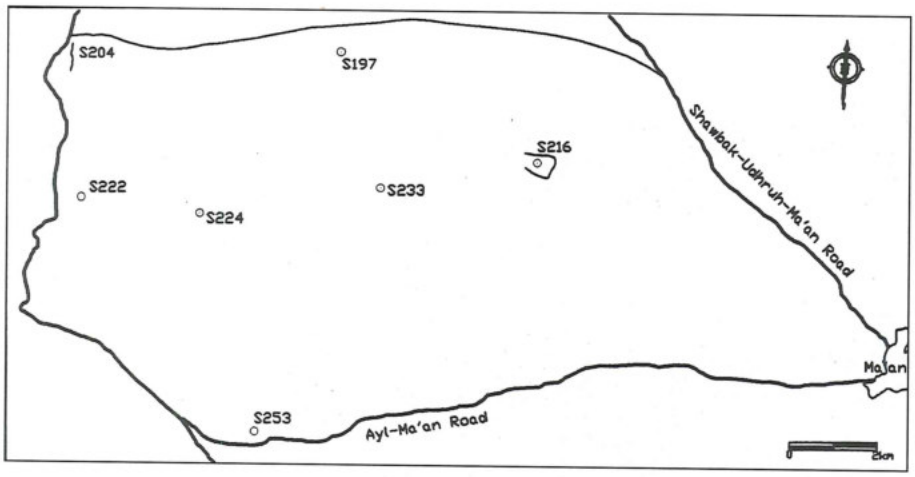
This area is enclosed by four roads, the Shawbak-Udhruḥ-Ma'ān road to the east, Udhruḥ-al-



17. *Wusm* or camel brand.



18. Site no.253, Safaiatic inscription.



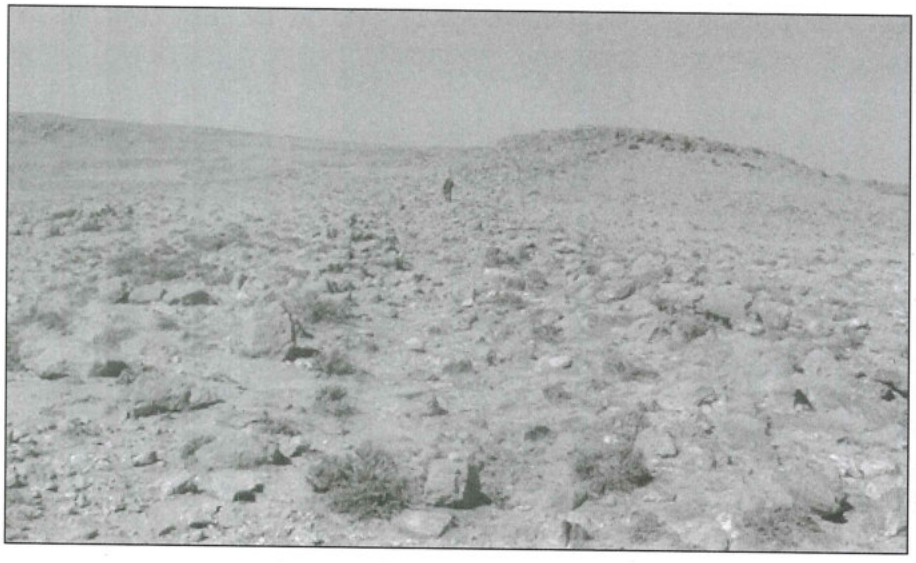
19. Map shows the sites recorded in Area VI (ref. map Jordan 1:50000 Bir Khidad 3150IV K737 and Ma'an 3150III K737).

Qā'-Abū Dannah-Basṭa-Ayl road to the west, Dhrā' Qaṣīb road to the north and northwest and Ma'ān-Ayl road (9). Many sites in this area were previously recorded; hence, they will not be mentioned here ('Amr *et al.,* 1998 and 2001 under al-Jiththa and Ayl sectors, Killick 1986). Only the archaeological sites which were recorded and visited for the first time will be briefly presented here.

Tall Qaṣīb تل قصيب (site no.197) is a significant site about seven kilometres to the southwest of Udhruḥ. A spring, known as 'Ayn Qaṣīb, lies at the north-western base of the hill. Terrace walls were found on other side of the valley about sixty metres below the spring (**Fig. 20**). The function of these walls cannot be firmly determined. Nevertheless, they should be seen as agricultural terraces in the light of the presence of the spring. Up on the hill, fifteen graves were found on the eastern upper slope. Recently uncovered walls on the north-western part of the hilltop strongly indicate that a structure was built up on the hilltop, most likely a watching tower to guard the spring, a salvage excavation is highly recommended. Edomite, Nabataean (first-second century AD), Roman, L. Byzantine-E. Islamic and Ottoman sherds were found at the site.

Rujums are abundant in this area; most of them were located on hilltops with a clear view over the surrounding terrain. A well preserved tower known as Rujum Abū Ḥalaqa رجم ابو حلقة (site no.222) is a good example. The Rujum was located on a hilltop 2km northeast 'Ayn Basṭa. The tower is merely a square structure 6.5x6.5m built of large and very large flint and limestone blocks, and still standing for the height of 1.5m. A stone circle or courtyard lies just 15m apart from the eastern wall. Nabataean and probably early Roman sherds were collected from the site. The function of such a tower cannot be more than a watch point presumably to protect the cultivated area and settlement westward from any possible attack from the desert.

The presence of well preserved parts of two water channels deep in Wādī Basṭa (site no.224) leaves no doubt that the area to the east of Basṭa



20. Site no. 154, Ancient road.

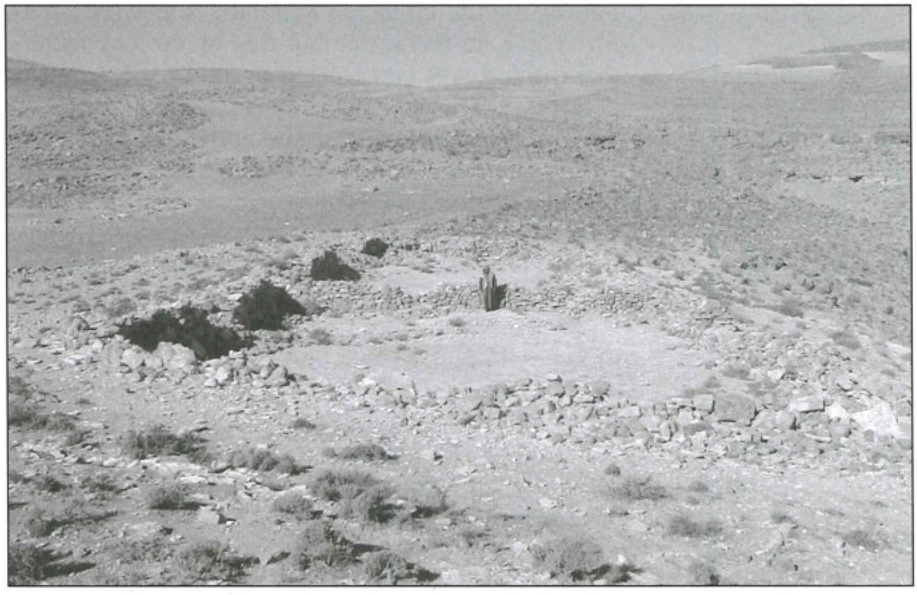
and Ayl must have had an economic importance for the central authority whether during the Nabataean or the Roman period. Parker (1986: 101) reported that a traveler had mentioned that the spring of Basṭa provided water to a Roman site three kilometres to the east of Ma'ān. Hundred of stone mounds are significant features in the landscape, particularly in the area to the east of Basṭa and Ayl, most likely due to an intensive agricultural activity. The remains of many small structures, probably farmsteads are also another sign that points to the agricultural substance of the area.

A very significant landmark in this area is Jabal aṭ-Ṭāḥūna (site no.216). The importance of this site was first indicated by Killick (1986). From the eastern base of the Jabal up to a thousand metres to the east, the area is occupied by important archaeological remains. A huge enclosure (550NS. 700EW) contains most of the archaeological components. Many rectangular and square architectural units, most likely houses, were built very close to the eastern base of the mount. The internal divisions of these units can be seen on the surface and they seem to have a considerable height beneath the ground when uncovered.

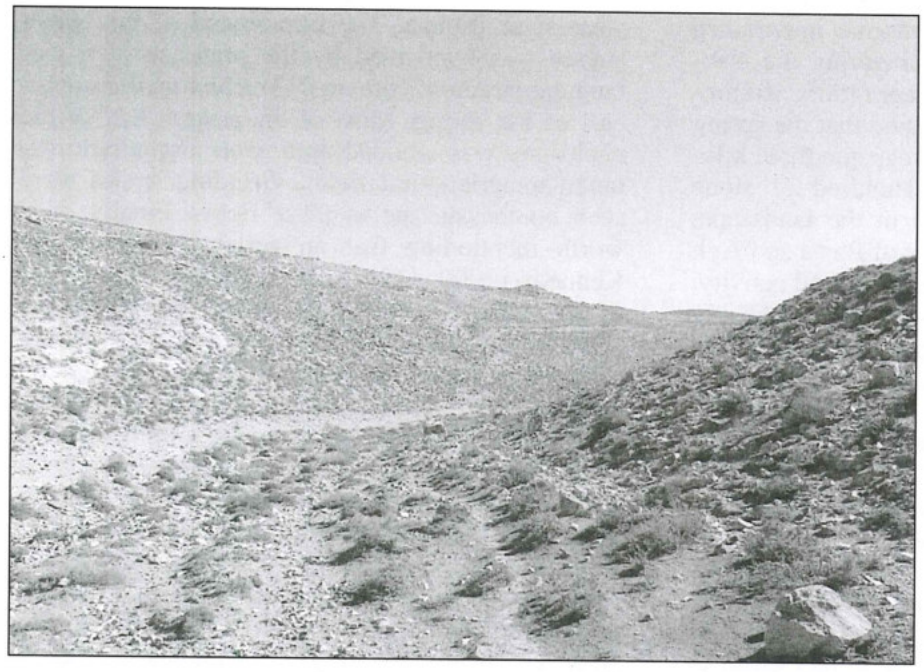
A rectangular reservoir lies inside the enclosure northeast of the architectural remains. A channel running from the west flows into the reservoir, and a few metres of it are still preserved. Two conceivable places might have provided the reservoir with water. The first, more reasonable, is the supposed dam reported by Killick (1986) on the southwest base of the mount. A modern dam, constructed in the same area, should have covered the ancient one. The second is the spring of al-Hsieh to the west of aṭ-Ṭāḥūna. The importance of this water source was confirmed by the presence of a rectangular structure (site no.233) a few metres southeast of the spring. Most of the eastern half of the enclosure was divided into well organised rectangular agricultural fields. Grinding stones were seen on the surface in these fields. Finally, it is worth mentioning that an aerial photograph by Kennedy (2000: 172, fig.17.3) clearly shows most of the features mentioned above. Many special symbols were observed in this area, and these were abundantly found on heaps of stones located on isolated hills. Three symbols were the most frequent (**Fig. 21**). The local people simply explain these signs as camel brands or *wusm*. Each tribe has a certain *wusm* that should be applied to its animals. Nevertheless, although this explanation was tentatively accepted, the fact that these marks were associated with archaeological material makes it preferable to find an alternative explanation. Dr. Khairieh 'Amr (Pers. Comm.) said that: *"wusum were usually applied to recognisable landmarks within a tribe's territory or roaming area and archaeological sites make very good landmarks"*. Many of these marks were recorded on the hills around Jabal al-Jiththa (جبل الجثة). Only one inscription was recorded on a hilltop (site no. 253) southwest of Jabal al-Jiththa (**Fig. 22**).

*Area VII (***Fig. 23***)*

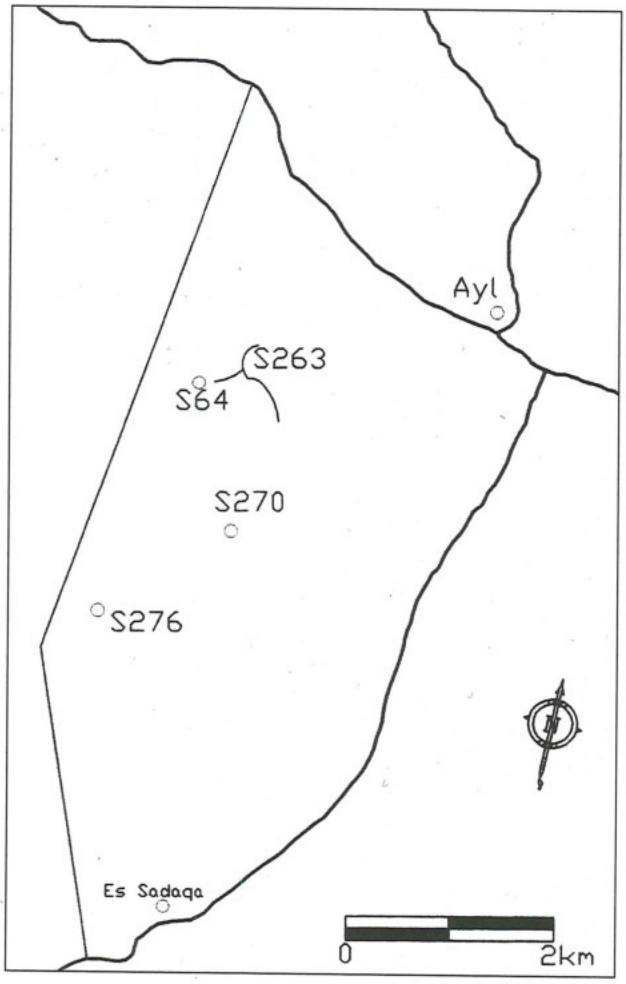
This area is enclosed by aṭ-Ṭayyba-Ayl road to the north, Ayl-Fardhakh-Ṣadaqa road to the east and northeast, the hills south and southwest of Ṣadaqa, and by the extension of the virtual line drawn in Area VI from the west.



21. Threshing floors in Muḥaydhrāt.



22. Site no. 177, A Rujum on the edge of Wādī Muḥaydhrāt.

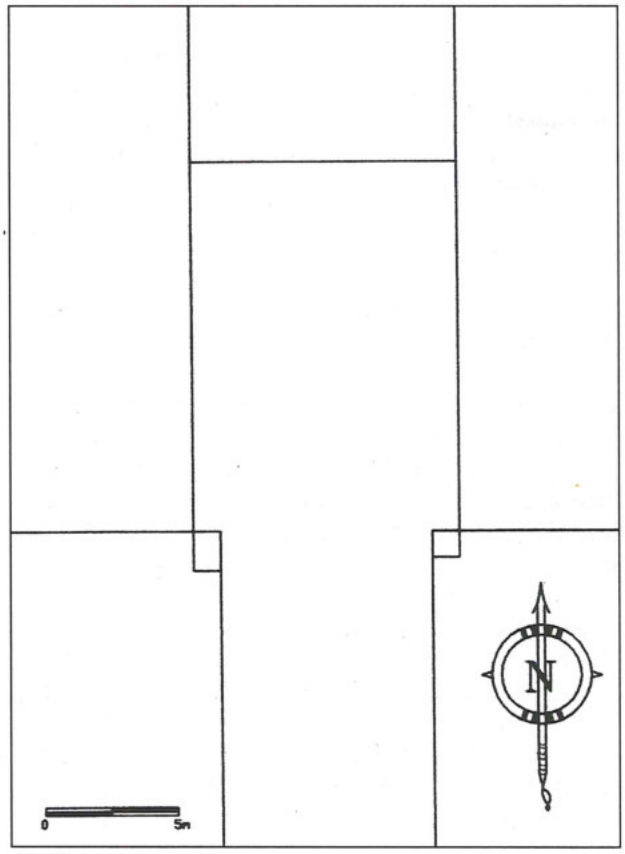


23. Map shows the sites recorded in Area VII (ref. map Jordan 1:50000 Ma'an 3150III K737 and Ras En Naqb 3050II K737)

Three major categories of archaeological material were recorded in this area, structures and complex structures, roads and threshing floors. The most significant structure was the fort (site no.264) on the top of Wādī al-Fardhakh, just 2km southwest of the Ayl-Ṭayyba road. Its walls are still standing for at least 1.5m, and its plan is also very clear (**Fig. 24**). The fort measures 32m(NS)x24m (EW), and was built of large and very large limestone blocks. Six internal divisions were recognised inside the walls, two divisions on the east and west walls, one on the north wall, the courtyard and the gateway in the middle. The entrance was located in the middle of the south wall. The few pottery sherds collected from the site were identified as Late Byzantine but this by no way means that the fort was constructed in the Late Byzantine period.

The importance of this site is indicated not only by the strategic location of the fort but also by the fact that it was connected by a secondary road with a road heading S-N over the hills northeast of Khirbat al-Fardhakh. The distance between the fort and the main road is about 200m. The main road (site no.263) seems to approach north and then northeast probably to Ayl. In fact, the similarity between the characteristics of this road and the road recorded in Area VI might cautiously suggest the idea that they are stretches of the same road. The road is bordered by curbstones, and is 3-4m wide and no pavement was seen.

The area to the northwest and west of al-Fardhakh seems to have been heavily settled in an-



24. Plan of site no. 264.

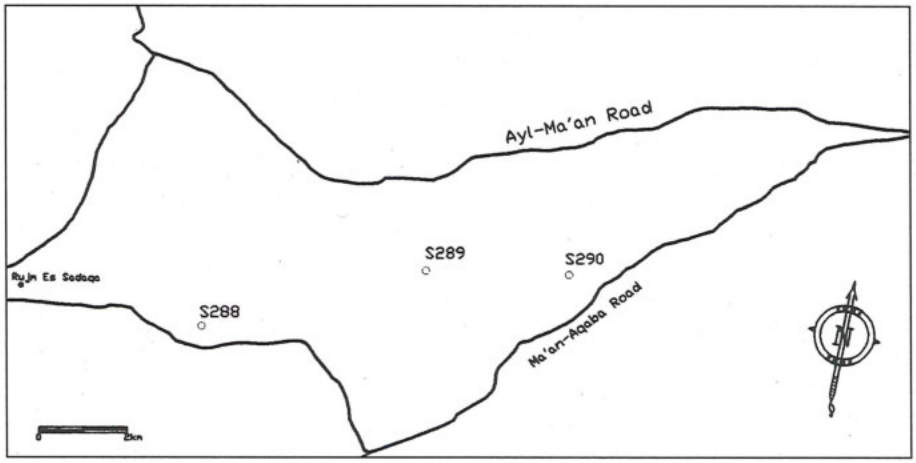
tiquity. Numerous terraces and structures were seen there, but because time was very limited we did not go beyond certain topographic features. Nevertheless, important sites were recorded there, and two intensively ruined sites are recorded here. The first site is known as Khirbat Ṣabbāḥ خربة صبّاح (site no.270) and lies on a hilltop northwest of Khirbat al-Fardhakh, and overlooks Wādī al-Fardhakh to the east and Wādī ar-Ruwayḥī (الرويحي) to the west. Architectural features including well-preserved walls and some divisions; caves and circle stones are the main archaeological material above the hill. These components cover a considerable area, approximately 150m (NS) and 80m (EW). Well-preserved walls with two and three courses high can be seen on the eastern edge of the hill. The architectural material of the walls designates two periods of construction. Meanwhile, Nabataean and Late Byzantine pottery sherds were collected from the site.

The second important site is Khirbat ar-Ruwayḥī (site no.276). The site is significantly located on the top of a flat shallow rocky hill and surrounded by a series of very high hills. The site extends northwest to southeast for about 450m. Four architectural features were observed above the hill: the main part of the site, and three separate rectangular structures on the south-eastern half of the hill. The main part consists of a complex structure with many internal divisions, and well-preserved external walls. Three caves are associated with the ruins and they seem to extend beneath the structure.

A flat exposed bedrock surface occupies the area southeast of the complex structure. A stretch of an ancient road ascends the hill from the south-eastern base, and can be easily tracked from there until it enters the centre of the site. This road could be a branch of a main road heading southeast and then southwest to Ṣadaqa via Wādī ar-Ruwayḥī, stretches of this road besides what might be road pavement were recorded in this wadi. To judge from the evidence of the pottery sherds, the site seems to have been settled during the Roman and Byzantine periods.

*Area VIII (***Fig. 25***)*

This area is encircled by the Ayl-Ma'ān road to the north, the Ma'ān-Aqaba road to the east and



25. Map shows the sites recorded in Area VIII (ref. map Jordan 1:50000 Ma'an 3150III K737).

southeast, the Ayl-Fardhakh-Ṣadaqa road to the west, and the newly constructed road between the Ayl-Fardhakh-Ṣadaqa road and the Ayl-Wahīda road to the south. Not too many archaeological sites were recorded there. However, some of them are worth mentioning.

A few kilometres to the east of Rujum Ṣadaqa (رجم الصدقة) and on the edge of the Khaṭṭ Shabīb lies Khirbat Layka خربة ليكة (site no.288). The site consists of a small collapsed structure surrounded by many stone circles. No internal divisions were noticed in the main structure, the outer walls can hardly be seen, particularly the western one. It is highly likely that the structure was originally one unit, a room or tower. This is very possible since the presence of simple structures in remote areas or on ancient roads is very common in the region. Moreover, at least one of the site's components whether the structure itself or the walls should have been coincidently built with the road. Pottery sherds of the Nabataean (first century BC onward), Roman (third century AD) and Ottoman periods were collected from the site.

By crossing the road between Ayl and al-Wahīda we came to a ruined hill known as Khirbat al-Wahīda (site no.289). A modern quarry at the hilltop disturbed the site. However, archaeological remains still exist on the hill. A wall which encloses the hilltop and many small and simple rectangular structures on the southwest half of the hill are still in good condition. The latter were most likely part of a pre-historic settlement to judge from the presence of some lithics and pottery sherds. Well-preserved parts of traditional houses occupy the north-eastern edge of the hill, and there is a possibility that it was built above a Nabataean or Roman structure if the pottery sherds of both periods reflect the existence of such structure. The spring at the north-western base of the hill must have been very attractive at least for the Nabataean.

About 3km east of al-Wahīda we came to the site of Khirbat Wahdān خربة وهدان (site no.290), it was a big surprise to find an archaeological site in such a remote area. The fact that a spring is a few hundred metres southwest of the site has explained our surprise. Also, three features were identified in the site, remains of irregular structure, enclosures or walls and many cairns. The structure was deliberately located on the edge of Wādī al-Wahīda and extended further southwest to incorporate a natural cave. Unfortunately, the structure's plan is not preserved well enough to understand its function. Remains of walls and an enclosure were strangely located in the gully. However, a very obvious wall seems to have been built to protect the structure from any possible flood from the wadi. Many cairns or simple stone circles were seen in the plain to the west of the structure. Within the circles the ground is massively covered with very small pebbles.

Conclusion

Although the main purpose behind the survey of the region of Udhruḥ was to support the present author's thesis, the data that was collected from the region is enormous and can be considered in many academic papers. The 291 sites recorded in the survey not only show intensity in settlement but diversity in the function and date of these sites. Archaeological remains dating from the prehistoric periods up to the Ottoman period were found in the area.

The outcomes of this project are many. Firstly, in addition to recording a large number of sites, plotting these sites on maps which has never been on before, apart from the sites which were recorded by 'Amr (2001 and 1998), will be very useful. Secondly, identifying certain sites for future investigations particularly excavations, especially these which are already disturbed or might be affected by human activities and natural factors. Thirdly, analysing the accumulated data, in the author's thesis, will offer a clearer picture about the history of human activity in the region of Udhruḥ, particularly in the first millennium AD. Finally, it is important to assert that this is just a preliminary report, final results and conclusions would be available in the future.

Acknowledgement

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41 St.Keverne Square
Newcastle upon Tyne
NE5 3YF
England
Email address
fawziabudanh@yahoo.co.uk

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RESULTS OF MORTAR AND STONE MATERIALS SAMPLING DURING THE ARCHAEOLOGICAL MISSIONS OF 2002 AND 2003

Giovanna Cecchi

In the course of the Archaeological Mission of the Italian Institute for Africa and the Orient (Is. I. A. O., Rome), as part of the Rabbathmoab Regional Project (Calzini 2004), conducted in Jordan in June-July 2002 and October-November 2003, two sampling campaigns on mortars, plaster and stone material were carried out at the monumental-archaeological site of ar-Rabba, the "Birkah" — a large cistern near the town of ar-Rabba (الربّة) — the archaeological site of al-Qaṣr and a stone quarry located nearby (**Fig. 1**).

This paper will in particular report the results of tests conducted on mortars sampled in the archaeological site of ar-Rabba, as well as on the stone material collected from the quarry in the vicinity of al-Qaṣr.

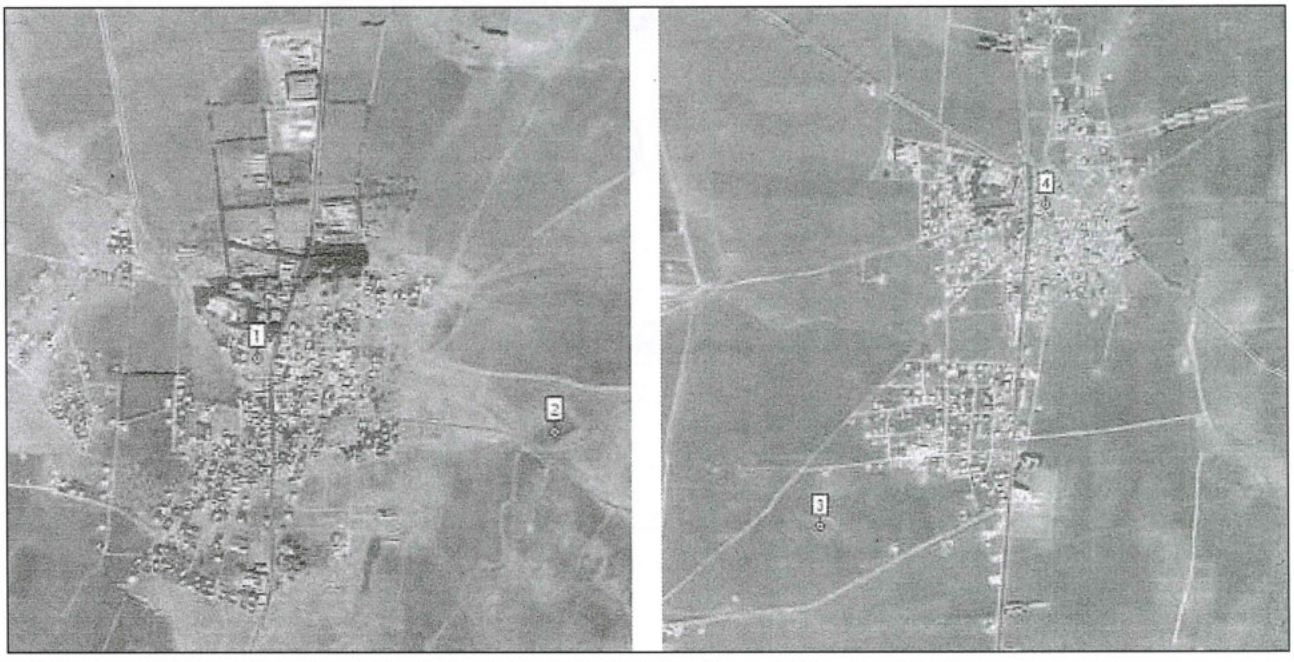
Analysis of Mortar Samples Collected in the Archaeological Area of ar-Rabba

The sampling and analyses conducted on the materials from the ar-Rabba archaeological area purpose to offer elements useful in evaluating the attribution of the different historical phases that concerned the buildings.

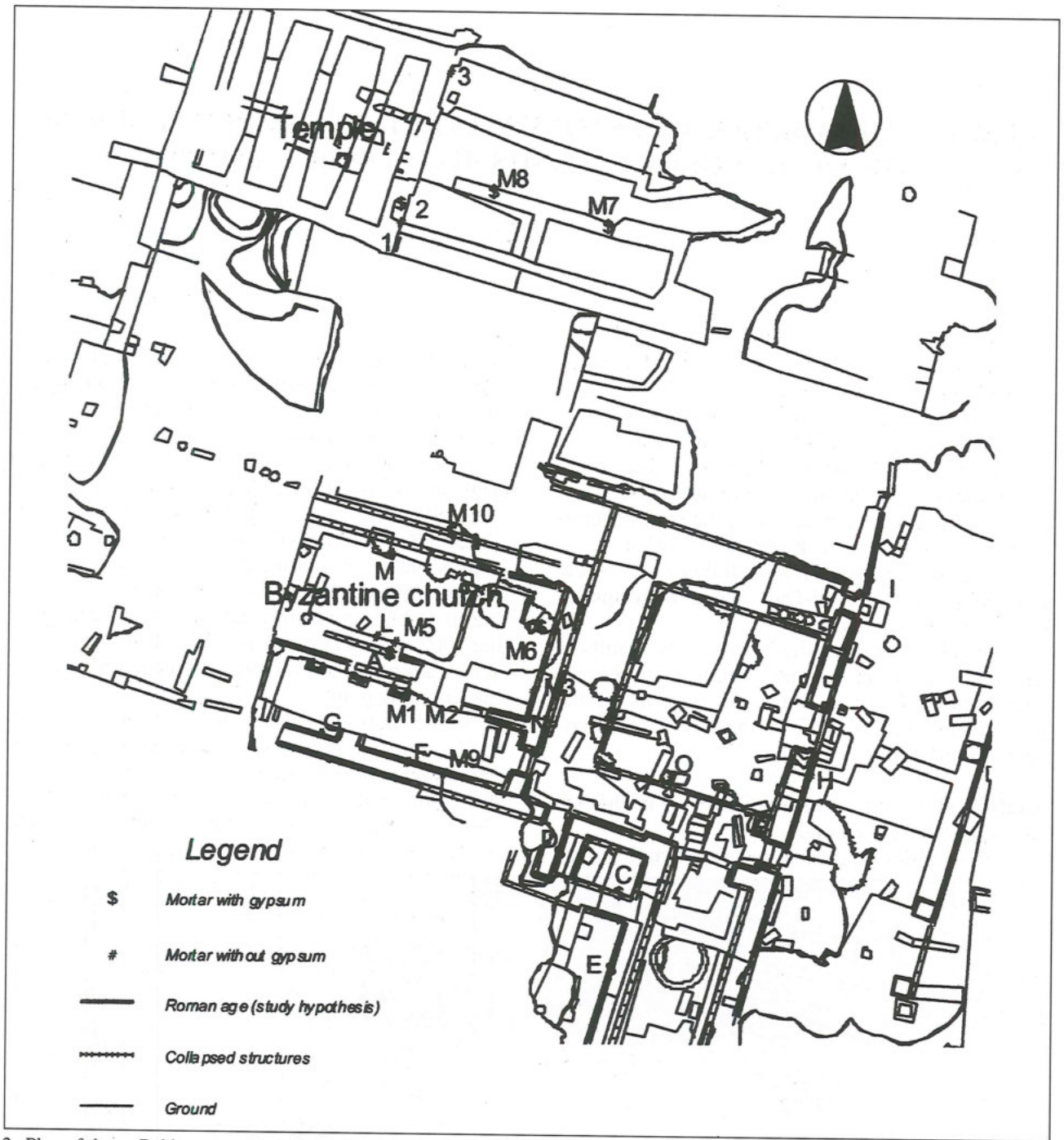
More specifically, it was decided to conduct analyses aimed at verifying the study theses formulated by Dr. Jacqueline Gysens Calzini and architect Roberto Sabelli, concerning the Roman phases and the Byzantine church.

Twenty-four mortar samples were collected at the ar-Rabba archaeological site in the course of the 2002 and 2003 missions, (**Fig. 2**) shows the exact location of each sample and the photograph of the sampling point.

In the analysis phase, a distinction was made on the basis of the presence or absence of gypsum in the cement, in this paper, we shall only describe the results of the analysis of the ten samples which, shown in **Fig. 3**, differ from the other sampled mortars because of the presence of gypsum.



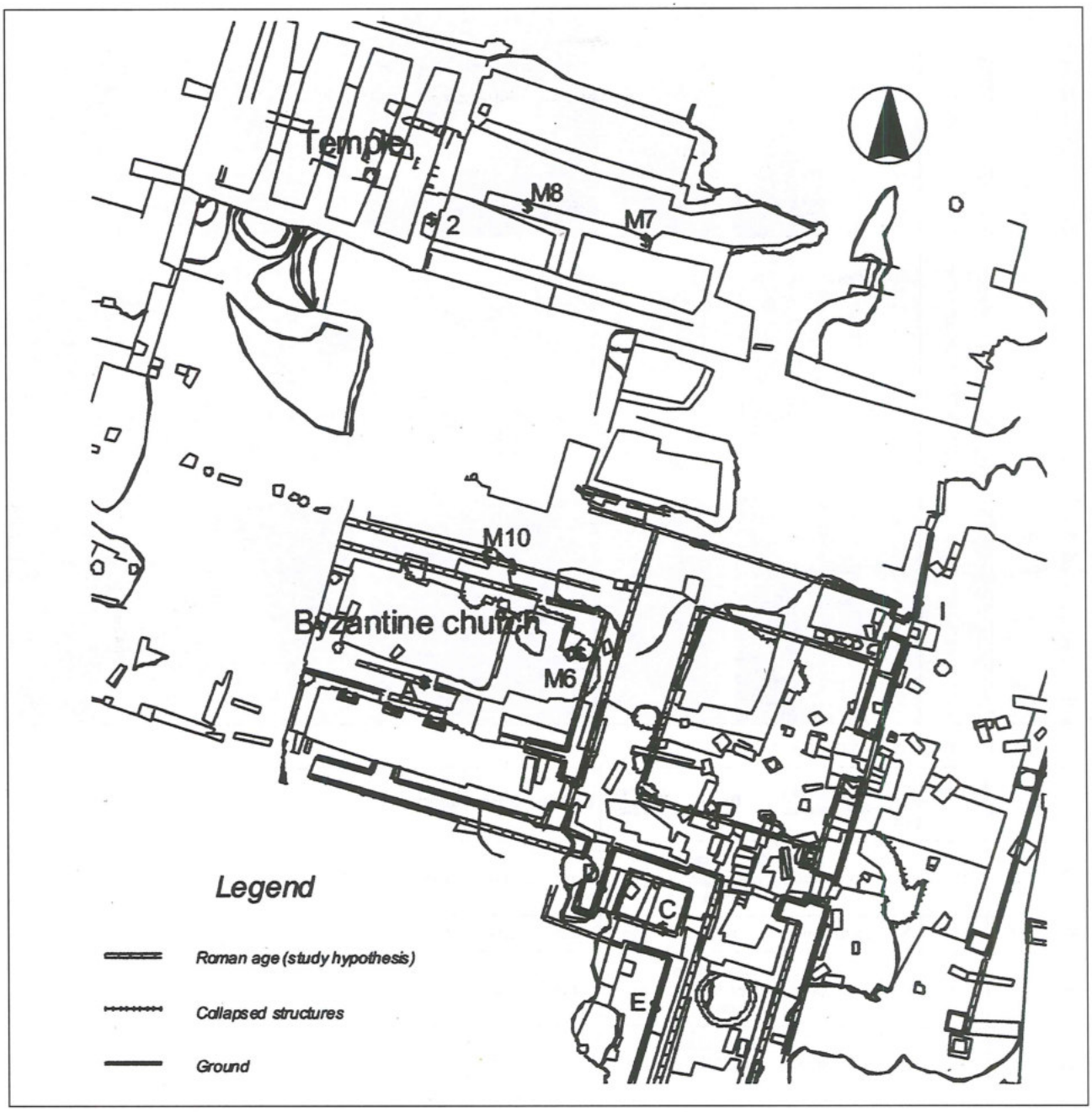
1. Monumental-Archaeological site of ar-Rabba; 2. the"Birkah"; 3. the Quarry; 4. Temple of al-Qaṣr.



2. Plan of the ar-Rabba monumental archaeological site (survey performed by architect Roberto Sabelli), the collection points of all mortar samples.

Nine of the ten gypsum-bearing samples present very similar features (**Fig. 4**): the intact samples are whitish in colour, moderately porous and have small-sized aggregates, rarely larger than 0.5cm. The fine portion is composed of percentages of calcium carbonate between 42% and 56%, of gypsum between 35% and 52%, and a scarce quantity (4 - 10%) of clayey minerals. The aggregate is almost entirely formed by gypsum crystals, accompanied by sporadic white, light grey or light brown flint. In several samples, sporadic grains of quartz, brick and carbon fibers are observed.

With the exception of sample M6, collected in the apse of the Byzantine church, and sample M8, collected from the arches opposite the façade of the Temple, all these very homogeneous samples were collected in association with structures identified as dating to the Roman period, thus strengthening



3. Plan of the ar-Rabba monumental archaeological site, the collection points of gypsum-bearing mortar samples.

the hypotheses formulated.

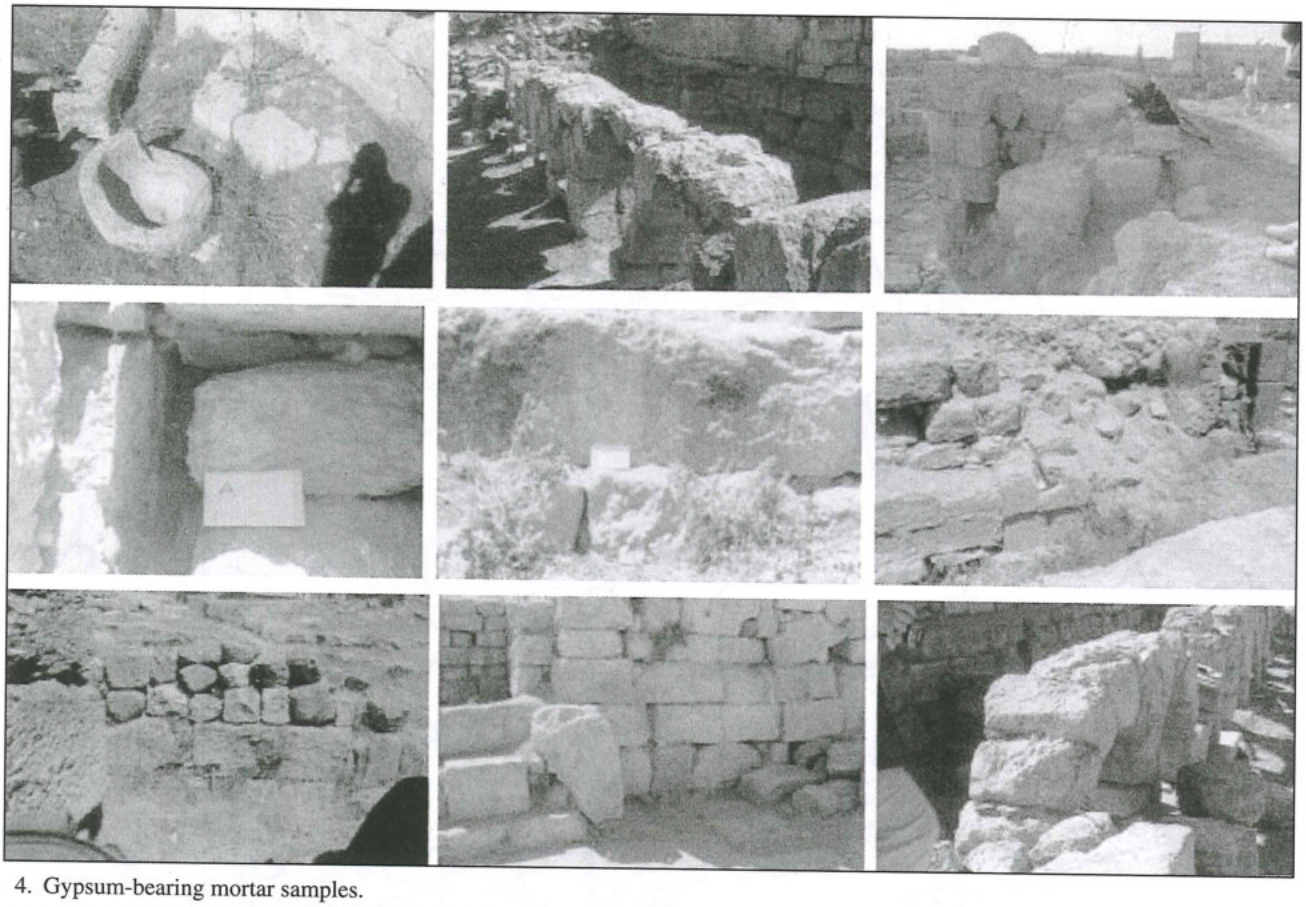
The tenth gypsum-bearing sample, M7, shows no affinities with any of the others, especially its higher percentage of calcium carbonate (78%) and large quantity of brick contained in the aggregate (**Table 1**).

Analysis of Stone Material Samples Collected at the al-Qaṣr Quarry

Field inspection performed in the course of the 2003 Archaeological Mission on several anomalies in the morphology of the territory detected by means of the stereoscopic observation of aerial photographs, among other interesting observations led to the discovery of a rectangular-shaped quarry measuring about 80 x 30 metres, and situated in the middle of a large flat field, 1.4km SW of the Temple of al-Qaṣr (**Fig. 5**).

Three walls of the quarry descend vertically for more than three metres, while the SW side of the rectangle slopes slightly and it too, formed the quarry floor (**Figs. 6, 7**).

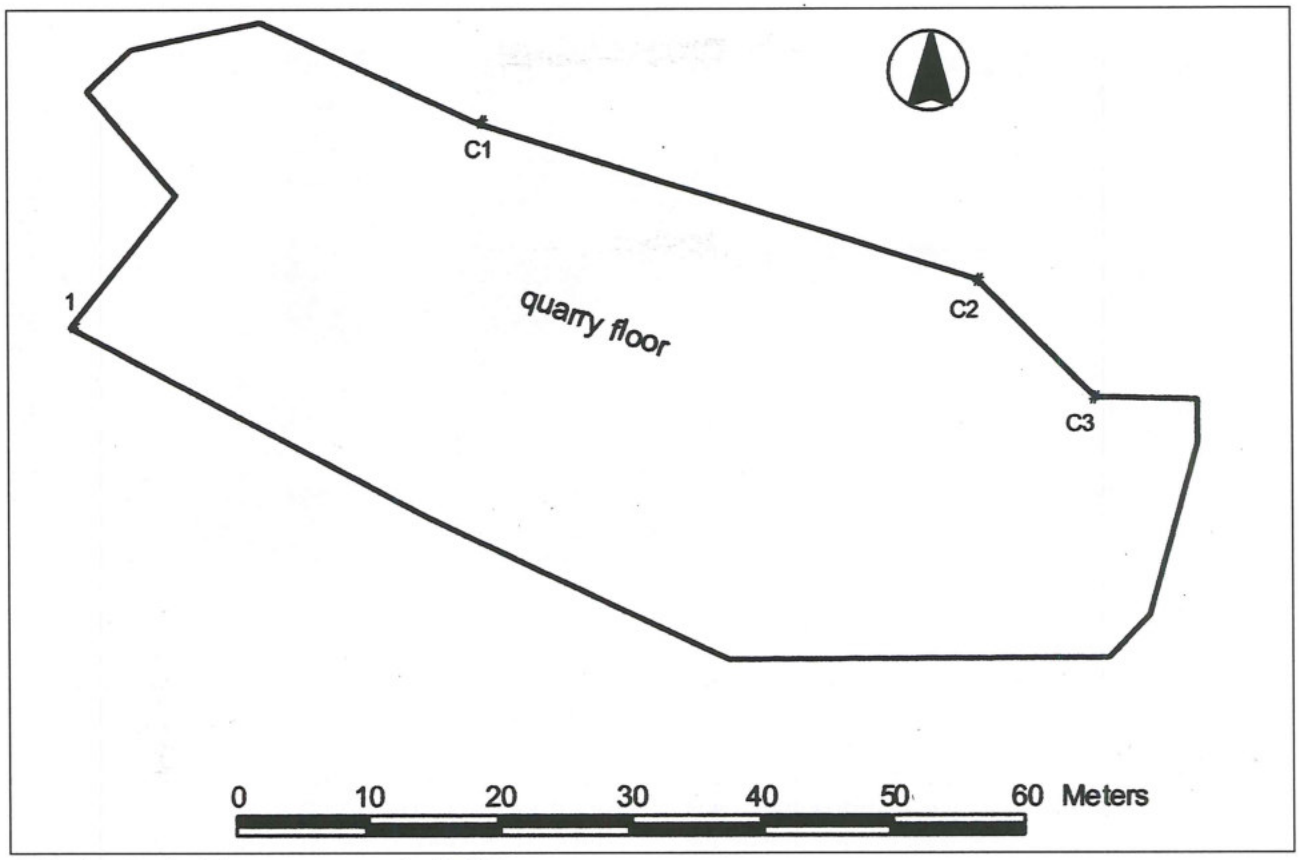
In the foreground of the photo on the upper right are three holes about 25cm in diameter and



4. Gypsum-bearing mortar samples.

	% $CaCO_3$	% fine mat.	% aggregate	aggregate dimensions	flint	gypsum crystals	carbon	brick	quartz	
2	45	45	10	up to 1cm	spor, white, grey, light brown	yes	no	no	spor.	
M6	55	37	8	up to 3mm	no	yes	spor.	spor.	spor.	
M8	54	40	6	above 5mm	spor, white, grey, light brown	yes	spor.	spor.	no	
M10	42	52	6	up to 3mm	spor, white, grey, light brown	yes	no	no	no	
A	50	40	10	up to 2mm	spor, white, grey, light brown	spor.	spor.	spor.	no	
C	52	44	4	up to 5mm	spor, white, grey, light brown	yes	spor.	no	no	
D	56	37	7	up to 5mm	spor, white, grey, light brown	yes	spor.	no	no	
E	42	48	10	up to 3mm	spor, white	yes	no	no	no	
I	55	35	10	up to 2mm	spor, white, grey	yes	spor.	no	no	ab. = abundant
M7	78	12	10	up to 3mm	grey, white	yes	ab.	50%	yes	spor. = sporadic

Table 1: Mortar samples with gypsum in the cement.



5. Outline sketch of the quarry, surveyed with GPS.



6. The quarry, overview from the SE summit.



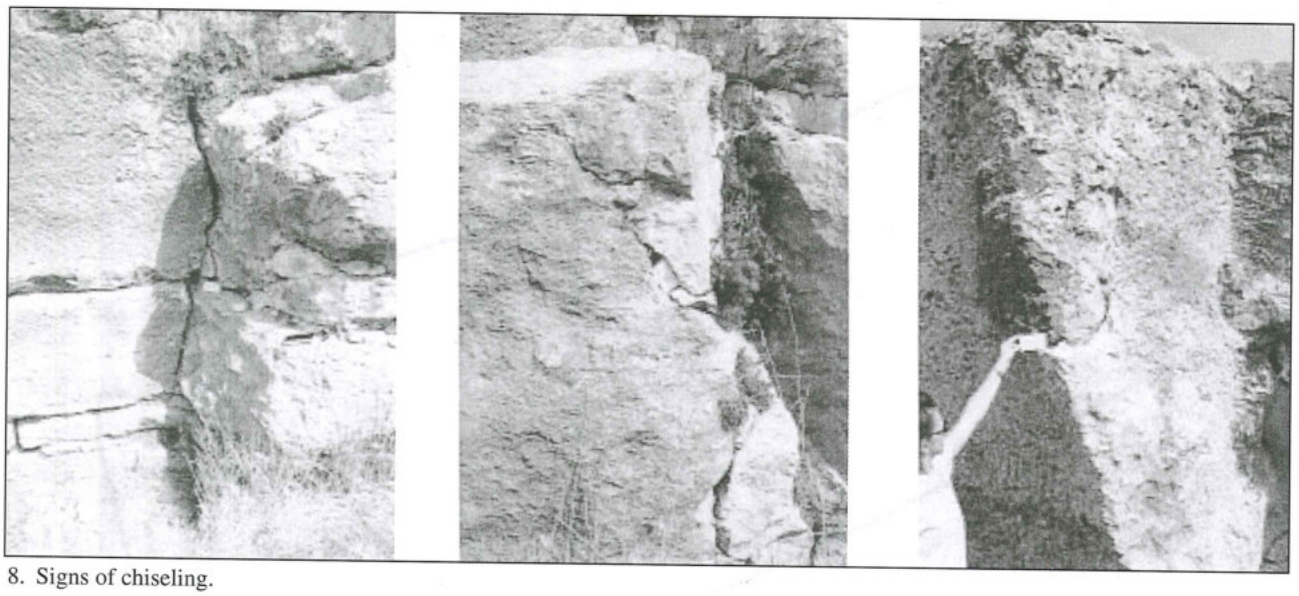
7. The quarry, overview from the SW summit (waypoint 1).

depth, made in the outcropping rock, presumably to secure the structures of a hoist.

The quarried material is a light fossiliferous silified limestone, subdivided into three layers, inclined about 20° southward. The base layer (C1) emerges at about 90cm; the intermediate layer (C2) is about 3m, and the upper layer (C3) about 2.5m. The uppermost layer, generally finer grained than the underlying layers, at its base presents a richer level of fossils than the others, with lamellibranches of dimensions of up to one decimetre, often filled with calcite crystals. It also presents large nodules or light brown levels of a strongly silified fossiliferous material.

Despite the frequent vertical fractures cutting through the layers, this site may have yielded blocks longer than 5 metres in length, especially layer C2 (**Fig. 8**), where the signs of chiseling and the forms resulting from the removal of blocks 50cm thick are still visible.

The excellent quality of the quarried material, its dimensions and the relative proximity to the temple of al-Qaṣr, have led to the hypothesis that this may have been one of the temple quarries. In order to verify this hypothesis, samples were taken from each of the three outcropping layers to be



8. Signs of chiseling.

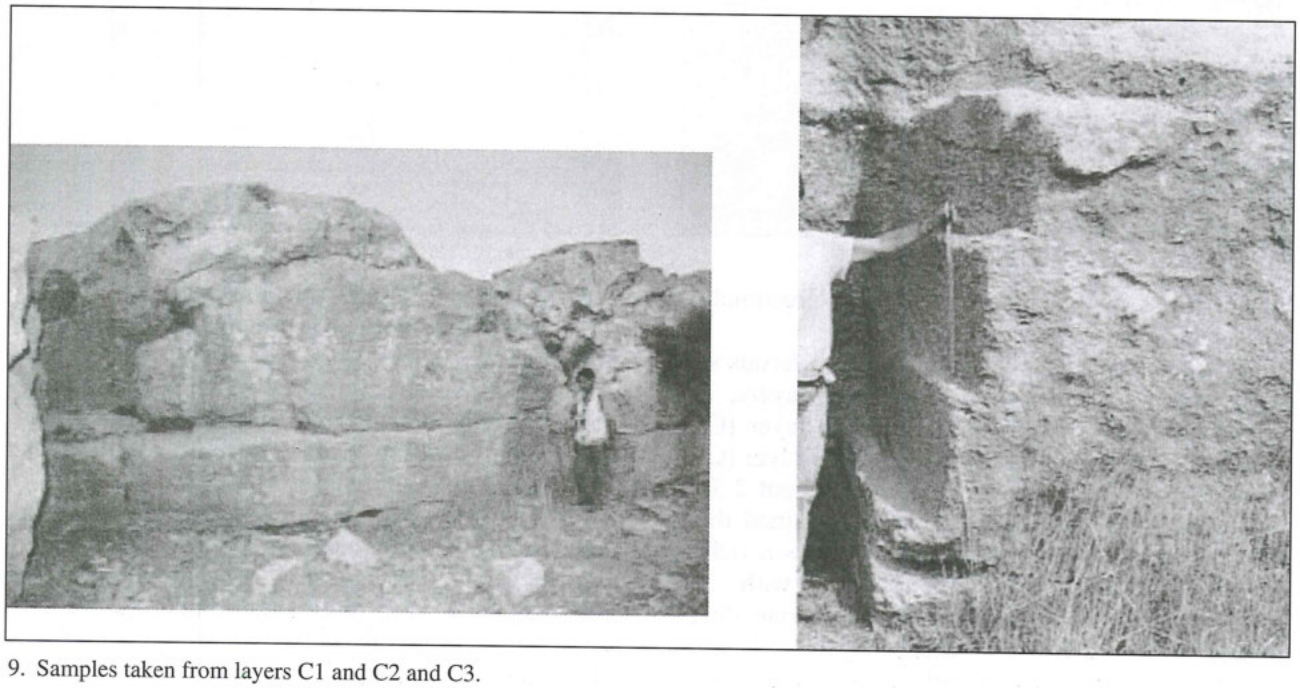
subjected to X ray diffractometry and thus be able to perform a comparative test with samples collected previously (1999 Mission) from the Temple of al-Qaṣr.

Figure 9 shows the diffractograms of the samples taken from layers C1, C2 and C3, and Figure 10 shows the results from their interpretation, each of which are flanked by the data of the comparable samples collected at the Temple.

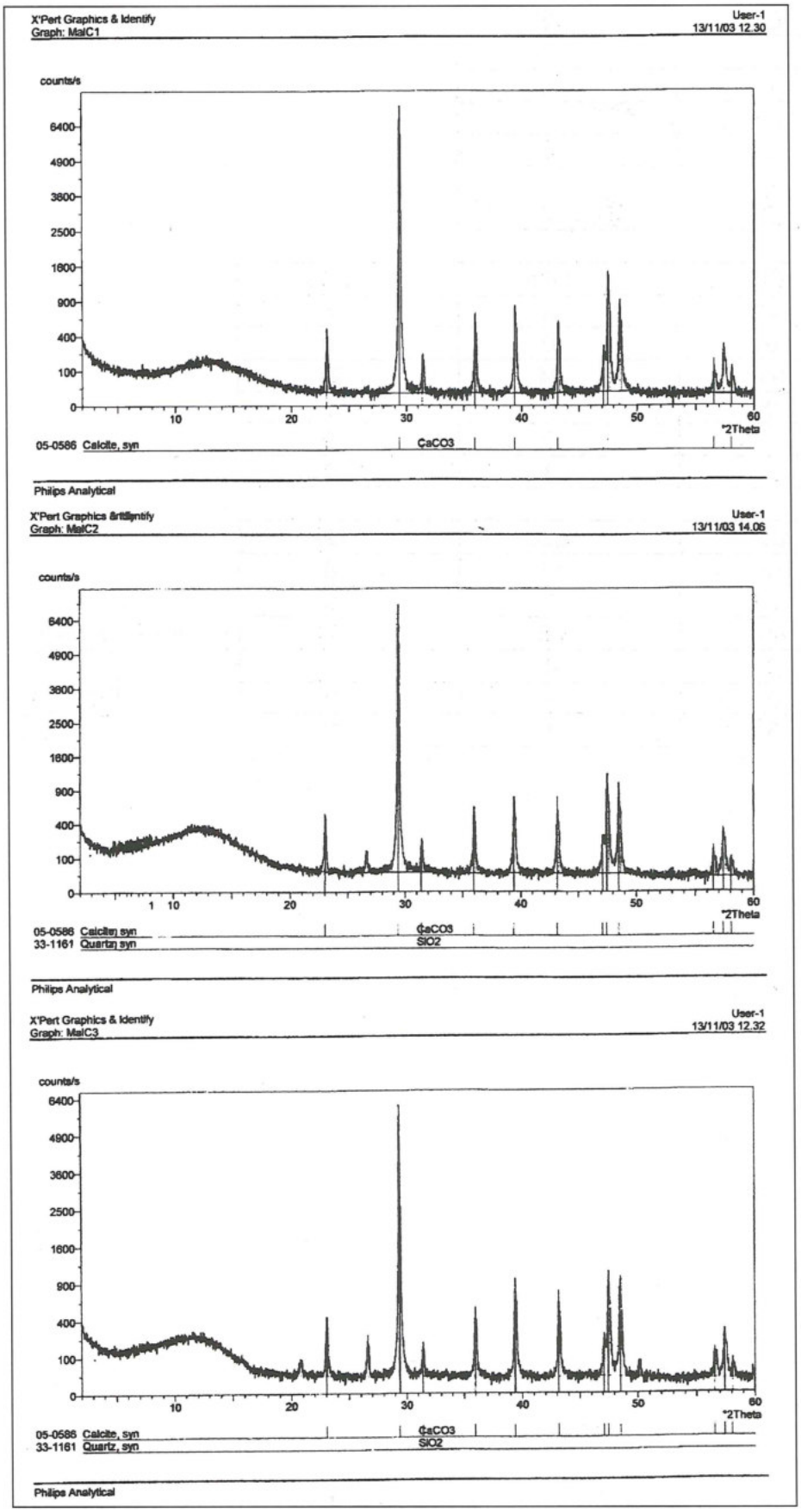
Table 2 shows the excellent association of the samples collected at the quarry with those of the temple, in particular, sample C1 with sample Q6, sample C2 with samples Q3b and Q4a, and sample C3 with samples Q2c and Q9.

The eight samples under examination all belong to bioclastic rock that formed in a sea environment above the storm level, with intermittent energy, and all recrystalized (diagenised). The bioclasts are formed for the most part by lamellibranches of dimensions of several centimetres. They can be classified as biomicrites (Folk) or as bioclastic floatstones (Durham). Lithologically speaking, they are bioclastic calcirudites except from samples C3, Q2c and Q9 (bioclastic calcilutites).

Giovanna Cecchi
University of Florence, Italy
Department Sciences of the Earth



9. Samples taken from layers C1 and C2 and C3.



10. Diagrams of the results.

	C1	Q6
Quartz %	2	3
Feldspar %	0	0
Limestone %	96	95
Dolomite %	0	0
Phosphate %	0	0
Phyllosilicate %	2	2

	C2	Q3b	Q4a
Quartz %	4	3	4
Feldspar %	0	0	0
Limestone %	94	94	94
Dolomite %	0	0	0
Phosphate %	0	0	0
Phyllosilicate %	2	3	2

	C3	Q2c	Q9
Quartz %	12	11	8
Feldspar %	0	0	0
Limestone %	85	85	89
Dolomite %	0	0	0
Phosphate %	0	0	0
Phyllosilicate %	3	4	3

Table 2: Association of the samples collected at the quarry with those of the temple.

THE TALL MĀDABĀ ARCHAEOLOGICAL PROJECT, PRELIMINARY REPORT OF THE 2002 FIELD SEASON*

Debra C. Foran, Timothy P. Harrison,
Andrew Graham, Celeste Barlow and Nola J. Johnson

Introduction

In July and August 2002, the Tall Mādabā Archaeological Project (TMAP) undertook a fourth season of excavation[1] on Mādabā's west acropolis as part of its ongoing examination of the development of urbanism in the southern Levant. The primary goal of this field research has been to collect archaeological data from the presumed urban center of the region in order to compare it with data collected from functionally differentiated settlements in the area. The modern town of Mādabā (مادبا), located 30km southwest of 'Ammān, lies directly over the ancient settlement, which is still visible in the topography of the site, constituting a large low-lying tall and acropolis that creates a rise in the town center.

The current field phase of TMAP began with a preliminary season in 1996, which aimed to create an integrated base map outlining the extent of the site's settlement area, and to establish a stratigraphic profile of the lower mound (Field A) (**Fig. 1**). In 1998, full-scale excavations were initiated along the western slope of the upper mound (or 'acropolis') of the tall. The main objective of this work has been to develop a detailed record of the major cultural strata present at Tall Mādabā (تل مـــادبا). This report will present the preliminary results of the 2002 field season (for a more detailed description of the project research objectives and the results of these previous seasons, see Harrison 1996; Harrrison *et al.* 2000; and Harrison *et al.* 2003).

The 2002 season contributed to the ongoing TMAP field effort to map the architecture and gather quantifiable artifact assemblages for each of the principal occupational phases present on the west acropolis. The project had two main goals for the field season: 1) to continue excavations in two units in the area to the east of the town fortification wall (Field B) (**Fig. 1**) with the aim of uncovering Iron Age levels first recorded in 1998, and 2) to complete excavation of the Late Byzantine / Early Islamic complex west of the pre-classical fortification wall (Field C) (**Fig. 1**), which was originally exposed by bulldozing activity in the early 1980s.

Consolidation and restoration work on the Field C building, begun by TMAP in 1999, continued throughout the 2002 season. Efforts focused on stabilizing the exposed walls and standing architecture, as well as consolidating and repairing the various mosaics that have been uncovered. In addition, a mosaic pavement that had been removed from the site in the early 1980s was restored and reinstalled on site. This project continued after the end of the excavation season, and was completed in December of 2002.

Field B Excavations

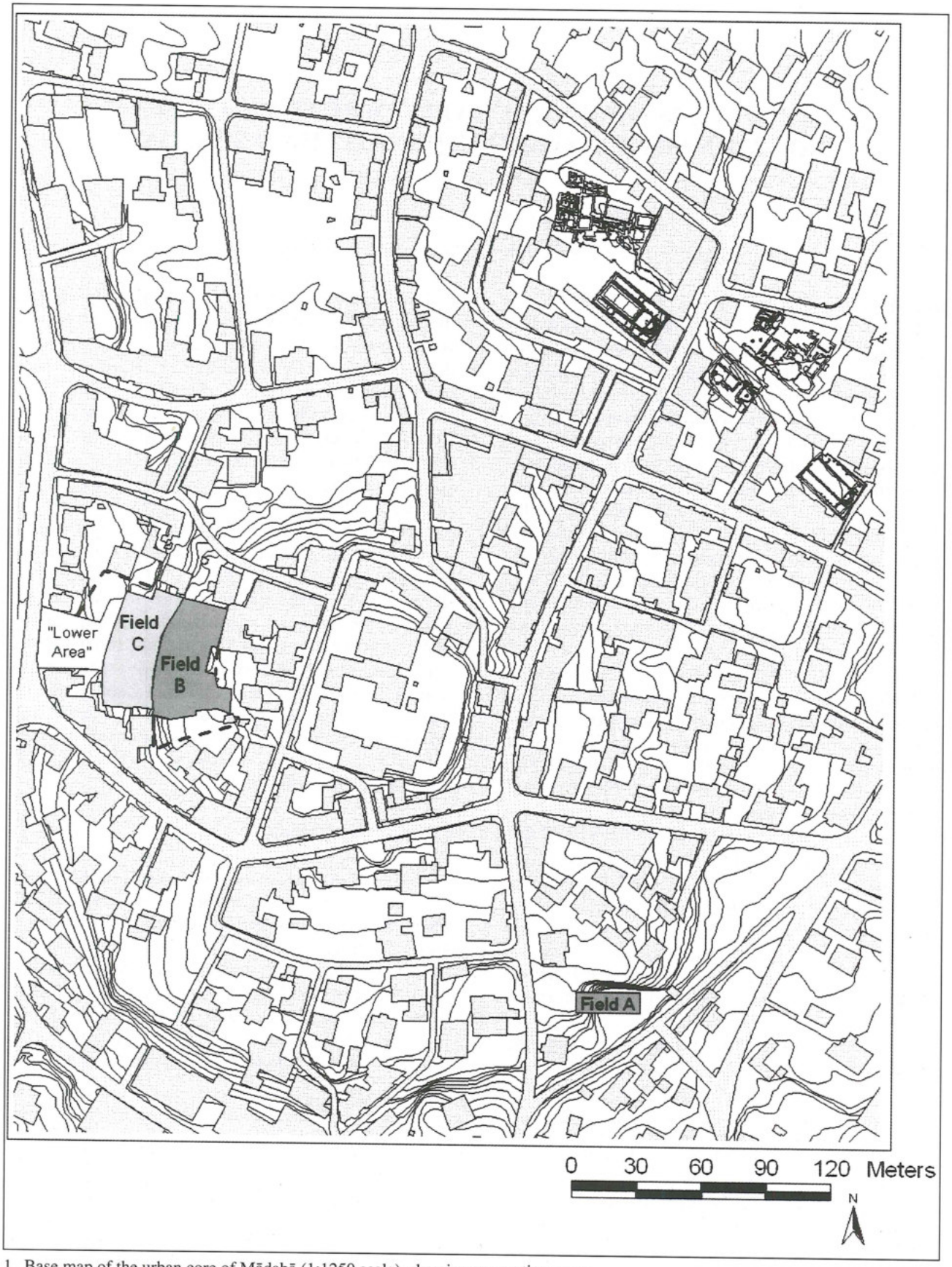
Architecture

To date, the excavations in Field B have uncovered remains dating to the Late Ottoman (Field Phase 1), Early Roman/Nabataean (Field Phases 2 and 3), Late Hellenistic (Field Phases 4 and 5), and Iron II (Field Phase 6) periods. The primary goal of the 2002 season in Field B was to continue excavation of the Iron Age remains first encountered during the 1998 season. To this end, two units (Squares 5M21V3 and 5M21U4) were reopened on

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* Specific contributions were made by individual authors to the following sections: Fields B and C architecture (A. Graham), Field B ceramics (C. Barlow) and Epigrphic Remains (N. Johnson).

1. The 2002 excavations were directed by T. Harrison (Director) and D. Foran (Assistant Director), with the assistance of C. Barlow (Field Lab Supervisor), A. Graham (site photographer and architecture project coordinator), T. Griffith (Faunal Specialist), F. Haughey (Illustrator), and the following Square Supervisors, Annlee Dolan (also ceramic lab), J. Ferguson (also flotation lab), Stanley Klassen, and Jode MacKay (also flotation lab). The 2002 student volunteers consisted of J. Barlow, D. Bilton, Y. Bourdeau, C. Brown, L. Butler, S. Crocker, S. De Decker, E. Fetterolf, D. Fraser, P. Grenon, K. Harrington, A. Harrison, J. Jackson, A. Joachim, K. Jones, M. Larocque, M. Maitland, A. McBride, C. Morgan, J. Osbourne, J. Quinlan, S. Radil, L. Service, S. Spadafore, J. Sproule, A. Subtelny, L. Welton, A. Zanghellini-Silva. Yazid Elayan served as the Department of Antiquities representative for the 2002 field season.

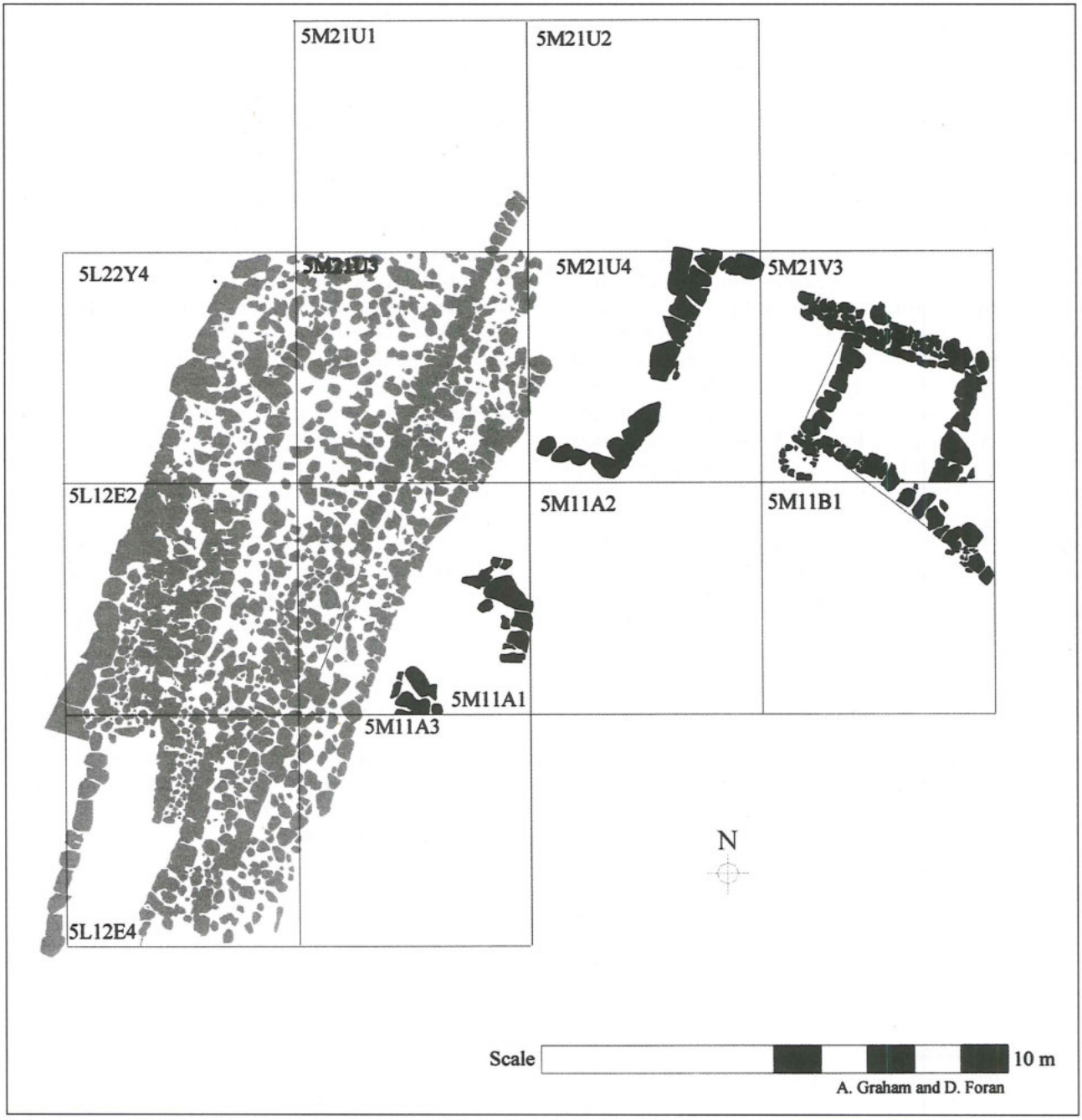


1. Base map of the urban core of Mādabā (1:1250 scale), showing excavation areas.

the northern edge of the excavated area, to the east of the large fortification wall (**Fig. 2**).

Square 5M21V3, in the northeastern corner of the excavation area, contained a room with a large pit of stones in the center (**Fig. 2**). During the removal of this pit, a significant amount of Late Hellenistic material was recovered, indicating that it may have been the result of later activity that penetrated down into this Iron Age structure. Once the pit was removed, two surfaces with flat lying pottery, stylistically dated to the Iron IIB period, were discovered. The walls of this room were built of medium-sized unhewn stones, and slumped toward the interior of the room. These roughly-built walls rested on the upper course of a wall made of large hewn boulders. These more substantial remains date to an earlier, as yet unexcavated, phase and were reused in Field Phase 6 as foundation walls.

The initial excavations in Square 5M21U4, to the west of 5M21V3 (**Fig. 2**), concentrated on the removal of a series of ash layers, the result of post-destruction abandonment debris accumulation. The



2. Plan of Iron Age Architecture in Field B.

removal of these deposits exposed more of the inner face of the monumental town fortification wall to the west. Under these ash layers were the remains of a north-south wall with a possible doorway. The quality and size of the stones used in the construction of this wall indicate that it was associated with the earlier phase walls in Square 5M21V3. Excavations to the east of this wall produced evidence of a substantial destruction, resulting from an intense fire, with some building materials having become vitrified in the conflagration. Sealed by this destruction layer were three well-preserved *ṭābūn*(s) and the remains of a surface.

Ceramics

The 2002 excavations in Field B produced a large corpus of Iron IIB ceramics, forming an assemblage of forms typical of the 9th/8th through early 7th centuries BC. Fine wares were well-represented, and were characterized by bichrome painted bands in red and brown (**Fig. 3:1-3**). Included amongst the common wares were small bowls (**Fig. 3:4-6**), some of which have slightly carinated walls (**Fig. 3:5**), as well as deep bowls (**Fig. 3:7-9**) that display a triangular-shaped folded rim. Kraters (**Fig. 3:10-12**) were also commonly found in the Iron Age deposits, along with single ridged cooking pots (**Fig. 3:13-14**). Storage vessels made up a significant portion of the assemblage. These included large storage vessels with rolled rims (**Fig. 3:15-16**), and a variety of smaller jars (**Fig. 3:17-20**), including an ovoid storage jar (**Fig. 3:19**). Jugs and juglets (**Fig. 3:21-24**) also formed an integral part of the assemblage.

Small Finds

The Field B excavations yielded a considerable number of small finds. These included a fragmentary female figurine holding an object in her left arm (**Fig. 4:1**), and a long copper spatula (**Fig. 4:2**). Ground stone tools were well attested in the corpus, including a complete basalt bowl (**Fig. 4:3**), a fragment of a sandstone millstone (**Fig. 4:4**), a complete basalt pestle (**Fig. 4:5**), and several limestone (**Fig. 4:6-7**) and chert (**Fig. 4:8-10**) hammerstones. A number of ceramic spindle whorls were also uncovered (**Fig. 4:11-17**), two with only partially completed center holes (**Fig. 4:15-16**).

Iron Age Mādabā

Textual sources emphasize the central importance of Mādabā during the Iron Age, when the surrounding region became a battleground contested by the rival nation-states of Ammon, Israel and Moab. The Israelite King David is said to have defeated a coalition of Aramaeans and Ammonites in the vicinity of Mādabā early in the 10th century BC (I Chronicles 19:7ff; cf. II Samuel 10). According to the Mesha Inscription, Mādabā was still under Israelite control ("the house of Omri") when Mesha captured (lines 7-8) and rebuilt the town (line 30) along with a series of other cities on the tableland in the mid to late 9th century BC. The town and region appear to have remained part of Moab until the end of the Iron Age, as Mādabā is listed with other Moabite towns in a biblical oracle (Isaiah 15:2) forecasting the devastation of Moab.

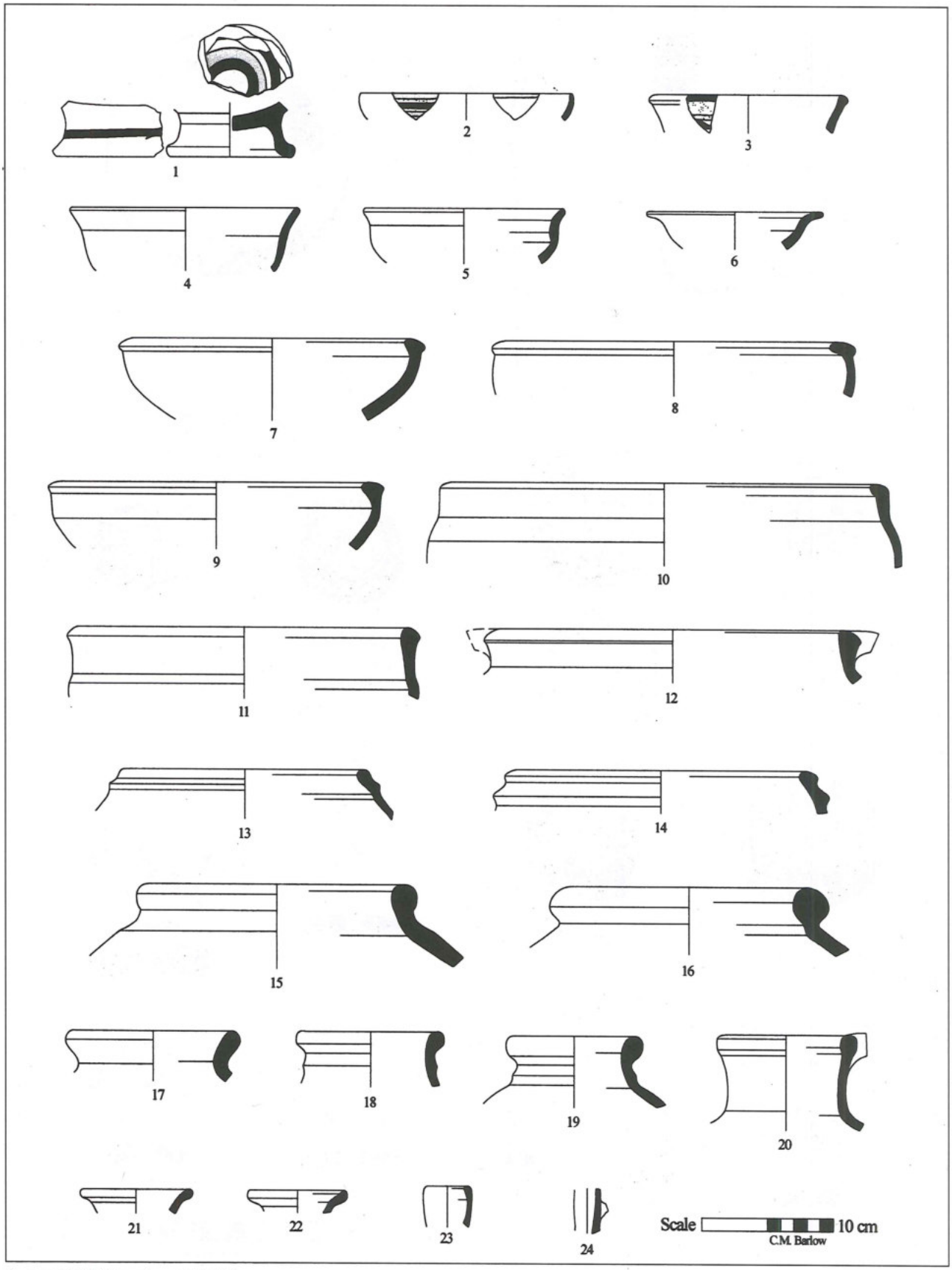
The Iron IIB remains in Field B, though only partially excavated, nevertheless strongly substantiate the view of a flourishing settlement during this period, possibly reaching as large as 13-16 ha in size, as first indicated by the 1993 surface survey (see Harrison 1996). In addition to establishing an Iron IIB date for the final use-phases of the 7m wide town fortification wall (Harrison *et al.* 2003), as a result of the 2002 field season, the Field B excavations have now successfully delineated the well-preserved remains of at least two occupational phases that date to this period (ca. ninth/eighth-seventh centuries BC). The later of these two phases was clearly less substantial than the earlier one, which preserved architectural remains constructed of carefully-hewn, boulder-sized stone, suggesting the possible existence of a large public complex in this earlier phase.

Although the Field B results are still preliminary, they nevertheless continue to raise the possibility that these Iron Age remains were part of an ambitious building program inaugurated by Mesha in the latter part of the ninth century BC. In addition, as noted previously (Harrison *et al.* 2003), the ceramic industry associated with these remains reflects close cultural ties with sites to the west and south of Mādabā historically attributed to the Moabite realm, including Khirbat al-Mukhayyaṭ خربة المخيط (ancient Nebo), Mā'in ماعين (ancient Ba'al-Ma'on), Khirbat 'Aṭarūz عطروز(ancient 'Ataroth), Libb لب (ancient Bamoth?), Khirbat al-Mudayna خربة المدينة (ancient Jahaz?), and Dhībān ذيبان (ancient Dibon).

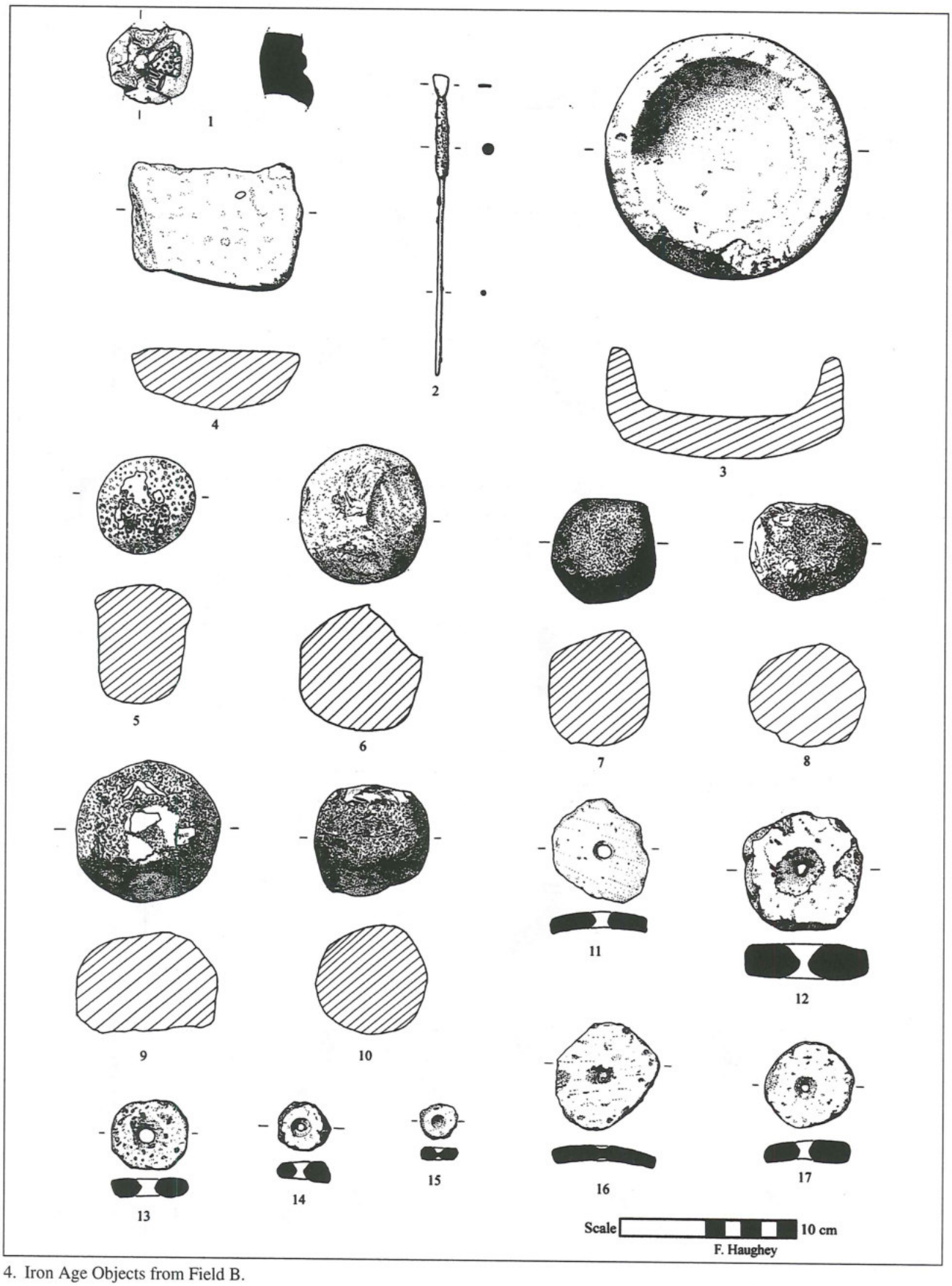
Field C Excavations

Architecture

The past five seasons of excavation at Tall Mādabā have revealed a number of rooms from a large complex built against the exterior, western face of the pre-classical fortification wall (**Fig. 5**). The structure was constructed on a series of bed-



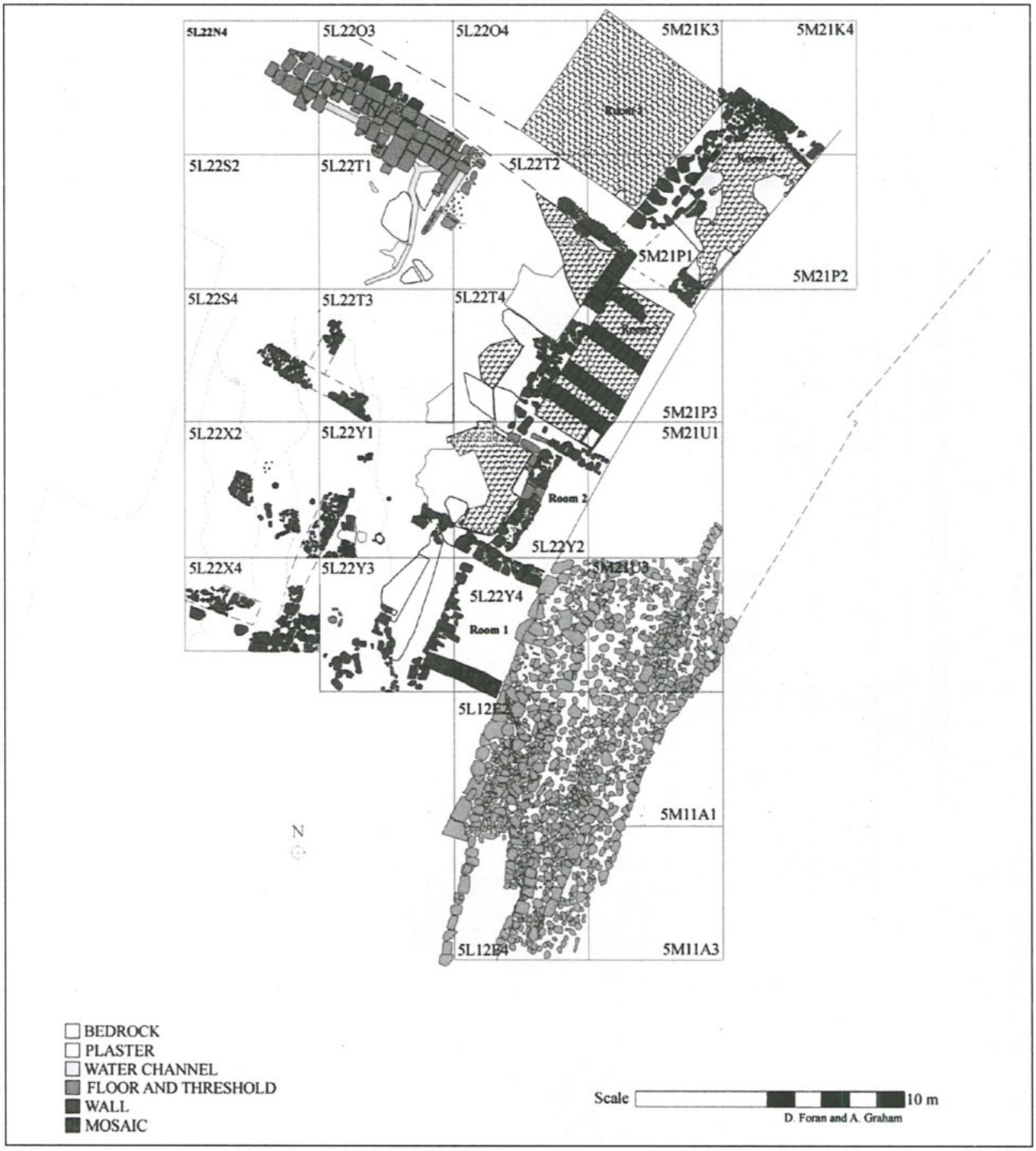
3. Iron IIB Pottery from Field B.



4. Iron Age Objects from Field B.

rock ledges, facing west toward a north-south street that would have intersected with the main cardo on the north side of the acropolis. There are several features of this building 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 eighth/early ninth centuries AD).

During the initial construction phase, the southern-most room, Room 1 (Squares 5L22Y3 and 5L22Y4; see **Fig. 5**), was paved with a mosaic that was removed in the 1980s. The eastern portion of this pavement depicted a field of rosebuds, with a



5. Plan of the Late Byzantine/Early Islamic Complex in Field C.

geometric panel framed by a double-swastika meander border to the west (Piccirillo 1989: 140-141; see also **Fig. 13**). The second construction phase in this part of the complex saw the installation of a vault, made of finely hewn stone blocks, which was inserted between the older, existing walls to help support a second storey room paved with a white plastered 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 a window in the southern wall and a doorway in the northern wall that once led to Room 2.

Room 2 (Square 5L22Y2; see **Fig. 5**), to the north of the vault, was entered through a doorway in its western wall equipped with a stone threshold. The floor consisted of a simple beaten earth surface. Parts of the western wall and doorway to Room 2 had been repaired, using small stone ashlars. The area in front of Room 2 was paved with a plain white mosaic, and its perimeter was delineated by carved bedrock complemented by stone and mortar construction. A bench was located along its north and west walls, and also acted as a step in front of the doorway to Room 2. An entrance, which was found sealed by a blocking wall, linked this area with Room 3 to the north (Squares 5M21P3 and 5L22T4; see **Fig. 5**).

Room 3 had four east-west arches that spanned the width of the room, supporting a second storey mosaic floor (**Fig. 6**). These arches were anchored to an east wall built directly against the exterior of the pre-classical fortification wall. The floor of Room 3 was paved with a plain white mosaic floor. A stone-carved basin was set into the floor in the



6. Northeast corner of the Field C Complex.

southeast corner of the room. The mosaic on the second floor was preserved only in a small strip along the top of the east wall of Room 3. A second stone basin was located in its northeast corner.

The area to the west of Room 3 was divided by a wall with a bedrock foundation. The southern portion was paved with a plain white mosaic floor. The northern section had a polychrome mosaic floor 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. A large flagstone floor (Squares 5L22N4, 5L22O3, and 5L22T1; see **Fig. 5**) was built against the southern face of the continuation of this wall to the west. The corners of each flagstone had been chipped away on their undersides to allow them to be supported in suspension by small chink stones. Two drains carved directly into the bedrock, and fed by a large channel equipped with a series of check dams, ran beneath this flagstone floor, which clearly formed the central courtyard of the complex.

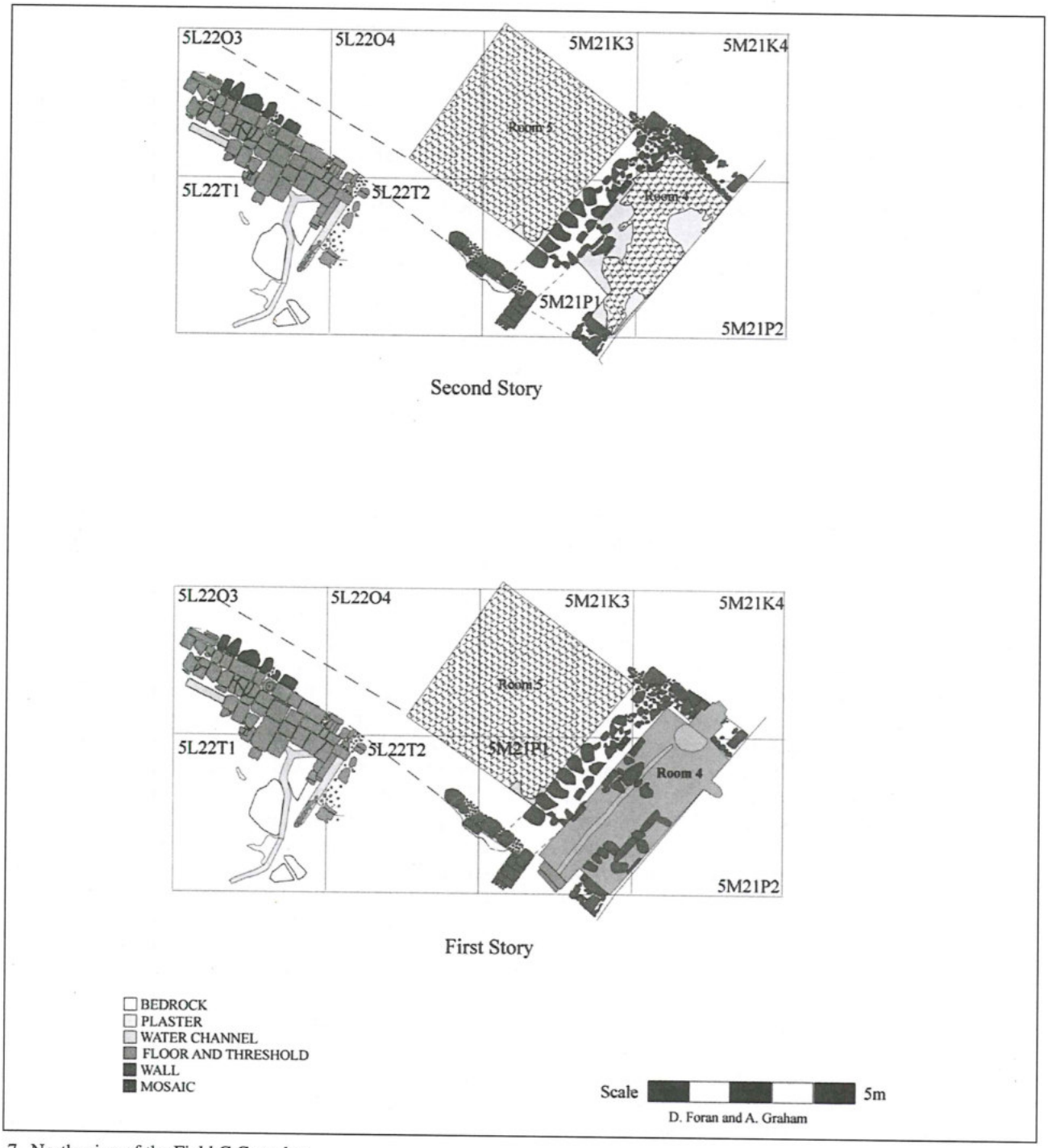
The 2002 excavations in Field C focused on two additional areas of the complex: 1) a large, partially exposed bedrock ledge in the center of the complex that measured approximately 15 x 20m, and 2) an area to the north of these rooms, approximately 8 x 10m in size. Due to previous bulldozer clearing activity, the level of preservation on the bedrock ledge was expected to be poor. Nevertheless, the excavations succeeded in uncovering a number of features still *in situ*, albeit considerably damaged. A series of small retaining walls (in Squares 5L22S4, 5L22T3, 5L22x2, 5L22x4, 5L22Y1, and 5L22Y3; see **Fig. 5**), on average approximately 2m long and 0.8m wide, were built to complement the bedrock in this area, which descends in step-like terraces to the west, thus creating flat surfaces for the floors in this part of the complex (depicted in upper right corner, **Fig. 6**). Though fragmentary, these walls help to delineate the parameters of the rooms that once formed this southern wing of the building. The bedrock in this area also contained a number of holes, on average 0.20m in diameter, which were probably the sockets for doorposts. The excavations in this area also uncovered additional portions of the flagstone floor and water channels first exposed during the 2000 field season.

The second excavation area, along the northern edge of the complex (Squares 5L22O4, 5M21K3, 5M21K4, 5M21P1, and 5M21P2; see **Fig. 5**) produced two additional rooms, one of which was preserved to the second storey (Room 4; see **Fig. 7**). The upper floor of Room 4, which measured 6 x 2.9m, was paved with a largely intact white mosaic (visible in lower left, **Fig. 6**). 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. The southern wall of the room had been destroyed in antiquity. This upper pavement sat on a series of large stone roofing slabs, which were supported by three arches anchored to the walls of the room below.

The walls of the first floor room (Squares 5M21K1, 5M21P1, and 5M21P2; see **Fig. 6**), which measured approximately 6.4 x 2.6m and stood three meters in height, were found intact. The floor was hewn directly out of the bedrock, with a channel (5.6 x 0.2m) cut down the center. This channel ran in a north-south direction, leading to a shallow basin against the northern wall. This wall (8 x 1.15m), which also formed the northern, outer wall of the complex, contained a window that had been blocked in antiquity, with a sharply cut ledge beneath it. Room 4 was entered through a doorway in the southern wall that separated it from Room 3. Three large stone bins were installed to the east of this doorway.

Excavations to the west of Room 4 uncovered a second well-preserved room, Room 5 (Squares 5L22O4 and 5M21K3; see **Fig. 7**). The floor of Room 5 was paved with a polychrome mosaic (5.7 x 5.5m), entirely intact except for two minor damaged portions in the center, and the southwest corner of the room, which had been destroyed by earlier bulldozer activity. The decoration of the mosaic consisted of a polychrome grid-pattern of cruciform flowers enclosing serrated squares, executed in black, red, yellow, and white, with a polychrome triple-filet border (**Fig. 8**). Two rows of larger cruciform flowers flanked the eastern edge of the mosaic, with a single row forming a border along the northern and southern sides. The western side was decorated with a well-spaced row of polychrome serrated lozenges.

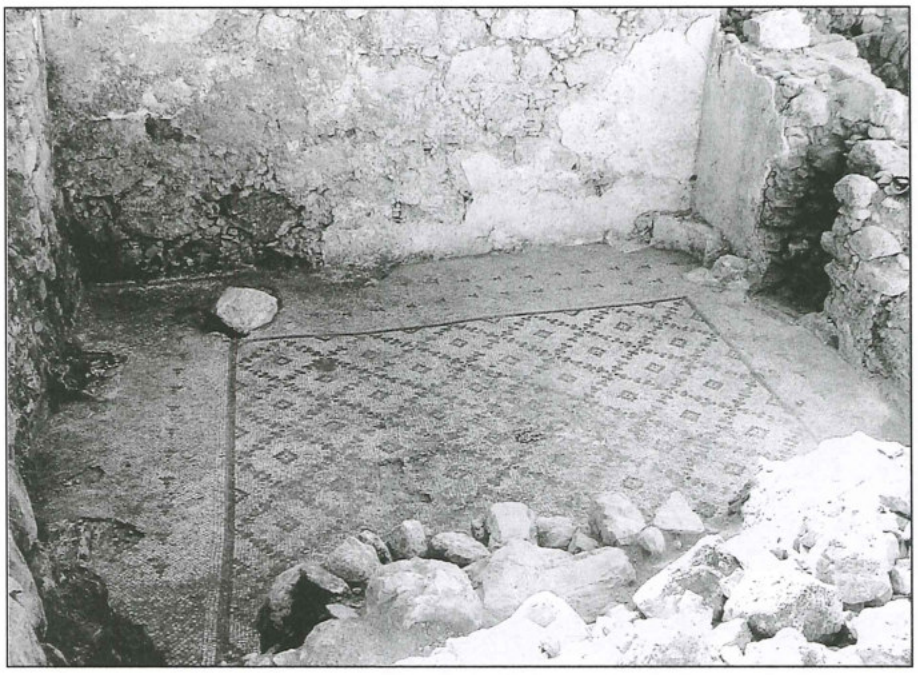
Traces of four arch supports were also uncovered in Room 5, two along the northern wall, with matching springers outlined by a border comprised of two rows of white tesserae along the south wall. These springers clearly had once supported two large arches that in turn had supported a ceiling, and possibly a second storey. A stone basin, measuring approximately 0.50 x 0.25m, was embedded into the mosaic floor midway along the western side of the room. This installation is very similar to the ones found in Room 3. The soil deposits above the mosaic floor contained large quan-



7. North wing of the Field C Complex.

tities of tesserae, providing further support for the existence of a second floor. A number of mortar patches and repairs, the latter accomplished with large white tesserae, were made to the mosaic along its western edge. It was not possible to excavate the northwest corner of Room 5, due to the presence of an obstructing modern retaining wall.

A small plastered niche (1.6 x 0.9m) was uncovered directly on top of the mosaic floor in the southeast corner of Room 5 (visible in upper right corner, **Fig. 8**), indicating that it was a later addition to the room. The upper portions of the niche had been destroyed in antiquity, although traces of plaster were found still adhered to the walls behind it, providing some evidence that the niche had once stood at least 2m in height, and possibly had even reached the ceiling directly above it. In addition, traces of a yellow painted design were found pre-



8. Room 5, with mosaic floor and plastered niche in southeast corner.

served on its inner surface.

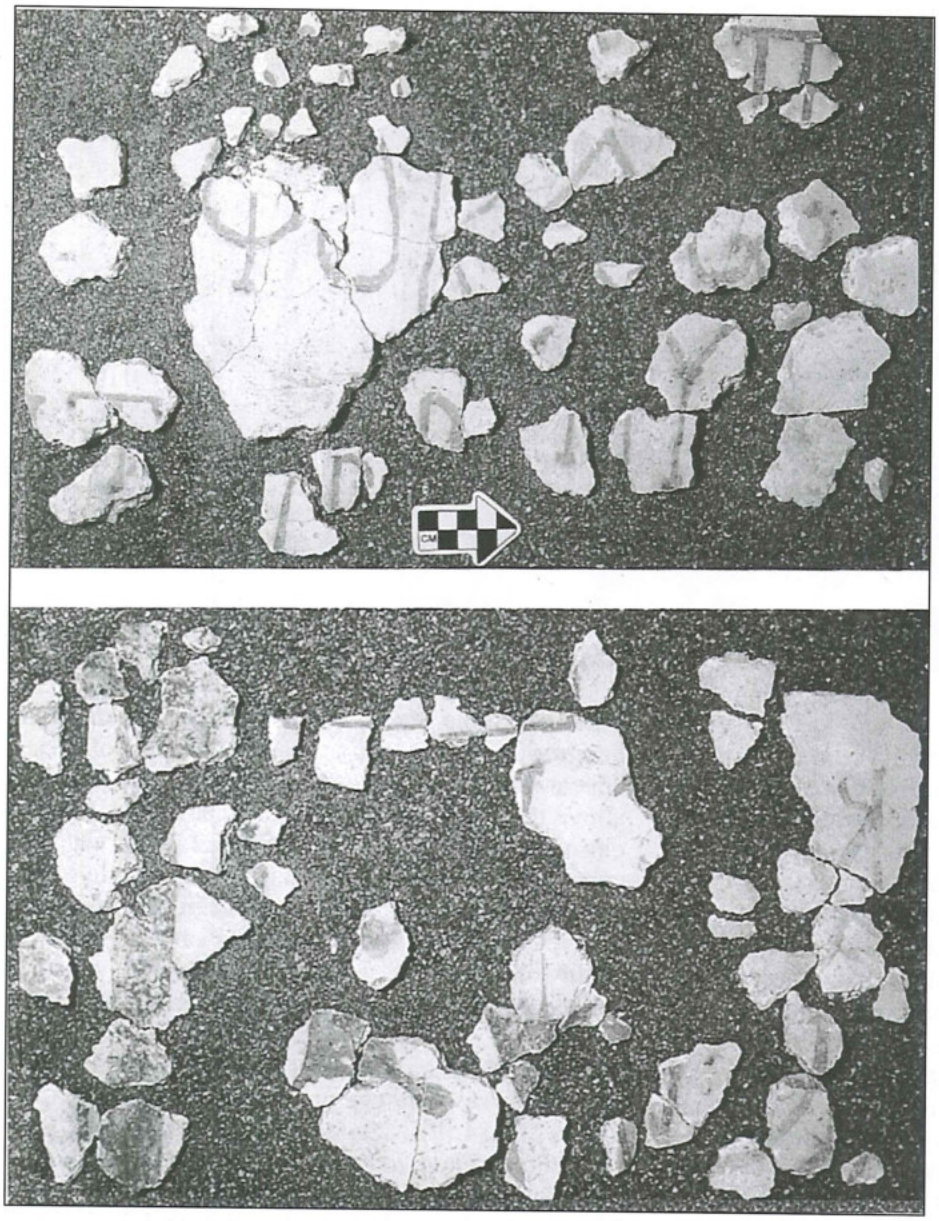
The precise function of the niche was not immediately clear. One possibility is that it was installed in the room as a decorative feature, perhaps as part of an effort to convert this part of the residence into a more formal reception area, such as the suite of rooms recently uncovered in a contemporary complex at nearby al-Qasṭal القسطل (Bisheh 2000). However, the niche also faces due south. Given the date of its construction, which occurred almost certainly during the seventh or early eighth century AD, it is tempting to identify the niche as a *miḥrāb*, or prayer niche. *Miḥrāb*(s) have been identified in residential contexts dating to the Early Islamic period, such as at Ramla (Rosen-Ayalon 1976: 119), but thus far they have only been rarely recognized as such. Further investigations are planned for Room 5, which it is hoped will help to clarify its intended function and use within the larger complex during this period.

Epigraphic Remains

Over the course of the excavations in Field C complex, a large corpus of painted plaster fragments was recovered, the greatest concentration of which was found in Room 2. Painted in shades of red on white are the remains of Greek script, text-framing and wall-dividing bands, and a large cross whose equal arms end in bulbous "jewels" (**Fig. 9**). Sufficient pieces have been recovered to indicate there was more than one inscription, as the script varies in size and hand. All letters belong to the oval alphabet as classified at Jarash (Welles 1938: Fig. 16). Some letters could have had an original height of 6.5-7cm, and at least three lines of these appear to have been within one frame. Aligned above the frame are the feet of other letters, placed close enough to suggest this framed script was incorporated into a larger textual program. Individual letters and some syllables have been restored, but no coherent text. The letter style of the Room 2 fragments may be compared with that in the framed, painted panel at the entrance to the burial complex of the cave monastery of St. Theoctistus in Israel, which has been dated to the Byzantine period (fifth-seventh century AD) (Goldfus *et al.* 1995: 279-84, Pls. 29a-c). Other regional parallels include a painted wall text in a tabula ansata in the Urn Tomb at Petra (McKenzie 1990: 38, 147, Pl. 97a), and a framed painted text found in an ecclesiastical context at Umm ar-Raṣāṣ ام الرصاص (Piccirillo 1987: 216-7, Pl. 25, Photo 37).

Ceramics

The pottery recovered from the Field C complex consists predominantly of material that dates to the sixth through eighth/early ninth centuries AD. The assemblage is characterized by a number of common wares, including bowls, jars, basins, casseroles, and lids (**Fig. 10:1-12**). There was a small amount of African Red Slip Ware in the corpus (**Fig. 10: 13-14**). Painted forms are well represented, and these can be divided into two categories. The earlier examples, which date to the sixth and early seventh centuries AD, are distinguished by an orange or buff colored fabric dec-



9. Epigraphic remains from Room 2 in the Field C Complex.

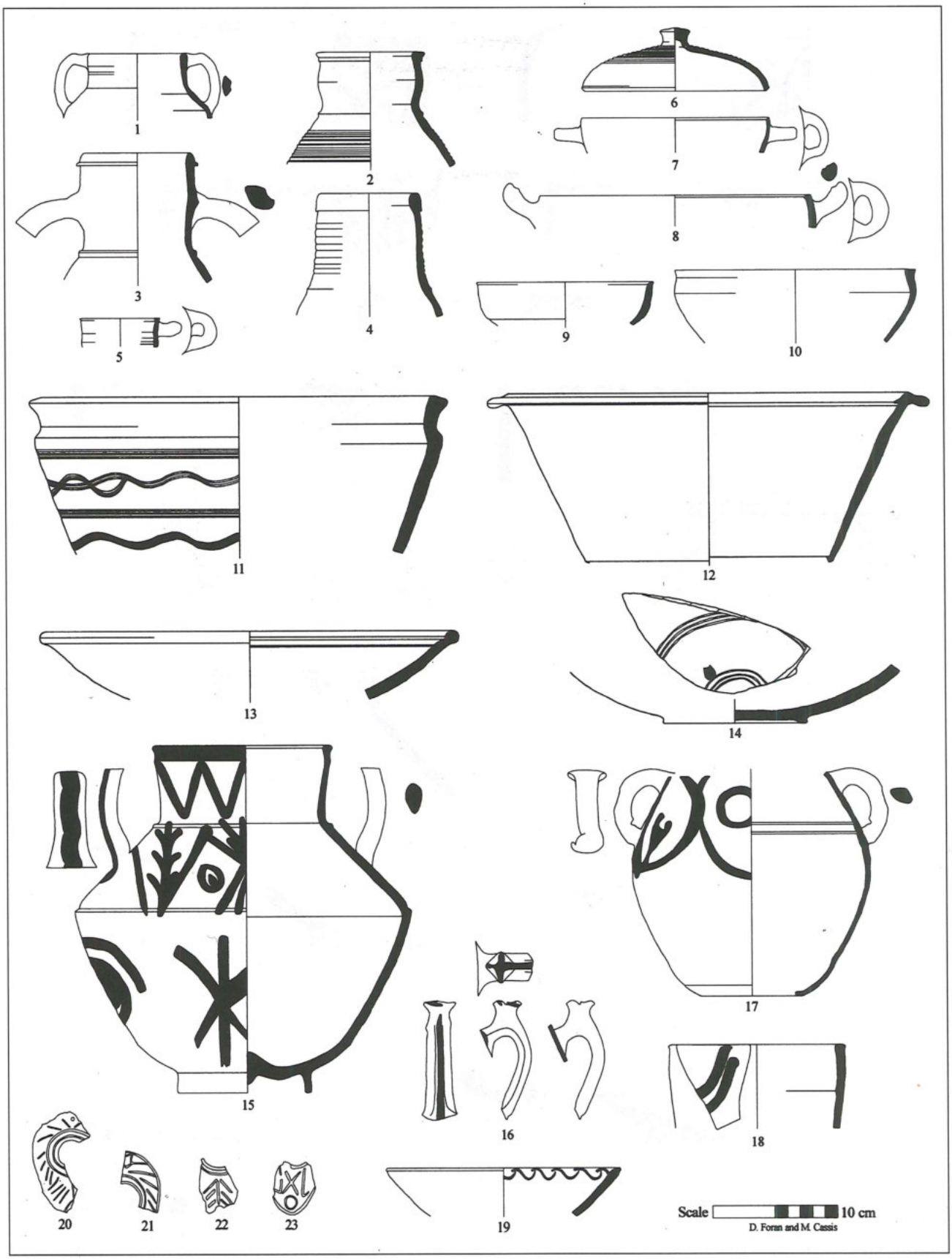
orated with dark red painted designs. The earlier painted forms include jars, bowls, and cups (**Fig. 10:15-19**). The fabric of the later pieces, which date to the late seventh and eighth centuries AD, is lighter in color, while the paint is slightly darker, and the designs more intricate. In this later phase, painted decoration appears to be limited to a single vessel type, the straight-walled cup (**Fig. 11:1-7**).

Fragments of moulded lamps have also been recovered from the complex. As with the painted wares, these lamps date to two different periods. The candlestick-type lamps (**Fig. 10:20-23**) date to the sixth through early seventh centuries AD, while the examples with grapevine and pomegranate designs (**Fig. 11:8-11**) are common in the late seventh and eighth centuries AD.

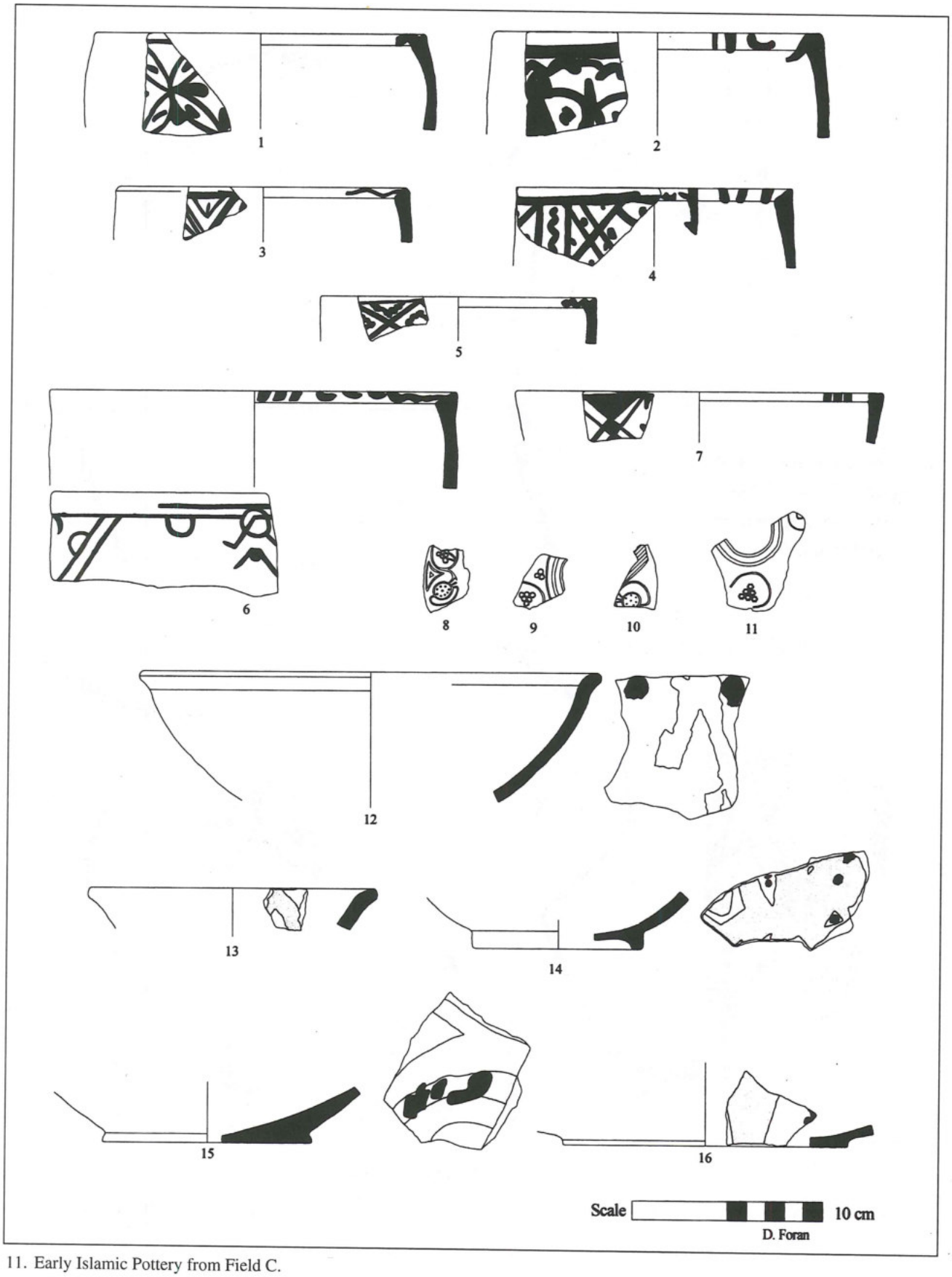
The 2002 season also produced several glazed ware bowls (**Fig. 11:12-16**). The glaze is usually found on the inside of the vessel, and it appears in a variety of colors, including green, white, black, and blue. The most common designs on these vessels consist of large dots, as well as rectilinear and curvilinear lines. These vessels belong to an Early Islamic glazed ware tradition typically dated to the eighth or ninth centuries AD.

Miscellaneous Small Finds

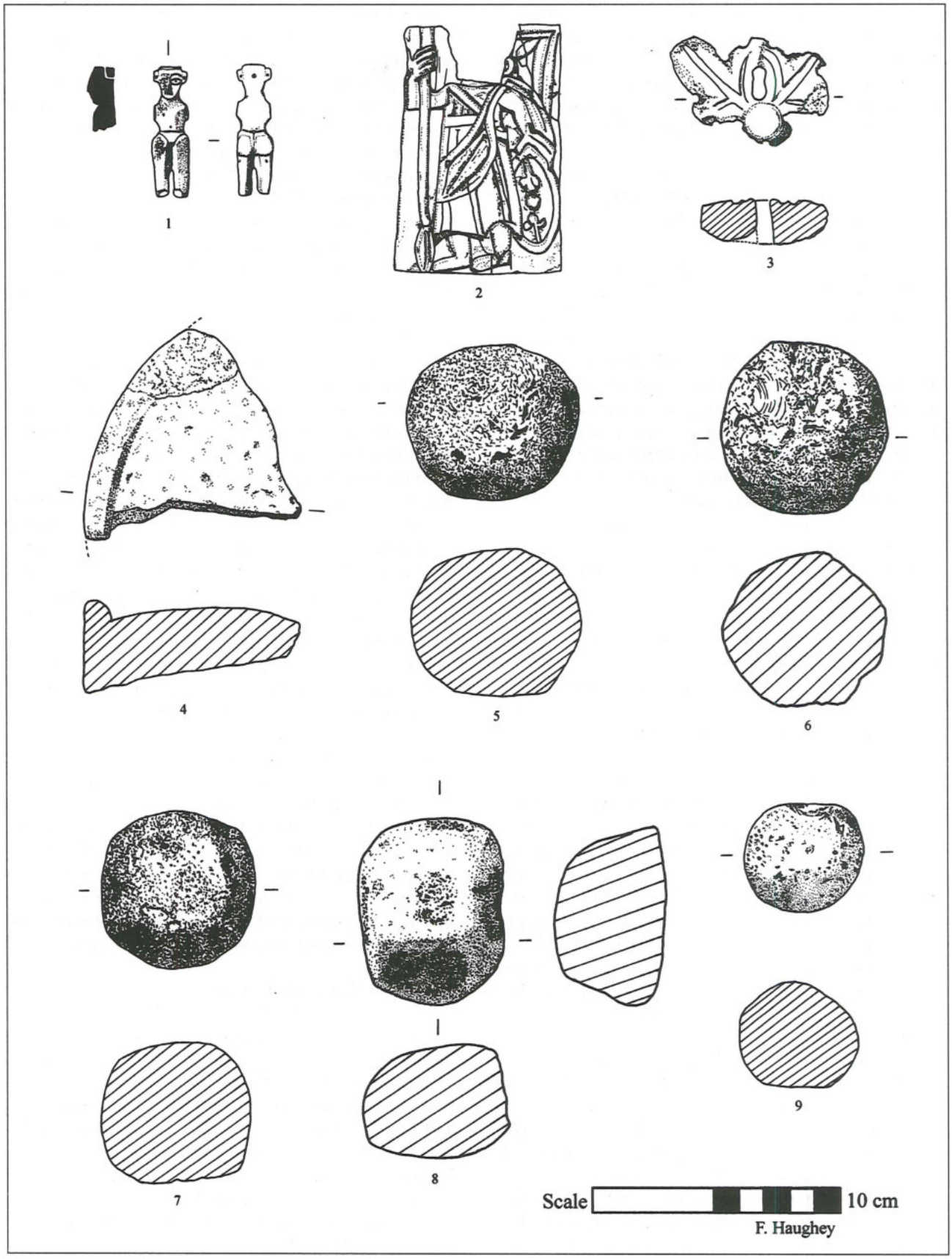
The 2002 excavations in Field C produced a number of miscellaneous artifacts. A small bone-carved figurine (**Fig. 12:1**) was found in the drain system under the flagstone courtyard floor. Both of its ears are pierced, and a hole enters the top of the



10. Late Byzantine Pottery from Field C.



11. Early Islamic Pottery from Field C.



12. Miscellaneous Ojects from Field C.

head and exits at its back. The figure's arms and feet are missing, and the top of its head appears unfinished, suggesting that some sort of headdress might have been attached. Figurines of this type have been identified as dolls, and are well known from Roman and Coptic Egypt (Petrie 1927: 62, pl.55).

A second bone-carved object, a plaque depicting a standing figure (**Fig. 12:2**), was uncovered on the bedrock ledge in the southwest corner of the complex. The figure is carved in low relief, and appears dressed in military clothing. He holds a shield in his left hand and a spear with the tip pointing downward in his right. The style of the figure depicted on the plaque suggests that it was produced in the fifth century AD (Beckwith 1986: 70). The identity of the figure remains unknown, although his appearance suggests a soldier or government official, or possibly a military saint.

The Field C complex also produced a number of stone objects, in particular a marble piece carved in a floral pattern (**Fig. 12:3**), and a variety of ground stone tools, including a fragmentary basalt millstone (**Fig. 12:4**), and numerous hammerstones made of chert (**Figs. 12:5-6**), basalt (**Fig. 12:7**), and limestone (**Fig. 12:8**).

A Late Byzantine/Early Islamic Mansion on the West Acropolis

In summary, the excavations completed thus far in Field C have uncovered the substantial remains of a large residential complex that measured at least 21 x 30m in size. The building's architects made efficient use of the pre-classical fortification wall that encircles the western slope of the acropolis, incorporating it as the rear wall of their structure, with the back rooms of the complex built directly against this monumental structure. The rooms of the complex were arranged around a central courtyard paved with flagstones, with an elaborate water drainage system running beneath it. The majority of these rooms were paved with mosaics, both in monochrome and polychrome designs. At least three of the rooms preserved direct evidence of a second storey.

When combined with the presence of sixth century AD mosaics, our excavations suggest that this complex experienced two distinct architectural phases, which straddled the Late Byzantine-Early Islamic transition. The first phase corresponded with the construction of the building in the sixth century AD (or Late Byzantine period), and included the installation of the mosaic pavements described above. The building was then renovated in the seventh or early eighth century AD (or Early Islamic period), when the vault was built over the mosaic floor in the southeastern room, and supplementary walls were inserted to shore up several sagging walls elsewhere in the complex. It was also at this time that the plastered niche was added to Room 5 in the northern wing, perhaps indicating the arrival of new occupants. The entire building was abandoned sometime later in the eighth or early ninth century AD.

The layout of this complex suggests that it functioned as a large private residence, or mansion, an interpretation that is further substantiated by the material culture recovered from its various rooms. The Field C complex is comparable, both in size and design, to other large private houses that have been uncovered in Late Byzantine Mādabā, and in the surrounding region. The contemporary Burnt Palace in particular, located to the north of Mādabā's acropolis, contains many of the architectural features that have been found in the West Acropolis building. As with the Field C complex, the Burnt Palace was furnished with a flagstone courtyard enclosed on its sides by rows of rooms of varying sizes. The Burnt Palace was also serviced by a drainage system that ran under the floors of the complex, while the presence of paved and unpaved rooms mirrors the layout of the Field C complex (Bisheh 1994: 555-56; see also Piccirillo 1986).

The history of the West Acropolis mansion, from its founding through to its eventual demise, are characteristic of a more generalized trend witnessed throughout the Mādabā region. Although long considered to be a period of decline, the seventh and eighth centuries have now emerged as a time of prosperity and cultural continuity in the southern Levant (Bisheh 2001). The additions and renovations that were made to the West Acropolis mansion support this conclusion, and present evidence from the private sphere of a phenomenon that has been documented more widely in the celebrated ecclesiastical traditions of the region.

Consolidation and Restoration

The ongoing effort to consolidate and preserve the impressive architectural remains in Field C continued during the 2002 field season. The edges of all of the partially preserved mosaic floors uncovered in previous years were repaired and consolidated. In addition, the newly-uncovered second floor mosaic above Room 4 was also repaired. The walls of Room 5, which are faced with rapidly decaying plaster, were also consolidated. Great care was taken to repair and preserve both the stone walls themselves and their plaster facing. The consolidation work on the walls and arches of Room 4 in the

northeast corner of the complex is still in progress. Mortar and plaster has been added to portions of these walls to ensure their structural integrity, in advance of more permanent conservation.

The 2002 conservation effort resulted in the stabilization and consolidation of most of the visible architectural remains in Field C, which are now ready to be prepared for presentation to the public. In anticipation of this next phase of restoration, a program to reinstall the mosaic pavement lifted from the Field C complex in the 1980s was initiated during the 2001 field season. Arrangements were made for Italian restorer Franco Sciorilli to commence work on the mosaic pavement removed in 1980 from beneath the vault in Room 1, located in the southeast corner of the complex. Mr. Sciorilli began by removing the cement backing that sections of pavement had been embedded in upon removal. Once the ancient mortar bedding, still *in situ* inside the vaulted room, had been cleaned and prepared, the mosaic pieces were reinstalled (**Fig. 13**). This entire process was completed in December of 2002.

Acknowledgements

The 2002 field season was made possible in part through a research grant from the Social Sciences and Humanities Research Council of Canada. The excavations were conducted in collaboration with the Department of Antiquities of Jordan, which provided workers and equipment. The results described in this report would not have been possible without the dedicated help of Dr. Fawwaz al-Khraysheh, Director General of Antiquities, and Mr. Ali al-Khayyat, Director of the Department of Antiquities Office in Mādabā.

Debra C. Foran
Pontifical Institute of Mediaeval Studies
University of Toronto
59 Queen's Park Crescent East
Toronto, ON M5S 2C4
CANADA

Timothy P. Harrison
Department of Near and Middle
Eastern Civilizations
University of Toronto
4 Bancroft Avenue
Toronto, ON M5S 1C1
CANADA

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13. Restored mosaic pavement in Room 1 of the Field C Complex.

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THE 2003 FINNISH JABAL HĀRŪN PROJECT: PRELIMINARY REPORT

Jaakko Frösén, Zbigniew T. Fiema, Mika Lavento, Christina Danielli, Richard Holmgren, Jaakko Latikka, Anu Rajala, Erko Mikkola, Antti Lahelma, Maija Holappa and Kai Juntunen

The Finnish Jabal Hārūn Project (FJHP) carried out its sixth fieldwork season between July 26 and August 28, 2003. The project is directed by Prof. Jaakko Frösén, University of Helsinki. The archaeological excavations were supervised by Dr. Zbigniew T. Fiema, and Prof. Mika Lavento was in charge of the survey (both from University of Helsinki) while Dr.Christina Danielli, Italy, directed the conservation activities. Prof. Henrik Haggrén, Helsinki University of Technology and Dr. Majdi Barjous, Natural Resources Authority of Jordan have also participated in the survey activities. In total, 34 archaeologists, conservators and cartographers from Finland, Italy, Sweden and the United States took part in the 2003 fieldwork. One DoA representative assisted in the fieldwork and up to 22 local laborers were employed. The FJHP is sponsored by the University of Helsinki and by the Academy of Finland. The Project wishes to express thanks to the Director-General of Antiquities of Jordan and the DoA office in Petra for their cooperation and support.

The FJHP focuses on Jabal an-Nabī Hārūn (جبل النبي هارون) located ca. 5kms SW of Petra, which, according to Jewish, Christian and Muslim traditions, is the place of burial of Moses' brother Aaron. The peak of the mountain is occupied by a Muslim shrine (*weli*) which contains a cenotaph believed to contain Aaron's remains. Below the peak, on a plateau ca. 1250m asl., there is a Byzantine monastery/pilgrimage center dedicated to St. Aaron, and preliminarily dated to the later 5th through the 7th/8th centuries AD. The main objectives, fieldwork methodology, and the results of the previous seasons have already been presented elsewhere (Frösén *et al.* 1998, 1999, 2000, 2001a, 2001b, 2002). The following is a summary of the excavation, survey, cartographic and conservation activities conducted in 2003.

CARTOGRAHIC REPORT

(J. Latikka and K. Koistinen)

During the 2003 field season, the cartographic team continued to provide assistance in the recording of the excavated entities. The recording system based on the use of a tachymeter, with 3D readings downloaded every afternoon to the Project's database, was supplemented by digital imagery taken regularly in the excavation area. This year, special attention was given to the digital documentation of the re-exposed mosaic floor in the narthex. The technical development work at the Helsinki University of Technology was continued, using the collected imagery to further improve the 3D model and to create various image products, such as photomaps. The aim of the photogrammetric documentation, extensively used in 2003, was to gather additional data in the excavated trenches which could be used later, either in modelling the trenches or in recovering data which might have been lost during the excavations. The digital images have also been utilized to record specific information related to the conservation work. Regularly taken, the photographs also act as a visual diary of the excavations. Finally, the plan of the entire monastery was updated again this year.

EXCAVATION REPORT

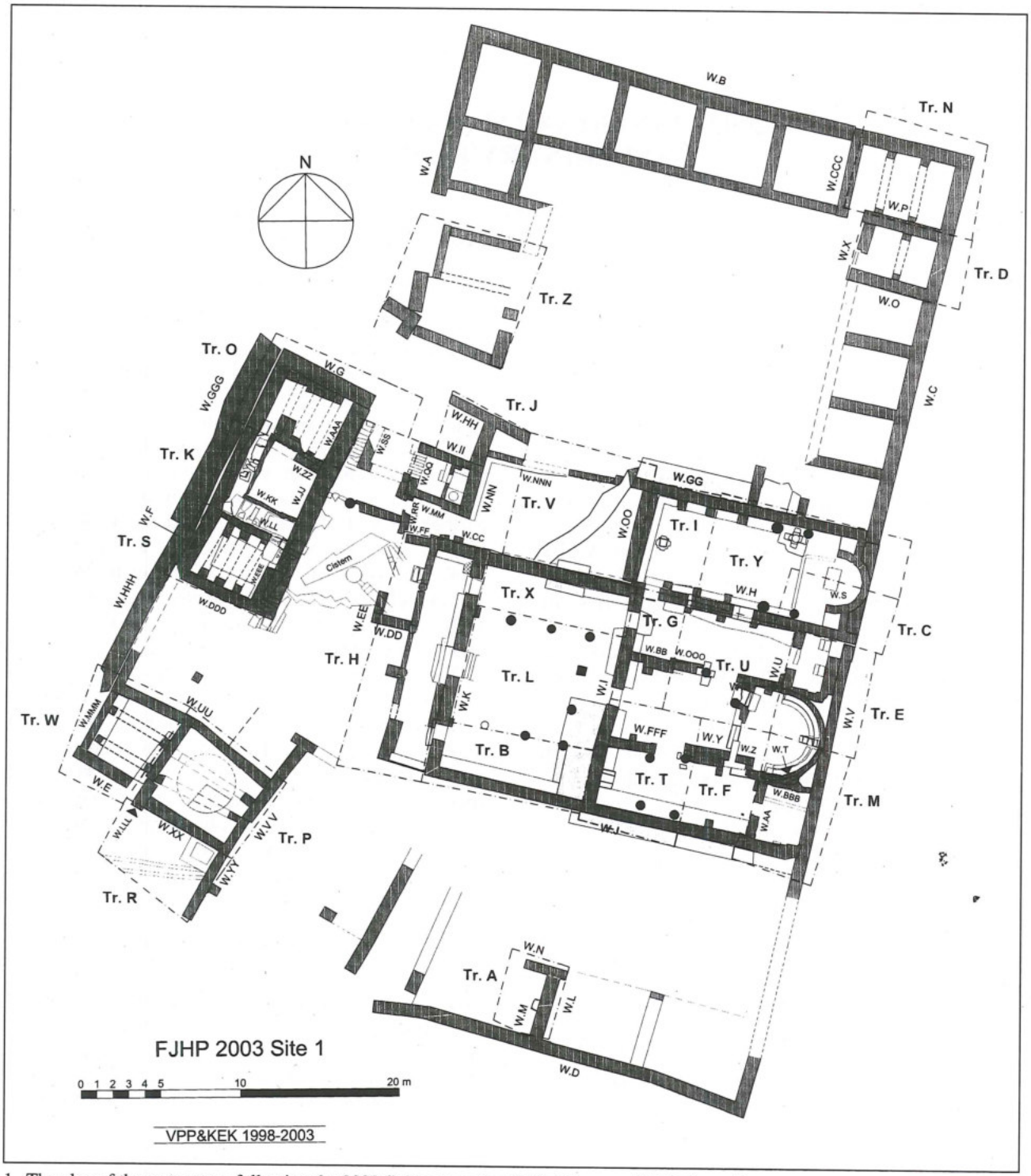
The 2003 exavations at Jabal Hārūn were carried out in five trenches; in the church proper, in the atrium, in the chapel, in the SW corner of the site, and in the area west of the atrium (**Figs. 1, 2**). Work was also started in a trench located at the SW end of the "hostel" but only the deep clearance was effected there.

Trench U (E. Mikkola, P. Miettunen, H. Kuisma)

Trench U covers the area of the eastern part of the northern aisle and a corresponding, substantial part of the nave. Following the excavations in this trench, the entire basilica is now exposed.

Phase I: Early Church.

The following walls were constructed in Phase I: Wall H (locus 05), i.e., the northern wall of the



1. The plan of the monastery, following the 2003 field season (by K. Koistinen and V. Putkonen).

basilica, Wall U (locus 06), the northern pastophorion wall, and Wall R (locus 04), being the apse's wall with the corresponding pilaster of the northern colonnade. Wall H had a doorway to the adjacent chapel. The floor construction included the mortar bedding (locus 44) and marble slabs (locus 41). The slabs differ in size, from ca. 1 x 1m to 0.4 x 0.4m. Judging from the imprints of the mortar bedding, the northern edge of the floor ended ca. 0.7m south of Wall H, i.e., there was a bench along Wall H, which did not cross the doorway. The bema platform (locus 42), possibly two courses high, was built in the front of the apse. Its estimated width (N-S) is ca. 6m while the length (E-W) is 2m. The



2. The view of the monastic site, looking west (photo by M. Mustonen).

bema's construction features sandstone ashlars and most likely a marble floor (locus 19) with bluish gray mortar bedding (locus 35). The northern column row separating the nave and the northern aisle is evidenced within the trench only by the pilaster (locus 04), but the information from Trench G and the remaining columns in Trenches B and L indicate its original existence. The original width of the northern aisle was ca. 3.1m from the wall to the central line of the northern colonnade, and the intercolumnal space was ca. 2.7m.

Phase II: The "Short" Basilica.

The destruction that ended Phase I was followed by a major reconstruction. The original church was shortened by the construction of the partitioning wall (I). Changes evidenced in Trench U include the modification of the roof support system, repairs to the marble floor and changes within the bema area. Wall H was repaired at least in its top courses, and many marble fragments, tesserae and other materials were used either as chinking stones or as a fill of the wall. The original colonnade was removed and re-erected in a different arrangement. Its line was now moved more towards the central E-W axis of the church, which enlarged the width of the aisle to 3.4m, while narrowing the nave to ca. 5m. This new support system seemingly consisted of only one column (locus 25), which was connected by arches to the corresponding pilasters: one by the apse wall (locus 08) and another one built against Wall I (G.05). The two arches which now spanned the E-W space of the church were ca. 3.80m long. The pilaster (locus 08) was built on the bema abutting the western end of the apse wall, clearly following the apse line. The gap of ca. 5cm between it and the Phase I pilaster was filled with smaller stones (locus 08a). This arrangement is mirrored on the southern side of the church (Trench F, loci 06a and 06). The column (locus 25) was erected on the new, probably sandstone foundations, with the drums recycled from the columns of the Phase I colonnade. Probably, the new roof arrangement would still accommodate the clerestory walls supported by E-W arches.

The marble floor, which most likely suffered severely in the destruction, was at least repaired, but also probably altered at this phase, especially where the foundations of the column (locus 25) were inserted. The doorway to the chapel was narrowed at this phase. The appearance of the bema area in this phase is uncertain due to the major modifications of the later phases, but probably it was still paved with marble slabs. A bedding of white mortar, with nine squarish impressions (locus 36) is most likely from this phase.

Phase III: New Roof and Other Modifications

There must have been another destruction that ended Phase II since the roofing system was again heavily altered. Abundant wall-plastering seems to be related to this phase. The new roof supports were both added to the already existing elements and built as new structures. Pilasters (loci 26-29) were added to the column (locus 25) forming a cross-shaped support with the column in the center. Also, an L-shaped pilaster (locus 37) was added to

the south and west sides of the pilaster (locus 08) and the pilasters (loci 16-18) by Wall H. As for new elements, free standing pillars (loci 24 and 38), made of local yellow limestone were erected on the marble floor, to which lateral extensions (loci 34 and 39/40E) were added. Thereby, as evidenced in Trench U, the following roof supporting system was created: four E-W, back-to-back arches, with spans of 1.4m, and three N-S arches over the northern aisle with spans of 3m, which in turn had corresponding arches over the bema, the nave and the southern aisle.

The bema area witnessed substantial modifications. It was extended ca. 0.59m towards west by adding a new edge made of sandstone ashlars (locus 43) and filling the space between it and the early bema with soil and stones (locus 46). On this new bema, and on the earlier marble slabs, a large masonry-built pulpit (*ambo*) structure (locus 40) was constructed. It consisted of five parts (subloci 40A-E): the platform and the steps leading to it, the column supporting a no longer preserved part of the platform, the bema chancel wall, the counter-like structure built between the pillar, locus 38/39, and pilaster, locus 37, and the integrated pilaster/ arch springer directly south of pillar, locus 38. The entire installation was plastered over, including a part of the marble pavement of the bema (locus 20). It is probable that the doorway to the chapel was blocked (locus 31) in this phase. The pilaster (locus18) was erected partially over the blocking, and the center section of the bench (locus 15B) was built in front of it.

Phase IV: Latest Modifications

The main change in this phase was the construction of Wall OOO (locus 07) between the pillar (locus 24/34) and the pilaster (locus 29) probably related to the support for the existent roofing system, but generally of an uncertain function. The eastern end of the northern aisle was also modified: a bench (locus 15 C) was built along Wall H during this phase, and the floor pavement was slightly rearranged. It is possible that the apse of the church was already destroyed or abandoned during this phase.

Phase V: Casual Occupation and Collecting Activities

At some point in time, the ecclesiastical use of the complex had ended. The apse and bema were no longer in use and instead, these spaces served as a collecting point or dump for tesserae, mosaic fragments and other materials (locus 02). Some sections of the marble floor were lifted and they were collected by the column (locus 25) in a pile which later collapsed in front of the ambo (locus 22).

Phase VI: Final Destruction

The lack of occupational strata on the marble floor may indicate that the structure was abandoned due to a sudden disaster. The lowermost layers in the nave (locus 23) and in the eastern end of the northern aisle (locus 32) were clayish with small fragments of charred pieces of wood and uncharred wooden beams, possibly the remains of the roof construction. This may suggest that these areas were the only remaining roofed sections. This also fits the floor evidence: no beams were found in the areas where the floor had previously been removed. All architectural elements, including ashlars and voussoirs, were found within the tumble layers (loci 03, 09, 10, 13, and 21). The soil among these layers partially originated from the wall infill, and partially as wind-blown sand filtered through the stone tumble layers. The column (locus 25) had stood for a long time since some of the fallen drums were already visible on the surface.

Phase VII: Latest Natural Deposition

The uppermost strata (loci 01 and the upper layers of 03) were the topsoil, which consisted of deteriorated sandstone and wind-blown sand.

Trench V (A. Rajala, V.Holmgvist, and M. Whiting)

The trench was located in the space between the chapel (Trench I) and the structures excavated in Trench J. The southern limit was Trench X - the northern part of the atrium of the church.

Phase I: Early Occupation in the Area

It appears that some pre-monastic activities were conducted in this area, reflected by rough modifications done in the bedrock, probably to accommodate a large water reservoir (?) or a channel. The date of these carvings could not be established. Some deposits of very hard-packed (probably water-borne) soil soon accumulated on top of these depressions.

Phase II: Early Construction

This phase is associated with the construction of the early chapel. It is probable that the easternmost area of the trench was occupied by the unpreserved western wall of the chapel. Some of the bedrock depressions were possibly modified in relation to the baptismal font in the chapel, in the form of steps and a basin (loci 24 and 28). The southern

wall (H, locus19) and northern wall (GG, locus 17) of the chapel were built then, the southern one separating the chapel from the northern aisle of the church. The western (not extant) wall (locus 27) of the chapel was built, utilizing the modification of the bedrock for its foundations. The remains of this wall are very poorly preserved. Basically, only its corner with Wall GG is the real, extant evidence for its existence. Notably, all these walls were built on top of the bedrock, using a layer of mud-mortar in between the stones and bedrock. The sandstone pavement (loci 22 and 23) was laid out outside the western wall of the chapel.

Phase III: The Remodeling

Major structural destruction associated with fire seriously damaged the structure of the early chapel. The rebuilt chapel was reduced in length, and its original western wall (locus 27) was completely demolished. The new western wall (OO, locus 18), built on top of a single course of sandstone blocks (locus 20) was now located closer to the baptismal font. Wall OO clearly abuts both Walls H and GG. The font itself seems to have continued in use during this phase. However, the basin and the steps, originally associated with the font, seem now to have been abandoned, as they were located outside the new, western wall. Debris of the burnt timber roof structure, including partially melted and fire-twisted shards of glass lamps, were dumped in the area of the former basin. It seems that this area became a convenient disposal place for debris from the chapel, periodically deposited there. In the western part of the square, where a large reservoir (?) of water existed in Phase I, natural accumulation of the fluvial material continued, probably due to water channelling in the area (locus 8a).

Phase IV: Casual Occupation

A period of a lower intensity of activities in the area may have followed. Uneven bedrock in the center of the area was coarsely levelled with small boulders (locus 13). Probably some occasional food preparation took place there, indicated by more debris (loci 8b, 11, 12) in the area, including animal bones and ash. Fluvial material continued to accumulate in the western part of the trench. It may be that a seismic episode took place at the end of this phase, seriously affecting the walls in this area.

Phase V: Water Channel and Later Occupation

This phase is dominated by the existence of a large, masonry-built water channel passing through the area of Trench V, from NE to SW. It is possible that the channel collected rainwater from an enigmatic "platform-like" installation built against the northern face of Wall GG, in the area of Trench Y. Two sub-phases have been identified:

Va- a substantial water channel (locus 4a) was constructed. Its structure includes foundation stones laid under the structure and the hard-packed soil layers mixed with demolition material forming the base for the conduit. The trough of the channel was made of flat-laid sandstone slabs at the bottom, and its walls made with rectangular-shaped stones. Originally, the channel had capstones; ca. 2 meters from its SW end, the sandstone capstones are still in situ. The outlet of the channel was in the atrium through a possible opening in Wall H. Notably, the center part (locus 6) of Wall H seems to have been thoroughly reconstructed during this (or the preceding) phase, probably in support of some structures on the southern side (atrium). As such, Wall H has a highly composite appearance.

Areas on the western and eastern side of the channel were used for food preparation, exemplified by find-rich loci 7 and 10. A narrow and generally insubstantial wall (NNN, locus 16) was built on the northern side of the area making it totally enclosed. Wall NNN was constructed partly on top of the bedrock, but the western part of it was standing directly on a soil layer.

Vb- this phase represents the final occupation in the area of Trench V, during which the water channel was probably still in use. Deposits of collected material were made in the area limited by the channel and Wall OO. Extensive concentrations of tesserae (locus 5d) and glass were found there. Small, simple structures of stone were built around the channel, probably serving as fireplaces and windshelters (loci 5a-c). An enigmatic stone (support?) structure (locus 9) was roughly piled up next to Wall NNN.

Phase VI: Abandonment and Natural Deposition

The collapse of the upper courses of most of the walls in the area may indicate another seismic-related destruction. The channel was now covered by a tumble of stones (locus 3). The area was definitely abandoned and the windblown sand accumulated over the tumble through time.

Trench W (R. Holmgren and H. Kelola)

Besides Trenches P and R, Trench W, ca. 5 x 6.5m, is the third one opened in the SW corner of the monastic complex. The room excavated in this trench forms the southernmost extension of the

western facade of the monastery. This room also forms the western, structural extension of the room excavated in Trench P. The latter is connected with the room in Trench W through a blocked doorway and both rooms give the impression of being built outside the compound wall. Notably, the small summit in the area of Trench W overlooks the steep, surrounding landscape to the SW and W. Not surprisingly, one would find in this area remains of a sturdily- built room with a second floor, perhaps related to some kind of defensive or surveillance purpose. There are no traces of any workshop or small-scale industrial activities in this room. The large quantities of fish bones found in the adjacent Trenches P and R did not materialize in Trench W. In fact, bones were almost totally absent there. In contrast, the evidence of the room in Trench P being deliberately filled up with soil and boulders in a later phase might explain its homogeneous stratigraphy of scattered bones. The reason for filling it up seems to be connected to the construction of a stone platform at the same height as that of the second floor of the room in the now excavated Trench W. Since the second floor in Trench W did not stand for long and thus there was no need for backfilling in order to build a similar construction, no bones from any backfill were found.

Phase I: Early Walls in the Area

It is possible that some structures existed in this area in the pre-monastic period. They might have been related to the large Nabataean-Roman period structure excavated in Trenches O, K and S. Some exceptionally large ashlars can be seen in the lower courses of the northern and southern walls (UU and E; loci 5 and 4) framing the room in Trench W. On these courses, Wall UU was constructed in Phase I, making an L-shaped turn northward and bonding with the western perimeter wall of the monastery. Some irregularly laid stones in the upper part of Wall UU indicate that a doorway (locus 16) found beneath them was opened up only when the room in Trench W was constructed. There is no reason to believe that this kind of access would have been constructed within the original main wall. Somewhat west of this doorway, an outlet of a smaller channel further indicates that Wall UU was the southernmost limit of the complex.

At the same time or somewhat later, the eastern wall, (LLL, locus 6) was constructed. It abuts Wall UU and is built with well-hewn boulder stones. It is not yet clear, however, how this wall was then integrated within the structures of rooms in Trenches W, P and R. Traces of repair and removed features have hidden some of its primary function. However, since the wall forms the "backbone" of rooms in Trenches P and W, its position with its later added and abutting feature, makes it clearly one of the first walls in the area, probably chronologically related to an early stage of the early church phase.

Phase III: Construction of the Arched Room

During this phase, a room with two arches supporting the upper floor was constructed in the area of Trench W. Originally, this room was accessed through the doorway opened up in Wall UU, as mentioned above. The room was planned to be longer than the already existent Wall LLL, and therefore the latter was extended southward through the addition (locus 7). The southern wall (E, locus 4) built then, is thus abutting the addition (locus 7) rather than Wall LLL. Notably, Wall E features least two different masonry techniques, suggesting some sort of repairs undertaken in the upcoming phases. Its upper part also shows a blocking of a small and high, light-aperture which again indicates that the wall was the southernmost part of the room-compound in this area. The western wall (MMM, locus 10), also built then and currently exceedingly poorly preserved, is the southernmost extension of the compound wall.

Four pilasters with arch-springers are still preserved. The E-W arches supported a second floor. Nothing of it remains but stratified deposits of its collapsed structure provide a fair indication of its original construction. The arch-springers, together with the ashlars making part of the pilasters, are embossed with parallel rectangular fields. This kind of decoration is also found on the pilasters in the other arched rooms located along the western perimeter wall. The eastern pilasters in Trench W are built on top of a shelf-like structure (locus 21), most likely a support for Wall LLL. The pilasters along the western wall are flanked by even larger supports (?) which are rectangular at the base (loci 14 and 15). The shelf/support structure and the pilasters here are all bonding and they seemingly belong to the same phase. A hard-packed soil layer (locus 20) was laid out in order to level the bedrock, but a stone (?) pavement was not found - a phenomenon relatively common in this monastic complex.

Phase III: Doorways

After some time of occupation of the room, a doorway was pierced in Wall LLL. It is clear that the inserted lintel and the southern frame of the opening bear traces of a later installation which interrupts the original building pattern of the wall.

The northernmost part of the shelf/support structure also shows similar indications of being cut in order to make way for the opening. At the same time, the adjacent doorway in the northern wall (UU) was blocked. The possibility of both doors being used at the same time is untenable due to their adjacent position.

Phase IV: Later Occupation

Later on, the doorway in Wall LLL was carefully blocked with well-fitting stones. The access to the room was now, seemingly, relocated to the area of the western wall. A column drum was placed on top of the northernmost support (locus 15) against the wall, as if creating step-like arrangement together with the shelf/support feature. Apparently, the creation of a new access from the exterior of the monastery rather than the interior, as before, must indicate a new function for this room, probably of lesser importance. Large quantities of pottery were recovered from the soil layer, locus 18, a thin deposition of sand. Locus 18 probably represents the latest occupation inside the room before the collapse of its ceiling. The ceramic deposit is mixed and it gives the impression of a garbage dump although sheltered by the still standing superstructure.

Phase V: Collapse of the Superstructure

During this phase, the arches and the second floor with its paving collapsed inside the room. The collapse was excavated as two major layers, loci 9 and 11, the latter being the lower. These deposits allow for the reconstruction of the original appearance of the upper floor and provide clear indication of the pattern of its collapse. The bulk of the debris is comprised of scattered large slabs that originally stretched across the arches and the tops of the walls. The slabs were in turn covered with flagstones forming the floor of the second storey. Apparently, this construction heavily caved in toward the center of the room while the slabs and the pavers slid down between the arches and landed below, often in an upright position. The flagstones are sometimes found beneath the larger slabs, especially close to the walls. Approximately, 60-70 pieces of the pavers were found. Furthermore, among the debris were also several fragments of wood and iron nails, which provide additional information for the composite character of the ceiling/upper floor construction.

Phase VI: Casual Occupation

A levelled surface could be detected on top of the debris of the collapsed superstructure. Some remains of ash, and scattered sherds were found there. These are likely to be the remains of squatter-like occupation in a place that could still offer some protection from wind and rain. At this point in time, the arches were still standing. A 0.3m thin layer of windblown sand (locus 8) then covered these last traces of human activities in the room. Soon afterward, the arches collapsed, with the voussoirs found embedded partially in locus 8 and the debris above it (locus 3)

Phase VII: Natural Deposition

Under the topsoil, two major stratigraphic layers were found. The lower one, locus 3, features a more than one-meter deep, natural and long-time deposition of material from the decayed walls mixed with windblown material. Locus 2 above it, consists of a dense layer of boulder stones, probably caused by a final destruction of the surrounding walls by a sudden and large-scale earthquake.

Trench X (M. Holappa and K. Juntunen)

Trench X is situated north of Trench L which covered the western part of the nave of the church, later, the central area of the atrium.

Phase I: Early Church

During this phase, the area occupied by this trench was the western part of the north aisle of the early church. As such, the earliest remains in the trench are represented by the northern wall of the church (H), which was then a continuous and homogeneous masonry line, but of which only two parts (loci 6 and 24) are still standing. Wall K, the western wall of the church, must have been built at the same time. Two soundings through the extant (later) floor level revealed good quality mortar bedding (loci 20 and 23) with a flat stone levelling (loci 19 and 22). These elements belonged to the original (marble) pavement of the church. The three columns just south of the trench limits must then have supported the church's superstructure.

Phase II: Later church with the Atrium

Following a probable seismic destruction, the church was divided into the church proper and the open atrium, the NW part of the latter being the area of Trench X. In the east, Wall I (locus 8) was built as the dividing wall between the church and the atrium, with a doorway (locus 26) for communication between these two spaces. Directly south of this doorway, a bench (locus 15) was built against Wall I, an extension of which was also uncovered in Trench L (locus 15) during the 2000 season. Another bench (locus 16) was built against

the eastern part of Wall H. There might also have been a doorway in Wall H to the area north of the church and west of the chapel, but later reconstructions of this wall make it impossible to prove this hypothesis.

Phase III: New Floor

Apparently because of periodical rainwater flooding of the atrium, a new floor (locus 12), made of irregular flagstones, was laid out in the atrium. This floor slopes towards the SW corner of the atrium where an outlet was also built to channel water outside the atrium. In a sounding made in the NE corner of the trench, a soil layer (locus 18) was exposed on top of the remains of the earlier pavement (locus 19). This soil layer, apparently a build-up for the new floor, is remarkably missing in the other sounding made near the NW corner of the trench, indicating the intention to create a gradually sloping floor. The new pavement was laid on top of a mortar bedding (loci 17 and 24).

Phase IV: Major Remodelling

During this phase, the doorway (locus 26) in Wall I was blocked (locus 9), apparently simultaneously with the construction of the large buttress against Wall I in the southern part of the atrium. Wall H clearly suffered badly at this point since a supporting wall (locus 13) was built against the central part of it, on the atrium's side, and partly on top of the bench (locus 16). Seemingly at the same time, a water channel was built in the area north of the Trench X. Its outlet (locus 25) was directed to the atrium either through the possible doorway in Wall H (*supra*) or it was built into the wall at this point. A square flagstone in the new floor in front of the outlet either suggests the existence of a doorway or gap in the wall in this place, earlier or concurrent with the construction of the channel. At any rate, the pavement of the atrium still served for water collection activity. Possibly, the westernmost of the three columns standing just south of the trench limit collapsed at this time, and the column drums were collected and reused somewhere else, perhaps in the construction of the buttress against Wall I.

Phase V: Later Occupation

This phase can be roughly subdivided into two sub-phases. At first, the natural deposition of sand (locus 10) on top of the floor can be detected. However, the atrium bears strong indications of casual occupation there then. A hearth (locus 11) was set against the easternmost of the three columns south of the trench and a simple enclosure structure (locus 14a) was built partly against the supportive wall (locus 13). Inside this enclosure, almost pure ash was dumped (locus 14b). There are also some traces of food preparation in the NE corner, where some bones were encountered in the sand. During the following sub-phase, the indicators of occupation form a more scattered pattern. A short term use of the area is evident from the oil lamp fragments at the bottom of a stone tumble (locus 7), which follows the pure sand deposit (locus 10) as the surrounding walls began to decay and crumble down.

Phase VI: Collapse and Abandonment

Extant remains and their relationships indicate the following pattern of collapse. First, the two remaining columns collapsed on top of each other. Then the remains of Wall K crumbled down (locus 4). As there is not much stone material found in this stone tumble, it is probable that Wall K, might, at this point have been an enclosure, only few meters high. Wall H then collapsed and Wall I fell on top of it creating an extensive stone tumbles (locus 5 and 2 respectively). Following the collapse, the entire trench area was covered by wind-blown sand (loci 1 and 3).

Trench Y (A. Lahelma, K. Hinkkanen and S. Santavuori)

Trench Y covers the central and NE parts of the chapel. The trench forms an L-shaped area between Trenches C and I, previously excavated. Perhaps the most interesting features of the chapel are the two cruciform baptismal fonts found inside it, and a masonry-built altar pedestal, half of which was already exposed in 1998. The first baptismal font, found in Trench I, was situated in the western end of the chapel. It was later replaced by the second font built in the area of the bema. The altar pedestal appears to have been built at the same time as the second baptismal font (**Fig. 3**).

Phase I: Early Chapel

This phase represents the construction of the chapel. The original chapel seems to have been a little longer than the present building. Structures that can be assigned with certainty to Phase I in Trench Y include: the apse wall (locus 2) and a cupboard (loci 10a-d) north of it, the eastern or outer wall of the complex (V, locus 12), the northern wall (GG, locus 3) of the chapel, and the three cupboards (loci 22, 38 and 39) in it. Remains of good-quality plaster associated with Phase I, and still attached to the lowest courses of the apse wall, have some traces of painting left. The construction of



3. General view of the chapel, looking east; the masonry altar base is in the center inside the apse (photo by M. Mustonen).

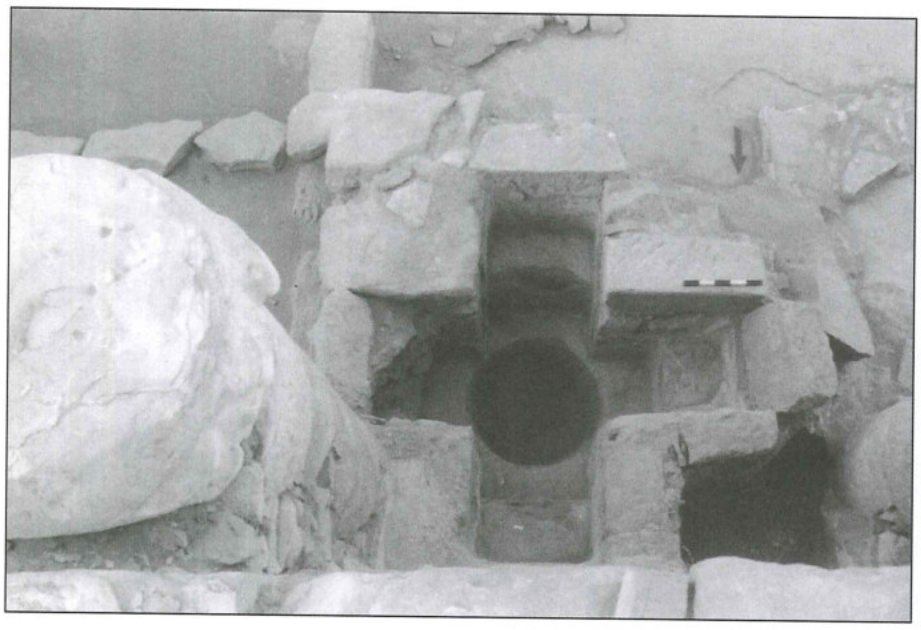
the southern wall (H, locus 16) may, in theory, precede the other Phase I structures. This wall is the northern wall of the church and does not seem to physically bond with the other chapel walls. The entrance to the chapel in this phase was from the northern aisle of the church, through a doorway (later blocked) in the middle of Wall H. As the floor of the chapel was situated lower than that of the church, the two steps (loci 32 and 36) leading down from this doorway also belong to this phase. None of the roof supports encountered in Trench Y can be securely assigned to Phase I. Evidence from Trench I, however, seems to suggest that the roof was supported by pairs of pilasters similar to ones still found standing. Similarly, no trace of the original pavement was found in Trench Y. However, a small sounding made next to the curving apse wall revealed a well-made mortar bedding (locus 25g) that can be associated with the Phase I floor. The phase ended in a destructive event, a fire or an earthquake or both, which brought down the roof supports and obliterated the original floor.

Phase II: Modified Chapel

This phase marks major changes in the appearance and quite possibly also the function of the chapel. The chapel was rebuilt, but apparently somewhat shorter than the original building, through the construction of a new western wall (OO; in Trench I). The new floor (loci 40 and 41) of the chapel was made of reused material (marble and Ma'an limestone slabs) and well-shaped sandstone slabs. Only small fragments of it are preserved, mostly in the area of the bema, which was now raised and separated from the rest of the floor by a low barrier (locus 34). A few remains of marble, alabaster and limestone slab fragments found *in situ*, as well as some remains of a bedding mortar, suggest that a similar floor was also laid out in the rest of the chapel. The roof of the chapel was now supported by two pairs of columns (loci 4, 14, 15, and a column in Trench C) in the east and a row of pilasters on the west (loci 17, 18, 19, 20), all of them built against the walls and supporting N-S arches (**Fig. 3**). A new entrance to the chapel, leading directly to the Phase I baptismal font located in Trench I, was opened in the SW corner of the chapel. The original entrance seems to have remained in use, but was narrowed for some reason. Also associated with Phase II are the benches (loci 30, 31 and 33) built between the pilasters along both the southern and northern walls. Of the cupboards in the northern wall, only one (locus 22) remained untouched: the central cupboard was blocked entirely and left behind a column, while the western one was reduced in size. Phase II also seems to have ended in a destruction. The arches supporting the roof fell, but those between the two pairs of columns may have stayed up.

Phase III: New Baptismal Font

This marks a clear change in the use of the chapel. Two significant, new features were added in the bema area: a cruciform baptismal font (locus 26) and a masonry-built altar pedestal (locus 7). The font, which is remarkably well built, has a round bottom with a water outlet, and two steps leading down from each cardinal point (**Fig. 4**). A small basin for water or oil is located in its northwestern corner. The old baptismal font in the west-



4. The cruciform baptismal font uncovered in the chapel in 2003 (photo by M. Mustonen)

ern end of the chapel now became obsolete. Its upper courses were dismantled and the font was backfilled with soil and left under a new floor paving made of roughly worked sandstone slabs (locus 27). Associated with these changes is the blocking (locus 23) of the original entrance into the chapel in the center of Wall H, so that from this time, the chapel could be entered only through the doorway in the SW corner. The abandonment of the original baptismal font made it possible now to build a bench (in Trench I) along Wall OO.

Phase IV: Gradual Deterioration

Phase IV, marking a clear deterioration in the use of the area, can be divided into three subphases.

IVa- The only significant feature then is the construction of a dry-masonry bench (locus 29) along Wall GG. A similar bench found along the southern wall of the church has been assigned to a post-ecclesiastical phase. Although there is no direct evidence that the chapel had lost its ecclesiastic function by this time, this association with similar events in the church makes it seem likely. The enigmatic installation (locus 13) found outside the northern wall of the chapel is also possibly related to this phase. It consists of a platform made of sandstone slabs and mortar, located rather high up, and somewhat tilted towards the west. It may have been used to collect rainwater into the channel found in Trench V.

IVb- During this time, the chapel had certainly lost its ecclesiastic function and was now used as a wind-shelter by occasional visitors. The roof, or at least the arches, were still standing, but small hearths were utilized inside the chapel. Parts of the floor were removed and fragments of marble and alabaster slabs, probably originating from it, were found scattered throughout the occupation layer (locus 25) associated with this phase. On the bottom side of one of the slabs, found next to a small fireplace, a charcoal drawing was found which seems to represent a rider on horseback approaching something, possibly a mountain. It would be tempting to see here a representation of a pilgrim on his way to Jabal Hārūn. A fair amount of glass sherds were found among the soil of locus 11 inside the cupboard. The second baptismal font and the small basin associated with it were apparently similarly used as dumps for the bottom parts of the soil (loci 28 and 37) excavated inside them contained numerous fish bones. At some point, the font was covered by a large slab (locus 26b), perhaps in order to turn it into a small storage space or cistern. An enigmatic row of stones (locus 35) running E-W in the bema area, also belongs to this phase. The phase was most likely ended by an earthquake which brought down the semidome and all the arches except for the easternmost one. The lower shelf of the cupboard (locus 10c) was smashed into pieces. A heavy stone tumble (locus 9, 24 and the lower parts of locus 8), containing all the fallen voissoirs of the arches in neat rows, was formed in the western and central parts of the chapel.

IVc- Although now in ruins, the chapel still saw some human activity. The apse area seems to have been better preserved than the western part, and at

least some of the stone tumble resulting from the last earthquake was cleared. Reusable material from the ruins was still being collected. As in Trench C, a cache of large limestone tesserae (locus 6b) was found inside the cupboard on the northern side of the apse. Sandstone slabs decorated with crosses and other Christian symbols, possibly once elements of a chancel screen, had been placed to cover the cupboard and the tesserae cache. This phase, and with it all human activity of any significance in the area of the chapel, ended in yet another collapse. The sole arch still standing fell on top of the already collapsed arches to the west.

Phase V: Abandonment and Natural Decay

The last phase, represented by a thick and rather homogenous layer of low-intensity stone tumble and wind-blown sand (loci 5, 6a and 8), marks the abandonment of the chapel. No clear evidence of human presence was found in the upper layers of the trench. Concentrations of ashy soil (particularly in loci 21 and 24), at first thought to represent temporary fireplaces, in fact derive from disintegrated ashy mortar, large quantities of which seem to have been used in the structures of the roof. Much of the stone tumble seems to have formed over a long period of time, probably caused by a slow decay rather than any single tumultuous event. Finally, a natural deposition of wind-blown sand (locus 1) has formed the surface soil of the trench.

OBSERVATIONS ON THE 2003 EXCAVATIONS
(Z.T. Fiema and R. Holmgren)

The 2003 fieldwork season at Jabal Hārūn turned out to be particularly successful in terms of the quantity and quality of new data. The church and the chapel are now fully exposed and thoroughly studied for the preparation of the first volume of the final publication of the FJHP which will specifically concern these entities. The most significant evidence recovered in 2003 concerns the intricate changes in the roof supports of the church. These changes came as a necessity, seemingly following each of the seismic-related destructions, and apparently they reflect the search for the most durable solution for the roofing of the church. Notably, the latest design appears to be strongest. In addition to the traditional E-W load-bearing supports (architraves/arches), the nave and the aisles were now spanned by N-S arches, probably reflecting the builders' trust in this traditional means of roofing a space, well known in southern Jordan. With the gradual isolation of the nave from the aisles, affected by the construction of Walls Y, FFF and OOO, the appearance of each of these entities increasingly resembled that of a dwelling unit.

The second, larger baptismal font in the chapel belongs to the same cruciform type well known from the Negev and southern Jordan. The closest parallels are provided by the masonry-built quadrangular-framed, cruciform fonts at the Petra church (Fiema 2001: 45-8) and at the East Church in Mampsis (Negev 1988: 48-50), both with additional basins or containers. Both these fonts had four columns which seemingly supported a canopy or baldachino over the font, a feature not evidenced at Jabal Hārūn.

The function of the plastered basin integrated in the font's masonry at Jabal Hārūn is puzzling. Such small basins or containers are also known from other baptisteries, often in association with cruciform fonts. Besides the stone jar at the Petra church font and a round basin at Mampsis East, the examples include: three small, trapezoidal basins flanking the main oval font at the Church of St. Theodore at Jarash; the semicircular basin sunk in the masonry of the cruciform font at Oboda/'Avdat North; oval, stone basins beside the cruciform monoliths at Sobata/Shivta North and South; a small plastered pit in one of the arms of the cruciform masonry font in Building D at Magen; and finally, a semicircular basin in the southern arm of the masonry-built cruciform font at the Old Diakonikon of the basilica at Mt. Nebo (all examples discussed and illustrated in Ben-Pechat 1989, figs. 1 and 2). It was suggested that these small basins were auxiliary to the main fonts, and served for the baptism of infants (Bagatti 1984: 307-8). Notably, even the largest known main fonts are not large enough to allow an adult to partake the required rite of total immersion, and certainly the second Jabal Hārūn font, although larger than the first one, would also not allow for such rite. Similarly, the small basin attached to the main font at Jabal Hārūn could hardly accommodate infant immersion, primarily due to its very difficult access restricted by the column standing nearby. Perhaps a rite of external infusion for infants could be performed there, as suggested for some other of these auxiliary basins (Ben Pechat 1989: 177-82). Alternatively, the small basin could have served as an additional water container.

The location of the second baptismal font in the chapel at Jabal Hārūn is important, especially in light of the hypothesis already proposed in 1999 (Fiema and Holmgren in Frösén *et al.* 2001: 405-6). Initially, it was thought that, with the construction of the masonry pedestal for the altar in the

chapel, the first (smaller) font was abandoned and the chapel itself changed its function from a baptismal to a memorial chapel. The latter was postulated on the basis of the compartment inside the pedestal, which appears to have held important relics, perhaps translated to the chapel from the ecclesiastical edifice on the peak of Jabal Hārūn, described by Wiegand (1920: 136-45). Indeed, the altar was most possibly constructed in Phase III of the chapel, at the same time when the smaller font was abandoned. But the same phase had also witnessed the construction of the larger font, discovered in 2003.

Two factors have to be considered here. The early font was indeed of extremely small dimensions. Even if it survived the first major destruction of the church and the chapel and continued its function afterwards (Phase II), it could have been felt that its size was inadequate. Furthermore, the remodelling of the bema area in the chapel, associated with the construction of a new altar, probably with relics inside its pedestal, created a new situation and a new main focus of religious observance. Notably, fonts in side chapels adjacent to the churches, would usually be situated either in the apse of the chapel or in a central position in the chapel. For example, both locations are well exemplified by the fonts in the South Baptistery and in Diakonikon of the Memorial of Moses Church at Mt. Nebo (Alliata and Bianchi 1998: 168-171; 176-7). If a new, larger font was contemplated for the chapel at Jabal Hārūn, it could not be situated in any such locations as it would have obscured the altar and would somewhat have distracted the attention from focusing on that most significant element in the chapel. Therefore, the new font was located to the left (north) of the bema, in a somewhat awkward position, yet unobtrusive for the main cult focus in the chapel. As such, at least in Phase III, the chapel would indeed have become a memorial chapel, yet its baptismal function and practices there were not abandoned altogether. Rather, the proximity of the new font to the bema and the altar indicates that the memorial and baptismal functions of the chapel seem to become even more liturgically interrelated.

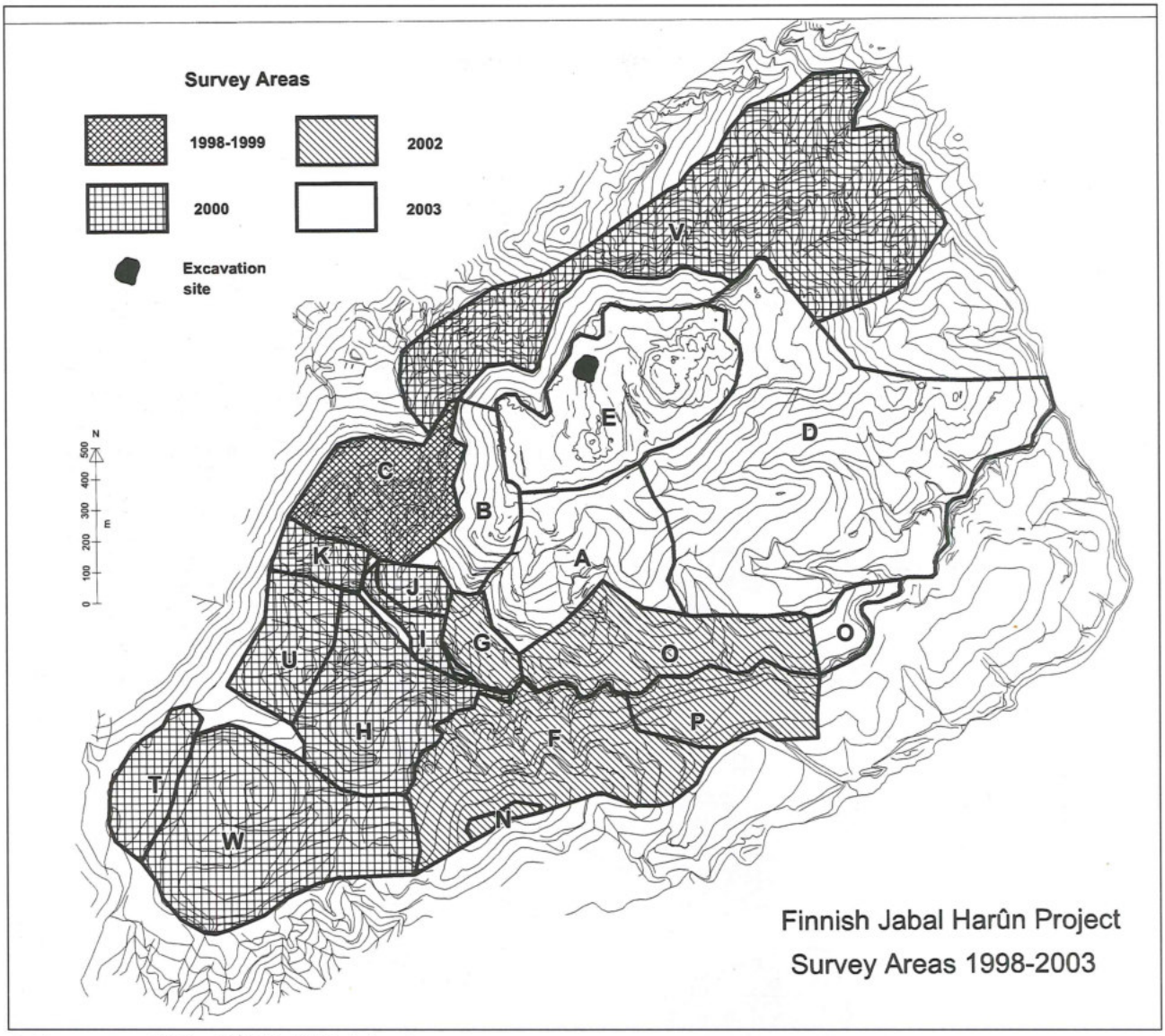
THE 2003 FJHP SURVEY

(M. Lavento, H. Haggrèn, E. Hertell, H. Junnilainen, P. Kouki, A. Mukkala, S. Silvonen, H. Ynnilä, M. Huotari, H. Jansson)

The area surveyed in 2003 was approximately 1.5 km^2 (**Fig. 5**), divided into 69 tracts. A total of 31 sites were documented. The number of finds on the lower slopes was smaller than in the previous years due to the steep topography and heavy erosion in the area. The survey area encompassed southern (Areas A, B and O) and southeastern (Area D) parts of the foothills of Jabal Hārūn, some higher terraces on the eastern side of the mountain (Area D), and the upper plateau of Jabal Hārūn (**Fig. 6**), including the summit of the mountain (Area E). While the work conducted in 2003 has largely accomplished the main surveying goals of the FJHP, further fieldwork – at least one field season – is still required to study the environment and surroundings of the area surveyed so far. In addition to the detailed geological and geomorphological description of the area already presented elsewhere (Frösén *et al.* 1999: 394-396), a few additional words will be in order here. The Jabal Hārūn massif is mainly Cambrian sandstone (GMD 1995), but the SE slopes of the mountain, the volcanic rhyolite underlying the sandstone was exposed and it forms very steep, heavily eroded slopes. In the sandstone area, stretches of relatively even ground alternate with rather steep, eroded slopes. Several tributary wadis cut the slopes, running into the Wādī an-Naqb in the south. Above the Wādī an-Naqb, remnants of several old terraces of the wadi can be seen. To the SE of Jabal Hārūn, Wādī an-Naqb becomes narrower and runs into a gorge that drops several meters between the sandstone cliffs.

The geomorphological documentation and sampling that began in 2002 was continued by clearing one more section of a low and presumably relatively recent terrace of the Wādī al-Farāsha. The sedimentary structures in the section were documented and the sediment layers were sampled for OSL dating and grain size and provenience analyses. The earlier OSL dates indicated a "too high" age of the terrace sampled (over 100,000 years) and for the possible redeposition of sediment. Hopefully, new samples will yield later dates and shed light on erosion phases related to human activities in the area. Additionally, Dr. Majdi Barjous from the Natural Resources Authority of Jordan participated in the survey for three days with the purpose of finding the origin of the flint that occurs in the survey area. The area is rich in flint from different geological periods, and the investigation will be continued in future seasons.

The cartographic team continued documentation in Areas A, B, D, E, O, F, and P. Documentation of terrace walls was mainly done by stereo photographs while other entities were measured by tachymeter. In addition, five geodetic control points (0301-05) were established. During the previous field season, photogrammetric 3-D re-

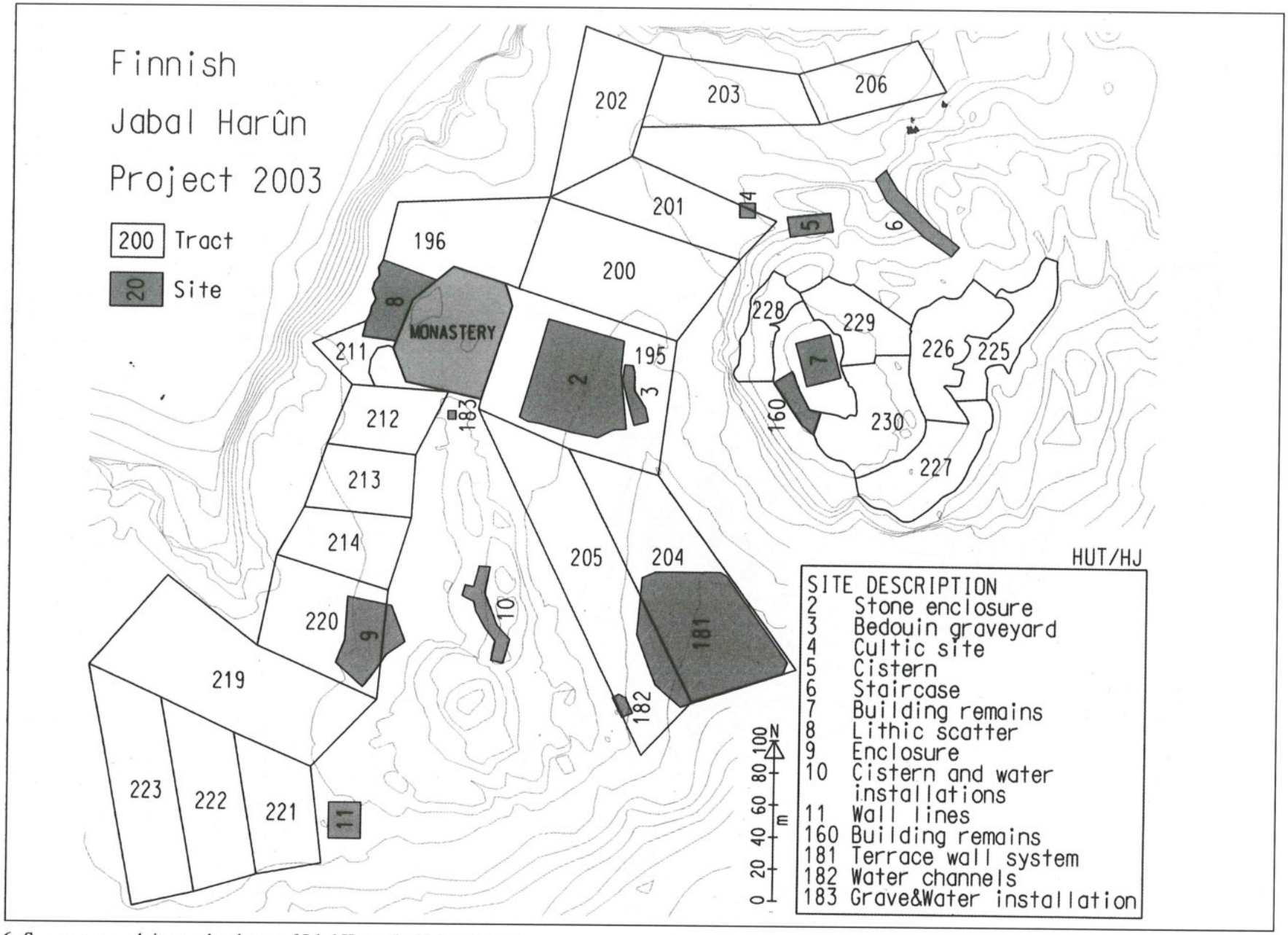


5. Survey areas 1998 - 2003 (by K. Koistinen).

cording of the barrage systems and terrace walls was tested in order to replace some time-consuming tachymeter measurements. Further research at the Helsinki University of Technology proved the stereo measurements of the terrace walls to be successful while the measurements of the barrage systems were troublesome with the software in use: the orientation of close-up stereo photographs, essential for the barrage documentation, has failed. Since the photogrammetric recording was successful, it was continued during the 2003 season. The stereo photographs were taken as panoramic image sequences, each typically consisting of three images. The base was principally about 15-20 meters, forming an approximate base-to-distance ratio between 1:10 and 1:15. Natural control points, like corners of rocks, were chosen and documented concurrently with close-up images. The control points were recognized in the field with interpreted images, and the coordinates were measured by tachymeter. Images were taken with a new digital camera, Olympus Camedia C-4000 Zoom, with an image resolution of 2288 x 1712 pixels. Additionally, the positions of the camera shots were approximately recorded with the GPS.

Lithic Sites

The survey of the plateau and slopes of Jabal Hārūn produced a considerable number of lithics. The collected material was dominated by flakes, flakelets and irregular cores for their production. In the lower part of the slope of Jabal Hārūn, Middle Palaeolithic material was present, but at the upper



6. Survey areas and sites on the plateau of Jabal Hārūn (by H. Junnilainen).

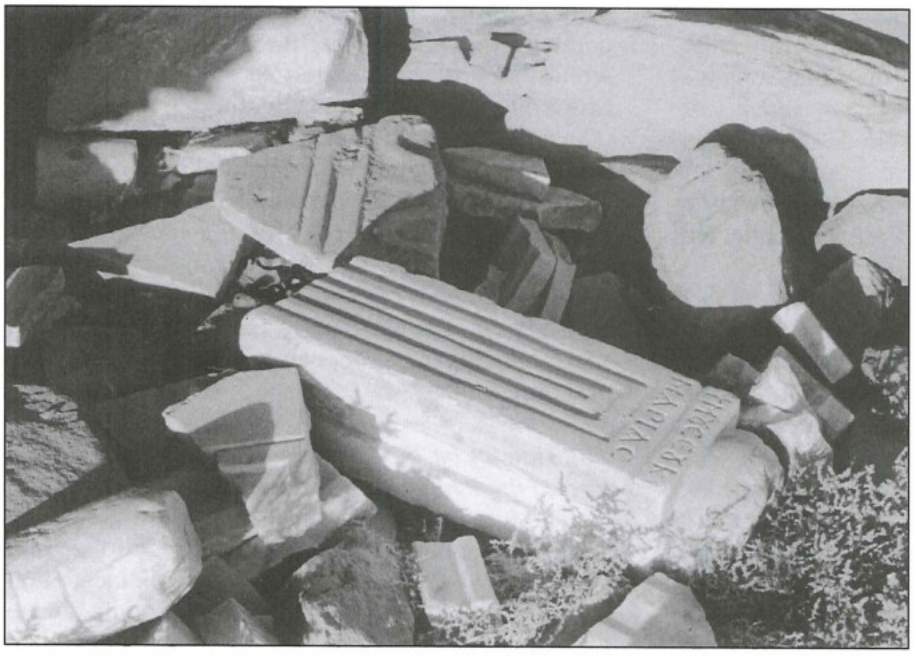
elevations it was relatively scarce. Two lithic concentrations (Sites 8 and 165) were detected during the 2003 season. Site 8 is situated on the top plateau of Jabal Hārūn, immediately west of Site 1. The assemblage is flake-dominated and it contains several tools, including sickles and tabular scraper fragments. These tools suggest a Late Neolithic - Chalcolithic - Early Bronze Age dating for the material (Rosen 1997: 75). Site 165 contains some Middle Palaeolithic as well as later elements. However, the assemblage is dominated by flakes, some irregular flake cores and heavy-duty tools made from older flakes, probably of Palaeolithic origin. This material probably dates from late prehistory.

Several times, a few flints and a core were found together on the slope of Jabal Hārūn. The flint raw material and successful refitting of some artifacts suggest that they were knapped in place from a single core. Taking into account the erosion rate and the effect of the Nabataean activity in the area, it seems unlikely that these lithics are prehistoric. They more likely relate to the Bedouin use of lithic materials during the last centuries (see Kuijt and Russel 1993).

Sites on the Plateau and the Weli Summit

The plateau of Jabal Hārūn (**Fig. 6**) was surveyed by walking 18 tracts. A large quantity of Byzantine and Islamic pottery was collected around the monastic site. In addition, some sherds of glass, mainly from glass lamps, and marble fragments were collected. Below the NE summit, Late Islamic pottery was also found, possibly originating from the top where larger quantities of this type of pottery were collected. In the SW part of the plateau, pottery finds were also relatively abundant. Lithic material was not as plentiful there with the exception of a flint concentration (Site 8). The sites previously noted during the reconnaissance survey in 1997 (i.e., Sites 2-4 and 8-11; see above and Frösén *et al.* 1998: 492-494) were documented in detail. Three new sites were also recorded, including the Nabataean water channels and possible locations of two ruined cisterns (Sites 182, 183), as well as a terrace wall system in the saddle between the summits of the mountain (Site 181). On the *weli* summit, finds consisted mainly of pottery, fragments of marble floor tiles and limestone tesserae, probably originating from the ruined ecclesiastical structure below the present *weli*, described by Wiegand (1920). There is also a cache of carved and inscribed marble fragments (**Fig. 7**) on the bedrock ledge, SE of and below the *weli* (Tract 230), and two large pieces of a round, well-made, polished black granite vessel on a lower ledge to the east of the *weli* (Tract 226). Practically no lithics were found on the weli summit, indicating that the summit area was probably not intensively used during the Stone Age. Most of the slopes leading up to the summit were considered too steep and precarious to be investigated safely, but the ledges and more even areas between cliff walls were walked in six tracts (225-230).

Site 6 (Frösén *et al.* 1998: 493-494) is a long, steep staircase carved into the bedrock in a natural



7. The cache of broken marble furniture located at the ledge below the *weli* (photo by P. Kouki).

ravine between two steep, tall cliffs on the NW part of the summit. The recognizable part of the staircase consists of 73 steps, but these probably continue under the pile of rubble and large boulders that currently fill the lower part of the ravine. This pile might have resulted from one of the ancient earthquakes known to have seriously affected the area. After that, the use of the staircase was probably discontinued. The staircase was most likely constructed and primarily used in Nabataean times since there are indications of Nabataean occupation in the lowest layers of the excavated monastic complex on the plateau, as well as in various places on the NE summit itself.

Site 7 consists of ruins under and immediately around the *weli* at the peak of the NE summit. Several wall lines can still be discerned, but most of the ancient building has been destroyed by the recent construction work on the outer terrace of the *weli*. The walls are probably remnants of the Byzantine church, although it is likely that some kind of structure existed here already in the Nabataean period. Surface sherds ranged from Nabataean to Late Islamic, and fragments of marble floor tiles were also collected at the site. Site 5 is a partly rock-carved, partly masonry-built cistern located at the bottom of the modern staircase from the plateau up to the *weli*. The cistern is entered through an arched doorway with several steps leading down to a quadrangular reservoir measuring approximately 20 x 4m. The ceiling is made of stone slabs supported by 15 masonry arches. The cistern appears to have several phases of construction and remodelling. Masonry details suggest that the cistern was used at least in Byzantine times, and it may have originated in the Nabataean period. Site 160 consists of poorly preserved building remains on a bedrock ledge immediately below and SE of the *weli*. Several wall lines can be discerned, and the building seems to have been supported by or constructed against large bedrock boulders. A large amount of coarse, Late Islamic ware was collected at this site.

Nabataean Remains and Rock Carvings in Area D

On a steep and narrow ledge of the Wādī an-Naqb (SE side), several building remains can be discerned (Site 166), probably Nabataean in origin according to the masonry and overall plan. The natural forms of bedrock and larger boulders may have been utilized as parts of the buildings. Among the 12 wall structures, 2 column drums were found, together with Nabataean fine and coarse ware.

In association with the structures, there is a niche with an anthropomorphic relief, carved on the sandstone rock and facing the opposite bank of Wādī an-Naqb. Mineral residue marks the location of a seasonal waterfall suggesting the possibility of a cultic place associated with water. The figure wears loosely draped clothes but its head is totally eroded away. Similar reliefs have been reported in the Petra area (Lindner 2001: 30), such as at Dushara Sanctuary in Shammāsa, on the NE side of Umm Saysabān (Lindner and Gunsam 2002: 231-234). An antropomorphic rock-carving has also been reported in connection with Jabal Hārūn (McKenzie *et al.* 2002: 472) but its more exact location is unclear. Site 180 consists of Nabataean-style rock carvings. They are quite visible, occurring on small cliffs by the steep rock face on the SE side. An interesting feature among the rock carvings on the continuation of the ledge is a set of three parallel rows of dots which resembles one found in Shammāsa (Lindner *et al.* 2001: 293).

Two stelae were found on the lower run of the Wādī-an-Naqb. Site 184 is situated only ca. 100 meters further to the east, close to the bottom of the deep drop of the wadi ledge. The site is a niche with a small stela. It cannot be reached from above, and the access from the east along the wadi bottom is almost barricaded by a huge block of sandstone as well as oleander bushes. This isolated niche is most certainly connected with the other two that are nearer the wadi. Before the intersection of the Wādī an-Naqb with Sayl Wādī Mūsā, two niches have been carved into the Jabal Hārūn side of the wadi (Site 176). On a small ledge of the Jabal Hārūn side of Sayl Wādī Māsā there is a human-made depression (Site 175) chiseled in the sandstone bedrock. It measures 0.5 by 0.7m with a depth of 0.3m. If it has functioned as a grave, it would have suited a child. On bank of Sayl Wādī Mūsā on the Jabal Hārūn side, there is a Nabataean (?) carved cliff wall (Site 174), ca. 5m in height, forming a right angle with a natural cliff wall there. Two small channels parallel to each other have been carved into the edge of the rock, ca. 0.7m apart. The bedrock surface there is covered by a thin layer of soil, but above there is a low step with masonry continuing towards the edge of the formation. Remains of plaster can be detected on the natural cliff wall.

The Hamlet on the NE Side of Jabal Hārūn (Area V) and the Remains in Area O

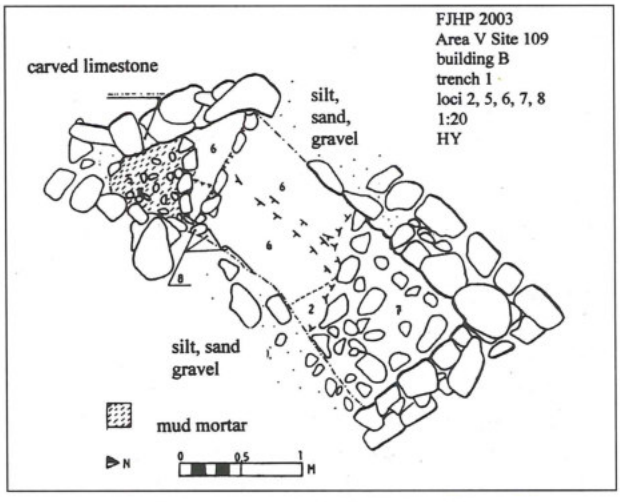
The remains of a small hamlet in Area V (Site 109) were documented during the 2000 season (Frösén *et al.* 2001: 372). The hamlet is located on a steep slope in the middle of the mountain, on the NE side of Jabal Hārūn. The building remains lay

on three natural terraces of a promontory between two ravines. In 2003, test trenches were opened inside two structures: Trench 1 in the NW corner of building B on the middle terrace, and Trench 2 on the N side of building A on the lower terrace. Trench 1 proved to be particularly interesting. The finds in trench 2 were limited to poorly preserved walls.

Trench 1 (**Fig. 8**) measured 2.5 x 1.1m was bordered by the walls on three sides. Locus 1 was a long-term natural deposition. The courses of uncovered walls were weathered and showed no working marks or plastering. Among tumbled stones, pottery and corroded metal artifacts were found, clearly in a secondary context. Locus 2 consisted of packed silty sand which contained bone, glass, shell, metal, pottery and rounded stone objects. Loci 3 and 4 contained small patches of hard-packed clayish soil and small stones, topped with even smaller stones and a mortar binder. Loci 6, 7 and 8 in the southern part of the trench might have belonged to a water reservoir.

During the excavation, it was noted that the masonry of the NW wall was of higher quality than the two other walls. This is rather peculiar, since it is an inner wall, while the other two face outside. The NW wall may possibly be an earlier, Nabataean wall reused during the Ayyubid-Mamluk occupation of the site. In addition to evident differences in the building architecture, pottery finds also support the hypothesis of the multi-period use of the building complex. This could also explain why wall lines are asymmetrical.

Additionally, Sites 149 and 151 (Area O; poorly preserved building remains) situated on the lowermost slopes of Jabal Hārūn, in the vicinity of the Wādī an-Naqb were investigated. Some wall lines can be interpreted as forming square-like structures



8. Site 109, Building B, Trench 1 (by H. Ynnilä).

ca. 3 x 3 and 5 x 5 metres in size. Remains that are similar in size, location and visibility have also been documented during the previous years (Frösén *et al.* 2000: 418). Some are found in connection with an ancient road passing through Areas T, W and H (Frösén *et al.* 2001a: 371, 381). The ancient road may also have passed by Sites 149 and 151, which could have been built in connection with that road.

Water Installations

Due to the steep gradient of the slopes and the heavily eroded environment, the hydraulic installations somewhat differ from those from the earlier fieldwork (Frösén *et al.* 1999; 2000; 2001a). But in general, the same kind of large, water-harvesting system is evident and comparable with systems widely found elsewhere in the Middle East and in Africa (Graf 1983: 654-655; Mayerson 1962: 231-246; Regner 2002: 267-278).

Only 5 clear barrage systems with 54 barrages were documented as sites in 2003. The small number of barrage systems can be explained by the topographical position of tributaries running down from the summit to the Wādī-an-Naqb. Several barrages, which are still visible, were built of huge stone blocks able to resist water pressure. The bottoms of wadis were eroded down the bedrock in almost all cases. The extent and degree of erosion gave the impression that the barrages are not very recent in date. This might support the hypothesis of their dating even to the Nabataean period (Lavento and Huotari 2002). In addition to the apparent barrages, two large terrace-barrages were also documented. Parts of these structures were clearly intended for keeping water in wadis whereas other, larger parts were meant to slow down flowing water and conduct it to terraces while depositing fertile soil there. These structures were usually broken in the middle where they crossed the tributary.

The most common hydraulic installations in the 2003 survey area were terrace walls (a total of 17) which formed a large-scale water management system spreading over the foothills of Jabal Hārūn. Their primary function was to stabilize the soil, but also to preserve water in the soil. It is currently difficult to estimate their total number or length. Because of their number, these structures were photogrammetrically documented and they will be measured later from pairs of stereo pictures. In general, the walls varied between 2m to over 40m in length and 0.5 to 1m in height. The state of preservation was relatively good on the eastern slopes of Jabal Hārūn, which may be due to both the gentle topography and the peripheral position of the

area. It is also possible that, on the gently sloping SW foothills of Jabal Hārūn, there are several terrace walls, which may have been used recently.

FJHP 2003 Survey Pottery

The pottery from the FJHP 2003 survey season can be roughly divided into two groups according to the surveyed areas. The pottery distribution in the lower survey areas, i.e., the southern and southeastern foothills of Jabal Hārūn, follows more or less the same pattern as in the areas surveyed in previous years: sherds are sparsely but evenly scattered throughout the slopes, and the principal types are Nabataean-Roman common ware with small quantities of Nabataean fine ware and later sherds. The foothill area also features large hydraulic installations (barrages and terrace walls) similar to those surveyed in previous years indicating a continuation of the agricultural area used by the Nabataean inhabitants. A preliminary analysis of the painted fine ware sherds collected suggests a dating in the first century AD.

As for the plateau and the NE summit of Jabal Hārūn (Area E), fairly small in terms of surface area, the pottery there was plentiful, comprising 60% of the total pottery collected. The types of sherds vary significantly more than in the lower slopes and foothills of the mountain. Although similar Nabataean-Roman pottery (mainly from the first century AD) was found in Area E, other periods and types were also represented. These include various Byzantine and Islamic types that are known from the excavation of the monastic complex. However, it is interesting to note that, according to a preliminary assessment, the sherds collected immediately around the monastery complex contain samples of imported vessel types that are rare or missing at the excavated site. For example, the survey yielded numerous pieces of African Red Slip ware, contemporaneous with the occupation of the monastery complex but very infrequently encountered within its walls. Further research is needed to determine a reason for this curious discrepancy.

A significant amount of coarse Ayyubid-Mamluk pottery was also collected, mainly in a small area on the NE summit. This type of pottery, characterized by geometric patterns, dates to the 12th century and is commonly found in the Petra area (e.g., 'Amr *et al.* 2000: 251). Another type of coarse, reddish-brown ware with mineral and organic inclusions was also found in rather large amounts and it resembles the Late Islamic "Mu'allaq ware" (Lindner 1996: 124-125). However, many of the Jabal Hārūn sherds feature taeniae marked by small, regularly pierced holes, which does not appear to be typical of Mu'allaq ware.

CONSERVATION REPORT

(Ch. Danielli)

During the past three seasons, conservation activities at the Jabal Hārūn site have been primarily concerned with stabilizing fragile finds and architectural elements uncovered during excavation. The guiding principle has been to treat and protect the most endangered remains while preserving the original building techniques and elements reflecting relative chronological phases. As more of the site is uncovered each year, a better understanding of the construction techniques and their relative chronology, as well as the testing of repair materials opened the possibility for a partial reconstruction of relevant architectural features at the site.

The structures most in danger of collapsing were the eastern wall (V), common to the church and the chapel. The intervention in this area consisted of dismantling the existing exterior eastern wall and re-erecting it by employing used masonry blocks from the site, bonded with mud mortar. Where it was possible, the original blocks were left in place, maintaining the height at the level found during excavation. This has produced an irregular surface line which is indicative of the level found during the excavation.

Other secondary structures, such as the buttress built on the SE corner of the atrium and the western wall of the chapel were also reinforced, as they were closely knit with the masonry of earlier phases and were threatening the stability of the adjoining walls. The method applied was the same used for wall reinforcements during the previous season. The original mud mortar found between the stone blocks was mixed with water and re-applied deep in the joints. After the partial setting of the mortar, a solution of 15% Syton was sprayed on the surface layer. This solution has proved extremely effective in the climatic conditions of the site. The plasticity of the clay, combined with the strengthening effect of an inorganic consolidant such as Syton X 30, allowed for a better stability of the mortar without having to use acrylic resins.

Another important feature of the site are the currently free standing rows of original columns running E-W along the nave of the church. During the excavation, some of these columns were embedded in the excavated soil and thus only partially collapsed, whereas in other cases the drums had already collapsed during earlier phases, and were

found dispersed in the soil or on the floor. As the base drums of these columns were found in their original positions, it seemed appropriate to partially re-erect a few of the drums to better illustrate the original plan of the church. In the case where the columns were found standing, the drums were dismantled and a selection of the least damaged drums was made, trying, where possible, to maintain the original position of the drums. In the case of the atrium columns, where most of the drums had already collapsed, only one or two of the better preserved drums were fitted on the extant base. The drums were cemented using lime mortar mixed with sand and a small quantity of white cement. The facing of the mortar in between the drums was left about 5 to 6mm from the surface to mark the conservation intervention.

Extensive areas of wall plaster were also uncovered during the 2003 season. The most important feature of these large fragments was the diversity of the aggregate and manufacture of the layers very close to each other if not overlapping, possibly indicating different phases. Although most of it was very fragile, it was important to preserve as much as possible the entire extension of the fragments as a whole to illustrate the different typologies of plaster within the same area. Injecting a liquid hydraulic mortar (Microlite) filled the large gaps, which had formed in many areas between the wall and the plaster layer. Where the layers of plaster were adjoining or overlapping, limewater was used to consolidate the fragments in order to maintain the original layers. The small lacunae of the plaster were then filled with a mortar made of lime mixed with local sand. Samples have been taken of the different plaster types and they are being analyzed in order to define a possible chronology of the phases.

The masonry altar pedestal in the chapel was excavated during the 1998 season. Immediately after excavation, the installation was backfilled and its surface protected with sand bags. It was uncovered again this season for a survey of its condition. Although the surface of the plaster covering the altar was in a stable condition, the partial exposure to the outside air caused a strong migration of salts towards the surface, especially in the small hollow compartment opening towards the east. Here the salts had formed very large spiky crystals which were extremely hard to remove mechanically. Moreover, the partial solidification of the salts between the masonry and the plaster layer had caused several large detachments of plaster which had to be carefully consolidated. Where the plaster was powdering behind the surface, a solution of 15% Syton X30 was injected. After the consolidation of the plaster layer (where necessary), the gaps between the masonry were filled with hydraulic mortar and pressed back into place with wooden props.

The correct assemblage of sample sections of architectural fragments back into place has not only permitted the effective protection of several collapsing structures at the site, but it has helped to put in clear relationship the building components and different phases of the site. In this way, the plaster and the related architectural finishing can be treated in situ and remain part of the features of the site.

JF, ZTF, AL, MH, and KJ
Institutum Classicum,
PL 4 (Vuorikatu 3A),
FIN-00014 Helsinki, University,
Helsinki, Finland

ML and EM
Institute for Cultural Research,
Department of Archaeology,
P.O. Box 59 (Unioninkatu 38 F),
FIN-00014 University of Helsinki,
Helsinki, Finland

ChD
Conservazione Beni Artistici,
Via Agrigento 3, 00161 Rome,
Italy

RD - ARCDOC,
Archaeological Documentation,
Wollmar Yxkullsgatan 15B,
SE-118 50 Stockholm,
Sweden

JL
Institute of Photogrammetry
and Remote Sensing,
Helsinki University of Technology,
P.O. Box 1200,
FIN-02015 HUT, Espoo,
Finland

AR
Department of Arts and Anthropology,
Linnanmaa PL 1000,
FIN-90014 University of Oulu,
Oulu, Finland

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SĪQ AL-MUDHLIM STUDY SURVEY, 2002

Petra National Trust

Introduction

In 2002 Petra National Trust (PNT) carried out a study in Petra in co-ordination with the Department of Antiquities of Jordan (DoA) and a specialist team of consultants in the private sector, Middle East Engineering Management (MeeM). The study assessed the impact of flash floods and the possibilities for flood protection of the Wādī Mūsā along its diversion into the Wādī al-Mudhlim and Wādī al-Maṭāḥa. The Wādī Mūsā catchment area extends east of Petra to both the north and south (**Fig. 1**).

The study comprised three stages: to collect data (i.e. topographic and archaeological survey) and review pervious works; to undertake the hydrological and hydraulic investigations and finally to explore the flood mitigation and management options. As a result of the work, the archaeological remains of the area were recorded and preliminary designs were developed for flood protection; four main groups of structures were proposed, two dams, one pond and three check dams, and the clearance of collapse within the Sīq al-Mudhlim tunnel was strongly recommended.

Overall the study area included the entire catchment area for the Wādī Mūsā, but for the topographic and archaeological surveys it was narrowed down to the courses of the Wādī Mūsā, Wādī al-Mudhlim and Wādī al-Maṭāḥa, beginning at the Mövenpick Hotel arched culvert (UTM E194900, N970550), continuing via the Nabataean tunnel (Sīq al-Mudhlim) at the entrance to the Sīq and ending at the Nymphaeum inside the central Petra basin (UTM E192600, N971020).

The authors and contributors of the information contained in this report are Ueli Bellwald, Ma'an al-Huneidi, Munther Kharouf, Dr. Adnan Salihi and Ibrahim Najjar. All the complete and detailed information regarding the studies and the location and details of the proposed flood mitigation measures are on file in Amman at PNT and DoA.

The Topographic Study

The topographic survey, which covered a length of just over 5.1km and an area of 152,559m^2, produced final drawings which formed the base for the other field studies. The study area was divided into 12 sectors (**Fig. 2**) and one-metre contour maps were developed for each sector together with a general plan for the whole site. Over 4500 points were taken and the elevation at the beginning of the survey (sector MS1) was 1062m, dropping down to 875m at the Nymphaeum. The tunnel was treated with particular care and a longitudinal section was drawn to show the ceiling features.

The Archaeological Study

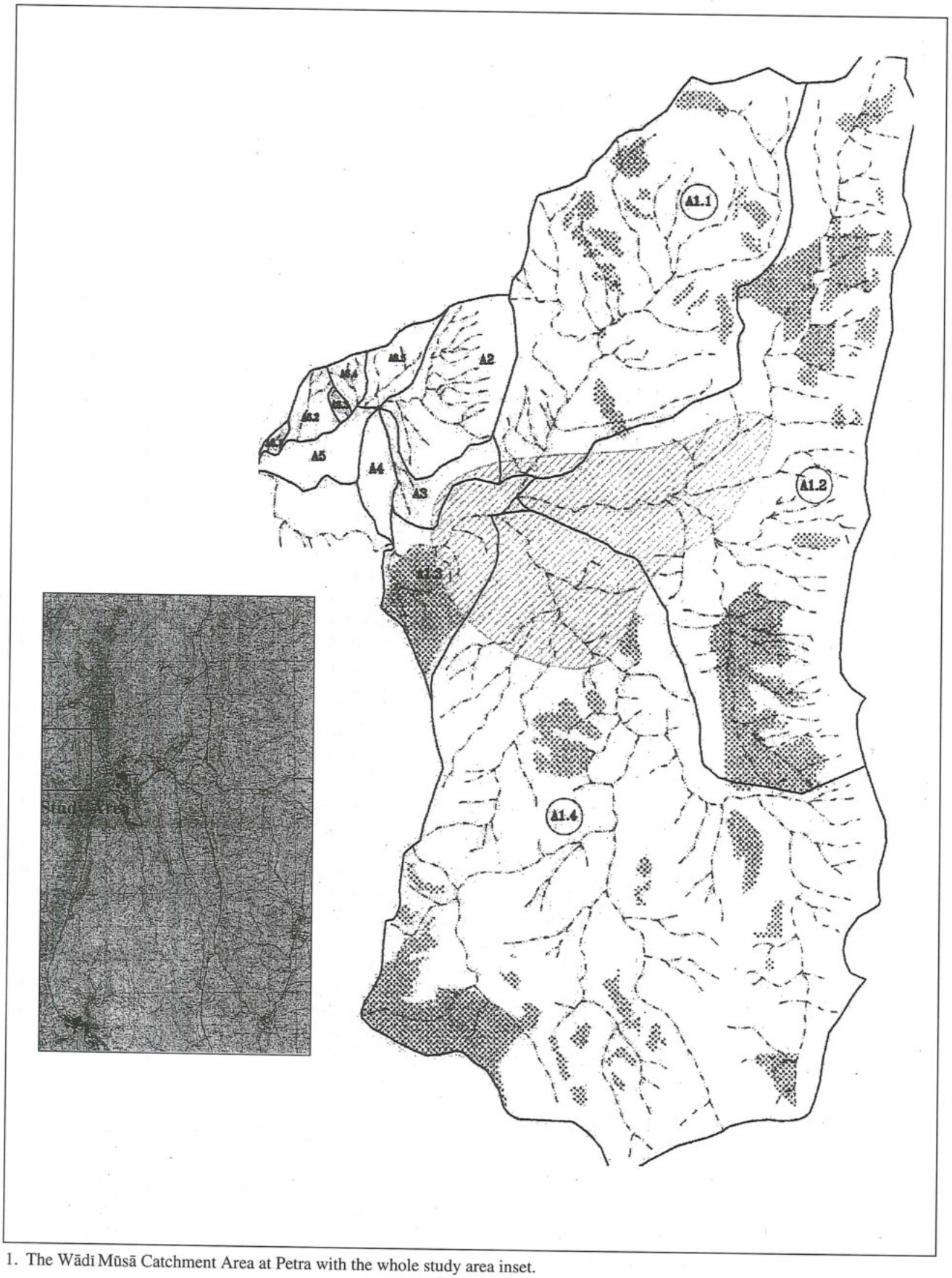
The archaeological survey included the flanks of the wadis along with the wadi beds, so that any connections between installations in the wadi beds and those along the banks would be recognized.

All ancient structures were recorded on the project maps, described and preliminary identifications made. A background study of all reports from the 19th and early 20th century (Burckhardt 1822; De Laborde 1830; Brünnow-Domaszewski 1904; Musil 1907; Dalman 1908; Bachmann-Wiegand 1921; Horsfield 1938) was carried out.

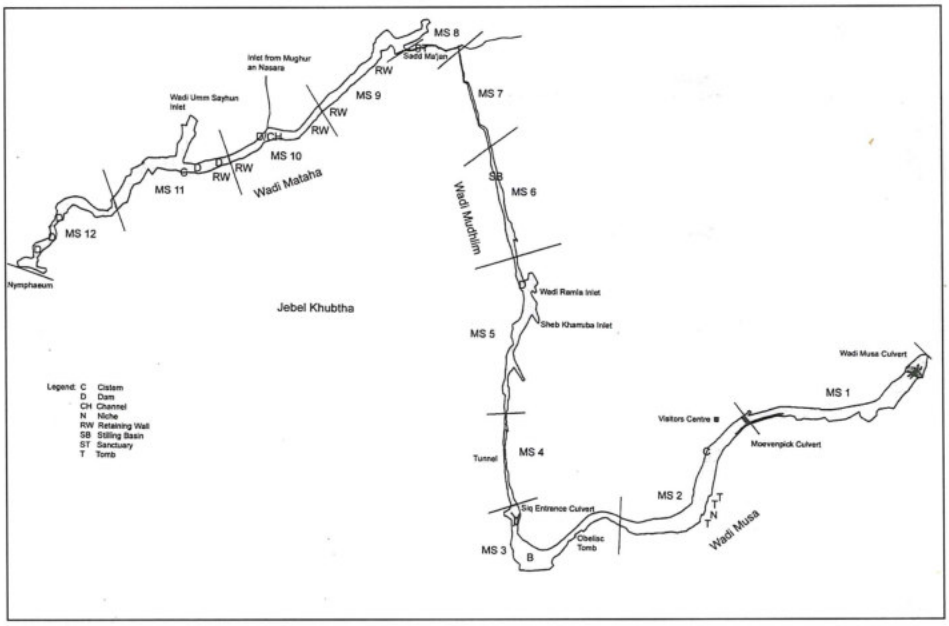
The results of the archaeological survey are presented below, sector by sector, with a short description of the most important elements recorded and an initial interpretation of function.

Sectors MS 2 - MS 3, Necropolis Area

During the Nabataean period, the entire southern and eastern part of the northern bank of the Wādī Mūsā in both sectors was occupied by a necropolis. Today about 60 structures have been identified, amongst which 12 border the wadi bank. From this group of ancient structures, four tombs and one sanctuary are partially buried by wadi rubble (**Fig. 3**). Estimates, based on patches of bedrock exposed in the centre of the wadi bed and other fully exposed structures located higher up the bank (such as the Dromos Tomb with the snake and horse bas-relief), suggest that these structures might be buried by up to two metres or more. Ac-



1. The Wādī Mūsā Catchment Area at Petra with the whole study area inset.



2. Map of the area surveyed showing the sectors and the location of the recorded archaeological remains.



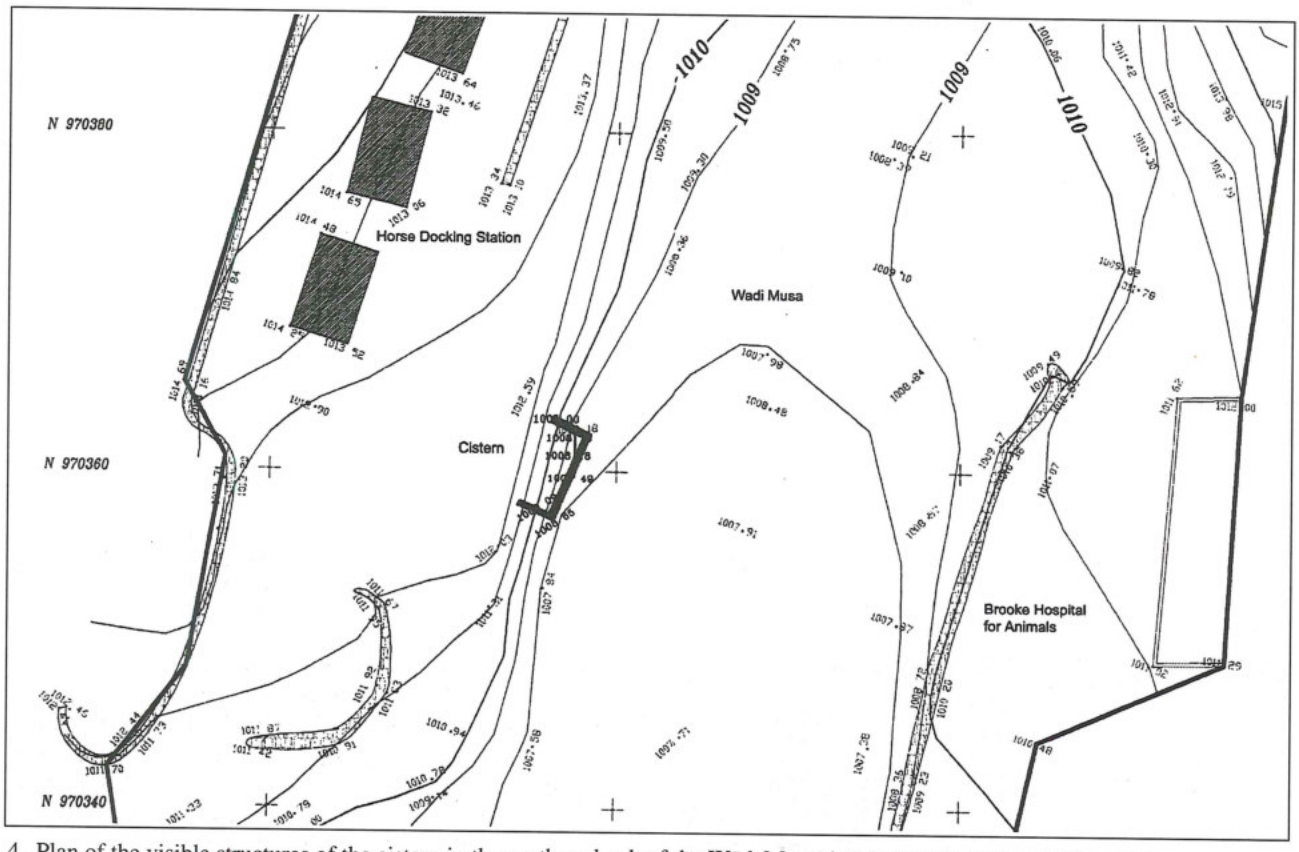
3. Partially buried tomb façade in the southern bank of sector MS 2, with an extended forecourt cut into the cliff.

cesses to all structures at present day wadi level are partially obstructed by debris, for example the Bāb as-Sīq Triclinium below the Obelisk Tomb. Here the disproportion between the width and the height of the façade implies that not all of it is visible and a thorough analysis of the architectural elements shows that none of the pilasters, quarter-and half-columns have bases, which means they were planned to reach further down. Well-preserved quarry trenches at the downstream end of the terrace, in front of the façade, also imply that the façade was left unfinished since quarry trenches were normally removed in front of finished monuments. The flood of 2nd May 2001 showed that the wadi bed in front of the Bāb as-Sīq Triclinium can be filled to the level of the terrace with washed-in debris within only two hours. If the façade was planned to reach further down, the conclusion must be that the bottom of the wadi bed then was at a much deeper level than is evident at present.

That the Nabataean necropolis extended onto the northern bank of the Wādī Mūsā is demonstrated by the large structures of the courtyard tomb (Triclinium No. 4) in the precinct of the Guest House of the Crowne Plaza Hotel. Besides the Urn Tomb in the western cliff of Jabal al-Khubtha (جبل الخبثة), this tomb is the only one in Petra with flanking porticoes chiseled in bedrock. This tomb, with its outstanding architectural design, highlights the importance of this little understood necropolis. Close to the northern bank of the wadi bed only one ancient structure is actually visible. It is a rather well-preserved cistern, located directly below the access to the horse docking station by the entrance gate (**Fig. 4**). Its front wall, towards the wadi bed, has been washed away leaving the internal structure of the cistern clearly visible. It is 4.6m wide, its interior was fully plastered and was covered by semicircular arches that supported a ceiling of sandstone slabs. The original bottom of this cistern is buried under wadi debris and for the moment, the context in which this cistern functioned remains unknown.

Sector MS 3, The Detention Basin

The most important element detected in sector 3 is the flash flood detention basin (**Fig. 5**). This enormous basin covers the entire area of the curve where the course of the Wādī Mūsā changes from east-west to south-north. Along the northern bank, the basin was closed by the dam of the high level road, built by the Nabataeans between 50 and 25 BC as part of the construction of the paved street in the Sīq. The course of this road and its dam can



4. Plan of the visible structures of the cistern in the northern bank of the Wādi Mūsā, just below the horse docking station.

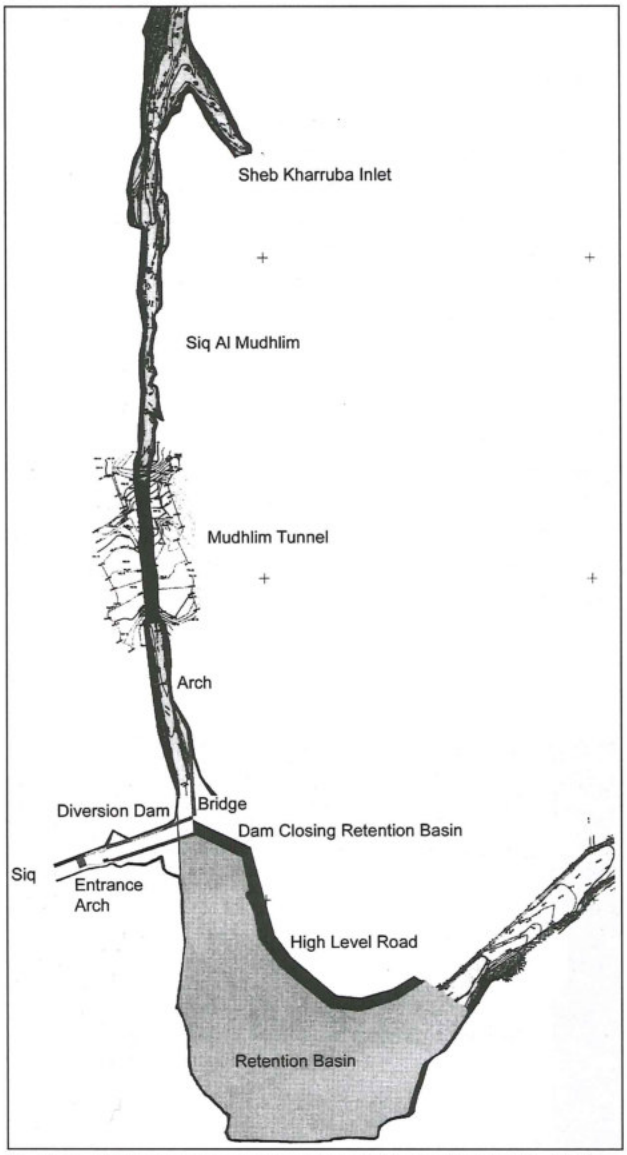
still be followed from the beginning of the curve down to the dam at the entrance to the Sīq and patches of its pavement may still survive below the debris that covers it. The basin's southern side was delimited by the cliff of Jabal Madrass (جبل مدرس). The layout of the basin by the entrance to the Sīq and the tunnel at the time of its construction in the late first century BC has already been explained elsewhere (Bellwald 2000 and 2003:55) (**Fig. 6**). Calculations based on the information given by Bachmann and Wiegand as well as the visible remains, make it clear that the bottom of the basin was at least two metres lower than the bottom of the tunnel. This difference suggests that the basin functioned as an enormous settling tank, preventing boulders, trees and other debris from obstructing the free outflow of water through the tunnel.

An important discovery was made between the box culvert by the Sīq entrance and the upstream mouth of al-Mudhlim tunnel: cut into both walls of the outflow channel leading from the basin towards the tunnel a pair of abutments can only be the remains of a collapsed arch (**Fig. 7a, b**). This arch was erected 37.8m upstream of the opening of the tunnel, with a span of 5.5m and a width of 1.3m. Since neither bank above the cliffs shows the slightest remnants of any construction such as a water channel, it can be concluded that the arch was not erected to support any structure.

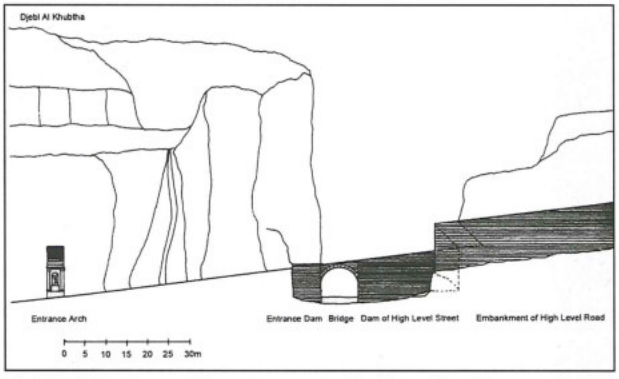
It is located at a slightly greater distance from the ancient bridge crossing the Wādī Mūsā than is the entrance arch to the Sīq and while a functional reason for the erection of this arch seems improbable, a commemorative one related to the entrance arch is much more likely. It could, for example, have carried an inscription commemorating the construction of the entire flash flood diversion system, the mouth of the tunnel being much too far from the bridge for such an inscription to be seen. Such commemorative inscriptions are known from the diversion tunnel in Seleukia Piera, the port of Antiochia (modern Antakya in Turkey). With the discovery of the existence of a second arch, a new component may be added to the design of the comprehensive infrastructure in and around the Sīq . With two monuments focused on the bridge crossing the Wādī Mūsā, offering spectacular and unexpected views, the basic plan of the infrastructure shows itself to be completely determined by Hellenistic urban systems.

Sector MS 4, The Tunnel (Sīq al-Mudhlim)

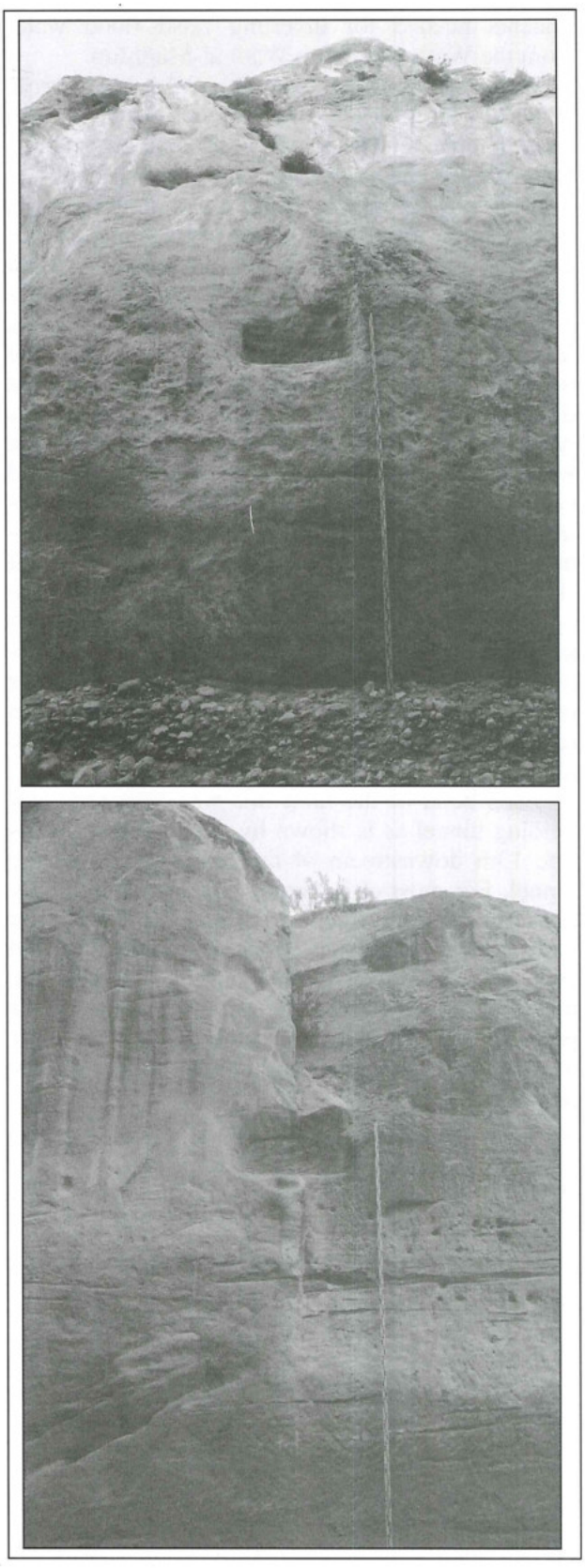
Sector 4 includes the tunnel and its inflow and outflow channels, which comprise the three com-



5. Plan of the retention basin at the bottom of sector 3, the infrastructure at the entrance to the Sīq and the Mudhlim tunnel.



6. The situation at the entrance to the Sīq after the completion of the infrastructure in the second half of the first century BC. Elevation of the dam crossing the bed of the Wādī Mūsā diagonally and of the retaining wall of the high level road along the axis of the uppermost 115m of the paved street in the Sīq.

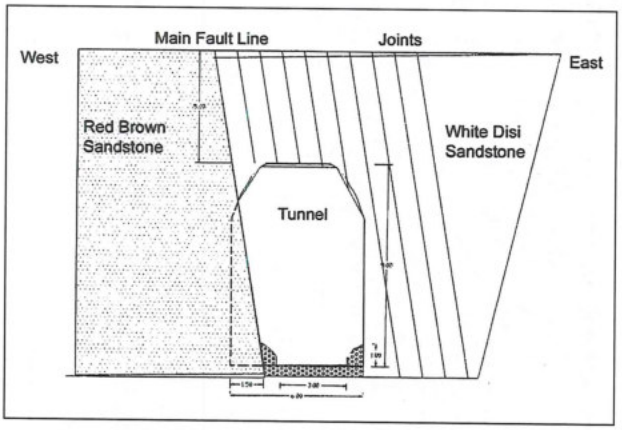


7a, b. The western (left) and the eastern (right) abutment of the arch spanning the outflow channel leading from the bridge to the tunnel.

ponents needed for diverting flash flood water from the Wādī Mūsā into Wādī al-Mudhlim.

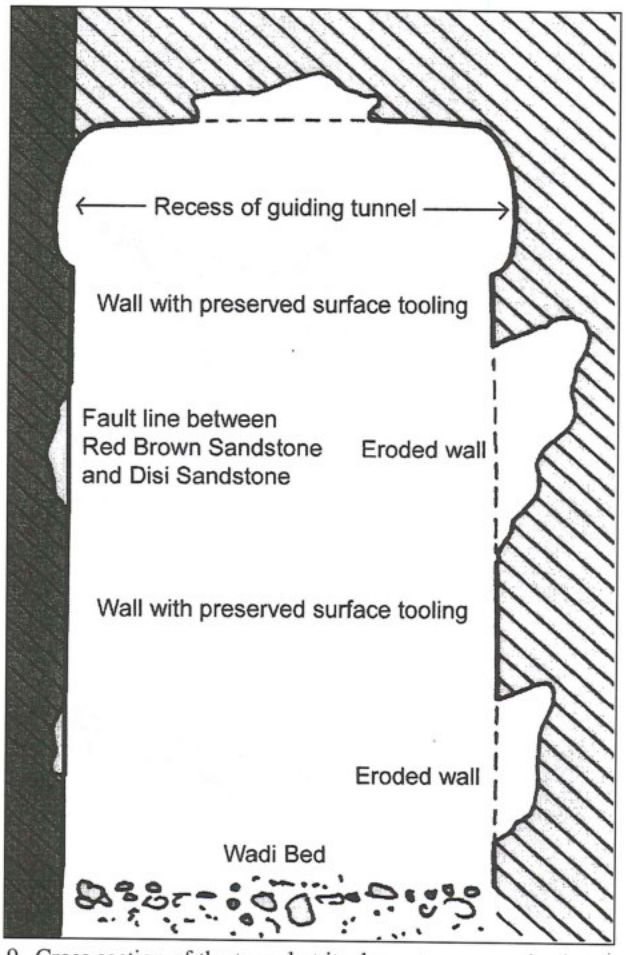
A bedrock bar separates the Wādī Mūsā from Wādī al-Mudhlim and this was cut down to form an open channel for as long a distance as possible. Only the highest, central part of the bar was pierced by the tunnel and close examination of its walls and ceiling has allowed a detailed reconstruction of how this was achieved. At both ends of the tunnel the surface tooling of the bedrock is preserved, but unfortunately for most of its length the original chisel marks have been lost due to partial collapse. On the right-hand (east) wall at the upstream mouth of the tunnel, surface tooling is preserved for about 20m. It shows that this side was worked down vertically whereas the left-hand (west) wall is inclined toward the west, thus making the tunnel narrower at its bottom (**Fig. 8**). Detailed inspection of the surface of the west wall shows clearly that no chisel marks have been eroded away, but that there never was any surface tooling. The slope of this wall and its lack of any surface tooling indicate that the original engineers used the fault line between the hard red-brown sandstone and the weak white Disi sandstone to align the axis of the tunnel.

Each bend of the fault line was followed by a guiding tunnel as is shown by the correction of its line 13m downstream of the upper mouth of the tunnel. For most of its length, the left wall simply consisted of the surface of the fault as it was after the covering white sandstone had been chiseled away. At the downstream mouth the axis of the tunnel no longer follows the fault line but runs in a perfectly straight line; hence there is surface tooling, which is preserved and covers both walls for more than 30m.



8. Cross section of the tunnel at its upstream mouth, sketch looking downstream. The left wall shows the inclination of the fault line between the red brown sandstone and the white Disi sandstone, which differs considerably from the projected vertical wall.

At both ends of the tunnel the surfaces with preserved chisel marks reveal that the uppermost 150cm of the walls were more deeply carved into the bedrock, by 2-5cm. The bottom line of this slight recess on both walls is parallel to the crest of the ceiling vault (**Fig. 9**). These differences in the surface tooling point towards various steps in the work during the making of the tunnel. They show clearly that work started with driving a guiding tunnel through the bedrock. This guiding tunnel ran along what became the ceiling of the tunnel; the work being executed from the top down, a procedure well known from the rock carved façades. As there are no recesses visible in the ceiling, the guiding tunnel must have been cut across its entire width in one work step. Once the guiding tunnel was finished, the tunnel proper was cut down using the technology applied in Nabataean quarries: a succession of parallel quarry trenches was incised into each successive layer of the bottom of the tunnel. These primary trenches, spaced roughly 40cm apart, ran at a right angle to the longitudinal axis of



9. Cross section of the tunnel at its downstream mouth, sketch looking downstream. The recesses of the guiding tunnel directly below the ceiling are clearly visible on both walls.

the tunnel. Next, secondary trenches were cut down parallel to the longitudinal axis of the tunnel, spaced from 50 - 80cm apart. Finally the rectangular blocks thus formed in the network of quarry trenches were split from the bedrock by two wooden wedges moistened with water. The ends of some of these quarry trenches are still recognisable as small, vertical recesses in the tunnel walls.

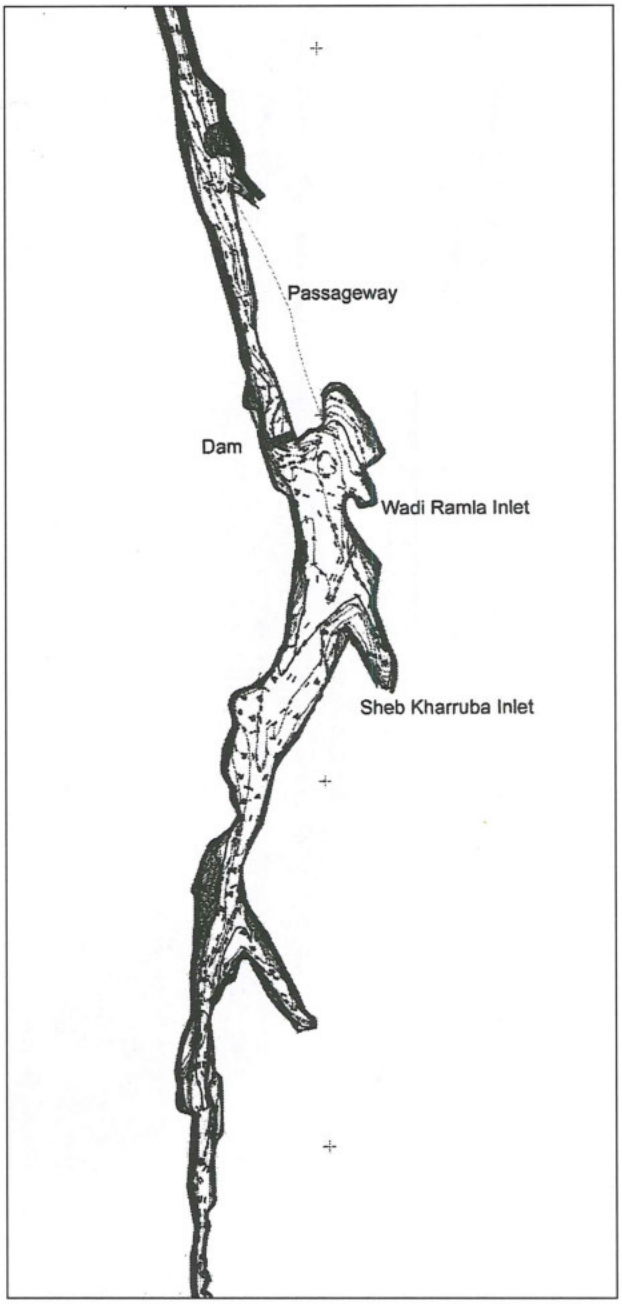
The technology used in the diversion tunnel of Sīq al-Mudhlim is very similar to the one used for the construction of the tunnel diverting the Orontes River around the port basin of Seleukia Piera, built during the reign of the Roman emperors Vespasian and his son Titus.

Sector MS 5

At the very bottom of sector 5, just before the narrow entrance to sector 6, eroded grooves in the bedrock on both banks of Wādī al-Mudhlim indicate that a dam was probably located here as part of the flash flood prevention system with parts of the grooves still visible in the bedrock. A natural crevasse behind the bedrock along the eastern bank of the gorge allowed an easy passage beside the dam. The basin of this dam took advantage of the extended width of the wadi bed upstream (**Fig. 10**). Additionally, the location of the dam allowed the detention of the runoff water from Sadd al-Kharrūba (سد الخروبة) and Wādī ar-Ramla (وادي الرملة).

Sectors MS 6 - MS 7, The Stilling Basin

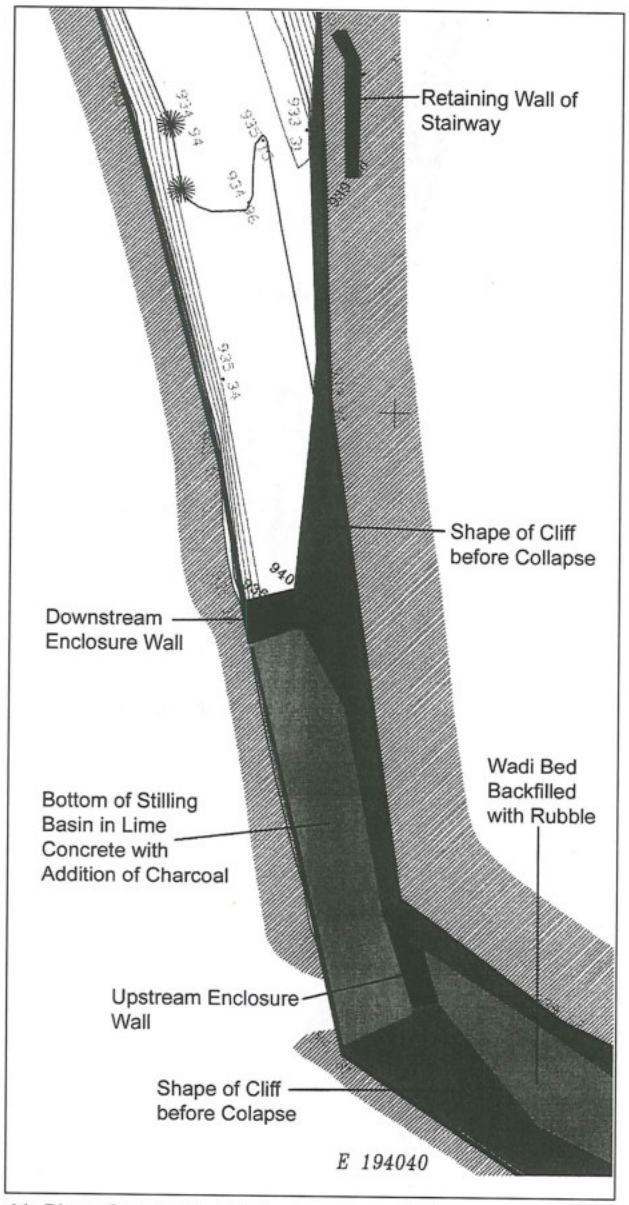
In the lower part of sector 6, there is a break in level of the bottom of the gorge of about 6m. At the lower end of this natural cascade are the ruins of what was once a closed basin. The basin has a slightly irregular rectangular shape due, no doubt, to the contours of the surrounding cliffs (**Fig. 11**). At its upstream end, the basin was entirely chiselled into the bedrock; only a short section on the eastern bank had to be closed by masonry. The downstream end of the basin was almost naturally closed by a rock projection in the eastern bank, therefore only a small, V-shaped dam had to be built for its complete closure (**Fig. 12**). Nowadays only a small fragment of the rock projection and most of the masonry has survived, because a great part of the bedrock has collapsed. To avoid scouring from the energy of the cascade, the bottom of the basin was completely constructed in lime concrete; its level was about one metre above the actual wadi bed. As there are no remains of any settlement activities or sanctuaries in the area, which could have required the storage of water, this hydraulic structure may be explained as a stilling basin, taming the speed and energy of the cascade.



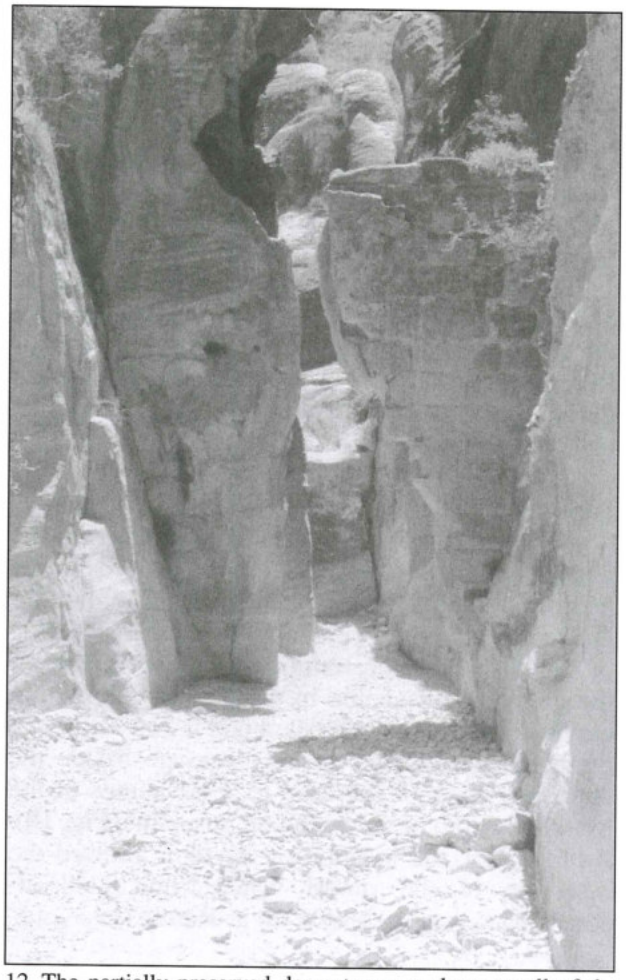
10. Plan of sector 5 showing the location of the dam and the passageway downstream of the inlets of Sadd al-Kharrūba and Wādī ar-Ramla.

Sectors MS 8 - MS 9, The Sanctuary

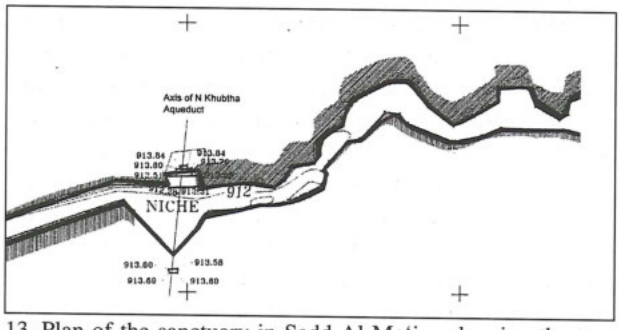
At the end of sector 7, Wādī al-Mudhlim joins Sadd al-Ma'jan (سد المعجن), and is forced to turn abruptly to the west at a right angle. Shortly ahead of the inlet into Wādī al-Maṭāḥa, the extremely narrow gorge of Sadd al-Ma'jan has a triangular widening in its southern cliff. Opposite this natural widening a deep and wide rectangular niche is carved into the bedrock (**Fig. 13**). The entire location is full of niches, some with Betyloi and others with various idols. The largest and most beautiful



11. Plan of sector 7 with the location and the remnants of the stilling basin.



12. The partially preserved downstream enclosure wall of the stilling basin on the right and the natural rock projection on the left; view upstream.



13. Plan of the sanctuary in Sadd Al Ma'jan showing the two most important niches and the superimposed axis of the northern al-Khubtha aqueduct.

is the niche in the artificial widening in the northern cliff, and is undoubtedly the most important sanctuary among the group of 90. The sheer number of niches and their concentration in such a restricted area makes it clear that this site had an outstanding religious character.

The survey of both banks above the sanctuary has confirmed a suggestion first made in 1970 by E. Gunsam (Gunsam 1983) that this impressive site must be seen in connection with the bridge of the northern Khubtha spring water supply system. The survey and detailed mapping of the area have now shown that the channel crossed the Sadd al-Ma'jan sanctuary on a semicircular arched bridge whose abutments are still recognizable. The bridge must have given the impression of a triumphal arch towering high above the access to this site of veneration. The close connection between sanctuaries and built elements of the Nabataean infrastructure has already been demonstrated by the excavations in the Sīq (Bellwald 2003).

Starting from the outlet of Sadd al-Ma'jan into Wādī al-Maṭāḥa, the southern bank of the latter was completely reinforced by a retention wall in

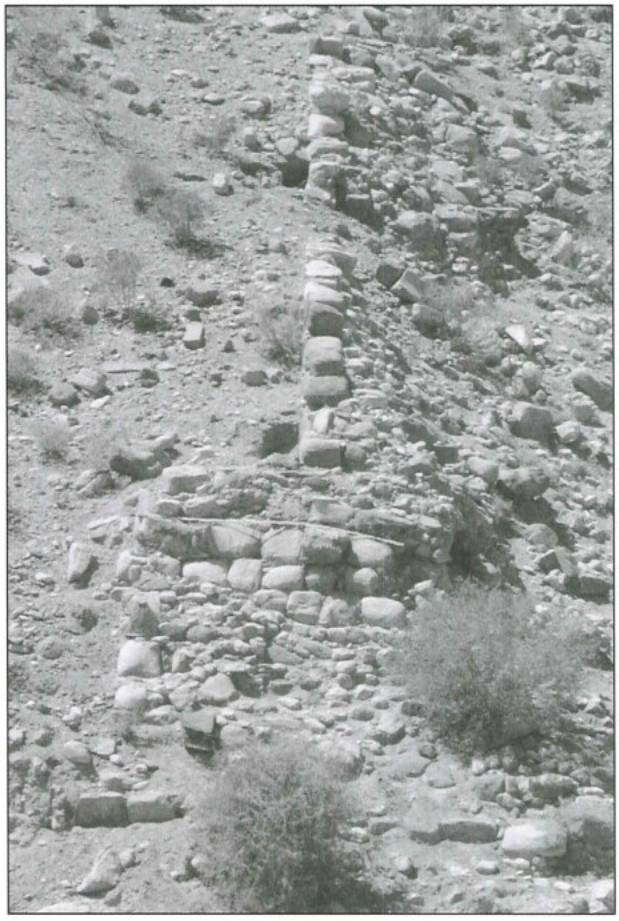
masonry of regular ashlar blocks, set up as headers and stretchers (**Fig. 14**). The survey has revealed that the reinforcement continues for the entire length of the shallow terrace to the south of Wādī al-Maṭāḥa down to the end of sector 11. Due to its steep and mostly rocky nature, the opposite northern bank of Wādī al-Maṭāḥa had no need of such protection.

Sectors MS 10-11, The Dams Protecting The City

In the middle of sector 10, a small side wadi enters Wādī al-Maṭāḥā from the north, descending from Mughur an-Naṣāra (مغر النصارى). Downstream from this inlet, the abutment of a large dam is visible in the debris of the northern bank of Wādī al-Maṭāḥa (**Fig. 15**). The dam continues to the north as a smaller wall. A water channel is attached to the western front of this wall. The construction of the conduit is 70cm wide and the channel itself is 20cm wide. On the southern bank, the abutment of the dam is visible too, but much less exposed. Even the water channel can be followed, and it is most probably the same conduit as the channel leading to or coming from the extended pool in front of the Carmine Tomb at the foot of Jabal al-Khubtha.

As mentioned above, the entire unstable southern bank of sectors 10 and 11 was fortified by a retention wall in ashlar masonry, of which long sections are still visible and others must be well preserved below the covering debris. In front of this wall the ruins of a cistern were found just upstream of the inlet of Wādī Umm Ṣayḥūn وادي ام صيحون (**Fig. 16**). The cistern is oriented parallel to the reinforcing wall and is 4.8m long and 2.6m deep. At its south-east corner the remains of a cylindrical feeding shaft are preserved. The interior surfaces of the cistern and the shaft still show the original hydraulic plaster. The bottom of the cistern is not exposed, but its level is most probably below the present wadi bed.

At the downstream end of sector 10, the bed of Wādī al-Maṭāḥa is lentiform. At both ends of this area, abutments of dams emerge from the debris of the northern bank (**Fig. 17**). There is an extensive



15. The dam below Mughur an-Naṣāra, view from the wadi bed towards the north. At the bottom, the full thickness of the dam, exceeding 6m, is visible. The narrow stone line above is part of the water channel which crossed Wādī al-Maṭāḥa on top of the dam.



14. The retention wall reinforcing the southern bank of Wādī al-Maṭāḥa at the outlet of Sadd al Ma'jan. The original masonry is visible on top of the restored foundation.



16. The ruins of the cistern opposite the inlet of Wādī Umm Ṣayḥūn. At the bottom right the cylindrical inlet shaft is visible.



17. The remains of the two dams at both ends of the lentiform section of Wādī al-Maṭāḥa at the downstream end of sector 10, view upstream.

fragment of the foundation of the upstream dam exposed in the middle of the wadi bed. Whereas the southern abutment of the upstream dam is recognizable in the debris along the southern bank, nothing from the downstream dam is exposed there.

Sector MS 12

The most impressive monuments in sector 12 are the ruins of the two bridges crossing Wādī al-Maṭāḥa from west to east. The remains of the larger bridge, which was used for carriages, are located about 150m upstream of the inlet of Wādī al-Maṭāḥa into Wādī Mūsā. The springers of the wide arches crossing Wādī al-Maṭāḥa are still well preserved in the northern abutment, whereas the constructions on the southern bank have been severely damaged by collapse. The foundation of the upstream face of this large bridge was protected by a dam with an original height of about 3m. Its lowest ranges of masonry are still preserved and have recently been restored.

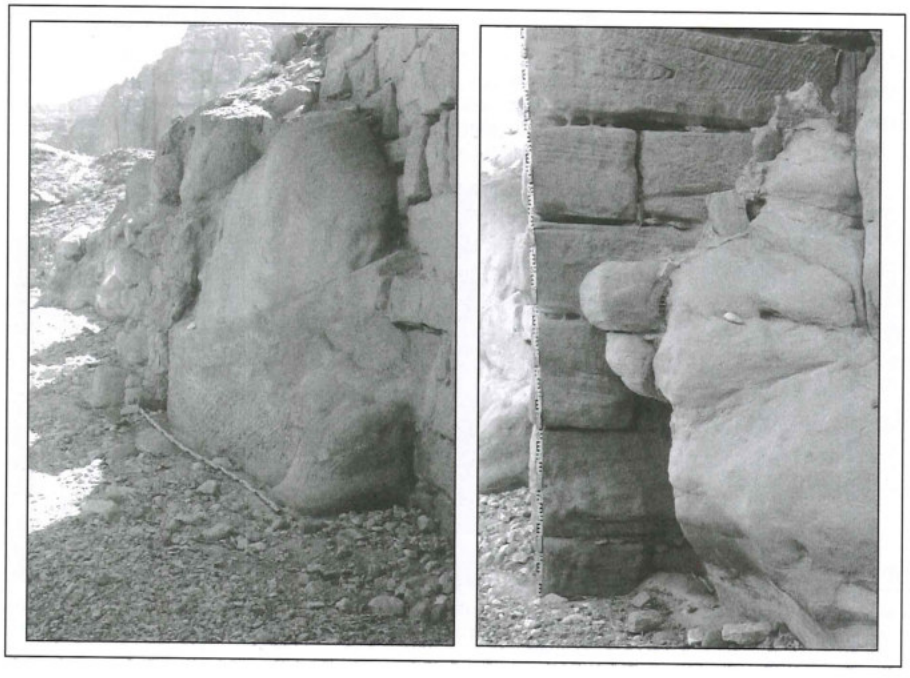
The ruin of the smaller, pedestrian, bridge is located about 90m upstream of the inlet of Wādī al-Maṭāḥa into Wādī Mūsā. As the bridge crossed Wādī al-Maṭāḥa at a lower level than the terraces on both banks, a staircase tower had to be built on the northern abutment. This tower is well preserved and forms a landmark in the urban pattern of Petra seen from the southern ridge of the city. In the wadi bed the foundations of this tower were protected by a reinforcing projection, built from very large blocks of limestone and sandstone (**Figs 18 and 19**).

A final dam crossed the bed of Wādī al-Maṭāḥa 40m from the inlet into Wādī Mūsā. Its groove in the bedrock of the northern cliff is well preserved, and some limestone blocks of impressive dimensions from the lower courses of the masonry still survive *in situ* (**Fig. 20**).

Conclusions

The Flash-Flood Detention System in Wādī Umm Ṣayḥūn

Strictly speaking,Wādī Umm Ṣayḥūn does not fall within the study area. Nevertheless, it is indispensable to include it for several reasons. First of all, apart from the diverted waters from the Wādī Mūsā,Wādī Umm Ṣayḥūn is the biggest inlet



18 – 19. Preserved fragments and the abutment carved into the bedrock for the reinforcement protecting the protruding edge of the bridge for pedestrians.

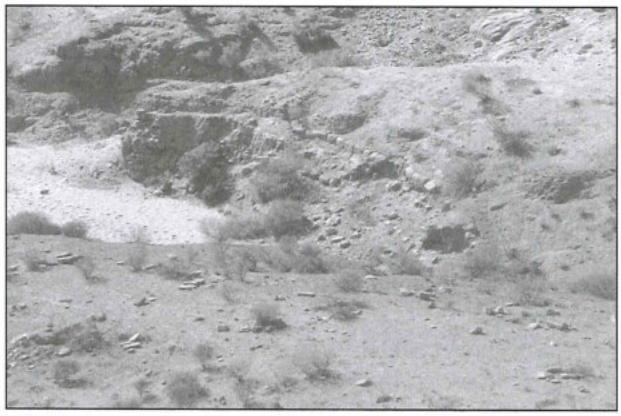


20. The northern abutment of the lowest dam in Wādī al-Maṭāḥa, which prevented runoff water from damaging the northern Nymphaeum. These fragments are now no longer visible, as they have been hidden behind a protecting wall built by the DoA in the summer of 2002.

into Wādī al-Maṭāḥa . Secondly, Wādī Umm Ṣayḥūn has cut down deeply into high and extended mounds of sand eroded from the surrounding hills, making its banks very unstable. There is therefore the possibility of massive erosion of the banks that would choke Wādī al-Ma āḥa.

To address this danger the Nabataeans reinforced the banks of Wādī Umm Ṣayḥūn with enormous retaining walls of ashlar blocks. These walls were parallel and effectively canalized the wadi bed over a length of about 200m and a width of 20.7m. In the upper part of Wādī Umm Ṣayḥūn, where several smaller inlets join it, the retaining walls bow out into a cylindrical shape (**Fig. 21**), and in the centre of the wadi at this point is a square structure of unknown function.

130m upstream of its outlet into Wādī al-Maṭāḥa, the retaining walls canalizing the runoff water from Wādī Umm Ṣayḥūn end in a massive dam structure, closing the wadi like a valve. The dam structure is very like the dam closing the basin in front of the entrance to the Sīq and might well also have carried a bridge. On its eastern abutment the foundations of a rectangular building of 14.8 by 11.75m may still be seen, with walls 2.82m wide (**Fig. 22**). Access to the building was from the north and the door jams are still *in situ*.



21. The exposed sections of the western half of the cylindrical structure at the upstream end of the retaining walls in Wādī Umm Ṣayḥūn.

The Flash-Flood Diversion and Prevention System in Sīq al-Mudhlim and Wādī al-Maṭāḥa

The archaeological survey has shown that the area under study was an integral part of the flash flood prevention system built together with the infrastructure in the Sīq . Without the diversion of the runoff water from upper Wādī Mūsā through the tunnel into Sīq al-Mudhlim, Sadd al-Ma'jan and Wādī al-Maṭāḥa, the paved street and the spring water supply system in the Sīq would not have survived the impact of any severe flash flood. The preliminary evaluation of the results of the archaeological survey highlight how efficiently the Nabataean flash flood protection system took advantage of natural conditions and how it was integrated into the urban pattern of the then newly built city.

From the arched culvert in front of the Mövenpick Hotel down to the Obelisk Tomb, Wādī Mūsā passes through a necropolis, most of which is preserved and still visible on the southern bank. Of the monuments on the northern bank only the tomb (No. 4) near the Guest House and a much eroded structure opposite the Obelisk Tomb are preserved; and now the cistern that has been discovered can be added. The descriptions above of the cistern on the northern bank and the tombs and sanctuaries on the southern bank have shown that all these monuments were oriented towards a wadi bottom much lower



22. The dam structure at the outlet of the canalized section of Wādī Umm Ṣayḥūn, view from upstream in the direction of Wādī al-Maṭāḥa and the Palace Tomb. The rectangular building was erected on the left section of the dam structure.

than today's level, otherwise they would have been threatened by periodic inundation. Patches of the bedrock occasionally exposed in the wadi bed after flash floods lead to the conclusion that in the Nabataean period the wadi bottom was kept clean and the bedrock was exposed throughout this entire section. To avoid any deposition of debris, a continuous and free discharge of the runoff water had to be assured; therefore, no water detention structure was ever built in this area.

The extended area at the bottom of sector 3, where the course of the wadi bends to the north, was completely remodelled as an enormous basin. The northern bank of this basin was reinforced by the dam supporting the high level road. Opposite the Sīq entrance, this dam crossed the bed of the Wādī Mūsā, reducing the outlet of the basin to the width of the tunnel and thus the discharge from the basin was restricted to the capacity of the tunnel. The survey has further revealed that the bottom of the basin was considerably lower than its outlet, hence boulders or trees were held back in order to prevent them from obstructing the outflow through the tunnel.

From the outlet of the basin in front of the Sīq entrance to the end of sector 5, the outflow of flood water was not detained so as to prevent any backwater towards the tunnel. At the bottom of sector 5 Sīq al-Mudhlim widens out. In this same area, two additional side wadis, Sadd al-Kharrūba and Wādī ar-Ramla, bring in runoff water into the main gorge. The favourable conditions of the topography in this location were used for the creation of another detention basin, which had a backwater height of at least 3m. The location of the basin was also acceptable because a natural path circumvents the dam on a terrace along the eastern bank, without which maintenance downstream would have been obstructed.

The extremely narrow passage along sectors 6-7 did not allow any construction of detention dams. The velocity and thus the pressure of the water against any dams would have led to their immediate collapse as was demonstrated by the immediate destruction of the gabions built by the DoA and UNESCO in this location in 1996. The only element detected was a stilling basin in the lower part of sector 6, built to still the discharge of a natural cascade with a height of about 6m. To avoid scouring, its bottom was filled with a thick layer of lime concrete. With this small construction, the devastating effect of the natural cascade was considerably reduced.

At the outlet of Sadd al-Ma'jan, an important sanctuary was situated directly below the bridge of the northern al-Khubtha spring water supply conduit. Among all the sites of veneration in Petra which were linked with the outstanding importance of water for daily life, this sanctuary, with the towering bridge like a triumphal arch high above, must have been by far the most impressive.

At the inlet of Sadd al-Ma'jan into main Wādī al-Maṭāḥa, the diverted flood water meets with the runoff water from upper Wādī al-Maṭāḥa, descending from the northeast. To protect the protruding southern bank of Wādī al-Maṭāḥa from erosion, a reinforcing wall was built from the inlet of Sadd al-Ma'jan down to sector 11. The construction of this retaining wall of ashlar masonry, with headers and stretchers, was the only intervention undertaken to tame the flood water. To avoid water backing up into Sadd al-Ma'jan, no detention structures were built. In the middle of sector 10, Wādī al-Maṭāḥa leaves the area of the necropolis and enters the city. From this point down to the inlet into Wādī Mūsā near the northern Nymphaeum a close sequence of dams was built in order to detain the flood water and to slow it down. An important one was built at the entrance of Wādī al-Maṭāḥa into the city area, immediately below the inlet descending from Mughur an-Naṣāra and at a short distance upstream of the inlet of Wādī Umm Ṣayḥūn. This dam was obviously built for two purposes: firstly it had to detain the flood water from the east in order to avoid damage to structures in the city and secondly it had to ensure the unobstructed inflow of the runoff water from the north descending from Wādī Umm Ṣayḥūn. The two dams at the downstream exit of sector 11 held back the runoff water from the inlet of Wādī Umm Ṣayḥūn. The dams in sector 12 were of much smaller dimensions and were built to protect the foundations of the two bridges. The lowest dam, some metres upstream of the inlet of Wādī al-Maṭāḥa into main Wādī Mūsā, was the last detention structure, which would have avoided water backing up in the direction of the theatre area and any inundation of the area around the Nymphaeum, which forms part of the city's spring-water supply system.

Hydraulic and Hydrologic Study

The Nabataeans had a variety of techniques to avoid flood damage and implemented them according to the particular requirements of each location. The following methods are known to have been used:

- Reduction of peak flow by building reservoirs.
- Confinement of the flow within a predetermined channel by levees, floodwalls or a closed conduit.
- Reduction of peak stage by increased velocities resulting from channel improvement.

- Diversion of floodwaters through a flood bypass, which may return the water to the same channel at a point downstream or deliver it to another channel or different watershed.
- Flood plain management.

This part of the project set out to understand the hydrology of the study area and based on that understanding, to make recommendations for certain flood protection measures. Flood protection structures require planning and engineering design. Every installation performs an operative function determined by hydrology and hydraulics, and a load-carrying function determined by structural considerations and construction procedures. In addition there are certain constraints imposed when working in an archaeological site.

The design, therefore, involves two independent design problems: hydraulic design and structural design. The intention of the hydraulic design is to determine the most economic installation by realistically anticipating the effects of hydrology in establishing satisfactory hydraulic operation. The intention of the structural design is to ensure the construction of an installation with sufficient strength to support the loads without adversely affecting the environment of the site.

A dam should be placed so as to achieve maximum protection, utility and safety and its design is, of course, greatly influenced by location and site conditions. Care must be taken to avoid introducing objectionable secondary effects or interfering with desirable hydraulic operating characteristics. The dam sill length should be designed to discharge the design flow with a reasonable head water level. Proper measures must be provided at the outlet, such as cascade-shaped dams, to prevent the downstream erosion of the bed, the banks and undercutting of the dam toe. The dams proposed for sectors MS5 and MS11 were designed with all the above constraints considered (see below).

Data Collection and Review

The data collected for the project included the topographical maps, climatic parameters and rainfall intensity records for rainfall stations at and near the study area, notes and photographs from site visits, the field surveys results, the geological and geo-technical investigations and relevant previous studies such as Petra Flood Protection by Dar Al-Handassah and Protection of the Sīq area by the PNT consultants MeeM.

Data were also made available by the Ministry of Water and Irrigation, the Department of Meteorology, the Royal Geographic Centre and the Natural Resources Authority.

Rainfall data of daily and monthly records for the Petra (1962-2001), aṭ-Ṭayyba (1962-2001) and Wādī Mūsā rainfall stations (1937-2001) were used to draw some statistical figures. The long annual rainfall averages for the three stations are 110.9mm, 164.4mm and 171.5mm respectively. The maximum average monthly rainfall falls in December for Petra and January for the Wādī Mūsā and aṭ-Ṭayyba rainfall station.

Site Investigation

The preliminary examination of the hydrology in the area was carried out based on site inspection. This was done to qualify both the quantity and distribution of surface water originating from the catchment areas of the natural drainage for Wādī Mūsā and Wādī al-Mudhlim. As with the archaeological study, the site investigation focused on the areas of the Wādī Mūsā beginning at the recently reconstructed new Zurrāba box culvert, 650m to the east of Mövenpick Hotel, through the tunnel and along the entire Wādī al-Mudhlim and finally along the Wādī al-Maṭāḥa as far as its inlet into Wādī Mūsā, including all tributaries (**Fig. 2**).

The following information was gathered:

- Runoff coefficients of different parts of the catchments.
- Potential sites for generating flood flows.
- Sites for proposed flood protection structures.
- Flood marks required to estimate flows.
- Characteristics of flow sections, such as roughness, sedimentation problems and erosion due to human activities.

Travelling from the Zurrāba box culvert (sector MS1) down through each sector, the main features were as follows:

Sector MS1 and MS2

In these two sectors, wadi training for flow modification purposes was carried out (in 1998 by the Department of Antiquities) and some sidewalls were constructed to enhance the landscape without considering the hydraulic characteristics of the wadi. At the beginning of sector MS1, a box culvert was built recently, that could have adverse effects on the main hydraulics of Wādī Mūsā. Another arched culvert in front of the Mövenpick Hotel was built (without alignment) following the main wadi flow.

Sector MS3

In sector MS3 the wadi meanders. There is a box culvert and a potential site for a flash flood detention basin at the end of the sector. The detention basin could cover the entire curve, in which the di-

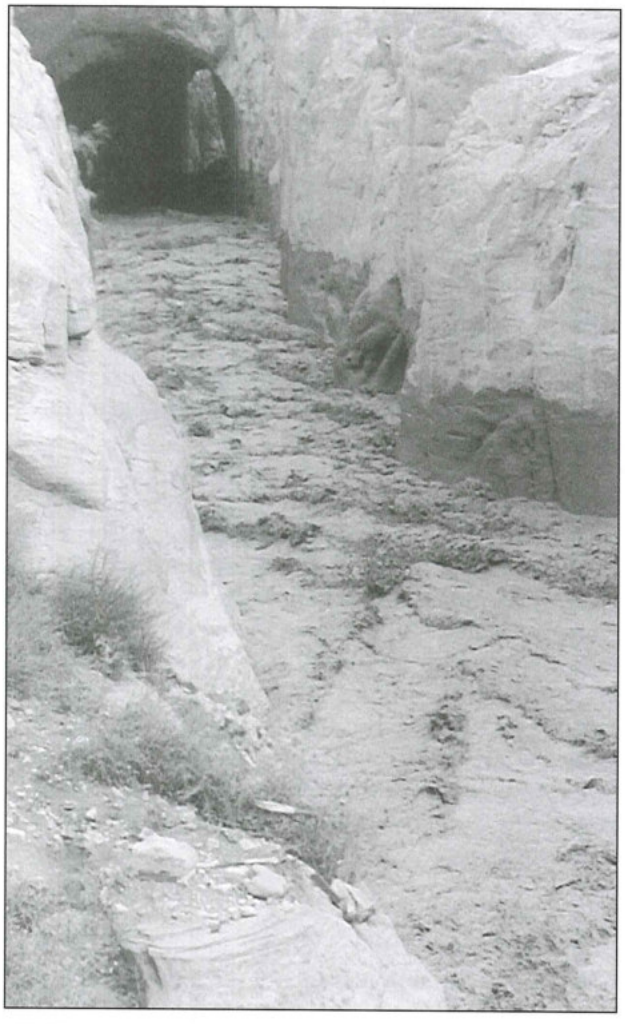
rection of the Wādī Mūsā flow changes from east-west to north-south. This is the location of a Nabataean basin that was designed for the same purpose (**Fig. 5**). Such a basin could hold back a large quantity of the flood flow and reduce the peak. The Sīq entrance box culvert and the channel at the upstream end of the tunnel are also in this sector. The low height of the box culvert leads to a blockage problem after floods and as is not aligned with the channel leading into the tunnel, cross-waves are caused, even at low flow levels (**Fig. 23**).

Sector MS4

Hydraulic analysis was carried out for the tunnel in this sector to check for its capacity and performance during flood conditions. This was essential in order to resolve the stability problems of the entrance to the tunnel.

Sector MS5 and MS6

At the end of sector MS5, Wādī al-Mudhlim widens sufficiently to create a suitable area for a reservoir and the Nabataeans had used the area as such. Due to the favourable conditions of the topography, the reservoir could be designed to be large enough to detain the flood flow, which would considerably reduce the flow peak.



23. Cross-waves at the entrance of the tunnel.

The end of sector MS6 is rather narrow, with possible high flow velocity if there is no dam and reservoir. From this section downstream to the end of Wādī al-Mudhlim, any protective structure is not recommended due to high flow velocity and insufficiently stable section. This was proven by the immediate destruction of some gabions built by DoA and UNESCO in 1996.

Sector MS9 to MS11

At the outlet of Wādī al-Mudhlim into Wādī al-Maṭāḥa, the diverted floodwater meets the runoff water from upper Wādī al-Maṭāḥa, coming from the north-east. At the end of sector MS9, a potential site for a detention reservoir could exist. All dams in Wādī al-Maṭāḥa can be expected to be long, with low crest levels due to the wide and shallow wadi section. In the middle of sector MS11, a small side wadi enters Wādī al-Maṭāḥa from the north. Just before the inlet, part of a large dam is visible in the debris, as described in the archaeology section above. The dam is long and low but could create a large reservoir due to the flat topography that would allow a large surface area in a shallow reservoir.

Sector MS12

The numerous monuments and ruins in the upstream part of this sector need protective work and the outlet of Wādī al-Maṭāḥa into Wādī Mūsā needs to be protected against flooding. There are two potential sites for dams, at the beginning and the middle of the sector. The reservoirs created could detain the floodwater and protect this rich archaeological site and junction point with Wādī Mūsā. Since the two wadis meet at an almost 90o angle, even with a moderate peak floodwater hits the south bank of Wādī Mūsā and floods the area.

Hydrological and Hydraulic Analysis

Flood Mitigation Measures

Wādī al-Mudhlim carries high flood flow because of the Wādī Mūsā flood diversion into it through the tunnel. The high flood flow is characterized by short duration and high peak even with low rainfall intensity, and heavy sediment loads. The short duration is characteristic of the catchment and is a result of the number of streams (in this case, four) and steep slopes. The flood peak

is mainly controlled by the catchment surface characteristics, which here are a high runoff coefficient and curve number, causing the surface to have both a high runoff and low losses. The sediments can be attributed to the nature of the surface materials of the catchment surface and in particular the erosion of the sandstone rocks.

The detailed investigation carried out on the hydrologic and hydraulic conditions allowed certain recommendations to be made, although further geotechnical investigations are still needed in order to estimate the rock conditions and the sediment bed thickness. Four important measures were thus proposed to establish a flood mitigation system that would achieve considerable safety:

- Enhancing the tunnel bed condition by clearing the fallen rocks, thereby improving the flow capacity of the tunnel and decreasing the water depth inside.
- Three check dams before the diversion at the Sīq entrance in order to stop sediment movement, specifically the bed load.
- A large capacity detention basin at the site between the check dams and the Sīq entrance to decrease the flood peak before the tunnel.
- Two main dams in sectors MS5 and MS11 to increase the detention time and to lower the flood peak downstream of the Wādī al-Mudhlim.

Sīq al-Mudhlim Tunnel

Flow through the tunnel was investigated in detail and revealed a very critical condition. The geological study showed a delicate situation regarding falling rocks from the tunnel ceiling (See below). Some blocks had fallen in December 2000 and it was essential to clear the tunnel bed to smooth flood flow through the tunnel and enhance its flow capacity by reducing the roughness coefficient. The roughness coefficient is inversely proportional to the flow capacity.

Therefore, over two months, from September to November 2003, these fallen rocks were cleared by TarMeeM International on contract to the Petra National Trust and in co-operation with the Department of Antiquities. The area cleared stretched over 160m from the box culvert at the entrance to the Sīq , through to the far end of the tunnel. Temporary ramps were set up for safe access to and from the tunnel, which were dismantled on completion of the project.

All the boulders in the tunnel were crushed manually, using such hand tools as chisels and hammers to avoid any vibration in the delicate tunnel walls. Crushed boulders and much washed-in sedimentation were removed from the entire tunnel bed. A small amount of sediments were left against the tunnel walls to act as a buffer between them and flood water.

How the tunnel looked before and after the clearance is shown in **Figs. 24 and 25**.

The increased flow capacity that the clearance has allowed should reduce the flood level inside the tunnel and this in turn should reduce the chances of collapse of the tunnel sides and therefore also of the ceiling, thereby reducing the likelihood of rocks falling in the future. (See geological section, below.)

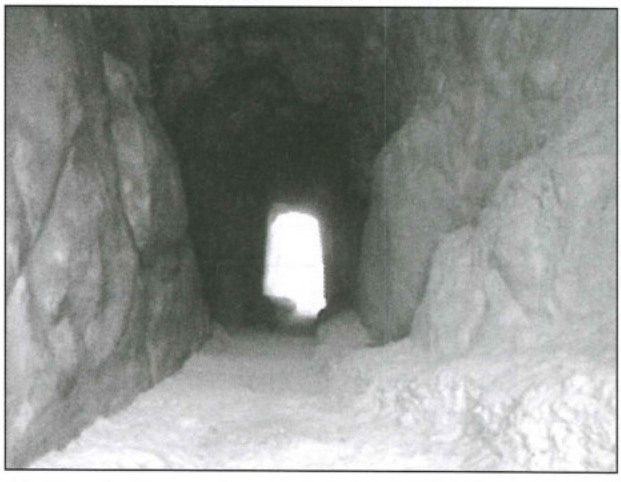
Proposed Structures

Check Dams

Three check dams were proposed in Sector MS1 between the two culverts of Wādī Mūsā and the Mövenpick Hotel. These check dams are planned to be100m apart and 1m high with an upstream and downstream slope of 1 vertical to 5 horizontal and a dam crest width of 1m. They are intended to stop the sediment bed load moving from Wādī Mūsā through the tunnel to the Wādī al-Mudhlim. Sediment accumulation could flatten the



24. Tunnel entrance before clearance of rock fall.



25. Tunnel entrance after clearance of rock fall.

wadi bed slope, which would lead to better flow conditions in the future.

Detention Basin

A basin on the bend of the Wādī Mūsā, just before the tunnel was proposed to hold back the flood peak before flowing through the existing box culvert and on into the Sīq al-Mudhlim tunnel (as the Nabataeans had done, see above). According to the studies, the positive effect of such a basin on the tunnel section regarding the flow depth and velocity is high at a 2-year return period and still considerable at a 5-year return period, with lower effects on the longer return periods. The study considered the effect of peak flow and not other flows and a basin would change the flow hydrograph and reduce the flood impact on the tunnel (**Fig. 26**)

The basin was proposed to have a maximum depth of 5m, based on stability and safety measures. The side slope was planned for 1:1 and would need geotechnical approval for stability. It is designed to absorb the flood peak and increase the detention time as a necessary measure for emergency evacuation.

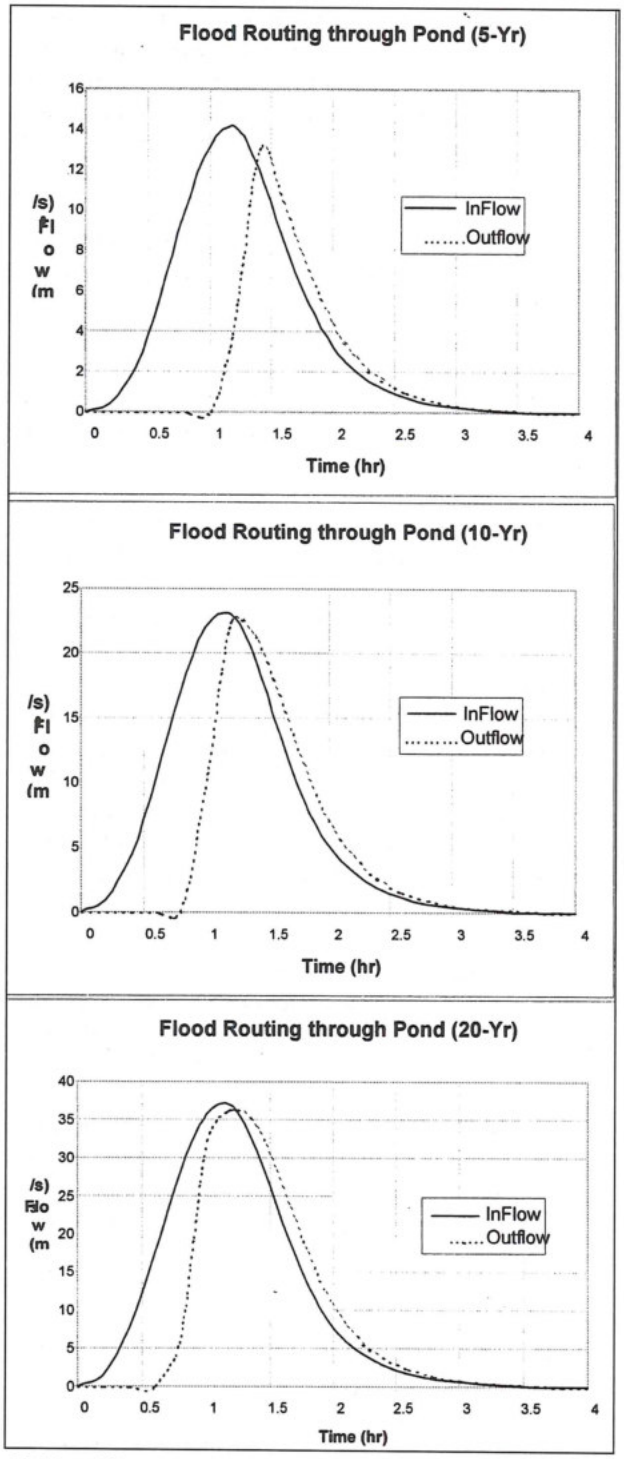
However, the design of the basin can vary to take into consideration floods at reasonable return periods (100-yr or more) and also depending on the surface area, required depth and function required of the basin as a sediment trap to detain large boulders, preventing them from entering the tunnel just downstream. The basin could be extended more if the entrance to the Sīq were to be restored based on the results of the archaeological investigations.

Two Main Dams

The study showed that there are two appropriate potential sites for dams with small reservoirs behind. The first site, located at the end of Sector MS5, is a promising location for Dam 1. The second site is situated in Sector MS11 with a larger reservoir area and higher capacity. **Table 1** summarizes the main features of both dams, which indicates a lower dam section for Dam 2 with comparable capacities.

Table 1: Main Features of Two Main Dams.

Feature	Dam # 1	Dam # 2
Bed Level (masl)	954.50	883.50
Crest Level (masl)	959.00	887.00
Dam Height (m)	4.50	3.50
Flood Top Level (masl)	961.00	889.00
Crest Length (m)	13.20	11.50
Reservoir Capacity (m^3)	3128.80	2514.50
Top Reservoir Area (m^2)	2483.20	2282.30



26. Flood flow through the basin.

The dams were designed to suit the archaeological site and to fit the geological conditions. The major constraint is the stability criteria, which makes a cascade section a reasonable option. A cascade section was thus designed, creating a stable structure on both upstream and downstream sides. The dam crest is 1m wide with 2 horizontal

to 1 vertical side slopes (**Fig. 27**). The side slopes consist of steps 1m wide and 0.5m high. The weight of water on the cascade upstream increases the stability and the cascade downstream discharges the flood with dissipating energy.

Conclusions

The study showed that the area was an integral part of the flood protection system built by the Nabataeans together with the infrastructure in the Sīq . The diversion of the runoff water from upper Wādī Mūsā through the tunnel into Wādī al-Mudhlim and Wādī al-Maṭāḥa was essential to protect the paved street and the spring water supply system in the Sīq .

Today an advanced and integrated flood protection system could exist, using this detailed hydrologic and hydraulic study, for diverting all Wādī Mūsā floodwater away from the Sīq efficiently and safely using local materials at appropriate sites. The points below highlight the type of problems that will face Wādī al-Mudhlim in the absence of the proposed management:

- Continued earth removal from just downstream of the arched culvert near the Mövenpick Hotel will result in the downstream blocking of the existing culvert and damage to the tunnel along with many of the archaeological remains.
- Figure 28 shows significant erosion of the foundations of sidewalls, which could lead to a failure. This risk can be reduced dramatically if the present management plan is executed.
- Another example is the erosion of wall foundations and gabion failure along the wadi in different sectors.
- The sediments are another hazard along the wadi, which can act as an erosion machine driven by the flood flow.
- Future activities can easily be damaged if there is no flood management plan for Wādī al-Mudhlim.
- The exit flood, where the Wādī al-Maṭāḥa rejoins the Wādī Mūsā at the Nymphaeum, could damage very important archaeological remains if there is no management.

Geological Study

Introduction

A detailed study of the geology of the project area was carried out and particular attention was devoted to the tunnel (Sīq al-Mudhlim). The lithological and physical properties of the rocks were identified, with an emphasis on recording the faults, joints and cracks in the hard rocks along Wādī al-Mudhlim and the tunnel. The condition of the bedrock in the tunnel was assessed by identifying why there have been collapses of its ceiling in the past and any physical indicators of possible future collapses.

There had been a collapse of the ceiling in December 2000 and its impact (or that of any other potential collapse) on the flow of the water in the tunnel and on the downstream area was studied, along with measures for the clearance of recent collapse (see above).

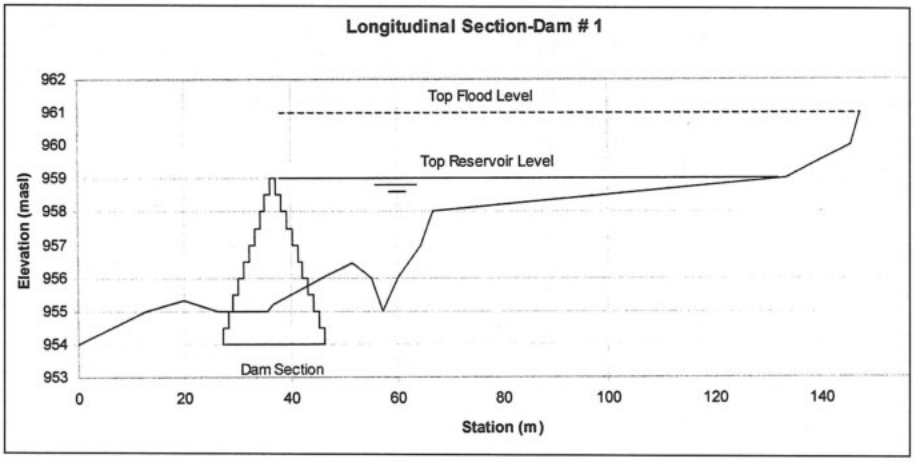
The Regional Geological Setting

The regional geology of the Wādī Mūsā area has been published elsewhere and will not be detailed here, however it is important to remember how much the local rocks have been influenced by the Jordan Rift Valley and the Dead Sea faulting. Petra and its surroundings are thus characterized by a system of faults and cracks.

The stratigraphic series used here was constructed using terminology adapted by the Jordan Mapping project (N.R.A.) and this terminology was further simplified using colour as it is the most distinguishing feature.

Stratigraphy

The lithological units outcrop because of the



27. Longitudinal section of Dam 1.

steep terrain, while the wadi and gorge bottoms are covered by Quaternary deposits and the high flat areas are masked with a thin cover of sandy soil.

The sequence in the study area is as follows (from the oldest to the youngest):

- *Cambrian Sandstone (Umm Ishrin formation or Red Brown Sandstone)*

Overlaying the quartz porphyry (Bayda Porphyry Unit), the contact is well defined to the west of Petra along Wādī Mūsā (especially west of ad-Dayr area), where the wadi cuts deeply into the rock, forming gorges.

The lower portion (12m thick) of this unit is composed of a sequence of fluviatile, coarse to pebbly sandstone and cross beds are formed in several layers each from 70cm to 150cm thick.

The rest of the Cambrian sandstone (310m thick) consists of many layers of coarse grained, cross bedded sandstone containing pebbles of quartz, generally of dark red-brown colour and in some parts they are intercalated with micaceous silty sandstone layers. This rock unit outcrops along the west side of Wādī al-Mudhlim and is strong because it is well-cemented.

- *Ordovician Sandstone (Disi formation or White Sandstone)*

This unit lies unconformably over the Cambrian sandstone, with a thickness of 70m exposed, consisting of cross bedded sandstone with distinct jointing. It is characterized by its white colour, spheroidal dome-shaped weathering, and its strength is medium to low due to poor cementation. It outcrops clearly on the eastern side of Wādī al-Mudhlim.

- *Wadi Bed Material (Wādī al-Mudhlim)*

The thick layer of wadi deposits hides ancient alluvial deposits of a few metres thick. On both flanks of the wadi, these deposits are well cemented and assume the nature of a conglomerate. In the wadi bottom, recent unconsolidated, heterogeneous alluvial deposits are present, varying in thickness between 4-8m and are composed of silt, chert, limestone pebbles, boulders and gravels of different sizes.

Summary of Findings

Fractures and Discontinuities

Fracturing of rock is one of the most important implications of faulting within the area, especially where the wadi course follows the fault line. Fault lines are an easy course for floodwater to follow since the rock is very weak because it does not form a continuous solid stratum.

A cross-section along Wādī al-Mudhlim shows different types and sizes of discontinuity. The joints, fractures and cracks were measured in order to carry out statistical analysis and evaluation. The size, extension, opening and filling materials of these fractures were also considered during the evaluation of the stability, in addition to their strike and dip measurements.

Weathering Effects

The superficial weathering penetrates only to shallow depths in the sandstone. The main factors that cause the weathering are wind and water.

The effect of wind was noted in the naturally exposed rock mass within and around the site area; the impact of wind is higher on the white sandstone where the shape of the rock mass is rounded and the surface is smooth.

Water plays a greater role in the weathering process: the action of water starts by dissolving the cement in between the sandstone grains, the dissolved material accumulates in the form of salts on the rock faces, and eventually this salty layer collapses. Also water percolation along discontinuities leads to the opening of fracture planes and degradation of the exposed rock surfaces.

During floods the action of water increases by means of erosion of the rock faces due to the high energy of the water, in addition to the effect of the bed load where the gravel and boulders repeatedly hit the bedrock surfaces.

Failures

A large number of failures was noted in the area adjacent to the Wādī al-Mudhlim, which are in general related to natural processes such as water action, especially in the tunnel area. These features will be discussed below.



28. Erosion cavity below the foundations of the sidewalls of Wādī Mūsā, in the Bab as-Sīq area.

Geology of Sīq al-Mudhlim, the Tunnel Area

Wādī Mūsā is the main wadi in the site area, trending E-W with subsidiary wadis branching in all directions within the catchment area of the Wādī Mūsā basin. Wādī Mūsā developed by cutting through weak zones, mostly main faults and master joints, which include the Sīq. The water was diverted by the Nabataeans away from the Sīq , through the tunnel to follow the Wādī al-Mudhlim fault. Subsidiary wadis also often follow such joints.

Wādī al-Mudhlim itself is a major normal fault where the white sandstone rests against the red brown sandstone. This fault is a set of parallel fault planes having the same trend and approximately the same dip. The tunnel was excavated along the main fault plane.

The tunnel is about 9m high, 6m wide and 83m long. The wadi bottom is completely covered by recent deposits. At the outlet of the tunnel the energy of the water flow during flood periods has eroded more than 1.5m of the wadi deposits in the central portion. Similar situations were observed inside the tunnel (before its recent clearance) with an even greater degree of erosion.

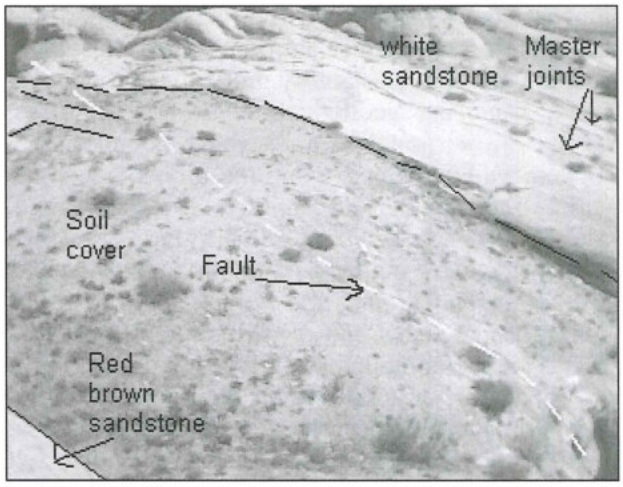
Except for the recent wadi deposits only two units (described above) outcrop within the study area, the white sandstone and the red brown sandstone.

East of the wadi generally, the white sandstone is exposed. It weathers into spheroidal shapes, has distinct master joints and some of these joints have been eroded forming subsidiary wadis. The flat areas are covered by sandy soil. West of Wādī al-Mudhlim, the red brown sandstone outcrops with clear cross bedding; it is much stronger than the white sandstone.

The top of the tunnel is a flat area covered with sandy soil (**Fig. 29**) where the fault traces are partially covered. The weathering effects are very distinctive in the northern portion. East of the tunnel the white sandstone is exposed with a smooth weathered surface and there are a number of master joints running parallel to the main fault. These joints have openings ranging between 1 to 3cm, filled partially with calcite and sand, while the joints observed west of the fault are filled with sandstone pieces, which are more resistant to weathering than the rock masses.

Two main sets of joints have been observed, one is almost perpendicular and the second parallel to the fault. The joint planes form a suitable environment for plants to grow as their roots can penetrate easily.

In the northern portion of the top of the tunnel



29. Top of the tunnel area.

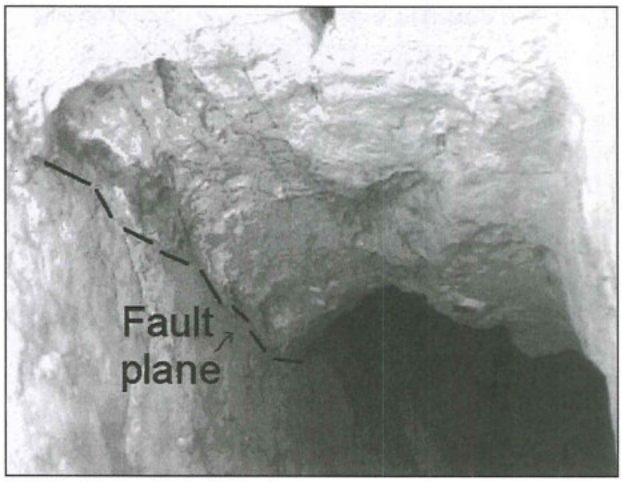
the soil cover is limited to the low areas and the fault plane can be clearly observed crossing through the rock units.

One of the most important structural features that has an impact on the tunnel is the Wādī al-Mudhlim fault, along the plane of which the tunnel was excavated (see above). This fault can be traced along the wadi 150m south of the Sīq , along the tunnel and along the wadi as far as the north-eastern corner of Jabal al-Khubtha. The Wādī al-Mudhlim fault is considered a normal fault, where the ar-Ramla block has moved downwards relative to the al-Khubtha block. Its strike is within the range of 355 to 10o from the north and the dip varies from 75 to 85o. From the horizontal, it dips toward the ESE.

Inside the tunnel, the fault plane has a smooth planer surface (**Fig. 30**), and five sets of joints were recorded in the ceiling of the tunnel.

Stability of the Tunnel

The rock thickness above the tunnel ceiling



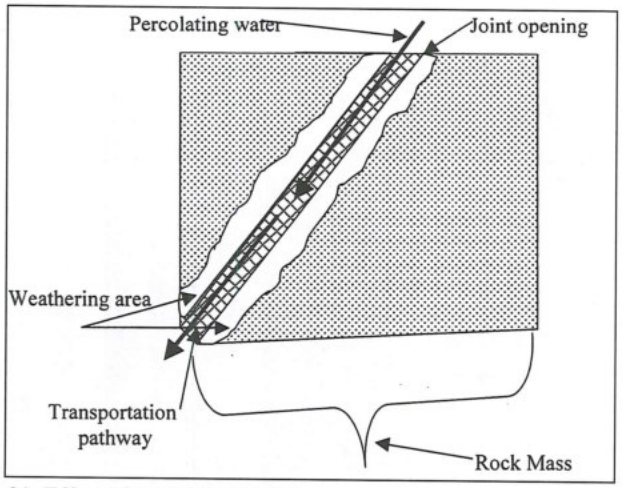
30. The Wādī al-Mudhlim fault plane.

ranges from 4-7m, which is a very low load and has therefore no significant effect upon the failure process. Instead the stability problems of the tunnel come from the geological conditions of rocks, where the surrounding rock mass is intensively jointed. Falls of blocks from the tunnel side walls and ceiling are the only failures so far recorded. These are structurally controlled failures governed by the geometry of the tunnel, structural elements present in and around the tunnel, the geological conditions of rocks and the effects of water from floods and percolation.

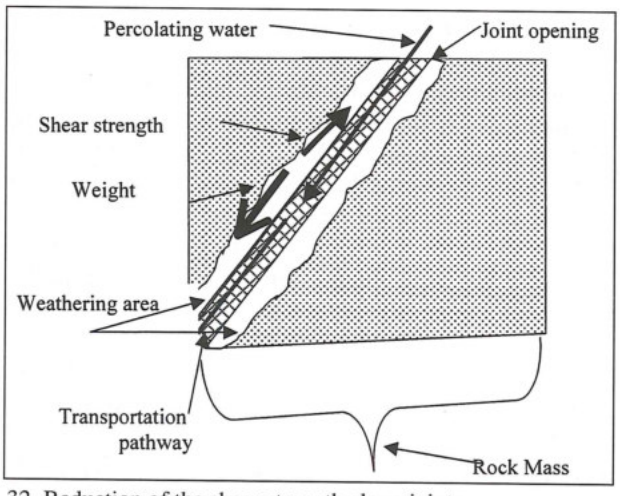
The tunnel was excavated along the Wādī al-Mudhlim fault (as described in the archaeological section above), so that its west wall and the fault have the same trend. The fault generated a number of joint sets, the most important of which are the two sets parallel to the fault trend and therefore to the wall of the tunnel. These are extension joints, mostly open; one set has the same direction of dip as the fault plane, while the other dips in the opposite direction. Within the tunnel area these two sets have spacings of less than 1m and openings of 2-3cm.

The joint planes are distinct in the wall of the tunnel and the dip of the joint sets ranges between 75 to 80o, which is greater than the friction angle of this plane in any case. Water percolating through the joint sets and fault plane has the following major effects:

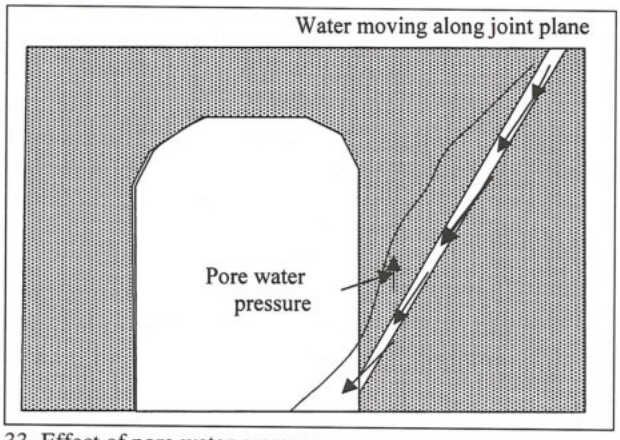
- Weathering along the joint planes and transport away of the material from the rock masses and from the filling of the joint openings (**Fig. 31**).
- Reduction of the shear strength of the joint planes (**Fig. 32**).
- Increase of the pore water pressure (water head above the joint plane) creating a force acting upwards (**Fig. 33**).



31. Effect of percolating water.



32. Reduction of the shear strength along joints.



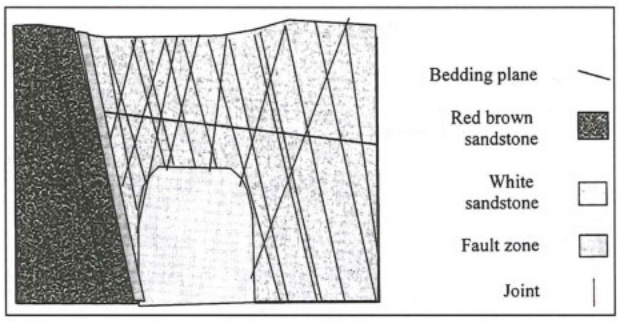
33. Effect of pore water pressure.

- Saturation of the rock mass by filling the space between the sand grains with water, creating extra weight.
- Widening of the joints planes and release of the blocks from the surrounding rock mass.

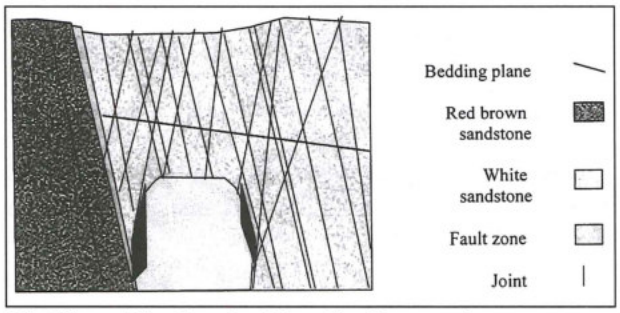
The conditions just mentioned are ideal for the sliding and free fall of blocks.

The two joint sets, the fault plane and the bedding planes all influence the stability of the tunnel ceiling and side walls. Taking into consideration the effects of water percolation and the effects of flood events the following is the expected sequence of failures in the tunnel, if no protective steps are implemented, illustrated by the two dimensional views in **Figs. 34-38**.

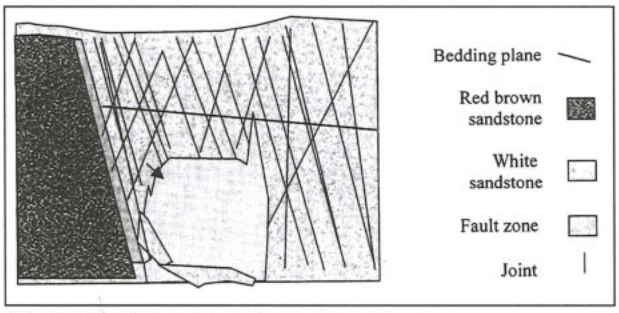
I. The original situation, with the factors encountered before any new failures start (**Fig. 34**).
II. The effect of floods wash out the lower portion of the side walls, at the same time percolating water affects the stability of the rock mass, particularly the block marked in black on (**Fig. 35**).
III. The blocks resting above the joint planes slide



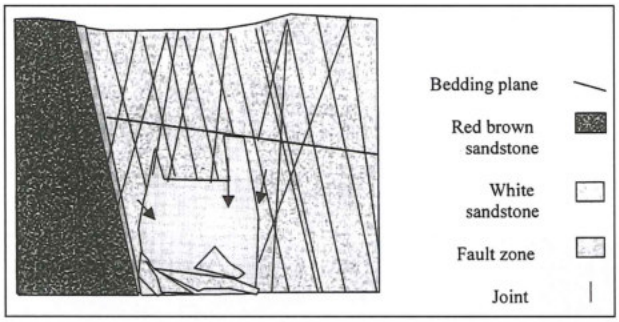
34. The Mudhlim tunnel before failure starts.



35. Effect of flood on the side wall of the tunnel.



36. Blocks sliding along the fracture planes.

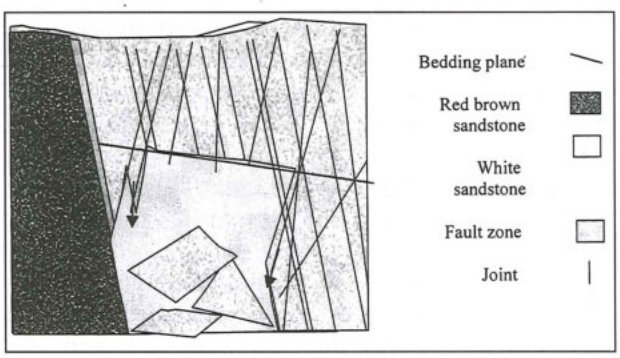


37. Blocks falling and sliding along joint planes.

along those planes in the east wall, and along the fault plane in the west wall. This will allow the blocks in the ceiling to fall (**Fig. 36**).

IV. Other blocks will then be free to fall from the ceiling and slide along the existing planes from the side walls (**Fig. 37**). This process will continue simultaneously and/or progressively until the flat bedding plane forms the ceiling (**Fig. 38**).

The above represents a two dimensional analysis of the current situation. Exact conditions are more complicated (i.e. 5 major sets of joints intersecting together on the ceiling and side walls, dipping in different, unfavourable directions). Whereas only two joint sets and the bedding plane are enough to create block failure, more serious collapse is anticipated due to the high number of joint sets.



38. Features continue until a bedding plane forms the ceiling.

Most of these joint sets are vertical or dip in unfavourable directions and the intersection of three of them can create a single block. The risk of this block falling depends on the other conditions discussed earlier.

At the entrance of the tunnel one of the joints is oblique to the wall direction. The joint opening has been enlarged by surface water runoff, a process that acts progressively in a downstream direction. In addition there is the degradation effect on the side walls which act as the support for this block. This block will become unstable and will fall down at the stage where the supporting and shear strength are reduced to a level that cannot hold the block's own weight.

There is a simple equation for the stability factor: stability=resistance/weight. The main factors which influence resistance are support and shear strength.

A protective measure is essential for preventing reduction of resistance in order to stop these blocks falling and inside the tunnel the loss of support of the ceiling will become critical if blocks in the side walls gradually slide down. Between 20-45m from the entrance of the tunnel, the conditions are very poor; some very large blocks have already slipped along the joint planes from the right wall after floods washed out its toe support. The rock is highly weathered, the cement between its grains having been gradually washed out by water action. Towards the outlet of the tunnel, the left wall along the fault plane is still intact, whereas parts of this wall upstream have been washed out.

All the factors discussed have been inspected

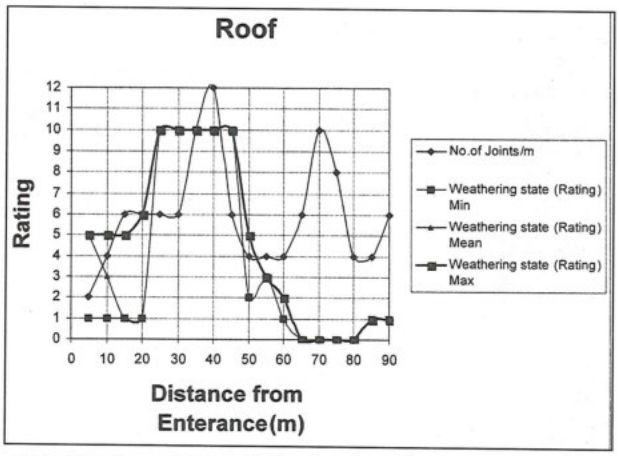
inside the tunnel, evaluated, rated and presented as a set of failure risk maps (combined in one map in **(Fig. 39)**. The blocks with the greatest risk of falling or sliding were rated 15 (blocks in immediate danger) and the safe blocks were rated 0. This scale (0-15) is the range used by software that evaluates the number of joints per area, rock mass strength and state of weathering.

Each of these conditions was evaluated separately and the risk rates were calculated using the value shown in **Fig. 40**, and were automatically processed at reasonable scale, and contoured to produce the risk maps.

The risk maps show that the left wall is less affected and is in better condition than the ceiling and the right wall. This is due to the nature and quality of the rock mass, which is composed of very strong, well-cemented sandstone. The joints are filled with well-cemented sandstone that is more resistant to weathering than the intact rock.

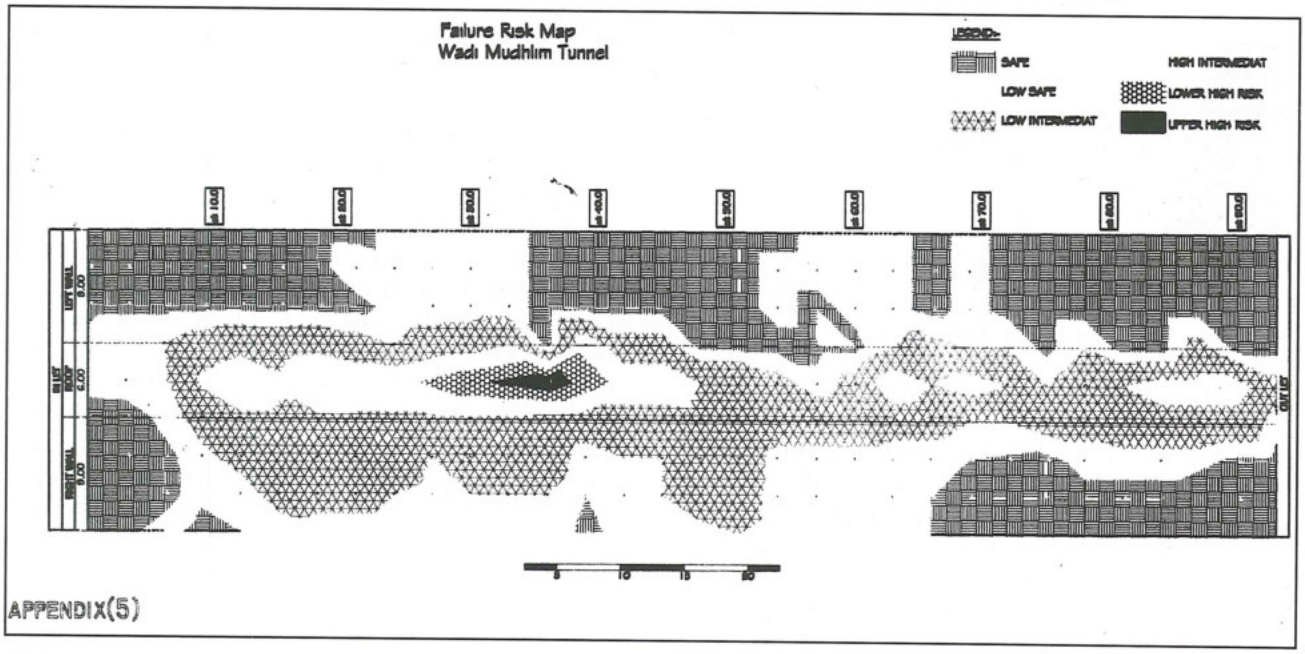
At a distance of 30-40m from the inlet, both walls of the tunnel are rated as low-intermediate risk, which puts the ceiling in this part at its greatest risk, because, without the support of the blocks in the wall, the situation becomes critical. Some of the walls have been washed out by flash floods and the situation between the ceiling and the left wall is indeed critical.

The conditions in the ceiling are more complicated and the risk is much higher than for the walls because of joint sets. The state of weathering of the joints is the main controlling factor, along with the number of intersecting joint sets. The ceiling is composed of poorly cemented white sandstone and water percolation and infiltration play a major role in enlarging the joint planes and releasing the blocks from the intact surrounding rock, allowing them to fall.



40. Risk rating of block fall in tunnel ceiling.

The right hand wall is classified as intermediate to high risk and is composed of poorly-cemented, highly jointed sandstone. The effect of flood erosion on the wall is very high, especially in the lower portion, in addition to the effect of percolating water along the joint. The erosion of the lower portion of the wall will remove parts of the toe support of higher blocks; this in turn will allow the second block to slide along the joint plane which dips towards the tunnel wall. This process is progressive towards the east after each flood and will widen the tunnel to a stage where the ceiling becomes un-



39. Combined risk map showing the ceiling in the centre and the two side walls.

stable. This will result in the ceiling's collapse (probably at a spot approximately 35m from the entrance where the situation is classified as upper high risk or immediate danger).

Conclusions

- Wādī al-Mudhlim in general is stratigraphically positioned within the Cambrian sandstone (Umm Ishrin formation) and the lower portion of the Ordovician sandstone (Disi formation). Structurally Petra is located within a highly complicated fault zone.
- The wadi itself is major normal fault trending N-S, where the red brown sandstone (Umm Ishrin formation) of the western wall rests against the white sandstone (Disi formation) to the east.
- Five joint sets were measured along the tunnel walls, some are parallel to the fault and the others crossing diagonally.
- The tunnel walls are parallel to the fault plane and major joint sets.
- The tunnel area is extensively affected by weathering, especially the ceiling and the right wall, the white sandstone having lower resistance to weathering than the red brown sandstone.
- Many failures were observed in the tunnel due to the free fall of blocks from the ceiling and blocks sliding from the side walls.
- Three major factors control the stability of the tunnel: structures (i.e. the fault, joints), the weathering status of rock mass and floods.
- In some areas the instability of the tunnel reaches critical level.

General Recommendations

In order to stabilize the conditions in the area of study, improve safety and minimize the damaging effects of flash floods to the tunnel, monuments and the immediate surrounding environment, the following interventions are measures that need to be implemented urgently.

Clearance of the collapse within the Sīq al-Mudhlim tunnel

The recent collapse within the tunnel was cleared in 2003, thus improving the flow through it and reducing the erosive power of flash floods.

The Construction of Three Check Dams

Immediate construction of three check dams is needed to stop movement of sediment in sector MS1 between the two culverts of Wādī Mūsā and the Mövenpick Hotel and from continuing down into the Sīq al-Mudhlim. Sediment accumulation could flatten the wadi bed slope, which would lead to better flow conditions in the future.

The Construction of a Detention Basin

The study revealed the need to construct a detention basin at the bottom of sector MS3. The basin is needed to absorb the flood peak and increase the detention time before flowing through the Sīq al-Mudhlim.

Clearance of the Roof of the Tunnel

All soil on the roof of the tunnel should to be cleared as soon as possible, to increase the runoff from the top of the tunnel. This includes removing the vegetation to prevent further root weathering. All cracks and openings need to be cleaned and filled with an impermeable material to prevent water percolating directly along the cracks and all depressions should to be treated to prevent water accumulation. The ceiling of the tunnel needs to be supported with a steel structure should the above recommendations be delayed, to avoid the high possibility of its collapse under the current conditions.

The Construction of Two Main Dams

Two dams need to be constructed, in sectors MS5 and MS11. The expected reservoir capacities are 3200 and 2500 respectively. Based on the site conditions, it is recommended to construct the dams as cascade structures as these would fit site requirements, work conditions and stability criteria.

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Petra National Trust,
PO Box 815480, Amman 11180
pnt@nets.com.jo
www.petranationaltrust.com

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NEW VERSION OF THE JADIS DATABASE FOR THE DEPARTMENT OF ANTIQUITIES OF JORDAN

Stephen H. Savage

Introduction

Under the auspices of a Senior Fellowship from the National Endowment for the Humanities and the American Center for Oriental Research (ACOR) I have had the opportunity to develop and install a revised and expanded version of the Jordan Archaeological Data Information System (JADIS) at the Department of Antiquities of Jordan (DOA) and ACOR. The new version supports many additional functions, including archaeological projects, information on permits, loans, condition reports and digital photographs. An embedded GIS map control makes it easy to see the distribution of sites and projects against a background of satellite images or 1:50,000 scale topographic maps. After reviewing the current JADIS database, this article will describe the new system briefly.

The original JADIS database was compiled and edited by Dr. Gaetano Palumbo (1994) under the auspices of ACOR's Cultural Resource Management Program, sponsored by USAID. Palumbo's original effort resulted in the encoding of over 8,600 archaeological sites in a FoxPro relational database implemented by CDG Management and Associates, of 'Amman. At the time the program was developed, GIS technology was relatively new, prohibitively expensive, and difficult to implement or manipulate. As a result, the original JADIS database did not offer map or GIS support, though the 1994 JADIS volume included a series of site distribution maps drawn by InfoGraph, Inc. of 'Amman from an ArcInfo database, and GIS support was always envisioned (Fakhoury and Azar n.d.). Though the original program did not include true map support, a limited spatial query capability was included, based on the scheme developed to create site numbers in the system. Using the site's location in the Palestine Grid projection, a site number was created by appending a sequential number to values that identified the 10 by 10km^2 in which the site is located. This results in a seven-digit site number in the format 9999.001 that could be spatially searched in a limited way by typing in the coordinates of a search box in the query section of the current program. The search retrieves all the sites in the rectangular area — there is no way to request an irregular region.

Recent improvements to the old JADIS database were made, but they were done outside the actual JADIS program. For example, the basic text entries from Palumbo's 1994 volume have been placed in a web-based search engine at http://www.nis.gov.jo/anti/owa/sitetype. If one knows the name of a site, its JADIS information can be retrieved from this web page. And I have produced a series of interactive GIS-based maps of Jordan, divided by time period, and placed them on my web page at http://archaeology.asu.edu/Jordan/jordmaps.html. Users can select a time period, and then pan and zoom around the map. Clicking on a site opens a small table or window with the JADIS site data. While both of these web pages provide greater access to the JADIS data, neither is a fully integrated database and map system, allowing for additions, editing and full-fledged map or attribute based queries of the data.

Now that GIS software, such as ESRI's ArcView and MapObjects (which allows GIS functions to be customized and built in to standard database packages like MS Access) has become fairly inexpensive and readily available, it is time to update the current system to provide greater flexibility. This need is fully recognized by the JDOA (Fakhoury and Azar n.d.). The addition of map-based support to the system makes it much easier to use, both as a research tool and as a planning tool for cultural resource management purposes. Development projects can be planned in order to limit their potential impacts on known archaeological sites, because the actual "footprint" of a planned development can be searched; the area of potential effect can be adjusted if significant archaeological sites will be impacted by the project. And researchers will be able to query the attribute tables and create distribution maps based on com-

binations of site attributes. For example, it would be easy to create a distribution map of all the EB III settlements in the country, and print a formatted map, ready for inclusion in an article or report.

The New JADIS Database

A significantly enhanced version of the JADIS system has been deployed at the DOA and ACOR. The new program has an MS Access front end, which employs a MapObjects control by ESRI and about 200 pages of VBA code to provide an interactive Access/GIS user interface. The new program supports Digital Chart of the World layers, satellite images at 28m and 10m resolution, and the new series of 1:50,000 scale topographic maps of Jordan. These are delivered as background images, and automatically load and unload as needed; the effect is a seamless quad sheet or satellite image coverage of the entire country. Users can query the Access table, or the map. Irregular polygons can be drawn on the map and buffered to a user-specified distance, and all the sites that fall within that region can be retrieved instantly, and sent to printed reports. Elaborate queries of the tables can be made, and the results can be displayed on the map.

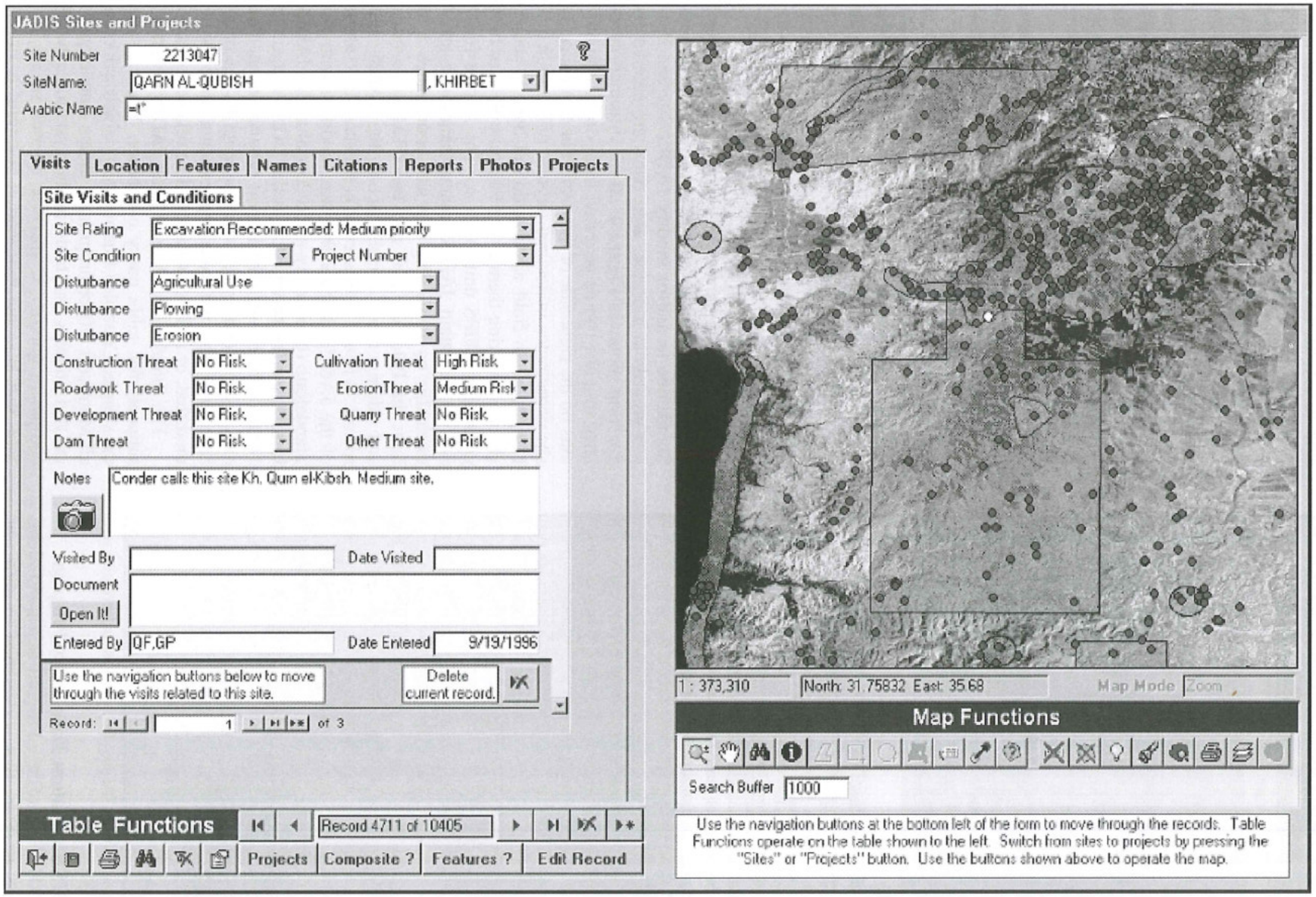
Figure 1 shows the Sites and Projects form, and illustrates several of the enhancements to the system. All information related to the Site is organized on a series of tab controls on the left side of the screen. Pressing the Projects button closes the site information, and opens project information on the same form. On the right side of the screen you can see the map controls. The map has been zoomed in to the region where the site shown on the left is located. Sites are shown on the map as points; projects are shaded regions. The current site record, Qarn al-Kabish, is shown on the map as a larger dot near the center of the map. The map also shows the use of the 28m resolution LandSat images. When the Pan button is pressed, the user can grab the map and drag it through the map window. The needed satellite images will be automatically retrieved from the hard drive and displayed, and unneeded ones will be dropped off the map. This, in effect, provides seamless coverage for all of the southern Levant. The user can zoom in and switch from 28m LandSat images to 10m SPOT images, and then to the 1:50,000 scale topographic maps of Jordan.

The program allows photographs and documents to be attached to sites, site visits, and it allows reports to be attached to projects, permits, and loans. **Figure 2** illustrates a visit photograph attached to the site of al-Murayghāt. Visit and site conditions have been removed from the Site table and placed in their own table, which means that many visit records can be attached to a single site. This lets the system be used to monitor changing conditions at any site, and document them with photographs and detailed reports.

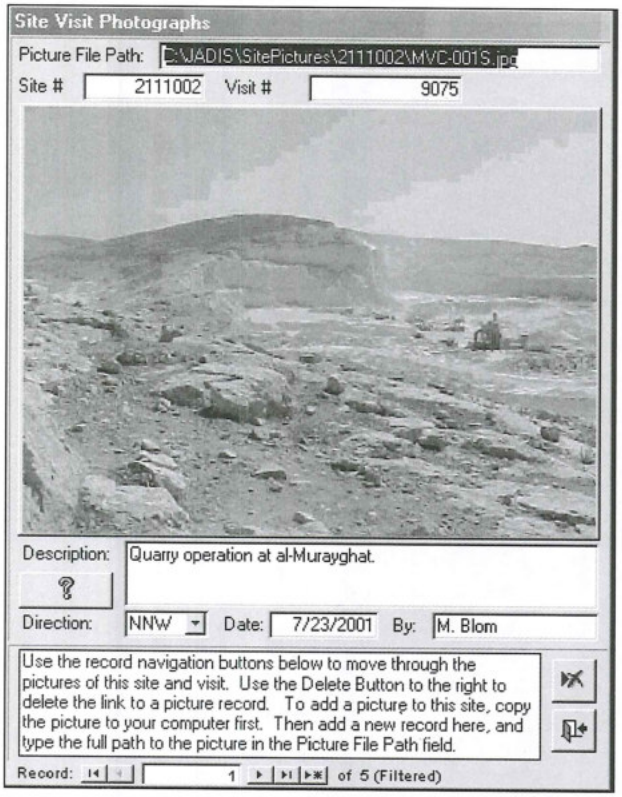
The new program also has an Export/Import function, and it now supports projects as well as sites. After having registered the project area on the system at the DOA, a PI can use the Export function to automatically retrieve all the known sites and other projects that intersect their project area, and export them to a new Access database. A stand-alone data entry program is included in the new system (discussed below), which can either link to an exported JADIS database, or create an empty database in the JADIS format. Sites and projects can be added or modified in the stand-alone program; then the modified database can be imported back into the main JADIS database via the Import function. The stand-alone program automatically includes all the codes that are used to define time periods, site types, etc. So you can create databases in the JADIS format that are completely compatible with the JADIS system at the DOA, and then import your data to the DOA database. You will no longer have to get printed reports of the sites in your area, and you would not have to mess with site cards.

Figure 3 is from the Export routine. It illustrates what happens when the user clicks on an existing project area on the map. All the sites and projects shown in cyan are located within 1000 meters of the project area. The buffered area is shown in hatched magenta. The user simply has to supply a valid MS Access file name, and the records related to these sites and projects will be exported to the new database.

The version of the program that has been set up at ACOR is read-only; it will support the Export function but not the Import function. This is necessary in order to maintain consistency in the assignment of JADIS site numbers. Only the DOA version of the JADIS program will be able to assign real JADIS site numbers, because they are assigned sequentially within 10km blocks, based on the Palestine Grid coordinate system (this method was established by the original JADIS program, and I have chosen to keep it for the sake of consistency). Two different users could very easily end up with different sites with the same JADIS site number, so the stand-alone program substitutes a randomly assigned large number for the JADIS site number. It is used throughout the standalone to link related records. When the records are imported into the main JADIS database, a real JADIS site number is assigned.



1. The Sites and Projects form.



2. A visit photograph attached to the site of al-Murayghāt.



3. The Export screen. The highlighted sites and projects will be exported.

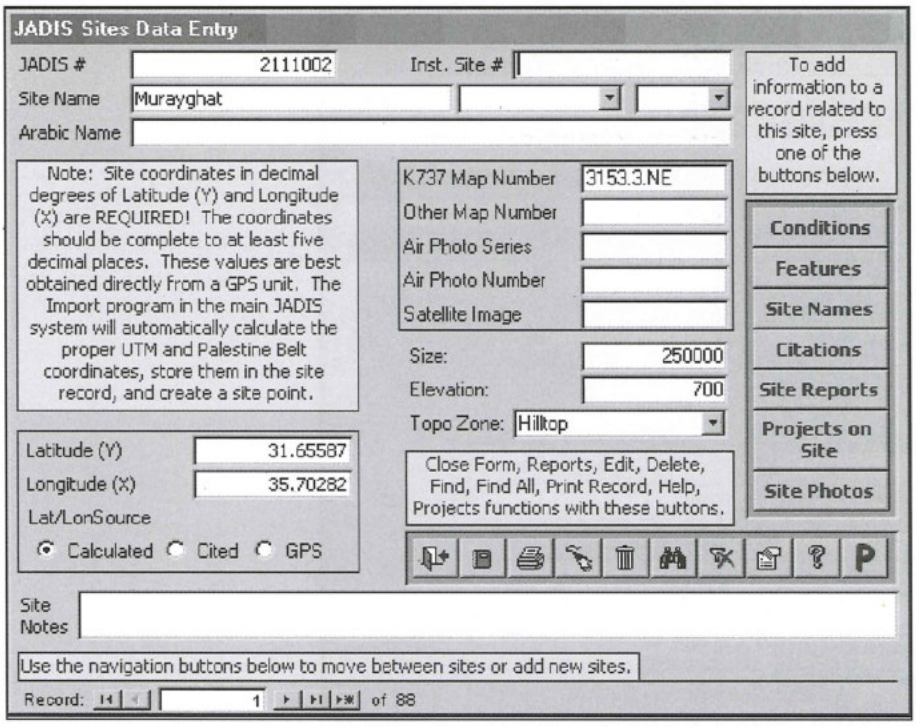
The JADIS Standalone Data Entry Program

The JADIS Data Entry Program is a stand-alone MS Access program that is designed to create or link to JADIS formatted .mdb (MS Access database) files. All codes and references in the JADIS system are included, so that records that are created or modified with this program conform to the JADIS format established by the Department of Antiquities of Jordan (DOA). Since the JADIS Data Entry Program does not contain data beyond the codes needed to operate drop down lists, the program is compact. The Standalone program can be downloaded free from http://archaeology.asu.edu/Jordan by pressing the JADIS button and following the links to the standalone download page.

The new JADIS database system that has been installed at the DOA provides many features that the older, FoxPro system did not. These new features include support for archaeological survey, testing, and data recovery projects, and built-in GIS features. In the new system, an Export/Import function lets the DOA staff export a subset of the main JADIS database to an external file in .mdb format. This will make archaeological survey work and reporting to the DOA a lot easier, because all the records currently in the main JADIS database from an area of interest can be exported in the JADIS format, and can be read by Access.

The Standalone program is designed to work with the exported subsets. Researchers can use the Standalone to add or modify JADIS Site and Project records in a project area. Sites are entered on the form shown in **Figure 4**, all the information related to a site can be accessed from one of the buttons on the right side of the form. The form accepts site coordinates in decimal degrees of Latitude and Longitude, so field workers do not have to worry about converting them to the Palestine Belt, or programming a GPS unit to do so. The Import function in the main JADIS system handles it automatically by projecting the site coordinates into both the Palestine Belt and the UTM projections and adding these coordinates to the JADIS site record. When a field survey is finished, the subset of the JADIS database that was modified with the Standalone (or a newly-created database in JADIS format) can be taken back to the DOA, where the JADIS staff can run the Import program on it. The data will be reintegrated with the main JADIS database. New sites will be added, existing sites will be modified, or additional data will be related to them.

The Standalone, like the Main JADIS Program, supports full table query capability. You can use the simple, Control-F find method (which works in all Microsoft Office programs), create simple queries that address one table in the system, or build composite queries. Composite queries search for Sites that have the information you want is stored



4. The Site Form in the Standalone Data Entry Program.

in more than one table. Composite queries are built on a special form, shown below, where you tell the program what information to look for, and which tables to use. The Composite Query Form is accessed either from the Main Menu. Once you have defined a query, you can save it and reuse it.

In the JADIS database, the Site table stores the main information about sites. However, other tables in the database also contain information about sites. For example, the Citations table links information about sites to published references. Similarly, the Features table links sites to time periods and site (feature) types, and information about site conditions is stored in the Visits table, and linked to Sites through the JADIS Site Number. On the Composite Query Form you put a check mark beside the fields you want to include in the query, and then type in the information you are looking for (or choose it from a drop down list). The form lets you open queries in related tables and automatically link specifications from those tables into the Site table. So you could, for example, look for all the sites in Sector 4 (sectors refer to the sections of the map published in the 1994 JADIS book) that have remains from the Byzantine period. **Figure 5** shows the results; there are 315 sites that satisfy the query.

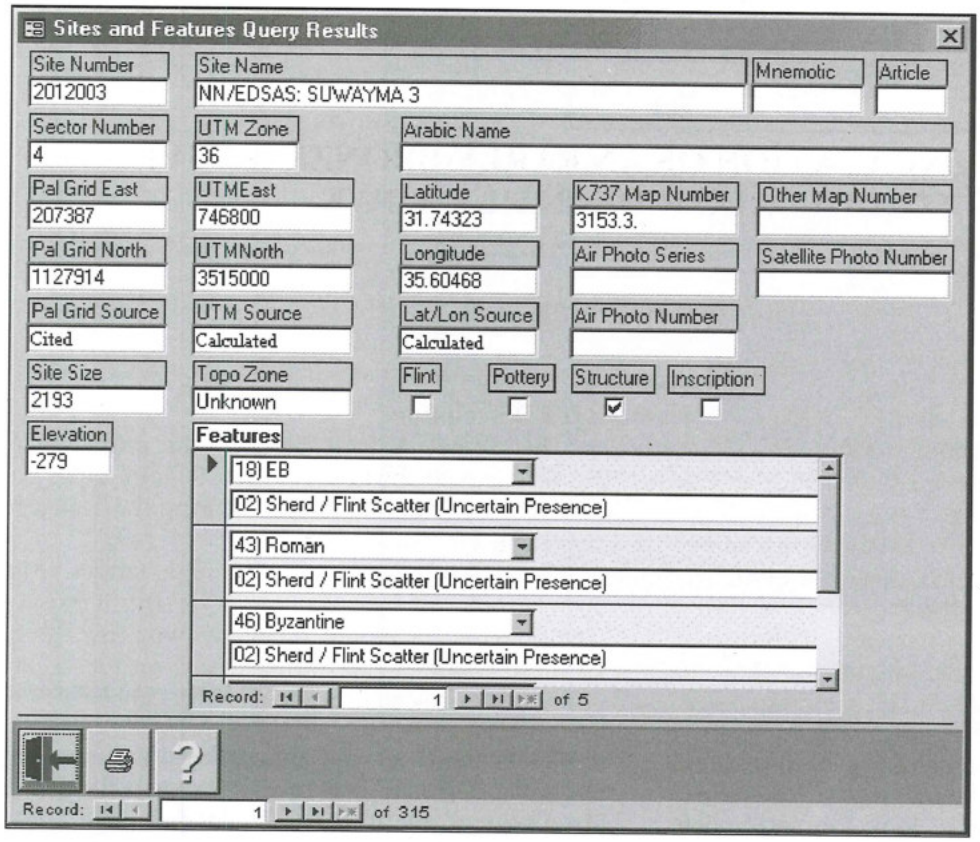
Summary

The importance of the updated JADIS database system cannot be underestimated. Its ease of use, both in terms of data entry and data retrieval, ensures that the DOA and archaeologists conducting research in Jordan will use it extensively. As a planning tool, the new JADIS database will allow much more detailed archaeological searches, especially when combined with topographic map support. Searches based on topographic maps can easily outline the impact area of a proposed new highway, for example, and quickly identify any known sites that will be impacted by the construction. The identification of impacted sites is only the first step in a process that can include the preservation and development of important archaeological resources for touristic purposes. The system's capability to conduct attribute queries and produce distribution maps will greatly enhance the ability of researchers to address any number of questions related to settlement patterns, human impact on ancient and modern environments and so on. I believe that the new JADIS database will form the backbone of future archaeological preservation and research efforts in Jordan.

Acknowledgments

The new JADIS database is a fusion of MS Access, SQL Server, and GIS capability, implemented through ESRI's MapObjects software in Visual Basic for Applications. The project represents a substantial effort at re-working the existing JADIS database, and could not have been accomplished without the generous support of many individuals and institutions in Jordan and the United States.

First, I would like to thank Dr. Gaetano Pa-



5. Results of a Composite Query — All Byzantine Sites in Sector 4.

lumbo for his efforts in developing and populating the original JADIS system, and for his continued enthusiastic support for the development of the new system. Although some changes were made in the database format, by and large the original system admirably suited the functions it was designed to perform, and it became the foundation upon which the current project was built.

The final programming, documentation, and training of people at the Department of Antiquities of Jordan (DOA) and the American Center for Oriental Research (ACOR) in Amman was financed through an NEH/ACOR Senior Fellowship, between September and December 2003. Without the generous support of the NEH and ACOR, and especially Drs. Pierre and Patricia Bikai, and Mr. Kurt Zamora, the final push toward implementing the new system would not have been possible. ACOR has proven to be an excellent base from which to do the work.

The topographic maps that underlie site and project data on the map form were derived from the 1:50,000 scale Arabic series for Jordan, 171 sheets in all. Mrs. Maha Tawrawneh and her staff at the Natural Resources Authority of Jordan patiently scanned these maps, clipped the borders off, georeferenced them, and edge-matched them, so that they could be incorporated in the program as a seamless topographic coverage. I am especially grateful for their efforts.

Finally, I would like to thank Dr. Fawwaz al-Khraysheh, the Director-General of the DOA, his staff, and the people of the Hashemite Kingdom of Jordan for their support of these efforts.

Stephen H. Savage
Department of Anthropology, Box 872402
Arizona State University
Tempe, AZ 85287-2402

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RESCUE EXCAVATION OF AN EARLY BRONZE (EB-IV) TOMB AT ABŪ RIDIN/NĀ'ŪR TOWN

Adeib I. Abu Shmais and 'Abdullah al-Nabulsi

ARCHAEOLOGICAL SECTION
by Adeib Abu Shmais
'Ammān District, 'Ammān, Jordanian Map Coordinates 521816N, 38882E

On the 17th of December 2001, during an enlargement of Nā'ūr main road alongside of the police station, some pottery objects were discovered among the digging spoil. In this case, with the cooperation of the police, the Mayor and the Department of Antiquities of Jordan, the archaeological team completed the mission in a few days.

The work began on the 20th of December 2001 and involved Adeib I. Abu Shmais (archaeologist) and Dr. 'Abdullah Nabulsi (anthropologist), and also three workers from the municipality, Tahseen al-Helw as driver and three other workers from the DoA, the drawings were inked by J. Safi and Q. Dasuqi. The work was accomplished under hard circumstances of heavy rain and rapid flooding into the tomb chamber.

This project is 001, the first entry in the Osteolab Registry database in the 'Ammān Antiquities Office.

Area Description

This cemetery is located on the east side of Nā'ūr (ناعـــور) town, Ḥayy Abū Ridin (حي ابو ردن), which was a traditional town during the last century (**Fig. 1**).

The tombs are situated on a single terrace (**Fig. 2**). The geological layers consist of soft limestone. The ridge of this mount is covered with trees. Four of these chambers were discovered on the higher side of the terrace. The shafts of the tombs seem to continue on a north-south line down the slope to Jordan Valley.

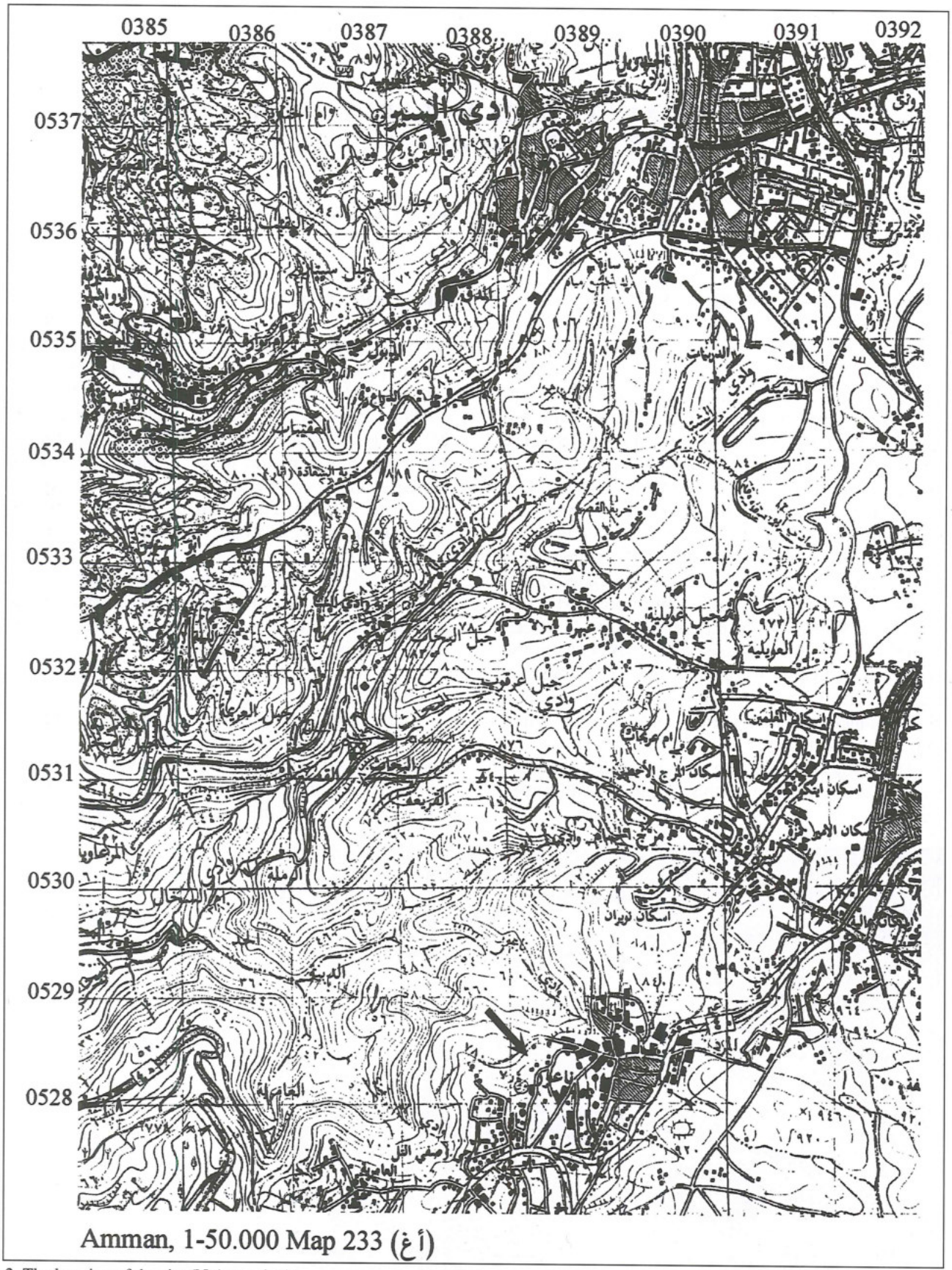
In our local survey we noted that many tombs were robbed and disturbed along this ridge. Some of them were reused as shelters or storage for sewage water about 80 years ago.

Surface Survey

There were no evidences of pottery sherds on the surface of this plateau. Nevertheless, there were visible squared marks of shaft tombs, and there were caves on the east side of the main road, which were uncovered by the Ministry of General Works



1. The traditional house, Abū Ridin village, on the Ridge of al-Balqā' Mountains.



2. The location of the site (Nā'ūr region).

about 30 years ago. There is no doubt that the burial chambers were man-made. The grave has two chambers opposing each other from a single shaft, these chambers are of the same size. They are rounded and had stones blocking the entrance leading to vertical shafts. The best example of this tomb is 4A/B (Helms and McCreery 1988), and is similar to a burial at Sports City (Zayadine 1978), and in al-'Umayrī discovered recently by Waheeb and Palumbo (1993).

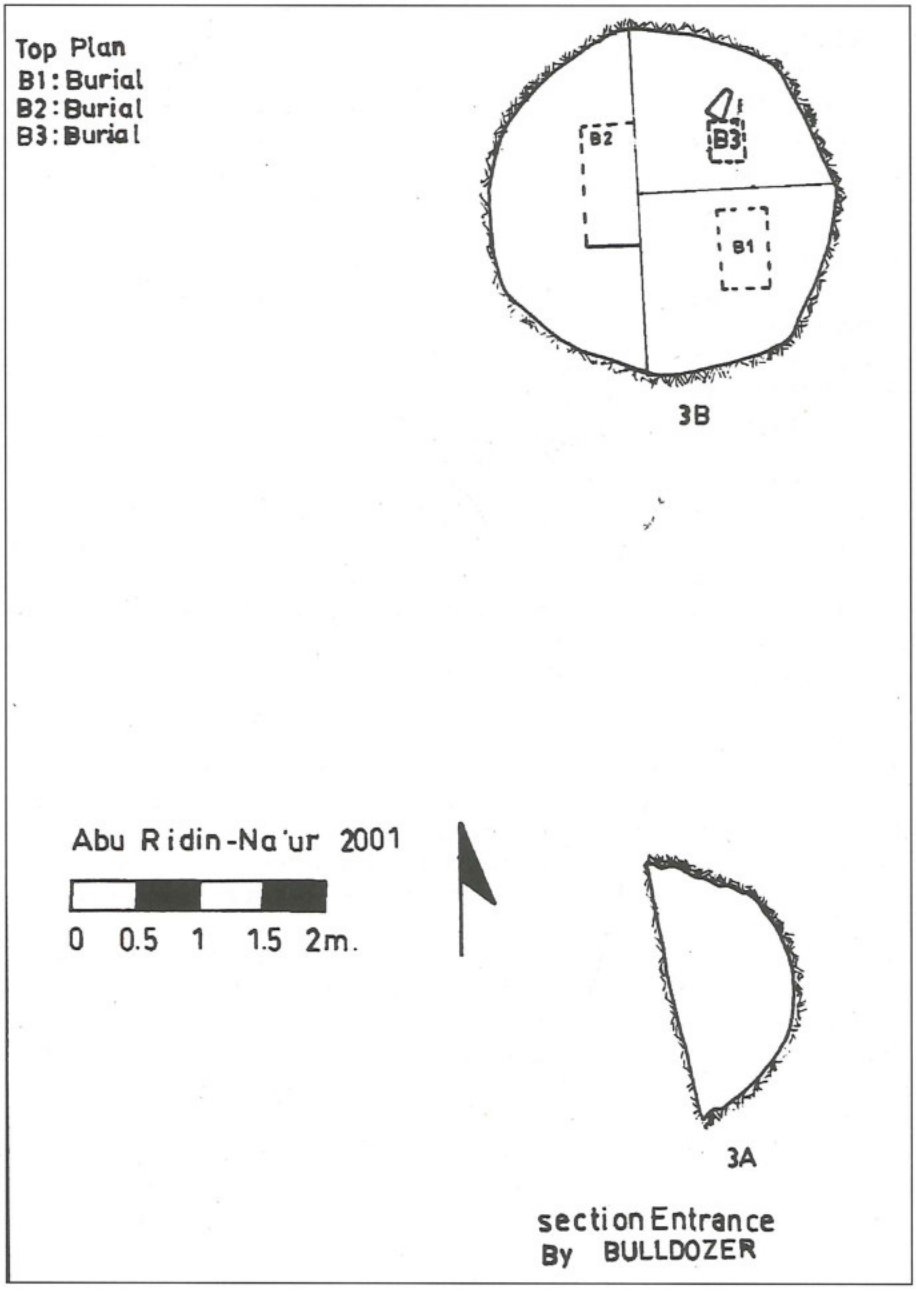
Tomb Description

A huge rock blocks the new entrance of one of the opened chambers. The section faced in the east-west direction to the chamber (274 x 190cm), but the remains of the chamber became round in shape, which is like the tomb entrance now (**Fig. 3A**).

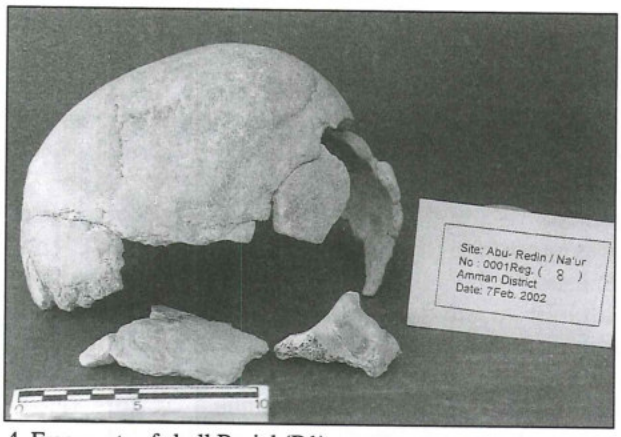
A few bone fragments of skull were scattered (B1, B2) just after removing a huge rock (**Fig. 4**).

Locus No.1: A stone measuring 35 x 20cm is located beside the main entrance of the shaft, and is lying on the floor of the chamber (**Fig. 3B**). This is usually the result of pressure from silt coming through the shaft of the tomb (195cm deep). Some remains entered the chamber with this silt.

The new entrance measures 220cm wide north-south and 110cm high. The limestone layer above consists of a soft limestone 180cm thick, and easy



3. Top plan of the chamber.



4. Fragments of skull Burial (B1).

to cut or chiseled. The ceiling of the chamber has a good finish with a faint black color of smoke. This is parallel with hinterland tombs on both sides of the river. Moreover, there is exposed mixed pottery, this means that the new soil entered the chamber during the destruction.

Clean-up Locus: this work seemed very slow because of the rain. It was a new horizontal layer mixed with some crushed medium and small stones spread on the first half on the chamber floor. Fragments of skull and human bones, very few pottery sherds and tiny pieces of copper were found in this soil layer. It was a 4.5cm thick layer and consists of natural lime soil. This equates to Locus No.1, a chert stone, as mentioned above, rested in front of the main entrance of the shaft and was still visible on the floor of the burial (**Fig. 3B**, burial 3).

Locus No.2: it consists of a thin dump layer of soft limestone earth mixed with red soil 5-7cm thick. It could be the layer which covered the tomb chamber floor. It was prepared for resting the body.

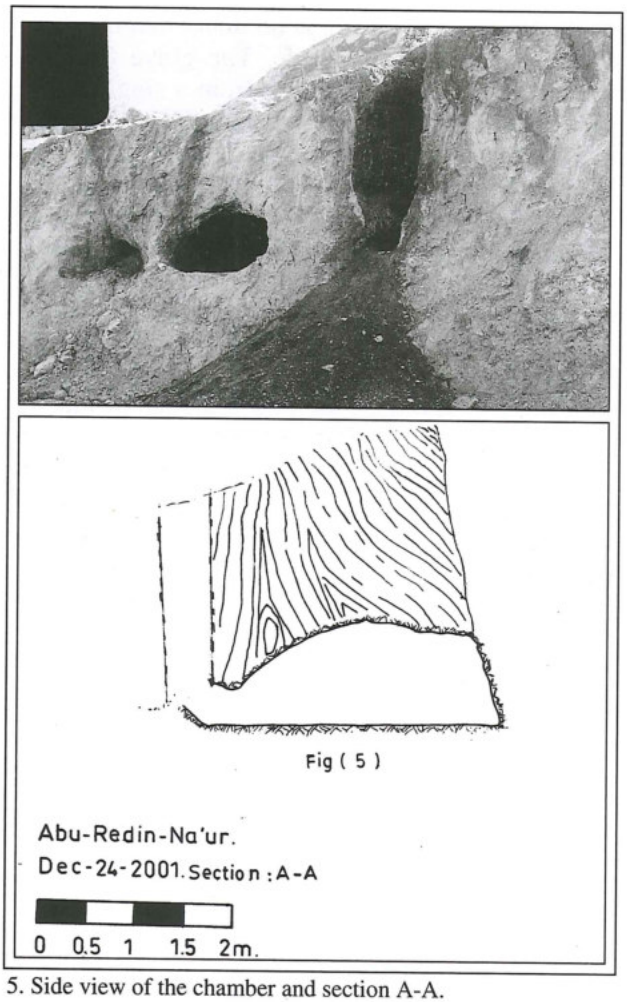
Burial 2, mixed with triangular stones, extends on this soil (40 x 96cm). This looks used in that an amulet was found there (Field No.1).

Locus No.3: Burial 1 (**Fig. 3B**) recovered 7cm. A thick layer of red soil, like red clay, covers this portion of the chamber floor to provide a bed for the burial. This burial, oriented north-south, appears to be *in situ*. Human bones of an old man were found in the fine red earthen layer (**Fig. 4**).

Locus No.4 (B3): This sterile deposit is in the shaft entrance to the chamber from the north side (**Fig. 5**). The silt is 54cm in thickness. Part of this burial was still *in situ* on the bedding layer.

The loci have more than one adult in the chamber, and the analyses of this section will be discussed by anthropologist Dr. Nabulsi in this article.

As I mentioned before this burial contains three individuals (**Fig. 3B**), some of the human remains



5. Side view of the chamber and section A-A.

are still *in situ*. The main finds were pottery objects. Therefore, I will carefully present the general characteristics of this pottery.

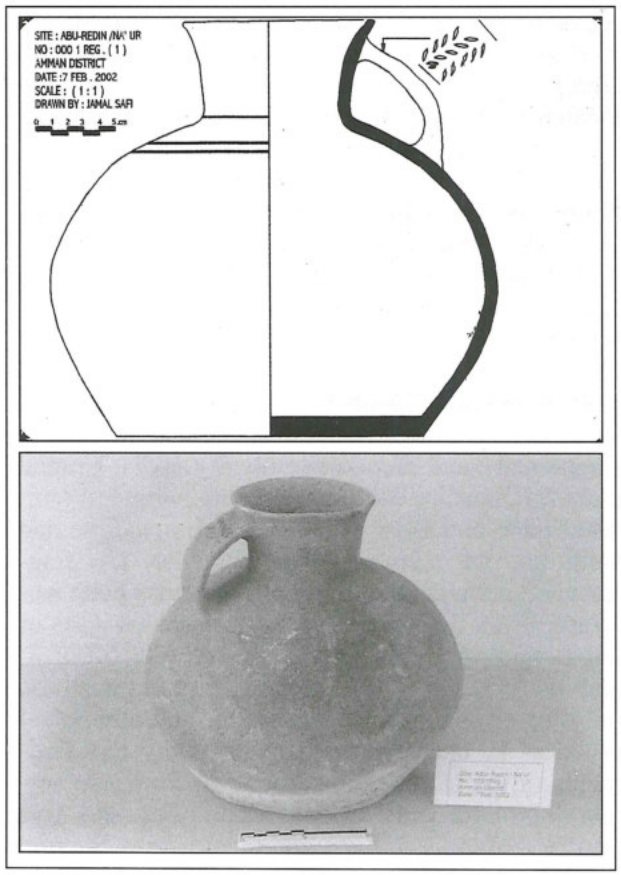
All of pottery assemblages were uncovered under rescue conditions (Zayadine 1978; Suleiman 1985; Helms 1988; Dajani 1967 and Hadidi 1982). It may be a local group. There were a few remains of occupational sites found in 'Ammān region relating to these tombs.

Jars, divided into two types, the largest ones are made with strap handle. The jugs have loop handles.

Plain jars with slightly averted rims are common in the central region of Jordan. Parallel — incised bands of lines on the shoulder of jars have flat round bases. MB-EBIV types are more frequent on the east bank of Jordan River.

Object Descriptions

Field No. 1 (**Fig. 6**) Hemispherical jar with an averted rim; height 35.8cm; diameter 11.5cm; thickness 4-5cm, sandy temper core: grayish brown (10YR4/2). One strap handle under the rim, the



6. Hemispherical jar with an averted rim, incised decoration on the handle of the jar.

handle is decorated by three bands of incised slashes beside the neck. It has a flat rounded base.

Parallels have been found at Tall al-Ḥayyāt (Falconer and Magness–Gardiner 1983), Iktānū (Prag 1996), and Umm al-Bighāl (Helms and McCreery 1982).

Field No. 2 Hemispherical jar: vertical neck; simple round rim; EBIII-IV; height 21.9cm; diameter 10.2cm; grayish brown (10YR4/2); rough in shape, incised lines on the shoulder and strap handle.

Parallels: as in field No.1.

Field No. 3, simple round jar with an averted rim; height 20.6cm; diameter 10.1cm; grayish brown (10YR4/2); sand temper; loop handle higher than the rim, EBIII-IV.

Parallels, as in field No.1, and also Bāb adh-Dhrā‘ (Schaub and Rest 1989). Khirbat al-Ḥimmah (Wightman 1988).

Field No. 4, Small round jar; height 16.7cm; diameter 9.3cm; grayish pink (10YR6/6); loop handle touches the rim.

Parallels were found at Tall al-Ḥayyāt (Falconer and Magness-Gardiner 1983), ‘Irāq an-Na‘sāna (Dever 1973), and al-Ḥuṣn (Harding and Isserlin 1953).

Field No. 6 (**Fig. 7**) Saucer lamp with four spouts; height 5cm; diameter 8.4cm; reddish yellow (5YR6/6); large white inclusions; hand made, EBIII-IV.

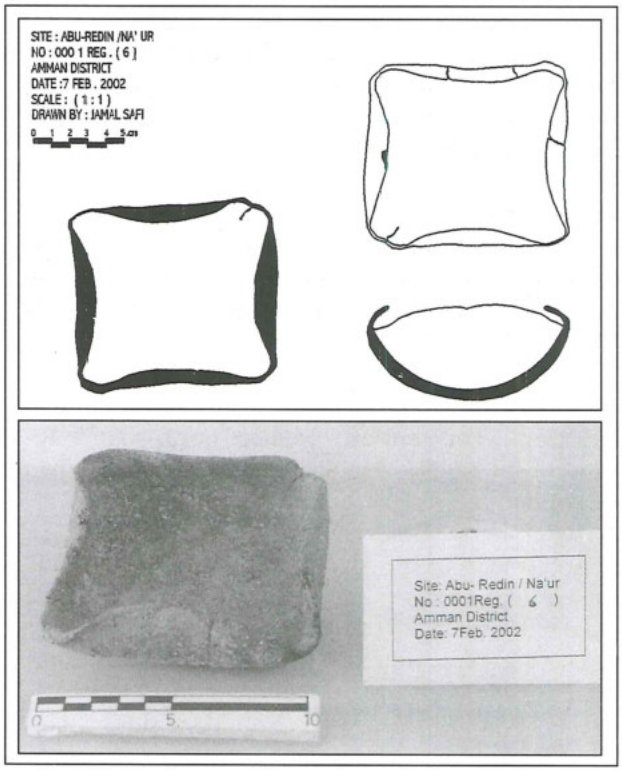
Parallels were found at Umm al Bighāl (Helms and McCreery 1982), Jabal al-Jawfa in ‘Ammān (1982), and Ṭiwāl ash–Sharqī (Helms 1983).

Field No. 9 Bronze tools, complete pin, fragments of stick cover (ring in shape).

Conclusion

According to previous studies of the early Bronze Age this region has no evidence of settlements during the EBIV period (2300-2000BC). However, there are magnificent numbers of tombs in the central plateau of H.K. of Jordan (Falconer 1988; Glueck 1951; Ibrahim *et al.* 1976; Peterman 1992).

Therefore, this should explain the changing settlement patterns during the early Bronze Age, and complemented the idea of their pastoral life. In addition, it brings up the need for new investigations. This theory becomes a reality after the discovery of these tombs along valleys and hinterlands. This reflects the change of environment and climate and their dependency on raising animals. In such a case, there is very little evidence of settlements. The tribes of these settlements have dwellings, the



7. Saucer lamp with four nozzle.

best example is Tall al-'Umayrī, an Early Bronze II-IV domestication area, and other structures related to this period found on the west bank of the airport.

HUMAN OSTEOLOGICAL REPORT
by 'Abdullah al-Nabulsi

Introduction

The present report documents the preliminary macroscopic analysis of the human skeletal remains obtained during a salvage excavation of an EB-IV chamber burial in Abu Ridin (Na'ūr town within Great 'Ammān) exposed by road works.

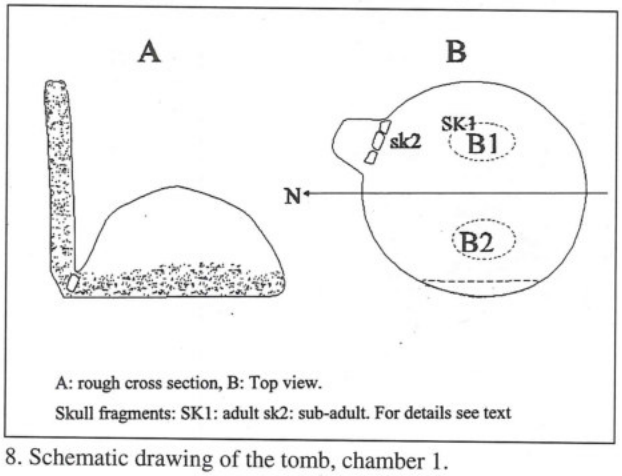
A- Excavation of the Material

This part includes excavation information relevant to this report. Adeeb Abu Shmais presents further details in the archaeological report.

The excavated tomb (Tomb 1), like many in the area, is located on the western hill slope. It consists of a vertical shaft (ca.250-300cm depth and 60-80cm in diameter) leading to a semi-circular chamber (ca.270cm in diameter) with a concave ceiling. The western tip of the chamber was artificially cut by the ongoing road works. The chamber floor was covered with an irregular earthy layer (30-50cm in depth) consisting of clay and decomposed lime stone material intercepted with a few stones of variable size. Fragments of human bones were scattered on the surface. Two main excavation loci were localized. The first was defined as Burial 1 (B1) to the east of an imaginary N-S line dividing the chamber. The second (B2) was to the west of that line (**Fig. 8**).

B- Osteological Analysis

The strong fragmented was dried and clean brushed. From each collection bag the fragments were sorted (cranial and post-cranial parts). In the reassembling process, human remains from Tomb 1 were found to be those of three individuals: two adults and one non-adult. Skeletal fragments allocated to the adults were obtained from different loci in the burial chamber. A number of small fragments, teeth and broken hand and feet bones could not be assigned with any degree certainty to any individual: These were put together as mixed and were excluded from analysis. Human bones collected from Tomb 2 probably belong to one individual.



8. Schematic drawing of the tomb, chamber 1.

1- Individual 1- Tomb 1

Material: Available skeletal material is in general fragmentary and incomplete (nearly 40%). Cranial parts fragmentary, skull base, facial parts, left temporal bone and most of os occipital, mandible and teeth are all missing. Both scapulae are fragmentary and incomplete but no clavicular bone was found. From the upper extremities: caudal parts of left L. and right R. humerus present with 2/3 of R. and 3/4 of L. shaft. R. Humerus head fragmentary, only the proximal half of R. radius and ulna, olecranon of L. ulna. No hand bones. Only few fragments of the lower ribs are present. From the vertebral column only one cervical, T12 and five lumber vertebrae (broken and incomplete). Sacrum is intact but missing coccyx. Both pelvic bones are fragmentary and incomplete. From the lower extremities L. femor missing femoral head (lost during transport!), R. femor only shaft, tibia and fibula both strongly fragmented. Most feet bones are missing. R. patella is present (see attached Human bone documentation sheets).

Sex Determination: Cranial features show high processus mastoideus, skull lateral profile, and R. orbital upper ridge suggest male. The pelvic bones sciatic notch and pubic symphysis indicate male features. Postcranial bones reveal extensive robusticity.

Age Estimation: Teeth are not available for this analysis. Cranial suture closure shows complete fusion in the S1, S2 and S3 regions of the sagittal suture, and of C1 and C3 of the coronal suture, C2 almost complete as well as available parts of L2 and L3 regions of the lambdoid suture. All these features with the pubic symphysis indicate an age well above 50 years.

Pathology: A medium stage of porosity can be observed on the outer cranial surface, particularly on the parietal parts. These are well expressed around the poros acusticus (ear) area. Around the frontal crest of the cranial wall there are multiple depressions with smooth edges. No cribra orbitale was detected on the fragment from the right orbital

part. Probable histological abnormal formation (lesions?) is found on the lateral end of the R. zygomatic arch (5-10mm) and of the temporal bone (lateral) of the same body side.

The proximal end of the left scapular spine reveals a healed fracture that lead to a moderate morphologic deformation. The left ulnar bone reveals another fracture, transverse, below the proximal epiphysis (tuberositas ulnae). The traumatic injury led to the separation of the epiphysis from the ulnar shaft. A long healing process lead to an abnormal bone growth closing the gap between the two broken parts of the ulna (pseudoarthritis), thus limiting the functionality of the L. arm. It is very possible both traumatic injuries described above, that healed long before mortality, are related or were caused by the same factor (a fall more probable).

Degenerative joint diseases were also examined. Almost all the available articulation surfaces reveal porosity of pitting or both. Osteophytosis (abnormal bone growth) can be observed on the edges of the long bones joints, patella, pelvic parts and sacrum. It is more acute in the case of the all allocated cervical, thoracic and lumber vertebrae. Osteophytes were so extensive on the lumber vertebrae. This led to ankelosis (fusion) of the L1 with L2, and L3 and L4 with L5 (Block vertebrae).

2- Individium II- Tomb 1

The material is scarce in general including fragmentary cranium missing the facial parts. No maxillar nor mandibular bones are present, though a fragment of os alare is available. The left parietal and occipital parts are strongly fragmented. Post cranial fragments include parts from L. femor, R. radius and both fibulae and tibias as well as from the ribs and vertebrae. The material reveals less or no fossilization (hardening), compared with the material of the other individuals found in the burial (Tomb-1)

The material belongs to a non adult individium, probably 5-10 years old as suggested by the femoral fragment and cranial suture closure. Sex determination for this individium is macroscopically not possible.

On the outer surface of the frontal bone of the skull, two small depressions (ca.5mm in diameter) are present. These can be of pathological origin, though root intrusions or rodents bites can not be excluded.

3- Individium III- Tomb 1

The scanty material of an adult individium consisting of most of the right squamous bone and parts of the occipital and parietal bones. Post cranial material includes fragments of the humeral, femor, tibial shafts. Minimal and maximal humeral diameter measure 21, 18 of the right and 21, 17 for the left respectively.

The length of the mastoid process and cranial gracility suggest a female individual. The material suggests an age between 25 and 40 years.

Pathologic features observed include slight porosity around porous acusticus. The presence of a lightly expressed mastoid suture was documented.

4- Individium 1- Tomb 2

The material consists of two bone fragments only: the sternal end of the right clavicula and 3cm long rib fragment. The articulation surface of the clavicular fragment suggests an adult of 22-25 years old. No further analysis was possible.

Conclusion

This part will handle the material of Tomb-1 only. In this tomb the incomplete remains of 3 buried individuals were found: indiv.1 (NAAR-2001) is a male died probably at an age above 60 years as suggested by the age factors and the pathological features of the joints. It was probably buried at the same time or after the burial of the third individual NAAR-003 (female 25-40 years old), which is more probable. This is indicated by the poorer condition of the NAAR-003 material. Both can be dated, as suggested by the excavated pottery, to EB-IV phase. The remains of the non adult, NAAR-002, are comparatively less fossilized and deteriorated than the other two adult burials. This suggests that the child was buried at a much later period (first or second millennium AD). This assumption is strengthened by the observations made during excavations as well as the retrieval of few Byzantine pottery fragments in the tomb (pit fall).

Note: Tomb 1=(Locus 1).

NAAR= Osteo-lab Registry No.

Adeib I. Abu Shmais
'Abdullah al-Nabulsi
Department of Antiquities
B.O. Box (88)

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BROWN UNIVERSITY 2003 EXCAVATIONS AT THE PETRA GREAT TEMPLE: THE ELEVENTH FIELD CAMPAIGN[1]

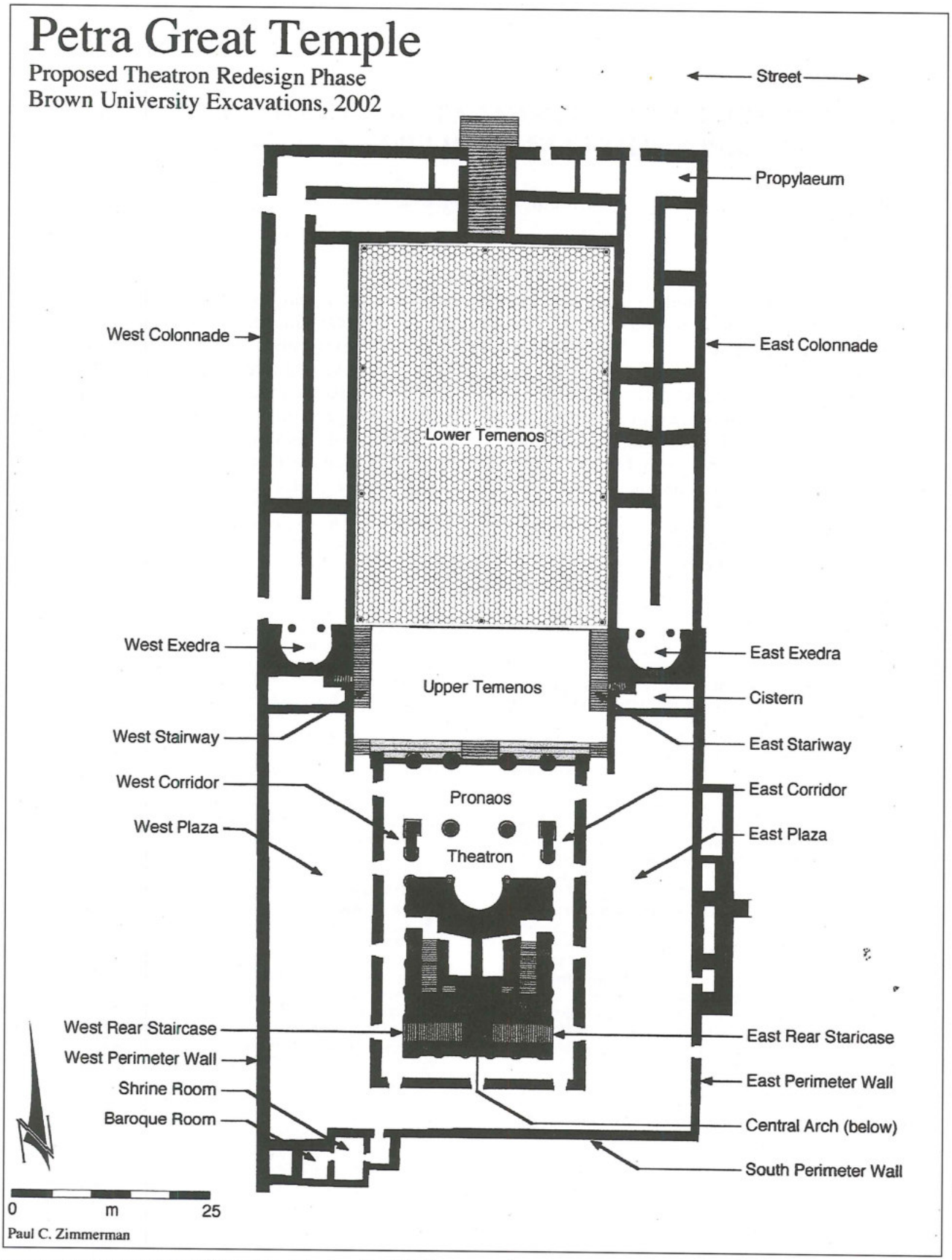
Martha Sharp Jowkowsky

The eleventh season of field excavations by Brown University archaeologists took place from July 5 until July 31, 2003, under my direction. **Fig. 1** is the digitized site plan.

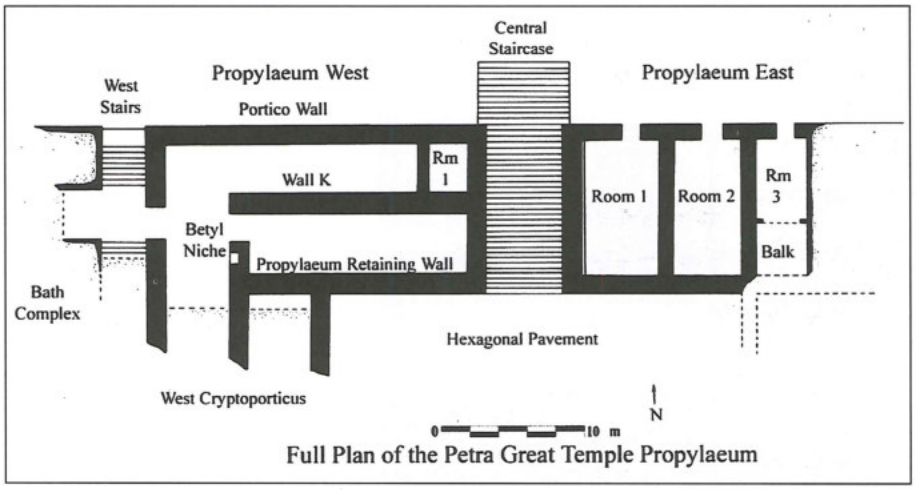
This article presents the 2003 excavations of the Great Temple Propylaeum shown in its entirety in **Fig. 2**, however, our 2003 excavations concentrate on the Propylaeum East shown in **Fig. 3**. Thereafter our 2003 architectural fragments and consolidation efforts are summarized. Simultaneously, during the 2003 summer, analysis is undertaken on previously excavated materials at Brown University, discussed in a concluding statement.

This campaign would not have been possible without the generous assistance of the Jordanian Department of Antiquities, Fawwaz al-Kraysheh, Director, Suleiman Farajat our Department of Antiquities Representative and Director of the Petra

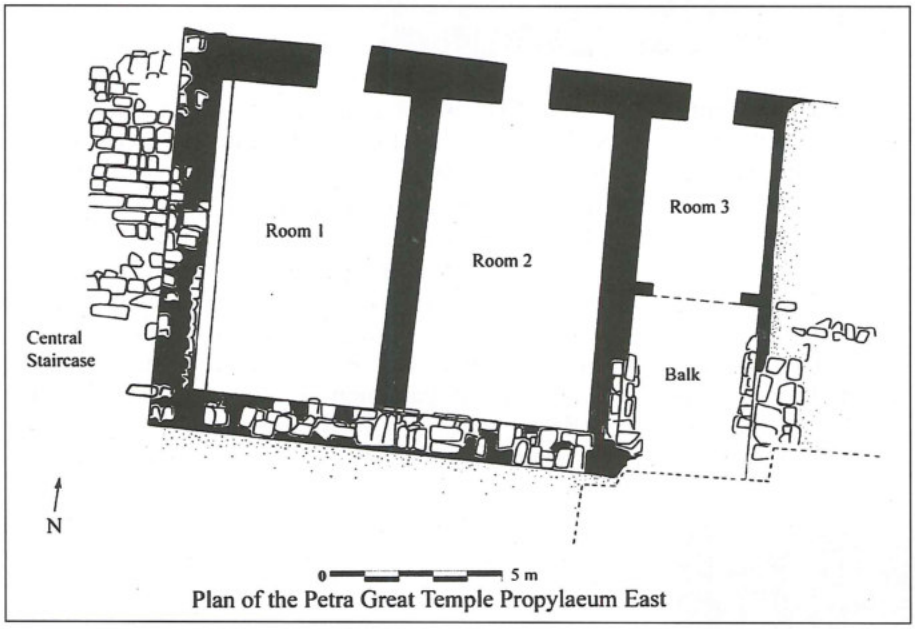
1. For the reader's convenience, a brief review of the site is provided here. The Great Temple represents one of the major archaeological and architectural components of metropolitan Petra. It is the largest freestanding building yet excavated in the city. Located to the south of the Colonnaded Street and southeast of the Temenos Gate, this 7560 m² precinct is comprised of a Propylaeum (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. No structures were evident before the Brown University 1993 excavations under my direction. The precinct, which is partially constructed on an artificial terrace, was littered with carved architectural fragments toppled by one of the earthquakes, which rocked the site.
In the Propylaeum and Lower Temenos are triple colonnades on the east and west with a total of 120 columns crowned by phenomenal Asian elephant-headed capitals. Under these colonnades are cryptoportici or vaulted chambers. These colonnades lead into east and west semicircular buttressed exedrae. Here in the Lower Temenos, large, white hexagonal paving stones were positioned above an extensive subterranean canalization system, traced from under the Temple to the Lower Temenos, the Propylaeum, and the Colonnaded Street to the Wādī Mūsā. In addition to 11,000 architectural fragments, there are coins, limestone facial frieze elements, lamps, Roman glass, and ceramics including figurines and Nabataean fine wares. Elaborate floral friezes and acanthus-laden limestone capitals suggest the temple was constructed in the beginning of the last quarter of the first century BC by the Nabataeans who combined their native traditions with the classical spirit.
The Great Temple in its Site Phase IV rebuilding had its columns and walls colorfully stuccoed, which must have had a dramatic impact when set against its rose-red environment. It is tetrastyle in antis (four columns at the front) with widely spaced (ca. 7m, 21ft.) central columns at the entrance, two end columns located about five meters (15ft.) to the east and west, respectively, and beyond these originally stood anta walls decorated with carved reliefs. Approximately 15m in height, the Porch columns plus the triangular pediment and the entablature, hypothetically place its height at a minimum of 19m. The temple itself measures 35m east west, and is some 42.5m in length. The podium rests on a Forecourt of small hexagonal pavers; a stairway approaches a broad deep pronaos (entry), which in turn leads into side corridors that access a 630-seat theater. The Pronaos entry is marked by two columns, which are the same diameter (1.50m) as those at the temple entrance, but are larger than either the eight flanking the side walls or the six at the temple rear, which have diameters of 1.20m. In the interior north are massive anta walls resting on finely carved Attic bases. To the south is a two-or-three-storied complex dominated by a large, central vaulted arch and twin stepped arched passages leading to paved platforms, plus a series of steps which accessed the rear of the Theater, and another series of steps which accessed the colorfully stuccoed temple corridors. There are exterior paved walkways on the temple east and west, where sculpted facial fragments and fine deeply carved architectural elements have been recovered. The relief of a Sword Deity can be seen carved into the rear wall of the Upper Temenos and below is an underground cistern with a volume of 390,000 liters or 103,038 gallons of water.
Based on what we knew about a partially recovered South Passageway shrine in the temple south, we completed its excavation—measuring 5.64m north south-by-3.87m east west. A west doorway leads into an adjacent room measuring 4.50m north south-by-3.67m east west where a massive wreckage of extensive remains was discovered—the Baroque Room filled with collapsed delicately designed painted and gilded plaster. The exacting task of the removal of these stucco components has been completed and their restoration is now underway. To the west of the Baroque Room we excavated a "Residential Quarter" of two caves with extensive architecture—including eleven rooms with columns and arched walls, along with masses of plain and figuratively painted Nabataean ceramics.
Five years of excavation results 1993-1997 with a CD-ROM have been published and are available to the public by contacting the director. Annual reports can also be found in the *Annual of the Department of Antiquities of Jordan (ADAJ)* and in the *American Journal of Archaeology (AJA)*, and the final report of these excavations is now underway.
Web page: <http://www.brown.edu/Departments/Anthropology/Petra/>



1. Great Temple Site Plan of Phase V architecture (Paul C. Zimmerman).



2. Sketch Plan of the Propylaeum (Emily Catherine Egan).



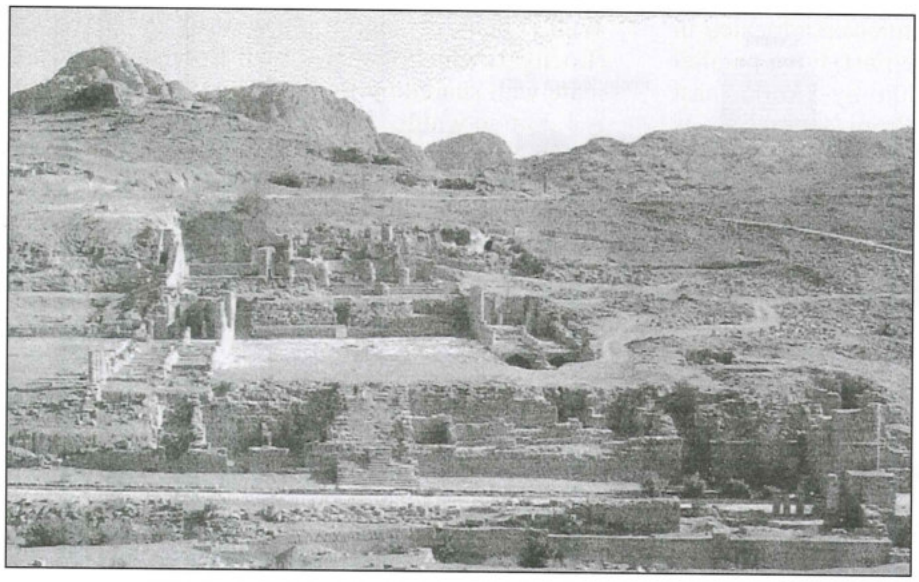
3. Sketch Plan of the Propylaeum East (Emily Catherine Egan).

National Park and the American Center of Oriental Research, Pierre M. Bikai, Director. We would also like to express our gratitude to Brown University for making this season possible.[2]

Excavation Results

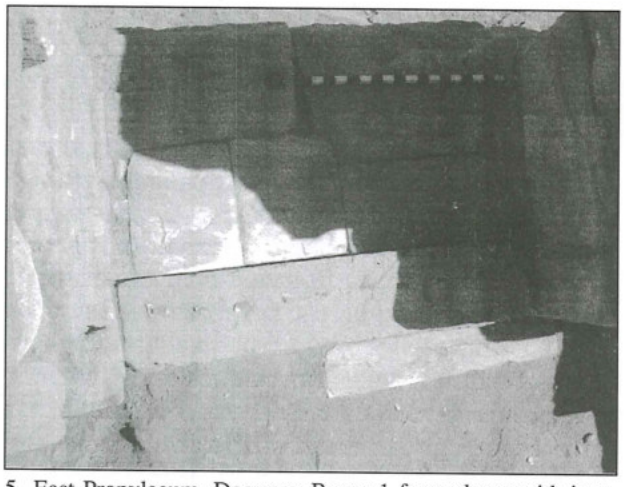
The total area covered by the Propylaeum East is 25.00m east west-by-11.00m north south. A large portion of the Propylaeum East now is completely exposed, measuring 11.00m in north south width-by-17.00m in east west length to an approximate depth of 7.50m. **Fig. 4** shows the site at the close of the 2003 excavations. Although the finds are homogeneous, the architectural character of the East Propylaeum is considerably different from its counterpart to the west as can be seen in **Fig. 2**. Revealed are three entries into the Propylaeum East from the Roman Street, two of which are rooms and the third is a passageway (?) into the East Cryptoporticus west. Of particular importance is that the Propylaeum East is contained within two walls, the Portico Wall and the Propylaeum Retaining Wall, whereas the Propylaeum West has middle Wall K bisecting the area. This is clearly illustrated in **Fig. 4**, indicating that major revisions are undertaken in the Roman period, when Wall K

2. This work was funded partially by the Replogle Foundation, the Brown University Exploration Fund and the Joukowsky Family Foundation. Brown University Staff members included Artemis A. W. Joukowsky, and Shari L. Saunders who is researching the plain wares from the Residential Quarter deposits served as a valued staff member. We were supported by a work force of 24 devoted Bedouin, directed by Dakhilallah Qublan, Foreman. The Petra Crowne Plaza Hotel and the American Center of Oriental Research in Amman, to whom we are most grateful, also provided additional support.



4. Overview of the Petra Great Temple to south at the close of the 2003 Excavations (Photo Artemis W. Joukowsky).

is dismantled and the character of the Propylaeum East changes from east west galleries and cryptoportici to large north south rooms. Most curious about these rooms is that each of their limestone thresholds has vestiges of ten closely fitting bars, serving as stationary iron grills across their doorways (**Fig. 5**). We question how these rooms functioned in antiquity because access into and out of them would have been difficult with such impedimenta. This evidence suggests that the Propylaeum East is a more public space with direct exposure to the street than its counterpart on the Propylaeum West.



5. East Propylaeum, Doorway Room 1 from above with iron pins in the threshold (Artemis W. Joukowsky).

At first we thought we might be excavating shops, and that possibility cannot be ruled out, however, if what is protected is secured behind bars, these rooms may serve as a state treasury or a place where exotica such as animals are kept. Unfortunately this functional analysis remains conjecture because the massive collapse filling the rooms and the robbing of the floors before the collapse. What is known is that the contents of the rooms (floor pavements), are cleared before the collapse takes place, for elephant-headed capital fragments and pilaster blocks are found in the fill on the floor bedding where they tumbled.

The particular strategy for Trenches 95 and 96 was to recover and document the Propylaeum East.[3] The goal was to continue the 2002 excavations and explore the area adjacent to the Central Propylaeum Staircase and understand the integrity and functional analysis of the area as compared to the Propylaeum West. Trenches 95 and 96 were opened to determine the character of deposits as well as to define the stratigraphy where the deposits abutted the Propylaeum Central Staircase and Retaining Wall. Trenches 95 and 96 fulfilled their goals and defined the latest architecture of the Propylaeum East. Three north-facing rooms were found, from west to east Propylaeum East Room 1, Propylaeum East Room 2, and further east in Trench 96, Propylaeum East Room 3. In each of these rooms robbed out floor surfaces were found.

3. Excavation in Trench 95 began July 5 and continued until July 28, 2003. Sequence numbers began at 95000 and ended with 95994. Four Trench 95 Sub datum points were assigned and marked with PK nails. Sub Datum #1 was located on the Propylaeum Main Stairway where it becomes flush with Trench 95 in Locus 5 at an elevation of 894.437 m. Sub Datum #2 was located on an inner ashlar block of the Portico Wall West Doorway, Locus 7, and is approximately 0.65m below Sub datum 1 at 893.657m. To provide control for the east side of the trench, Sub datum #3 was located on the Locus 8 wall (below and abutting our Locus 3 wall) in the trench east at an elevation of 894.585m. Sub datum #4 was located at 894.395m on the central north south Locus 9 wall to the west of Sub datum #3.

Trench 95 is a large rectangular area located in the west area of the Propylaeum East, lying parallel to the Street. Measuring 10.50m-by-23.50m east west before excavation,[4] the Propylaeum East is bordered in the north by the Great Temple Portico Wall, and its east perimeter is bounded by a party wall shared with Trench 96. In the south, the Propylaeum East is bordered by the Propylaeum Retaining Wall, and its west flank terminates with the main staircase of the Propylaeum as it is seen today. **Fig. 6** shows the Propylaeum East, Rooms 1-3 looking northwest to the street.

Once excavated, Room 1's interior measurements are approximately 9.70m north south-by-5.05m east west. It is bounded on the north by Doorway #1 (Loci 7 and 13, its west and east doorjambs, respectively), on the east by the partition wall (Locus 9) which it shares with Room 2, on the south by the Propylaeum Retaining Wall (Locus 1), and on the west by the west walls that delimit the main Propylaeum Staircase (Loci 2 and 6). The casemate party wall (Trench 95, Locus 9) shared by Rooms 1 and 2 measures 0.90m in width. As mentioned above, the interior threshold of Doorway #1 (Locus 17) is comprised of a limestone ashlar 1.62m in length-by-0.33m in width with ten iron bars set in mortar approximately 0.165m from one another. Against the northwest corner of Room 1, a sondage, SP 95 infra, was excavated to determine earlier deposition levels.

Room 2's internal measurements are 9.68m north south-by-5.05m east west. It is bounded on the north by Doorway #2 (Loci 14 and 15, its west and east door jambs, respectively), on the east by a party wall shared with Room 3 of Trench 96 (Locus 8), on the south by the Propylaeum Retaining Wall (Locus 1), and on the west by the party wall (Locus 9) which it shares with Room 1. The casemate wall shared by Rooms 2 and 3 (Loci 3 and 8) is 1.23m in width.

Trench 96's overall measurements before excavation are approximately 6.50m north south-by-4.00m east west, and the subsequent discovery of the architecture restricted these dimensions; smaller than either Room 1 or Room 2, Room 3's internal excavated measurements are 3.90m north south-by-3.44m east west. In these excavations ten loci are assigned. The Room 3 excavations were halted at the south balk between it and its probable continuation in the East Cryptoporticus, which was partially excavated in Trench 82 in 2001. On the north is Doorway #3 which is entered through its west and east piers (Loci 2 and 3), to the east lies the north south wall (Locus 4) and on the west is the wall shared with Room 2 (Locus 8).[5] Although it is not completely excavated to the south there seems to be minimal evidence for the Propylaeum Retaining Wall in Room 3. To the south lies the south balk (Locus 9) with ashlar pier extensions (Loci 5 and 6) built out from the east and west sides of the east and west walls. The balk and the piers are shown in **Fig. 7** with tethering holes (possibly for use for tethering animals). Found in the fill is a corroded fragment of the iron bar (Seq. No. 96103) that had blocked the threshold entry; it is 12.5cm in length, 3.5cm in width-by-2cm in thickness and weighs 8 oz. In antiquity, these bars must have provided a formidable protection for these rooms.

Special Project 95 (2003) — Sondage in Trench 95 Room 1, under Locus 10

To explore below the fill and debris of the PE



6. East Propylaeum, Rooms 1, 2, and 3 to northwest (Photo Artemis W. Joukowsky).



7. Propylaeum East, Room 3 south balk (Photo Artemis W. Joukowsky).

4. The results of its excavation should be thought of as a continuum of Trench 93 2002.

5. Locus 8 in Room 2 and Locus 8 in Room 3 were used to designate the same wall.

Trench 95 Room 1 (Locus 10), Special Project 95 (**Fig. 5**) was undertaken measuring 2.00m north south-by-2.40m east west, located in the northwest corner of Trench 95 Room 1 under the Locus 10 deposits. The main question to be answered by this sondage was the nature of the deposits under the assumed robbed out floor level of Trench 95 Room 1 and at the base of Doorway #1. What were these room walls built on? Would there be foundation deposits? What was the nature of the soil and how had it been impacted by the earthquakes and the resulting massive column fall and overburden of collapse? The Sub datum 2 point on Trench 95 (Locus 7) with an elevation of 893.657m served for the control of this test trench.

This test trench presented us with the basic information we were looking for: the original deposits under the floor of Room 1. Important was the fact that here we were excavating in a homogeneous sandy fill to a depth of 1.46m that had been built over by the Portico Wall and the other room walls that were not impacted by the collapse and fill of the earthquake. This was the original pre-Great Temple deposit of the Nabataean city. The only cultural material found was Nabataean pottery, some shell and some metal. Save these artifacts, the deposit lacked any architectural elements, giving us every indication that we were below the earthquake collapse level.

We now turn to the overall phasing of the Great Temple precinct, which is followed by a discussion of the Propylaeum East phases.

Phasing

Before the Propylaeum East stratigraphy is investigated it will be necessary to examine the different phases identified within the Petra Great Temple deposits. Based on site deposition the general sequence of some 14 phases (I-XIV) is now evident for the Great Temple construction, collapse and abandonment. Although these sequences (progressing from earliest to latest) indicate the following stages of construction, future excavations may modify these ideas. Building periods are sometimes separated from artifact periods moving the latter to later phases, depending upon the context in which the materials were found. Therefore, even if an elephant head we ascribe to the Propylaeum colonnade was constructed in Site Phase IV, it is placed in Site Phase IX where it was found mixed in with other elements of the AD 363 collapse. We will begin each brief description with the Propylaeum, since it was the focus of the 2003 excavations, but we will consider the other areas of the Lower Temenos, Upper Temenos and the Great Temple as well.

Nabataean Great Temple Site Phase I is assigned to the preparation of the precinct — the quarrying of bedrock, particularly on the east and south for the terrace surround as well as the import of fill for areas requiring leveling. Site Phase II, the first and earliest major Nabataean construction phase follows shortly thereafter when the Propylaeum east west Portico Wall fronting the street is constructed, as well as a distyle in antis temple with a central stairway to access the structure (Joukowsky 1998: 147 note 4). Site Phase III marks a period of minor damage[6] to the distyle building and this prompted the Nabataeans to undertake a monumental rebuilding,[7] in Site Phase IV. Known as "The Grand Design", this phase sees the completion of the full Propylaeum with two additional east west walls behind the Portico Wall, from north to south: Wall K and the Propylaeum Retaining Wall. The Portico Wall is breeched at this time for the construction of the Propylaeum West Stairs that are shared with the Temenos Baths to the west. In the Propylaeum and the Lower Temenos this phase also includes the construction of cryptoportici under the triple colonnades and the installation of the limestone elephant-headed capitals. Flanked in the east, west and north by the colonnades and twin exedrae is the sweep of the great Lower Temenos plaza with its white limestone Hexagonal Pavement. In the Upper Temenos, the complex including the Anteroom, Shrine Room and Baroque Room (located behind the South Perimeter Wall) and the Residential Quarter are constructed. Additional measures include building of the walls and arches of the East Cistern and the precinct's East Perimeter Wall and its plaza are also completed. The focal point of the complex, the then free-standing distyle temple is expanded into a tetrastyle in antis structure with a new stylobate, an extended porch bordered by east and west antae along with the erection of perimeter corridors and exterior walkways. Other monumental structural changes take place as well coinciding with the building up of the temple Forecourt with fill and its embellishment with smaller white hexagonal flagstones.

On the basis of the floral decoration stylistics, especially seen on the limestone capitals and elements of the entablature, the Petra Great Temple Phase IV iconography appears to be similar to that

6. This could possibly be attributed to the earthquake of 312 BC.

7. This idea is suggested in Joukowsky 1998: 147, note 45.

of the al-Khazna.[8] Tentatively, the evidence suggests that the Great Temple and the adjacent Residential Quarter to the southwest are originally constructed sometime in the last quarter of the first century BC[9] by the Nabataeans who combined their native traditions with the classical spirit during the reign of Malichus I (62-30 BC), or Obodas II (30-9 BC).

In Site Phase V many exciting changes occur in the Propylaeum West — most notably the installation of the double betyls (Joukowsky: 2002 :317-318, figs. 4-5). The most major change in the upper area of the precinct includes a major remodeling of the temple interior to hold a theater, supported by the contemporary additions of casemate intercolumnar walls (walls between the columns), a central arch, vaulted chambers and four vast interior stairways, two with landings and small steps for entrance into the Theater rear and new limestone floor pavements. This renovation we place sometime in the AD first or early second centuries near the end of the reign of Aretas IV, ca. AD 40/44, or to the rule of Malichus II (AD 40/44-70), and possibly to the reign of Rabbel II (AD 70-106).

Dated to the mid-second century, Nabataean-Roman Site Phase VI coincides with the ca. AD 106 Roman annexation — witnessing collapse in the Propylaeum along with the collapse of the south cryptoporticus of both the Propylaeum West and Propylaeum East. In the Lower Temenos repairs are made to the Hexagonal Pavement and to the East Exedra walls, and the subterranean canalization system is reworked due to soil accumulation — some containing first century ceramics. In the Upper Temenos is the probable collapse of the Baroque Room and damage occurs in both the Anteroom and Shrine Room, and shortly thereafter there is the abandonment of the Shrine Room and modification of the Anteroom's east wall. This phase may also be the latest use of the Residential Quarter. In the temple proper, the East, West and South Corridor doorways are blocked or narrowed restricting access to the sanctuary's interior. Further collapse is indicated by damage to the east and west walls of the East Interior Staircase, the major structure, however, remained standing, as far as we know.

In Site Phase VII (AD mid-second century) is a period of repair and reconfiguration in the Propylaeum with the building of the upper treads of the Central Staircase to provide direct access to the Lower Temenos. The Roman Street is also paved at this time, and Wall K is rebuilt in the west, but razed in the Propylaeum East. Also in the Propylaeum West, benches are installed against Wall K in Room 1, and the east Portico Wall is reconfigured with the insertion of the three north south doorways of Rooms 1-3; their thresholds securely fitted with iron bars. The Lower Temenos East Cryptoporticus has cross walls built between the stylobate walls of the East Colonnade and between the cross walls an intentional fill is deposited supporting their structural integrity. There is also continued repair of the East Exedra, and the West Exedra's small bathhouse construction. A lead pipe is laid across the base of the Lower Temenos Retaining Wall extending across the precinct from east to west between the two exedrae.

In the Upper Temenos, aboveground canalization trenches are cut into the bedrock in the south and east. A bench is built along the South Corridor Wall facing the South Passageway, and drains of the temple Forecourt are repaired with ceramic pipes for aboveground canalization. As far as the temple is concerned there are visible repairs, as well as the robbing of structural elements seen in the removal of the Pronaos floor pavements and the blocking or narrowing of the East, West and South Corridor doorways restricting access to the temple; there is also the installation of the east and west walls at the south end of the east and west walkways. Phase VII in the temple also sees the reuse of large ashlars and worked architectural fragments with the building of the theater pulpitum (stage). Closely following is Site Phase VIII, predating the late AD second and third centuries. During this time there is another period of damage, abandonment, collapse and reuse.

Site Phase IX is dated to the major AD 363 earthquake — a cataclysmic event bringing about the fall of the Propylaeum and the Lower Temenos cryptoportici with their arches tumbling onto the floors. Additionally there is the partial collapse of the Propylaeum Retaining Wall. In the Lower Temenos the collapse of the West Colonnade is clear-

8. Judith McKenzie (1990) has undertaken the most detailed study of Petra monuments. And also see the discussion regarding the site of Madā'in Ṣāliḥ in Saudi Arabia, Judith McKenzie and Angela Phippen (1990) "The Chronology of the Principal Monuments at Petra", 1990: 152. They summarize their views of Nabataean sculpture by stating: "Simplification of the classical elements of architectural decoration is related to chronological development. This change was seen in the moldings, Doric frieze, capitals, florals and sculpture".
9. J. McKenzie's (1990) chronological assessments assign the structures including the Qaṣr al-Bint, al-Khazna, the Temple of the Winged Lions and the Baths to this time period.

ly indicated by rows of deep indentions in the Hexagonal Pavement. The Lower Temenos is covered over by the accumulation of architectural fragments mixed with fill and sedimentation extends over the West Perimeter Wall. Some collapse is also seen in the south of the East Triple Colonnade. In the Upper Temenos, there is the major collapse of large features and fluvial and wash down deposits accumulate — the lower levels of which were found to contain scanty remains of two human bodies. In the Shrine Room, abandonment occurs followed by collapse and the accumulation of debris. The West Walkway wall is destroyed, as is the Residential Quarter after which more sediment accumulates. The temple west Porch columns fall onto the temple Forecourt and other temple elements crash and fall into the west Upper Temenos and the Lower Temenos. In the temple, at some point in this phase, the floors are robbed out and debris covers the lower risers of the interior staircases, allowing for the robbing out of the upper treads. Subsequent silting of the areas occurs and the west intercolumnar wall buckles under the pressure of falling debris.

In Phase X there is little activity in the Propylaeum and all signs indicate an abandonment of the precinct represented by the collection of a fluvial deposit dated to ca. AD 4th-5th centuries. As a period of Byzantine reuse the Lower Temenos deposits indicate secondary destruction levels and the rebuilding of intercolumnar walls using temple pilaster reliefs as building elements. There are industrial activities taking place as well as including lime manufacture in the south East Triple Colonnade and exedrae. Using fallen architectural elements a platform is constructed in front of the West Exedra, and there are continued industrial reuses of several areas in some cases leaving significant quantities of burned ash residue. During this period in the Upper Temenos the East Plaza floors are stripped, and there are modifications in East Perimeter Room A. Within the casemate of the East Perimeter Wall, the floor of Room A is built up with purple sandstone bedding and a low blocking wall is installed across the doorway to retain the fill. Tethering holes are cut beside a trough set into the room's east arch, transforming Room A into a possible animal shelter and blocking the entrance to the east Garden area. Haphazard masonry walls are also constructed, drainpipes are installed clumsily and scattered shabby walls are built. Multiple drainage systems are put into place, and in the west, the most western precinct wall is rebuilt along with its aboveground canalization system. In the temple there is the robbing of various elements including the upper treads of the interior staircases and the east and west landings. There is some attempt to rebuild the East and West Walkways. Domestic secondary uses are found in the temple Theater stage, vaulted chambers, cistern, central arch, and in the East Corridor.



8. East Propylaeum looking west (Photo Artemis W. Joukowsky).

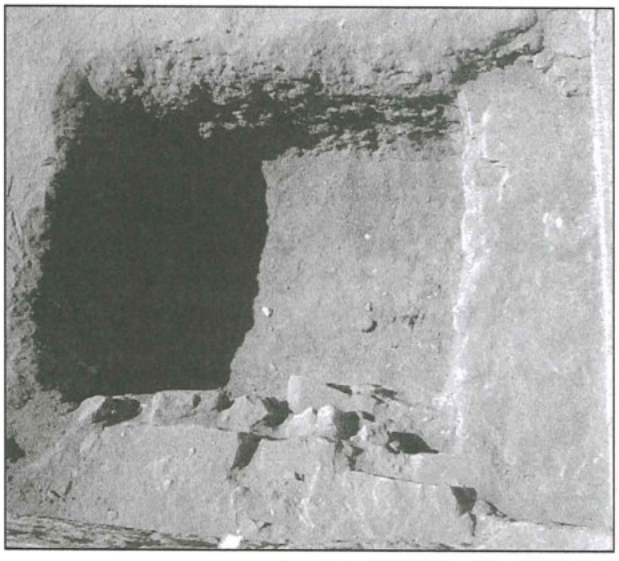
In Site Phase XI there is further collapse that possibly post-dates the AD fifth century and possibly may be the result of the earthquake of AD 512. In the Propylaeum major collapses continue, and in the Lower Temenos there is continued accumulation of fill and the East Colonnade collapses along with the East Exedra's entablature. The Upper Temenos also is subject to further collapse, with the accumulation of fill after disuse of the canalization system, and areas of localized burning. The temple East Porch columns collapse, and fluvial deposits continue to accumulate. Site Phase XII is a time of abandonment, and robbing. Another fluvial deposit then accumulates. In Phase XIII, again, there are a series of major collapses, and Phase XIV encompasses the modern era when the Lower Temenos is used for Bedouin farming marked by the division of the area into two fields by overturned column drums. The Bedouin also construct various makeshift walls in the Lower Temenos.

In the Upper Temenos temple Forecourt, fill is found including pieces of plastic tent stakes and an Israeli bullet casing. Nazzal's dump is dug between the collapsed Porch columns. There is the German survey of the temple stylobate and Forecourt, resulting in the reverse stratigraphy of these deposits. By this time the temple precinct is deeply buried under successive collapses and topsoil. When we arrive in 1993, the only visible components are the collapse of the East Porch columns and the outline of temple walls seen in the 1992 aerial photographs.

Propylaeum East Site Phase Chronology

Several distinct occupation phases are visible in the 2003 excavations. There is a clear chronological relationship among the three terrace walls. The Portico Wall is the earliest; and sometime later the middle wall, Wall K (not present in either Trenches 95 or 96) and the Propylaeum Retaining Wall are probably constructed at the same time. Wall K, the middle retaining wall of the Propylaeum (recovered in the Propylaeum West), is not found in the Propylaeum East suggesting a period of substantial redesign in this area. A photograph of the Propylaeum East is shown in **Fig. 9**. From earliest to latest the phases in Trench 95 are as follows:

In Site Phase I an early use of the Propylaeum is found in Trench 95 (Locus 20) where an early wall is recovered below the presumed floor level — it is not aligned with other walls, including the Portico Wall. In Site Phase II of the first century BC the lower levels of the Portico Wall in the Propylaeum East and West are constructed.[10] As a result of minor damage in Site Phase III, the Propylaeum undergoes considerable change which takes place in Site Phase IV: The Grand Design, which includes the construction of the full Propylaeum. Wall K and the Propylaeum Retaining Wall are built with cryptoportici between them and both walls are topped by a colonnade crowned by elephant-headed capitals. This creates both an east west and north south passages in the east and west areas of the Propylaeum. We do know that Wall K must have existed originally in the Propylaeum East because there are north south arch springers that have been incorporated into the construction of the east face of the main Propylaeum Central Staircase and there are the remains of some 13 slots in the Propylaeum Retaining Wall originally holding them in place. These extend to the north from the Propylaeum Retaining Wall and must have had their support from a counterpart wall, presumably Wall K. The remains of these springers can be seen also in the west balk where the Propylaeum Central Staircase is built to incorporate them and also in the Locus 8 wall where their voussoirs still extend to the south. In the east the remains of arch springers indicate the presence of a groin vault where the north south arches leading into the East Cryptoporticus abut the east west springers that were part of the original east west East Cryptoporticus. This indicates that at one time one large gallery extended across the East Propylaeum, and with the collapse of the cryptoporticus arch system the main staircase of the Propylaeum was extended.



9. 2003 Sondage in SP 95 (Photo Artemis W. Joukowsky).

In Site Phase V in the Propylaeum West is the installation of the double betyls (Joukowsky 2002: 318, figs. 4-5). In Site Phase VI, ca. AD 106, some collapse and damage occurs which theoretically I believe is the result of the Roman bombardment of ballista balls in an attack on the Propylaeum by general Cornelius Palma (Joukowsky 2003: 389-406). This would account for the number of ballista balls found along this wall in our 2002 excavations. Site Phase VII is the AD mid-second century time of repair and reconfiguration when the Colonnaded Street is paved and the upper treads of the Propylaeum Central Staircase are constructed. In the Propylaeum West Wall K is rebuilt; Propylaeum West Room 1 is built and benches are installed. In the Propylaeum East, however, Wall K is razed and there is the reconfiguration of the east Portico Wall with the insertion of Rooms 1-3. Sometime later the original doorways are modified and their thresholds are fitted with iron bars. In Site Phase VIII there is some column collapse and in Site Phase IX the area undergoes further damage due to the AD 363 earthquake with the partial collapse of the Propylaeum Retaining Wall and the accumulation of soil and debris. In Site Phase X, dated to the Byzantine period in the AD fourth and fifth centuries, there is abandonment, and in Site Phase XI the Propylaeum undergoes further major collapse, possibly the result of the earthquake of AD 512. In Site Phase XII the robbing and abandonment continue, in Site Phase XIII there are ongoing major collapses throughout, and in the modern period in Site Phase XIV we assume the Propylaeum is clogged with debris. The only rec-

10. This wall may be aligned to the early wall found in Trench 86 of the Propylaeum West excavated in 2001.

ognizable sign of use, however, is a graffito, "1921", inscribed on Room 2 Doorway #2.

Now we turn to the rich collection of architectural fragments unearthed in these excavations.

Architectural Fragments

In 2003, from the approximate 5.00m depth of deposit, it is clearly demonstrated how the elements that fronted the Great Temple precinct collapsed, for in the three rooms some 975 architectural fragments were registered — 152 (16%) column drums, 563 (58%) ashlar wall blocks — six of which bore Nabataean Mason's Marks. There were 133 (14%) capital elements, of which 39% were elephant head fragments, and 59 (6 %) cornice fragments, which clearly are the collapsed elements of the colonnade that fronted the Great Temple precinct in the north. Combining the architectural fragments from Trenches 82 in 2001, Trench 93 in 2002 and those from Trenches 95 and 96 in 2003, a cumulative total of 1346 fragments are recorded from the Propylaeum East: 250 column drums, 673 ashlars, 95 elephant head capital fragments and 62 cornice fragments. From our Great Temple database of 11,006 fragments to date, 12 percent of the total are recovered from the Propylaeum East excavations.

Extraordinary architectural materials from the 2003 excavations were comprised of relief sculptures fallen from the Propylaeum and Lower Temenos, and elephant-headed capital motifs including eggs and tongues, helices, darts, and other capital elements with bead and reel designs. Among the spectacular finds are partial pilasters including one most exciting find of Athena (Seq. No. 95977) shown in **Fig. 10** with her two javelins and a battered Medusa relief on her chest. The block is 0.36m in height-by-0.30m in width and 0.18m in width. To the left she has a twisted hair plait and her shoulder is draped. The Medusa pendant is visible hanging from a snake necklace, and a herringbone pattern distinguishes the breastplate.



10. Relief of Athena (Seq. No. 96104) with her weapons and Medusa medallion (Photo Artemis W. Joukowsky).

Remains of a cyma reversa can be seen on the top of the block and there is a partial cyma reversa on the left. A round hole is carved in the base and there are two holes in the neck area probably for affixing the head. A parallel for this figure is published as a sculpture of Allat-Athena (Zayadine 1990: 45, Pl. I:2; McKenzie 1990 Pl. 60.b).[11]

One finely sculpted relief is a female in two fragments emerging from a helix acanthus cluster (Seq. No.95490) shown in **Fig. 11.** Measuring 0.195m in length and 0.15m in width it reminds us of a figure published by McKenzie (1990:Pl. 64.b to the right). **Fig. 12** pictures a spectacular ornamental bow measuring 0.41m in length, 0.35m in width and 0.19m in thickness, with bunched grape leaves in white limestone (Seq. No.95471). Found in front of the doorway to Room 3 is perhaps the most extraordinary pilaster relief of a Hellenistic type embossed helmet with double perforations on the cheek flaps with a (?) quiver. Pictured in **Fig. 13** (Seq. No. 96014) this panel measures 0.65m in length, 0.42m in width and 0.285m in thickness. The helmet itself measures 0.295m in length, the curious embossed volute is 0.07m in length and the cheek flap measures 0.13m in length. There is a partial weathered cyma reversa on the left face, and in the upper right is a circular gouge approximately 0.08m in length.[12] Another is the shoulder of a draped female (Seq. No. 95922), which is also a fragment from a pilaster.

A pilaster relief of a female (Seq. No. 95345) is found on the sidewalk in front of Trench 95. Shown in **Fig. 14**, it is 0.54m in height, 0.87m in width and 0.31m in thickness. The head insert measures 0.15m-by-0.10m. The shoulders and breast (left breast fractured) are covered with a chiton worn over a diaphanous peplos with wavy pleats, higher on the right shoulder than on the left, and there is a herringbone braid around the neck. There are vestiges of two corkscrew curls on the left shoulder and a V-shaped depression in the neck above — vestiges of plaster where the head was inserted. This block is fractured on its left side, the top is scored, the rear and side are rough,



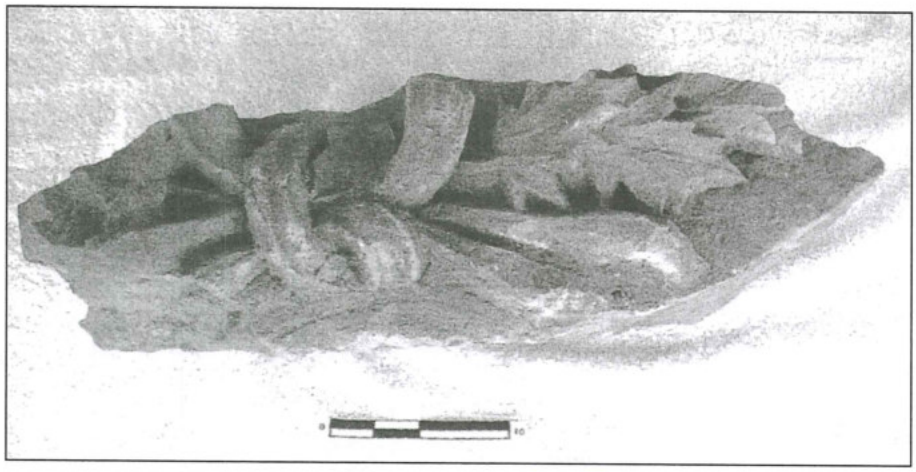
11. Female figure emerging from acanthus leaves (Seq. No. 95490) Trench 95 Locus 10 (Photo Artemis W. Joukowsky).

but a smooth area is found on the left side, which is indented 0.15m-by-0.12m. It is weathered with lichen remains on the right side and the cyma reversa on the left side is 0.11m in width. Of interest is that no cornucopia is represented as we have found in other similar pilaster sculptures recovered at the Petra Great Temple.

Based on this extraordinary corpus, I would like to suggest that some of the sculptures represented in McKenzie's (1990: 134-135, Plates 60-66)

11. This pilaster was brought to my attention by my graduate student, Lisa M. Anderson, who comments: "The two finely carved javelins behind Athena are unusual in their number. While Roman soldiers are occasionally shown with more than one javelin or spear (Bishop and Coulston 1993, figs. 3.2 and 4.2), to my knowledge, this relief represents the first occurrence in the iconography of Athena or Allat…This example is from a double faced pilaster panel, discovered south of the arched Gate of the Qasr al-Bint Temenos. The figures look similar and the position of the caduces on the other face with Hermes corresponds to the position of the spears in the Great Temple panel".

12. Lisa M. Anderson observes: "Although the top of the helmet and the bottom of the cheek flap are missing, the lack of a neck guard and the shape of the brim help to place this helmet firmly within the ream of Hellenistic representation". Volute decorations are common on Hellenistic helmets, although most are much tighter (resembling a snail shell) and twist toward front of the helmet and not toward the back, as is this case. The best parallels appear in sculpture, for example on the Pergamon Altar (although cheek flaps are lacking) and the so-called Altar Domitius Ahenobarbus. A relief of Ares, which probably belongs to the same group as the Athena relief, depicts a helmet with a loose volute, LIMC 1981: II, fig.1.



12. Relief of Grape Leaves tied with a knotted ribbon (Photo Artemis W. Joukowsky).



13. Pilaster relief (Seq. No. 96104) decorated in relief with an embossed helmet (Photo Artemis W. Joukowsky).



14. Pilaster relief of a female (Seq. No. 95345) (Photo Artemis W. Joukowsky).

"1967 Group of Sculpture" dated to the first century BC, belong in fact to the Great Temple. These new discoveries combined with those already published by J. J. Basile (2001: 335-346) and E. L. Schluntz in Joukowsky (1998: 225-234) demonstrates the very high quality of Nabataean workmanship.

As was mentioned previously, these deposits clearly demonstrate that they are part of the collapsed architectural elements of the north colonnades that fronted the Great Temple precinct as well as elements that presumably were used in the Great Temple itself. I believe now it is possible to theorize that the Great Temple was entered through a monumental gate that was decorated with pilaster reliefs. This could also account for the large number of pilaster fragments found in Great Temple contexts and may include some of those reliefs identified in the McKenzie group as well. The density and distribution of the architectural fragments vividly argues for considerable earthquake and fluvial activity.

Concerning the Catalog registry of Great Temple Propylaeum East, small finds include six coins, a small horned altar, a bead and a metal clasp.

Conclusions

Of particular importance is that the Propylaeum East is contained within two east west walls, the Portico Wall and the Propylaeum Retaining Wall, whereas the Propylaeum West had central Wall K bisecting the area. This would seem to indicate that major revisions were undertaken in the Roman period, when Wall K was dismantled and the char-

acter of the Propylaeum East changed from east west galleries and cryptoportici running parallel to the street to large north south single chambered rooms aligned on a completely different axis and with no access between them. The revised spatial arrangement of these fully enclosed triple rooms is perpendicular to the street. As soon as the north south walls appeared, one of my beliefs was that we were excavating a shopping complex. During excavation the recovery of the partition walls dividing the three rooms indicated that these rooms may originally have functioned as shops, but we were convinced otherwise when we recovered the thresholds with bars extending across them. We had to wait until the conclusion of the excavations to find the most suitable explanation for those enclosed spaces — notably Rooms 1 and 2 with no outlets, no stairs and no entries except for the doorways. In other words there was no point of access from within the precinct at all. Although there are bars also covering its threshold, Room 3 poses another set of problems, because it appears to have served as an entry into the East Cryptoporticus. But of this we cannot be sure until this room is fully excavated.

A concluding note must also be offered about the three thresholds found in Rooms 1, 2, and 3. Each of these doorways is comprised of three rows of blocks. To the north is usually a large sandstone ashlar, which provides the step into the threshold from the sidewalk and street. This ashlar stretcher was put in place to span the width of the doorway, but often its shortfall had to be compensated by another ashlar on either the east or the west to span the full width. There is then a second row of ashlars, often a combination of limestone (or white sandstone) pavement stones, placed at approximately the same level as the outer sandstone ashlar. Inside of this row, and raised above the second row of slabs, is a horizontal limestone slab with sturdy iron pins stabilized with lead that form the inner threshold. It appears that the outer threshold area would have secured a pair of wooden doors that opened onto the sidewalk, and we assume the bars on the thresholds would remain in place. With signs of bars at the thresholds of these large rooms, these excavations are providing us with even more surprises in our excavations of the Petra Great Temple.

In later periods, these rooms were robbed and re-used as far as we can tell, until the AD 363 earthquake collapse. Since the thresholds for these rooms were their only access, there must have been a moveable upper part of the cage or some system for the entry for whatever was placed inside these rooms. We question how these doorways with their threshold barriers and their rooms may have served in antiquity because these bars obviously prohibited easy entry and/or exit and were a physical boundary between the world of the sidewalk and street and what was going on inside the precinct.

Further Discussion

Our work in the Propylaeum West in previous seasons indicated that double rows of columns were erected at one time. These fronted the monumental entry of the Propylaeum, and were placed on top of Wall K and on the Propylaeum Retaining Wall to define the structure's northern extent. Most of the column drums that originally lined the East Propylaeum Retaining Wall were found in Trench 95, but this column drum fall raises a number of logistical questions. If Wall K no longer existed when these rooms were created, as we have presumed in our phasing at the beginning of this report, then the drums found in Trenches 95 and 96 could have fallen from a single row, standing on top the Propylaeum Retaining Wall. Would this seem to indicate that there was a remodeling of the Propylaeum perhaps once the cryptoportici collapsed, and only one line of columns thereafter was left in place? This and other questions involving the functional reconstruction no doubt will further stir researchers to seek out other explanations. Comparable physical evidence from other sites at the moment is lacking. But for now although the functional significance is problematic, the physical evidence offers a few possible interpretations, including that these rooms served as a

- Zoo for exotic animals
- State treasury
- Holding space for criminals or captive people
- Sacred area devoted to the veneration of the city or a deity
- Storage facility

Unfortunately there is no balanced explanation and the non-verbal clues we have excavated have left us with major questions and few definitive answers. Unfortunately we have no documents from anyone who actually saw the Great Temple.

What conclusions can be drawn about the roofing for this area? We do know that the Locus 1 Wall's extant height is 6.33m and that the depth of the area from the Lower Temenos measures approximately 7.50m. It is possible that there was either no roof or that there was a sloping or flat tiled structure that, using the aforementioned dimensions as a guide, extended across the whole area from a monumental height on the north to cover the two part doorways. This, however, is con-

jecture, and will have to be reckoned with the architectural historians in their reconstruction of the Propylaeum.

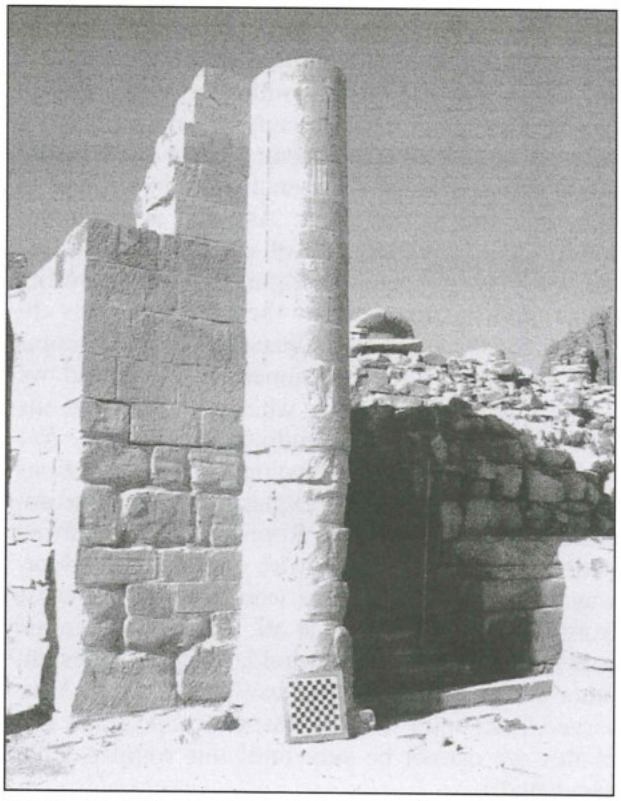
Potentially, more questions have to be answered by the completed excavations of the Propylaeum East to determine the early architecture that was here before the massive construction of the Great Temple took place.[13] Additionally, the early wall that surfaced in Room 2 (presumably covered by the flooring) should be followed in Room 1 to determine its full extent and to ascertain if it was part of an earlier structure that went out of use when the new plan for rooms was instituted.

Dating

This discussion should make it clear that the architectural evidence for these rooms must be separated from their contents. As was mentioned earlier, the artifact contents cannot be associated with a functional analysis of the rooms. In other words, the architecture of these three rooms cannot be dated by associated artifacts, and the relationship between the rooms' architecture and the contents found in the collapse must be assigned to different periods of time. Because we are operating on the assumption that the AD 363 was responsible for the destruction of the Petra Great Temple, in short, we cannot date the room construction by its contents, but we can say that the last use phase of the rooms was terminated by the AD 363 earthquake collapse. Artifacts such as the elephant-headed capitals and pilaster blocks from the destruction of AD 363 date to Site Phase IV from the first century BC to the AD first century when the Petra Great Temple in all its glory was constructed. The construction of the rooms we assign to the later Site Phase VII in the mid AD second century, and the AD 363 earthquake to Site Phase IX.

Consolidation

As for consolidation, the Petra Great Temple has achieved tremendous success in reconstruction not only for Petra itself, but also for the elucidation and distinction of Nabataean sites in general. Restoration is under the direction of Dakhilallah Qublan and includes numerous projects such as the re-erection of the columns and the pointing of walls. Shown in **Fig. 15** is the restoration of the East Exedra engaged column. Also restored in 2003 and shown in **Fig. 16** are the Lower Temenos West Cryptoporticus arches and **Fig. 17** is the Upper Temenos East Perimeter Wall Arch, which was a massive project. Naif Zaban was involved in the puzzle of fitting together the thousands of pottery sherds from the 2002 excavations of the Residential Quarter and Ulrich Bellwald removed the Baroque Room decorative ceiling plaster and continues to serve as



15. The East Exedra Engaged Column, to south re-erected in 2003 (Photo Artemis W. Joukowsky).



16. The Lower Temenos West Cryptoporticus arches to south, restored in 2003 (Photo Artemis W. Joukowsky).

13. To complete the excavations of the Propylaeum East, the area to the north of Trench 80 2001 and the adjacent earth fill measures approximately 5m north south-by-4.5m east west. Trench 82 is an area 5m north south-by-3m east west and to the south of Trench 82 5.00m north south-by-5.00m east west. These excavations should complete the excavation of the Propylaeum East as well as clarify its functional reconstruction.

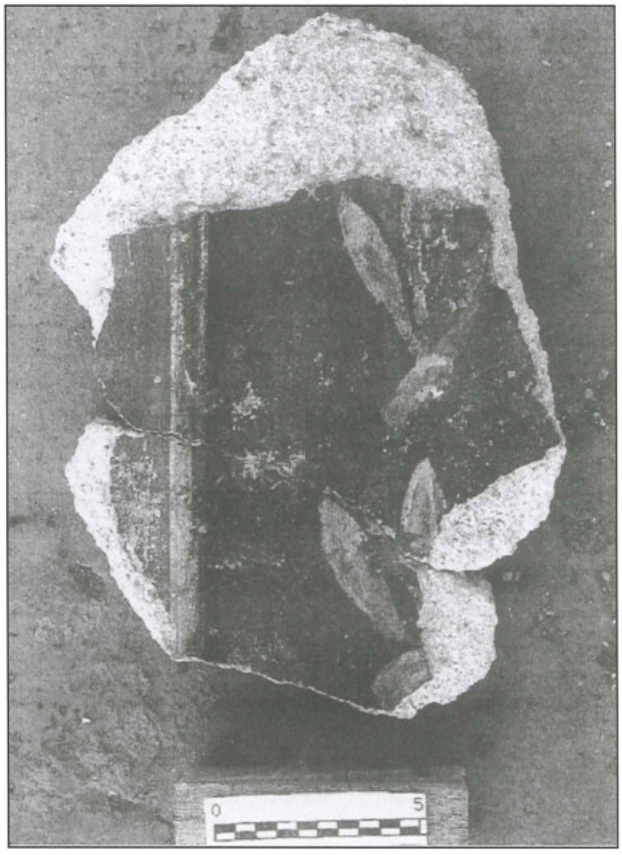


17. The Upper Temenos East Perimeter Wall and arch to east, restored 2003 (Photo Artemis W. Joukowsky).

its conservator. One fragment of painted plaster from the Baroque Room is shown in **Fig. 18**.

At Home Research 2003

At home during the 2003 summer through 2004 fall seasons analytical and organizational work continued on the Great Temple excavation material. Team members Christian F. Cloke, Emily Catherine Egan, Eleanor A. Power, and Brown University anthropology student Margaret McNamara finalized the phasing of the site, defining the fourteen distinct phases we have chronicled here for the evolution of the Great Temple complex. Based on the new phasing, the site databases for the Petra Great Temple Catalog, Architectural Fragments, and Grosso Modo were updated, assigning a final temple phase to each of the 96 trenches and myriad of special projects excavated since 1993 and their loci and associated material finds. Excavation efforts throughout the precinct from 1993 to 2002 were compiled and summarized, and chapters are currently being written on the Petra Great Temple water systems and stucco decoration in preparation for the final site publication. Volunteer Laura Harrington gave further assistance in research.

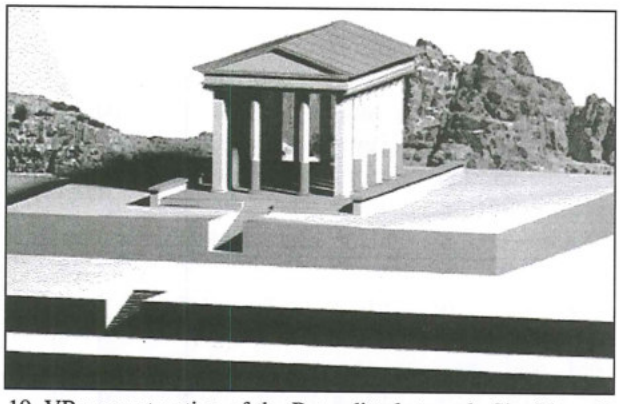


18. Painted Plaster from the Baroque Room (Photo Artemis W. Joukowsky).

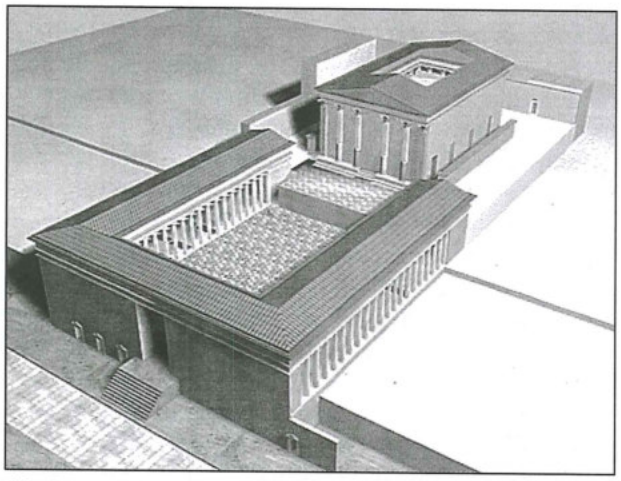
Now that our phasing of the deposits has neared completion an additional direction we have taken is to have our faunal record analyzed by Sarah Whitcher Kansa. Our interests are threefold: the first is to trace the faunal record to see if there are any demonstrative differences between the various phases of the site. Second is to compare remains found in the Residential Quarter to those from temple contexts. And third we want to know if there were different activities taking place within the Residential Quarter itself to see if the households there reflect the subsistence base. Another study we have undertaken is to analyze the shells of the temple. David S. Reese is undertaking this analysis. Again, the evidence from the Petra Great Temple survives in some quantity and although bones and shells are already quantified in our Grosso Modo database, the analysis will give us evidence that may modify some relationships hitherto unknown.

As part of our integrated program we have given some thought to the virtual reality reconstruction of the temple. In creating the CAVE (Cave Automatic Virtual Environment), we have had to think of what physical (e.g. shape) and what theoretical aspects should be emphasized and transformed into the VR environment. The architectural tangibility of the temple can now be analyzed using a myriad of factors such as its architecture and the distribution of artifacts. This is an area we have spent some time developing in 2003 and winter 2004, and many fresh ideas have emerged for research potential. **Figs. 19 and 20** illustrate Site Phases II and VII as represented in the CAVE.

On other fronts, Sara Karz Reid is completing her work on the Small Temple architecture and its interpretation in a dissertation entitled, "Imported Marble and Success in Trade Relationships at the Small Temple at Petra". Additionally, Deirdre G. Barrett is completing her dissertation entitled, "De-



19. VR reconstruction of the Petra distyle temple Site Phase II (Eileen L.Vote).



20. VR reconstruction of site phase VII (Eileen L. Vote).

tecting Cultural Identity Within Nabataean Society After the Annexation of Its Kingdom in CE 106 By Examining the Terracotta Oil Lamp Within Sacred and Secular Sites: Khirbet et Tannur, The Tombs of the Petra Ridge Church and the Petra Great Temple."

We are also in the process of writing our final report even before the completion of the excavations and are hopeful that we will publish the full results of the excavations within the next three years. We are, after all, excavating but one phenomenal complex and the task of its completed excavation should take us no longer than two-to-three more field seasons. After having committed 11 years to the Great Temple, we have uncovered an astonishing wealth of information that has much potential for future research and the multi-vocality of the site and for Petra as a whole.

Martha Sharp Joukowsky
Brown University,
Center for Old World Archaeology and Art
Providence RI 02912, USA
e-mail: Martha_Joukowsky@brown.edu

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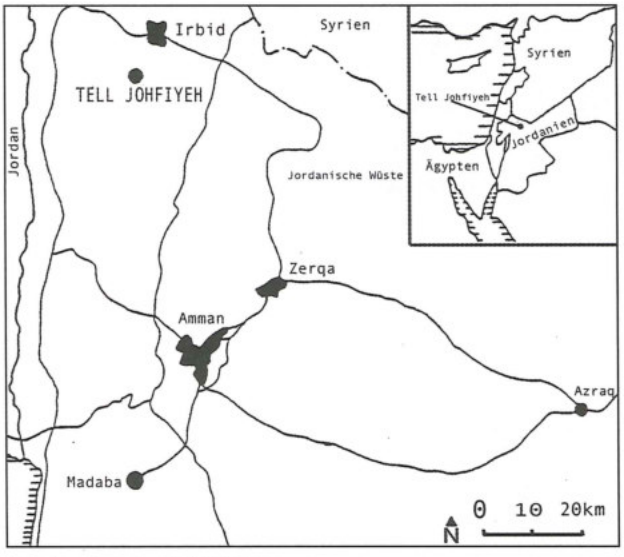
TALL JUḤFIYYA: AN IRON AGE SITE AND ITS SURROUNDINGS IN NORTH JORDAN PRELIMINARY REPORT ON THE 2002 AND 2003 SEASONS

Roland Lamprichs and Ziad al-Sa'ad

Introduction

Tall Juḥfiyya تل جحفية (**Fig. 1**) is situated in an intensively used agricultural area about 7.5km southwest of Irbid (UTM-Zone 36, UTME 7653, UTMN 35986) on the northern fringe of the modern village of Juḥfiyya. Its topographical location on a high mound, about 793m above sea level, is exposed but offers an excellent view in all directions. Nowadays the inhabitants of the modern village of Juḥfiyya grow mostly grain and different kinds of fruit trees.

A few weekend trips in the area surrounding Irbid back in 1995 during my time as an Alexander von Humboldt fellow at the Institute of Archaeology and Anthropology, Yarmouk University, were in some ways the starting point of the Tall Juḥfiyya archaeological project. During these trips, my attention was drawn to some small, archaeologically unnoticed sites to the west and southwest of Irbid. An initial analysis of surface pottery carried out on the spot, suggested that most of these sites were founded and occupied mainly during the Iron Age, while late Byzantine and early Islamic pottery further hinted to a later resettlement of the sites.



1. Map showing Tall Juḥfiyya.

Published material on the sites mainly comprises early travel reports (Schumacher 1893: 82-83, 153-154; Steuernagel 1926: 46=A.430; Abel 1967: 35-36), the reports of Nelson Glueck (1951: 170-172, 175, 186-187), who visited the region within his extended "Explorations in Eastern Palestine", different scientific compilations (Zwickel 1990: 309; Palumbo 1994: 2221.007) and maps (e.g. TAVO B IV: 6). These reports are restricted to very short descriptions with a rough dating of the sites, and with no further archaeological investigation. Information about the structure and function as well as the regional, historical and political settings of the sites is still missing. Although several hundred Iron Age sites have been identified on the plateau and its catchment area during the last decades (e.g. Glueck 1951; Mittmann 1970; Banning and Fawcett 1983; Lenzen and McQuitty 1988; al-Ma'ani 1992 or Kamlah 2000) there is, even now, almost no information available about the Iron Age on the northern Jordanian plateau in general (Bartl *et al.* 2001: 128-132; 2002: 95-96). The archaeological and historical knowledge about the era under discussion is still very poor. Almost no written sources that might help in clarifying the role and function of the Iron Age sites mentioned above are available. Furthermore the interpretation of the available data is very difficult due to the facts that Iron Age layers are often disturbed by a later resettlement of the site and that a regional system for the exact chronological classification of Iron Age pottery and finds is still missing for the area. New studies and in particular new excavations are badly needed.

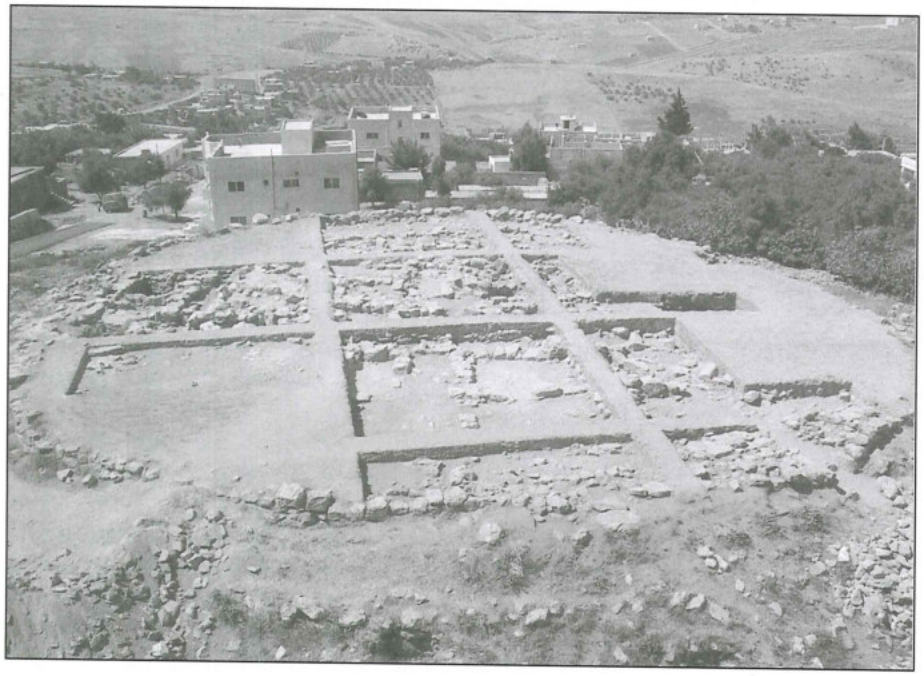
It was only in 1995 that the published information on the sites was completed by new research. Visits to the region in 1995, 1996, 1998 and 2000 produced very promising results (Lamprichs 1996; 1997a,b,c; 1998a,b,c; Lamprichs and Kafafi 2000) and led to a joint archaeological project at Tall Juḥfiyya. Under the joint directorship of Dr. Ziad al-Sa'ad (IAA-Irbid) and Dr. Roland

Lamprichs (DEI-Amman), the Institute of Archaeology and Anthropology in Irbid (IAA) and the German Protestant Institute of Archaeology in Amman (DEI) conducted two seasons of archaeological excavations at Tall Juḥfiyya. The first one lasted from May 5th to May 26th 2002 (Lamprichs 2002; 2003a,b,c,d; Lamprichs and Sa'ad 2002; 2003) and the second from May 24th to June 14th 2003 (Lamprichs 2004). The excavations were carried out with the constant support of the Department of Antiquities of Jordan (DoA) and we would like to express our gratitude to its Director General, Dr. Fawwaz Khraysheh. We are also thankful for the help of Mr. Nasser Khassawneh and Mr. Ibrahim Zoubi, Inspector of Umm Qays, and our representative Dia' Tawalbeh who did an excellent job in the field. Important logistic support was given to us by Dr. Ziad Talafeha (Juḥfiyya), the inhabitants of the village of Juḥfiyya and our excellent team members (K. Bastert, M. Batainah, E. Khreis, U. Koprivc, A. Kulla, Dr. A. Kunz, Dr. L. Martin, H. Nawafleh, K. Poenitz, E. Posselt, N. Qadi, G. Reimann, I. Schmalfuss, E. Schmidt-Kulla) and local workmen. Thanks are due to all of them.

Tall Juḥfiyya: Field Seasons 2002 and 2003

The archaeological site of Tall Juḥfiyya which is roughly aligned east-west at its base, covers a total area of only approximately 4,000m^2, and rises above the surrounding fields by about 7m. The main surface structure is an almost circular wall (up to 1m high and 0.8m wide) surrounding the plateau of the site, which measures approximately 950m^2 (**Fig. 2**). Traces of ploughing found on top indicated a recent agricultural use of the plateau. The slopes of the mound and its immediate surroundings were covered with many large and medium sized stones of flint and limestone. Another wall at the foot of the mound, roughly outlining the limits of the tall, reaches up to 2.5m in height and is more than 1m wide. We learned that the residents of modern Juḥfiyya rebuilt the wall recently for farming purposes. Unlike similar sites in the neighbourhood the general preservation of Tall Juḥfiyya was very good. Relatively little destruction and a few traces of illicit digging were found on the slopes and the levelled surface, while natural erosion was only of minor importance and barely affected the site.

In addition to Tall Juḥfiyya the following sites have been looked into briefly in the frame of the project: Tall Bayt Yāfā (تل بيت يافا), Tall ash-Shiqāq (تل الشقاق), Dhahrat as-Sūq (ظهرة السوق) and Tall Kufr Yūbā (تل كفر يوبا). They are all situated near to each other to the west and southwest of Irbid, in an area that was characterized by hundreds of dolmen until the late 1950s. The sites mentioned are characterized by common features such as the round to oval form of their bases, an exposed location (600m or more above sea level) within a very fertile region, a large cover of stones on the surface and remains of a perimeter wall. Some of the sites mentioned are located in view of each other. Most of them were founded during the Iron Age and were resettled during the Byzantine and early Islamic eras.



2. Tall Juḥfiyya: Situation 2003 (post excavation).

The only exception is represented by Tall Kufr Yūba which was occupied since the Bronze Age. The distribution of the sites is almost semicircular. Tall al- Ḥuṣn (تل الحصن) and Tall Irbid (تل اربد) most probably functioned as "central sites".

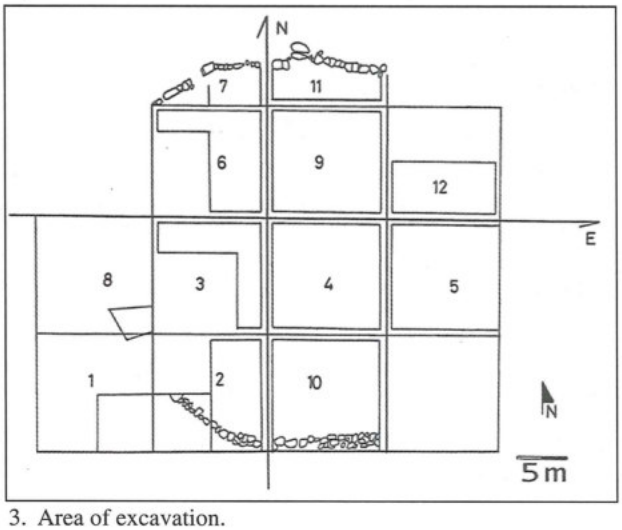
The Campaign of 2002

In the frame of our first three-week excavation campaign, a topographical map of the site was drawn up and an artificial grid (10mx10m) orientated to the north was laid over the tall (**Fig. 3**). Within this grid, eight squares (1-8) were selected and partially excavated. The results can be summarized as follows:

Two phases of settlement could be separated belonging to the Iron Age II and Byzantine-Umayyad era. Remains of the latter were found exclusively on the southwestern fringe of the tall and on the eastern slope. Remains of the Iron Age, however, were found all over the site and dominate the finds made so far.

The Byzantine-Umayyad era is represented by remains of a small room/house (on the southwestern slope), a cistern, two almost complete clay vessels (from the cistern area) and numerous clay sherds, glass and metal remains (mainly from the southwestern slope).

The architectural remains from the Iron Age excavated during our first campaign were heterogeneous. They were characterized by huge walls and simple settings but due to the limited area opened in 2002, no definite structures could be identified at that stage. The material remains found, however, belong to domestic activities within an agricultural world: numerous fire places and cooking spots, grinding stones, mortars, basalt pestles and scrapers, weaving weights, spindle whorls, a three footed basalt bowl with tools, "buttons", numerous stone vessels, several arrow-heads made of iron and needles as well as a few beads made of carnelian were found.[1]



3. Area of excavation.

In addition more than 16,000 pottery sherds were registered during our first three weeks campaign in Tall Juḥfiyya. More than 1,400 pieces were classified as diagnostics (bases, rims, handles, decorated body sherds). Altogether 20 wares were separated and classified into two main groups.

Group 1 consists of wares 1-5 and includes roughly 82% of the pottery assemblage. They are all dated to the Iron Age. All pieces are wheel-made. Their texture extends from fine to coarse. The temper usually consists of small white, grey and brown mineral grits. The colour varies from light beige up to reddish brown. Larger (storage) jars are often characterized by a greyish core. Group 2 consists of wares 6-20 and includes only 18% of the entire assemblage. They are most probably not of Iron Age date and two thirds of them seem to belong to the Byzantine/early Islamic era. The remaining third is a mixture of different wares, thought to represent different periods. The Iron Age pottery assemblage registered during the first campaign mainly consists of cooking pots, storage jars and jugs/juglets. In addition bowls, bases, handles, lids, spouts, decorated body sherds and lamps were registered. An initial analysis of the remains mentioned (architecture, small finds, pottery) excavated in 2002 indicates that Tall Juḥfiyya and the small archaeological sites in its vicinity were used most probably as farmsteads, dating back to the late Iron Age II.[2]

The campaign of 2003

Within the second three-week campaign in 2003, we continued the "plateau-excavation", that is the area within the perimeter wall, laid out a deep sounding in the western part of the plateau area (square 3), cleared part of the stratigraphy, recorded the architectural remains and tried to give a first interpretation of the excavated structures. By the end of the season more than 600m^2 had been

1. For detailed information and a first analysis of the small finds and pottery found during the 2002 season see Lamprichs 2003d.
2. As already mentioned, a regional system for the chronological classification of Iron Age pottery is still missing for the area under discussion. Due to this, no exact date of the pottery excavated so far can be given. Comparisons, however, with material found in Palestine and central Jordan points to a late Iron Age II date for most of the pottery found at Tall Juḥfiyya in 2002.
See also Lamprichs 1997a: 329-337.

opened and investigated within 12 squares; 200m^2 in 2002 and more than 400m^2 in 2003 (**Fig. 3**).

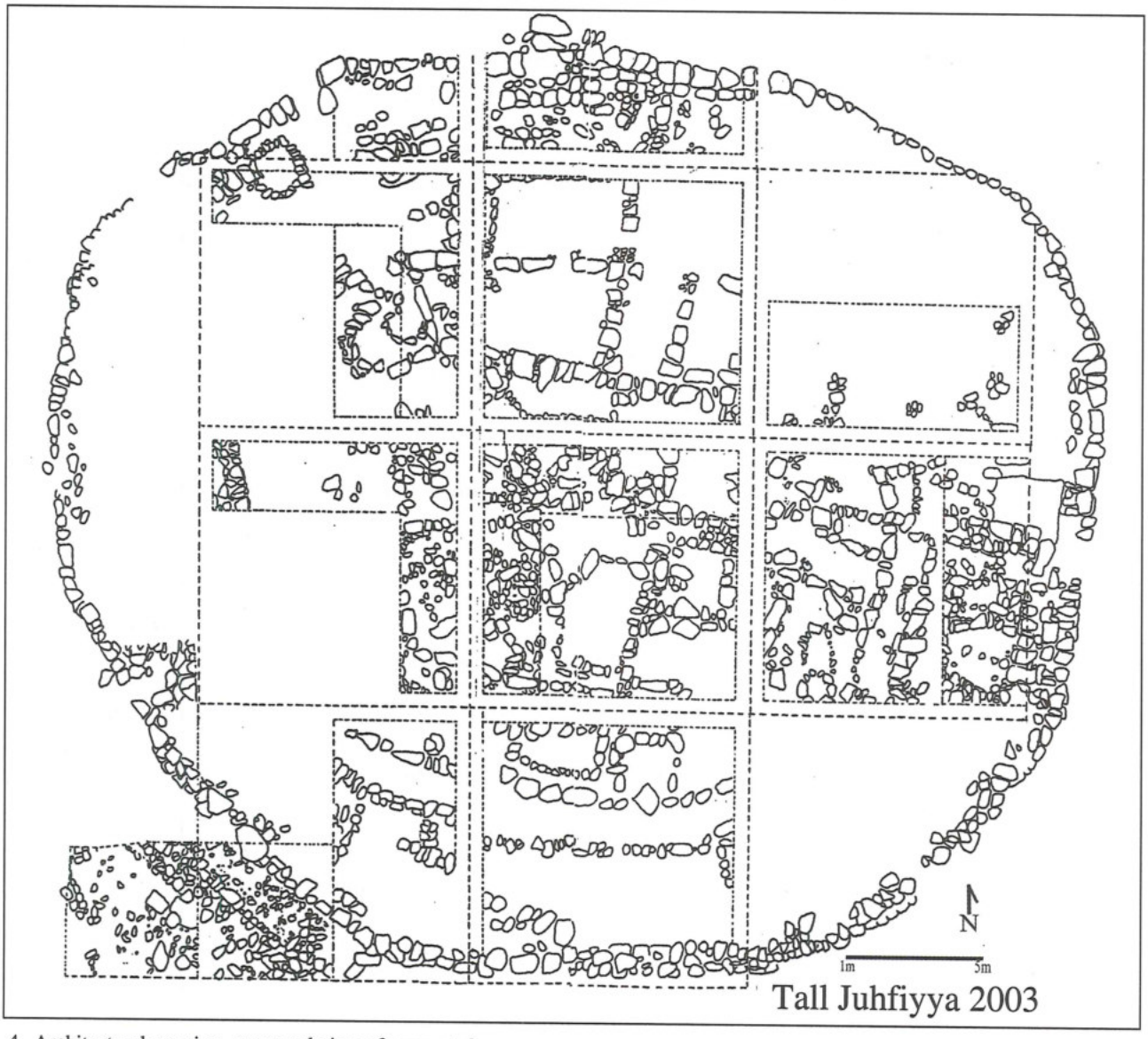
The stratigraphy worked out in 2002 was confirmed by the results of 2003. Besides some poor remains of the Umayyad era the material dates back exclusively to the late Iron Age II. A few pieces belonging to the early Iron Age II were found, mainly within the deep sounding.

The architectural remains uncovered in 2003 gave us a first clue concerning the structure of an Iron Age farmstead in the north of Jordan (**Fig. 4**). Based on our information at least two main units can be distinguished within the surrounding perimeter wall:

1. A storage and processing unit for agricultural goods situated in the southern and eastern parts of the tall (**Fig. 5**). It is characterized by small



5. "Storage and Processing units".



4. Architectural remains - a general view of excavated areas.

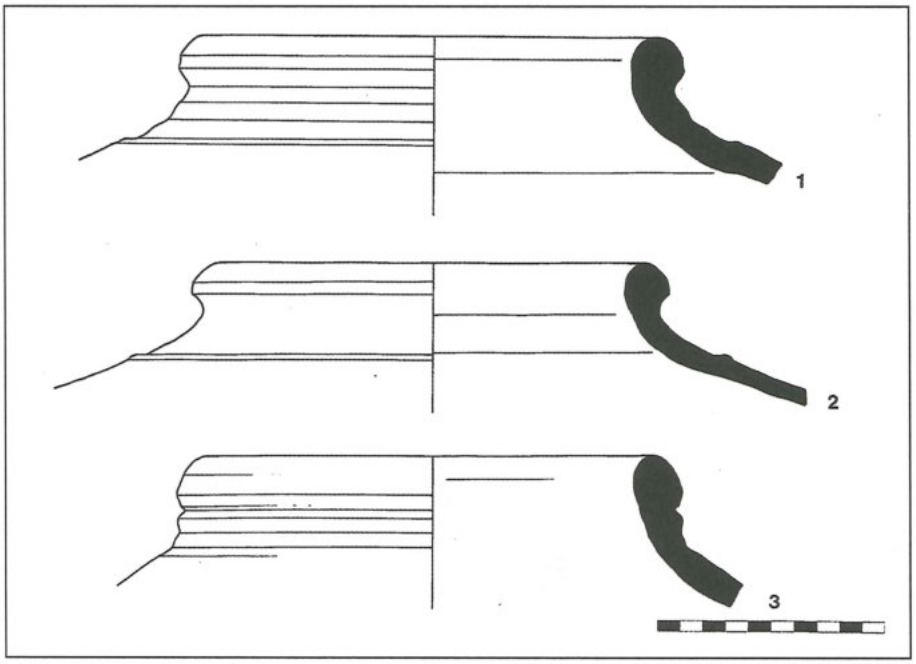
rooms which are connected to each other by a semicircular passageway, silos, *ṭābūn* (s) and storage jars (some placed upside down).

2. A main or farmstead building situated in the northern part of the tall consisting most probably of a courtyard house which is characterized by large rooms, domestic installations and "luxury goods" found *in situ* (**Fig. 6**).

Almost 80% of the more than 23,000 sherds registered during this season (in 2002 there were 16,802 pieces) date back to the late Iron Age II. The remaining pieces date to the beginning of the Iron Age II and the Umayyad period. Besides a huge amount of storage jars and (cooking) pots, many jars, jugs, bowls, pot stands, oil lamps and spouts were found in 2003 (**Figs. 7-12**).[3]

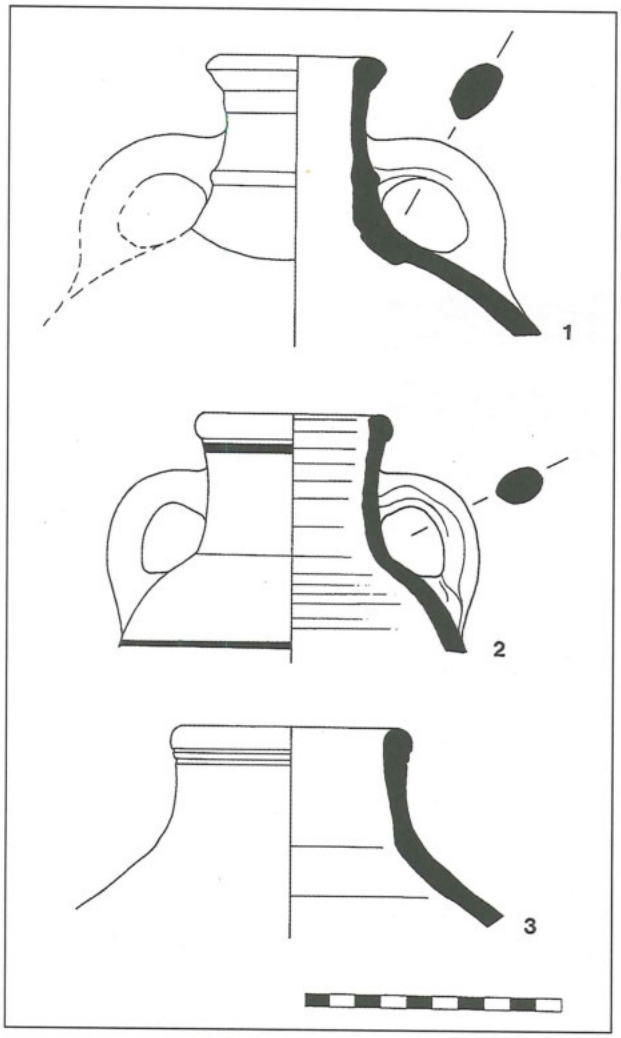


6. "Main building".

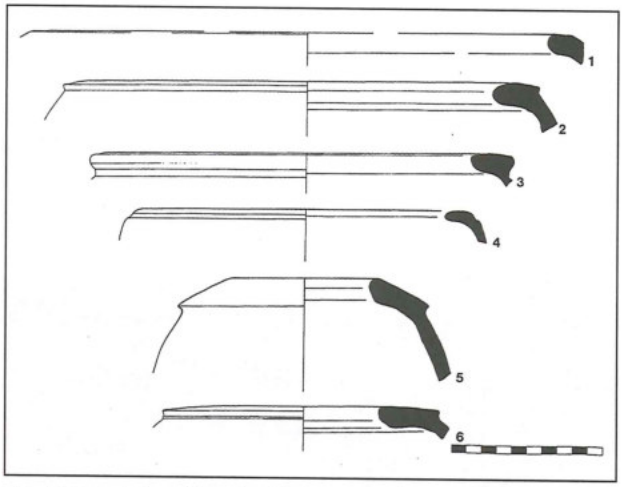


7. Storage jars (Iron Age): **1.** square 11, ware 2, locus 11002, no. 1100421; **2.** square 2, ware 2, locus 2013, no. 206002; **3.** square 10, ware 2, locus 10002, no. 1008804.

3. (**Figs. 7-12** and **14-16**) drawn by Ahmad al-Momani, Amman.
For a detailed description of pottery wares and abbreviations used in the captions of **Figs. 7-12** and **14-16** see Lamprichs 2003d: 369-374, Taf. 1-43.

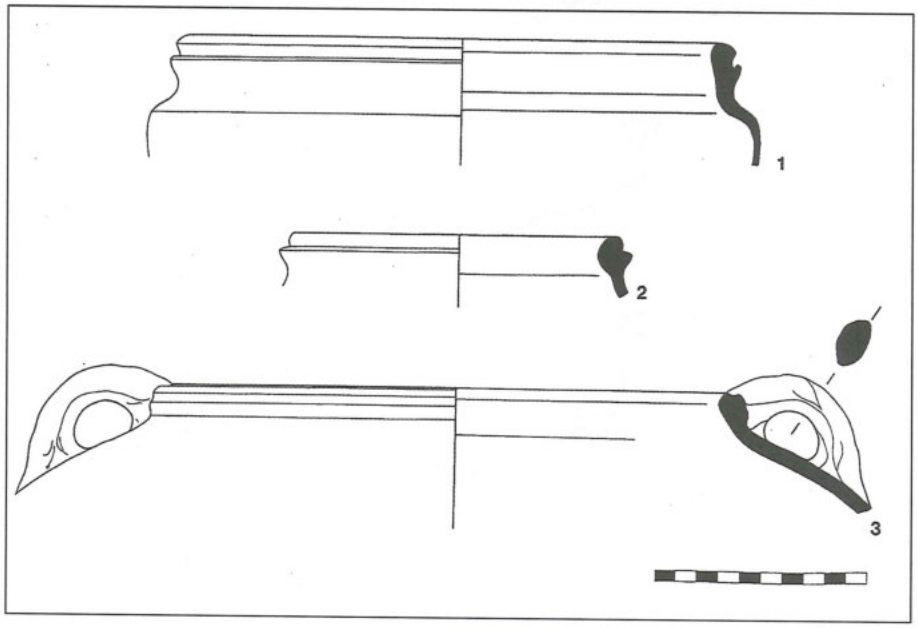


8. Jugs (Iron Age): **1.** square 9, ware 4, locus 9018, no. 913101/2; **2.** square 9; ware 4, locus 9018, no. 913201; **3.** square 9, ware 3, locus 9018, 911107/8/9.

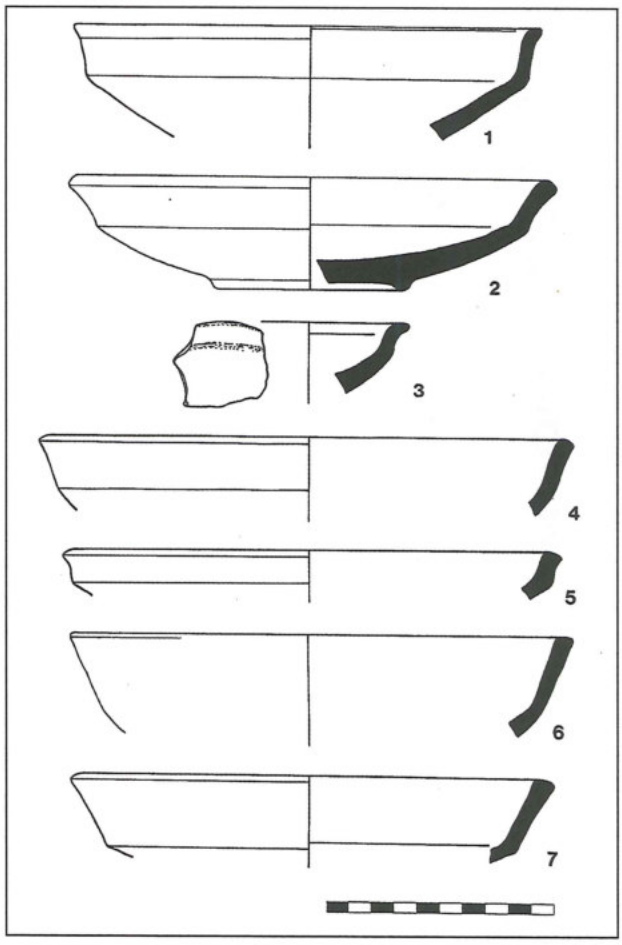


10. Pots and jars (Iron Age): **1.** square 3, ware 1, locus 3023, no. 310401; **2.** square 9, ware 3, locus 9004, no. 902803; **3.** square 4, ware 2, locus 4035, no. 415207; **4.** square 6, ware 5, locus 6036, no. 614003; **5.** square 10, ware 3, locus 10002, no. 1007901/2/3; **6.** square 10, ware 5, locus 10006, no. 1002527.

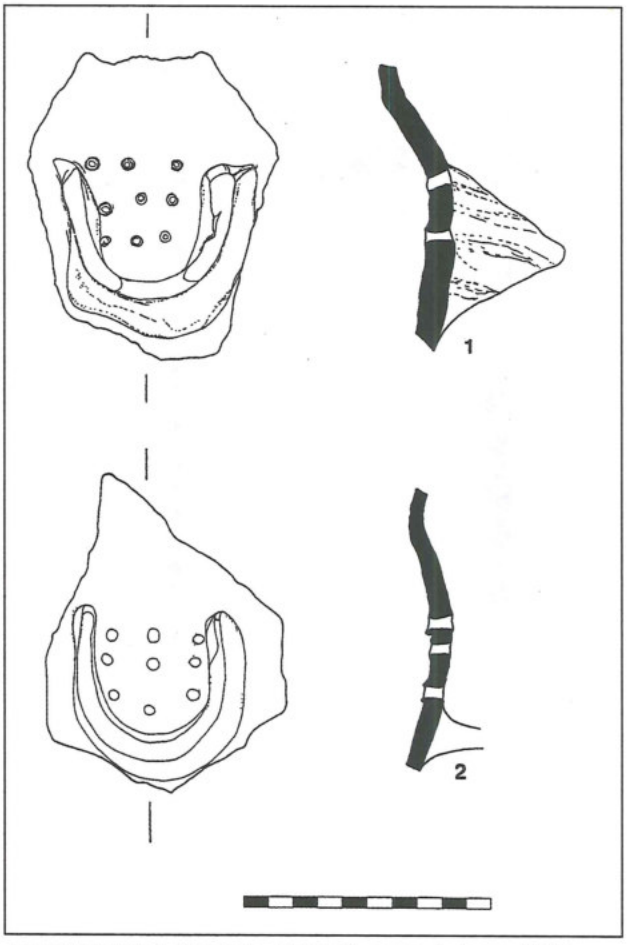
The excavated remains of the Iron Age belong again mainly to domestic activities within an agricultural world. The assemblage is dominated by pieces used for transportation, processing and storage of agricultural products. Apart from numerous fire places, cooking spots, ṭābūn(s) and pottery vessels, a great variety of querns, pestles (round, cornered, conical), scrapers, mortars (**Fig. 13**), bowls (round, cornered) and rubbers made of basalt as well as many weaving-weights, spindle-whorls, "buttons", stone "lids" and stone vessels were found. Additionally the excavations of 2003 at Tall Juḥfiyya produced, for the first time, some objects which are not exclusively used for farming activ-



9. Cooking pots (Iron Age): **1.** square 10, ware 1, locus 10006, no. 1002526; **2.** square 10, ware 1, locus 10006, no. 1002523; **3.** square 11, ware 1, locus 11003, no. 1102403.



11. Bowls (Iron Age): **1.** square 10, ware 4 (slip), locus 10002, no. 1008802; **2.** square 9, ware 4 (slip), locus 9018, no. 912304/12; **3.** square 5, ware 4, locus 5039, no. 516706; **4.** square 6, ware 4 (slip), locus 6032, no. 611312; **5.** square 5, ware 4 (slip), locus 5037, no. 514410; **6.** square 9, ware 4 (slip), locus 9010, no. 902813; **7.** square 9, ware 4, locus 9004, no. 902813.



12. Spouts (Iron Age): **1.** square 9, ware 4, locus 9011, no. 906401; **2.** square 9, ware 2, locus 9013, no. 908101.

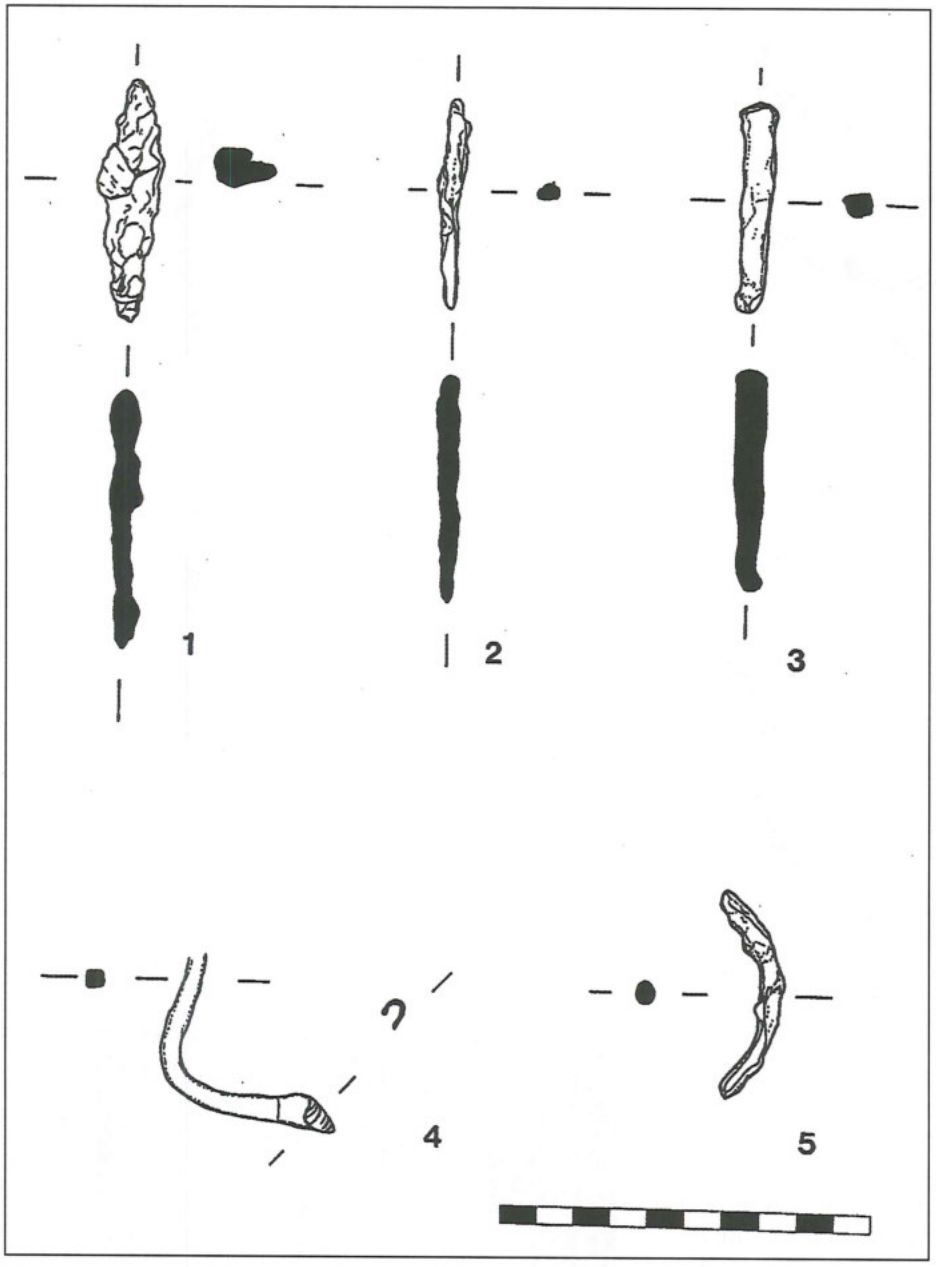


13. Complete basalt bowl (tripod).

ities. These are remains of jewelry made of carnelian and lapis beads, pierced stone discs and shells as well as a tooth of a comb, a fibula made of bronze (**Fig. 14:4**), two decorated cosmetic palettes made of polished limestone (**Fig. 15:1-2**), a small complete (tripod) basalt bowl (**Fig. 16**) for the preparation of cosmetics or spices (**Fig. 17**), some arrowheads and a chisel made of iron. The manufacture of basalt mortars or bowls on three legs has a long history in the Levant. They were used, as already said, for grinding spices and coloring matters. Examples such as this one, on high legs connected to each other with a central column, are rare. A similar, but broken piece, was found for example in Tall Dayr 'Allā (Ibrahim and van der Kooij 1986: Pl. XIX).

Summary and Outlook

Summarizing our results, we may say that Tall Juḥfiyya, Tall Bayt Yāfā, Tall ash-Shiqāq, Dhahrat as-Sūq and Tall Kufr Yūbā are quite homogenous sites, which were mainly founded and inhabited during the Iron Age. The function of the sites dur-

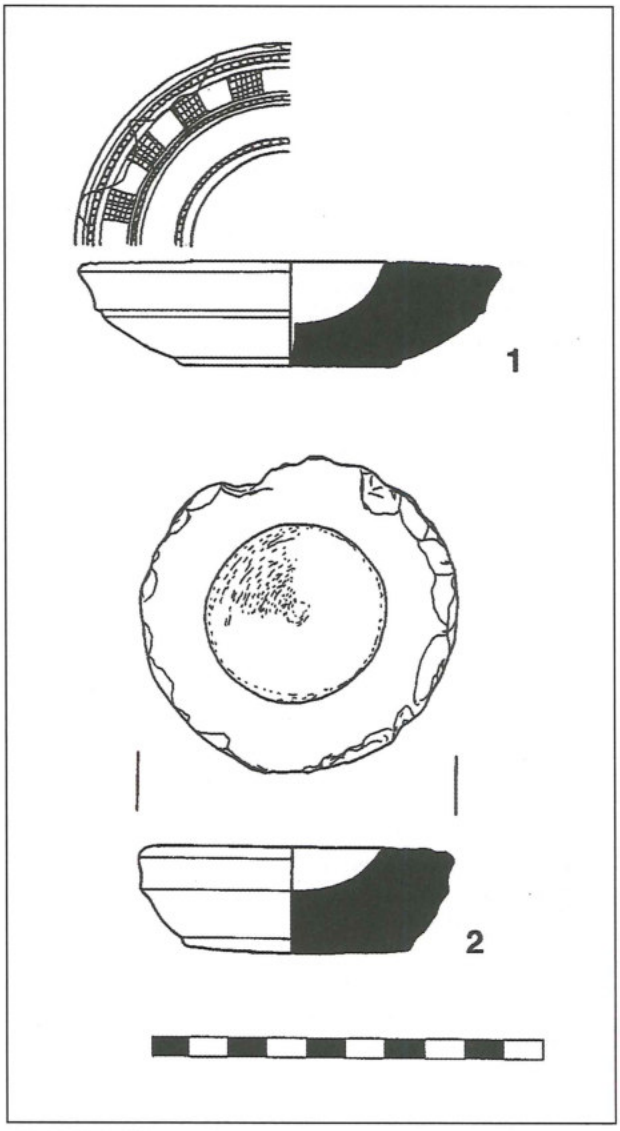


14. A selection of metal objects: **1.** arrowhead/iron 15g, square 2, locus 2014, no. 2084; **2.** metal-tool 10g, square 3, locus 3026, no. 3117; **3.** metal-tool 10g, square 9, locus 9002, no. 9025; **4.** fibula/bronze 20g, square 3, locus 3018, no. 3093; 5. bracelet/bronze 20g (fragment), square 5, locus 5035, no. 5125.

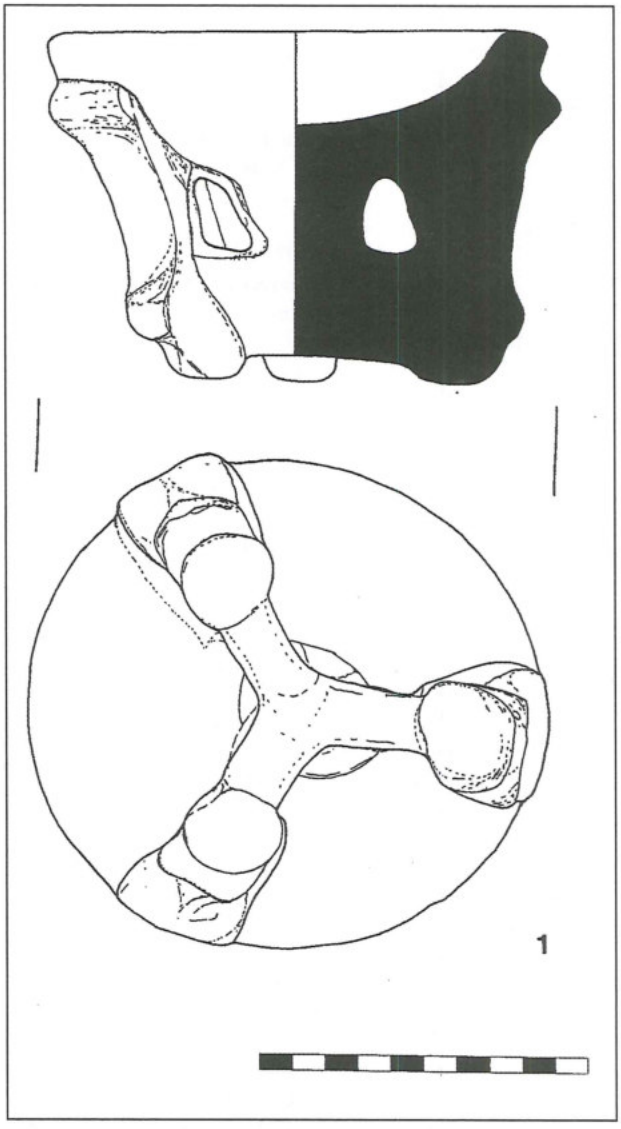
ing late Iron Age II times is best described as "farmstead". The finds made within the main or farmstead building at Tall Juḥfiyya suggest that its inhabitants were related socially and politically to some kind of elite leadership. A close link of the "farmstead" to one of the regional centers, most probably Tall Ḥuṣn, is very likely and the excavated remains may well represent the penetration of Tall Juḥfiyya and its surroundings by an arm of a centre-based administration. The huge amount of pottery sherds and grinding tools found within the "storage and processing unit" fits well in some way with the general association of farmsteads with periods of high intensity land use, demand for specialized economic goods and heightened security conditions (Hopkins 1997: 306). In how far the latter, however, were guaranteed by the main (regional) power of the period has to be found out in the future.

Roland Lamprichs
German Protestant Institute of Archaeology
in Amman
P.O.Box 183
Amman / Jordan

Ziad al-Sa'ad
Faculty of Archaeology and Anthropology
Yarmouk University
Irbid /Jordan



15. Tall Juḥfiyya: (decorated) cosmetic-bowls: **1.** polished limestone 150g (fragment), square 3, locus 3018, no. 3085; **2.** polished limestone 280g (almost complete), square 9, locus 9010, no. 9058.



16. Small mortar on three legs: basalt 1630g (complete), square 10, locus 10004, no. 10027.



17. Small basalt mortar (tripod).

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ARCHAEOLOGY AND ENVIRONMENT OF THE DEAD SEA PLAIN: PRELIMINARY RESULTS OF THE THIRD SEASON OF INVESTIGATIONS BY THE JOINT LA TROBE UNIVERSITY/ ARIZONA STATE UNIVERSITY PROJECT

Phillip C. Edwards, Steven E. Falconer, Patricia L. Fall, Alexandra Ariotti and Thomas K. Swoveland

Introduction

We report here on the third season of the Archaeology and Environment of the Dead Sea Plain Project's triennial fieldwork program located in the Dhrā' (الذراع) region of the Karak Governate (**Fig. 1**). The project has been a joint undertaking co-directed by Phillip Edwards (La Trobe University), Steven Falconer and Patricia Fall (Arizona State University), with the aim of investigating the consequences of long-term human interaction with the agriculturally marginal environment of the Dead Sea Plain. Our procedure has been to investigate pulses of occupation that fall at key periods of agricultural intensification during the Holocene. The first two seasons thus investigated the Pre-Pottery Neolithic A site of Ẓahrat adh-Dhrā' 2 (ZAD 2) and the Middle Bronze Age hamlet of ZAD 1 (Edwards *et al.* 2001; 2002). Sediment cores were retrieved from the Lisān Peninsula (اللسان) and analysed in order to elucidate the palaeoenvironmental setting of these communities.

In further pursuance of these goals, the third season saw the completion of a detailed geological map of the Ẓahrat adh-Dhrā' region, carried out by La Trobe student Emily House under the supervision of Dr John Webb and Dr Christopher Day. Emily House also took sediment samples from the ZAD 2 sections in preparation for a micromorphological study of the site's deposits. On the archaeological side, a third excavation season was carried out at ZAD 2, while La Trobe doctoral student Alexandra Ariotti simultaneously commenced work at Qaṣr al-Bulayda (قصر البليدة) (**Fig. 1**). This sprawling Roman-Nabatean site complex represents the most recent of the 'pulses' of human occupation investigated by the project, and dates to one of southern Jordan's most significant periods of socioeconomic intensification. Project excavations have been completed at the intervening MB site of ZAD 1, and in the current season, Steven Falconer conducted a wide-ranging survey in order to contextualise ZAD 1 within a landscape that is dominated by enigmatic but apparently ritual constructions which include numerous cairns, monoliths, and wall lines. Below we provide summations of Falconer's landscape survey work together with reports on the excavation season at ZAD 2 (Phillip Edwards), the survey, excavation and analysis of Qaṣr al-Bulayda (Alexandra Ariotti, Steven Falconer and Patricia Fall) and the ongoing analyses of the Lisan sediment cores (Patricia Fall and Thomas K. Swoveland).

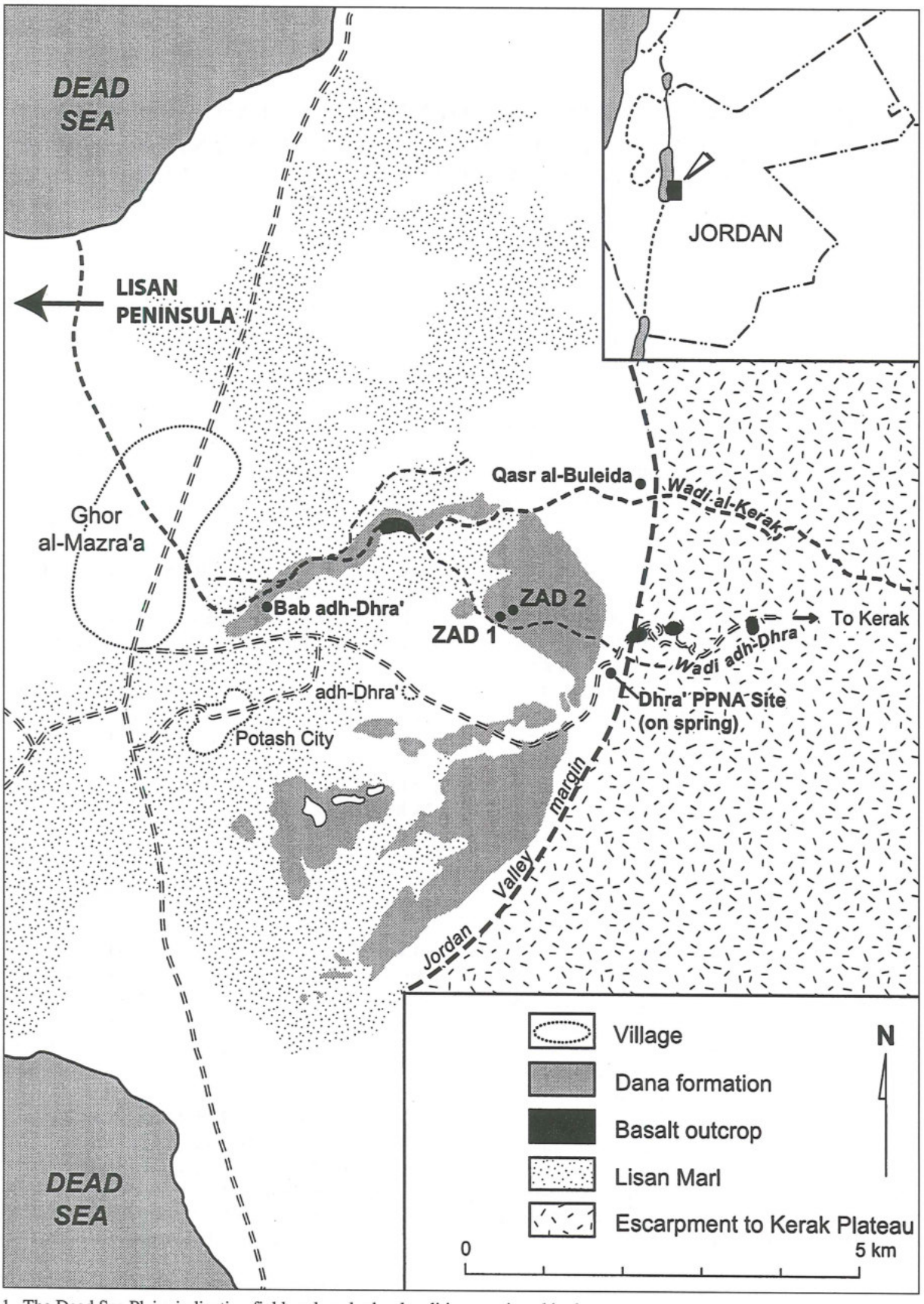
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Palaeoenvironmental Investigations on the Lisān Peninsula, Dead Sea

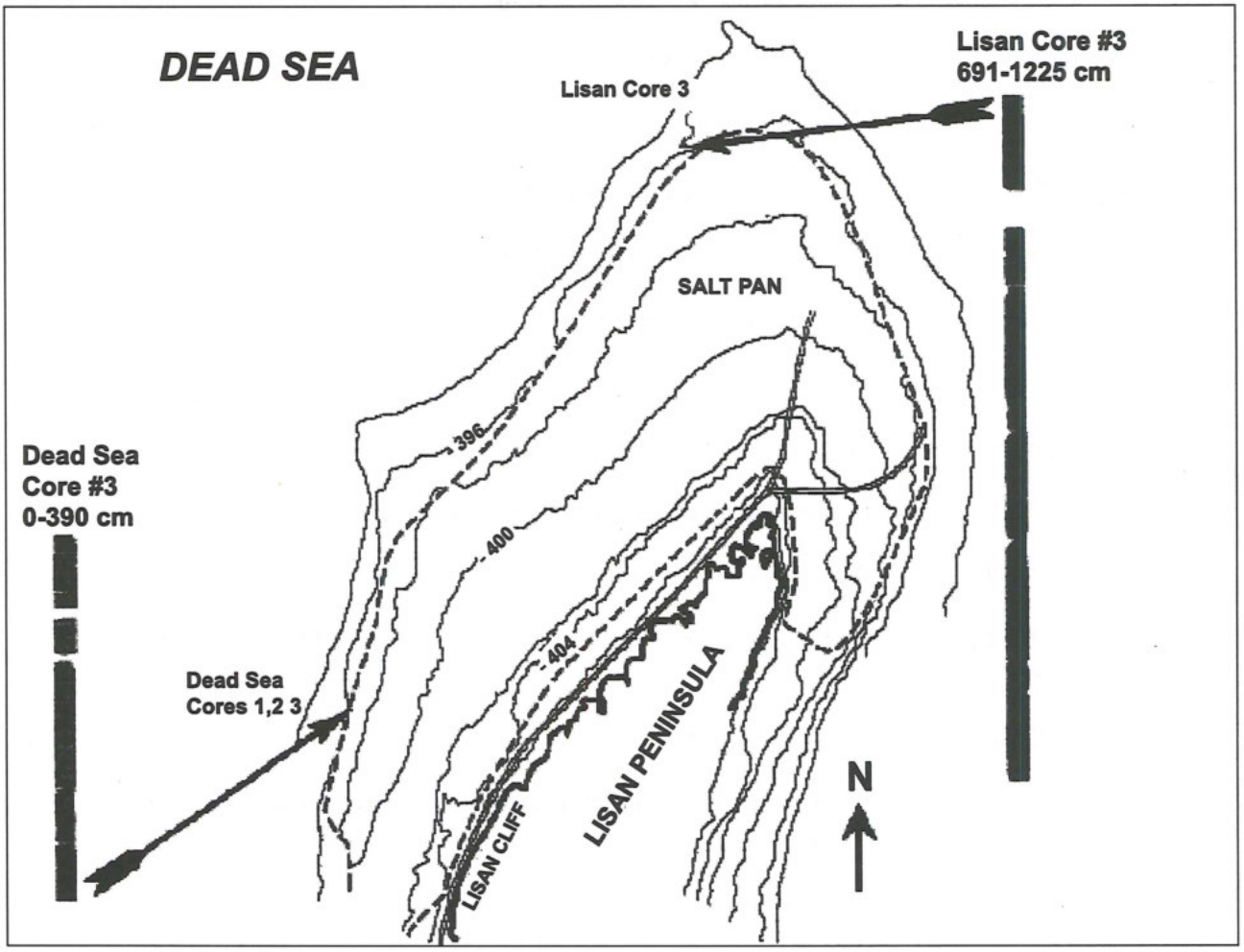
In 2000 eight sediment cores were collected from four localities along the northwestern edge of the Lisān Peninsula. Cores were collected from the modern surface of the Lisān Peninsula with a mechanized rotary drill rig and with a hand operated piston corer. In a previous article (Edwards *et al.* 2002) we reported on the preliminary results from Lisan Core 3, spanning the time period from 20,000 to 12,000 BP (uncalibrated radiocarbon years before present). Carbon and oxygen isotopes revealed a late glacial climate, between 20,000 and 14,500 BP, that was relatively cold and dry compared to today, followed by warmer and wetter climatic conditions from 14,500 to 12,000 BP (Swoveland 2001; Edwards *et al.* 2002). In this report we discuss the stratigraphy and radiocarbon ages for the younger cores, Dead Sea 1-3; and the carbon and oxygen isotopes from Dead Sea 3. Figure 2 shows the location of Lisan Core 3 and Dead Sea Cores 1-3.

Sediment Recovery of Dead Sea Cores 1-3

Three shorter cores (Dead Sea Cores 1, 2 and 3) were collected from along the northwestern edge of the Lisān Peninsula with a 5cm-diameter piston corer at -404 to -405mbsl (meters below sea level). The cores were taken approximately 100m (DS 1 and 2) and 50m (DS 3) inland from the modern western shore of the Dead Sea (**Fig. 2**). An impenetrable layer (15-25cm thick) of halite covers



1. The Dead Sea Plain, indicating fieldwork and other localities mentioned in the text.



2. The northern end of the Lisān Peninsula showing the coring localities of Lisan Core 3 and Dead Sea Cores 1-3; gallery images show the laminated stratigraphy of Lisan Core 3 and Dead Sea Core 3.

this portion of the peninsula in the vicinity of Dead Sea cores 1-3. This halite layer formed in shallow water in a near-shore environment. The halite shows ripple marks (indicating the prevailing wind direction from the WNW) and is covered with a fine layer of dust documenting wind erosion following formation. Vertical cracks in the clay and aragonite layers below the halite crust document a period of exposure and desiccation on the peninsula. Cores DS 1 and 2 were collected a few meters shoreward from the halite layer where our piston corer could penetrate the softer sediments below the halite crust.

Sediment was recovered from Dead Sea Core 1 to a depth of 65cm; below this the water table was encountered and no deeper sediments were recovered (**Table 1**). Dead Sea Core 2 was collected a few meters from DS 1. Sediments were recovered from the surface to 73cm and from 240 to 555cm below the modern surface, with the water table encountered between 73 and 240cm depth where no sediments were present. Dead Sea Core 3 was collected about 50m seaward of cores 1 and 2, at about 1m lower elevation (-405 mbsl). Sediments were recovered from Dead Sea 3 between 0 and 58cm and from 100 to 391cm, with the water table between 58-100cm.

Radiocarbon and Sediment Analyses of Dead Sea Cores 1-3

The sediments in the Dead Sea cores are brown to grey clays with white aragonite (CaCO3) layers and some minor evaporate minerals present in some sections (**Table 1**). The topmost sediments have no laminations and contain halite crystals. The lowermost sediments contain sand-size particles (ooids). Radiocarbon (AMS) analyses of small pieces of wood and charcoal fragments were used to date the cores (**Table 2**). DS 2 represents the period between about 5000 and 1500 BP, from the Chalcolithic through the Byzantine period. DS 3 may cover a similar time span; the younger, dat-

Table 1: Sediment description of Dead Sea Core 1-3.

Core	Depth (cm)	Sediment description	Interpretation
DS 1	0-21	Massive brown clay with halite crystals	Very shallow water
	21-65	Truncated aragonite and clay laminae	Deeper water
	65-189+	Water table (no sediment)	
DS 2	0-23	Massive brown clay with halite crystals	Very shallow water
	23-33	Grey clay and aragonite laminae	Deeper water
	33-73	Overturned grey clay and aragonite laminae	Tectonic event(s); deeper water
	73-240	Water table (no sediment)	
	240- 425 depth	Massive grey clay with occasional laminae	Moderate water
	425-475	Missing sediment	
	475-555	Massive grey clay with gritty sediment beach	Shallowest, near
DS 3	0-7	Massive brown clay with halite crystals	Very shallow water
	7-58	Grey clay and aragonite laminae	Deeper water
	58-100	Water table (no sediment)	
	100-122	Grey clay with aragonite laminae	Deeper water
	122-348 depth	Massive grey clay with occasional laminae	Moderate water
	348-391 beach	Brown crumbly sandy sediment (ooids present)	Shallowest, near

ed portion of the core covers about 2690 to 1350 BP, from the late Iron Age through the late Byzantine period. An analysis of the number of laminations per year in DS 3 shows a 1:4 ratio between the number of couplet layers and the number of radiocarbon years, whereas the ratio is close to 1:1 between layer couplets and years in Lisan Core 3 (Prud'homme 2002). This demonstrates that the couplets in Lisan Core 3 probably represent annual laminations, whereas the laminae in Dead Sea Core 3 were not deposited annually.

Palaeoenvironmental Interpretation Based on Dead Sea Cores 1-3

The youngest sediments recovered were late Byzantine in age, suggesting that the water level in the Dead Sea dropped following the Byzantine period (**Table 2**). At least the upper 150 years of sediment have been eroded from the top of Dead Sea Core 2, based on a comparison of the surface ages of DS 2 and DS 3. Halite crystals in the uppermost sediments of Dead Sea 1, 2 and 3 represent a shallow water, near- shore environment. The laminated

Table 2: AMS age determinations from the Dead Sea Cores (DS 2 and DS 3).
Beta ages calibrated courtesy of Beta Analytic; ANSTO ages (labeled OZG) calibrated using Calib 4.4.

Core	Depth (cm)	Age (yr BP)	Laboratory Number	Calibrated Age (95% probability Stuiver *et al.* 1998)	Cultural Period
DS 3	8.5	1440±40	Beta-160106	AD 550-660	late Byzantine
DS 3	26	1590±40	Beta-160107	AD 400-560	Byzantine
DS 3	45	1690±40	Beta-153581	AD 250-430	late Roman/Byzantine
DS 3	108	1820±40	Beta-153582	AD 100-260 and AD 290-320	late Roman
DS 3	234	2690±50	OZG298	930-790 BC	Iron II
DS 2	1.5	1510±40	OZG294	AD 440-640	Byzantine
DS 2	299.5	2670±40	OZG295	900-800 BC	Iron II
DS 2	361	7030±50*	Beta-155306	6000-5790 BC	--
DS 2	398.5	30050±300*	OZG296	--	--
DS 2	512	5020±50	Beta-155307	3960-3680 BC	Chalcolithic
DS 2	548	5020±50	OZG297	3950-3700 BC	Chalcolithic

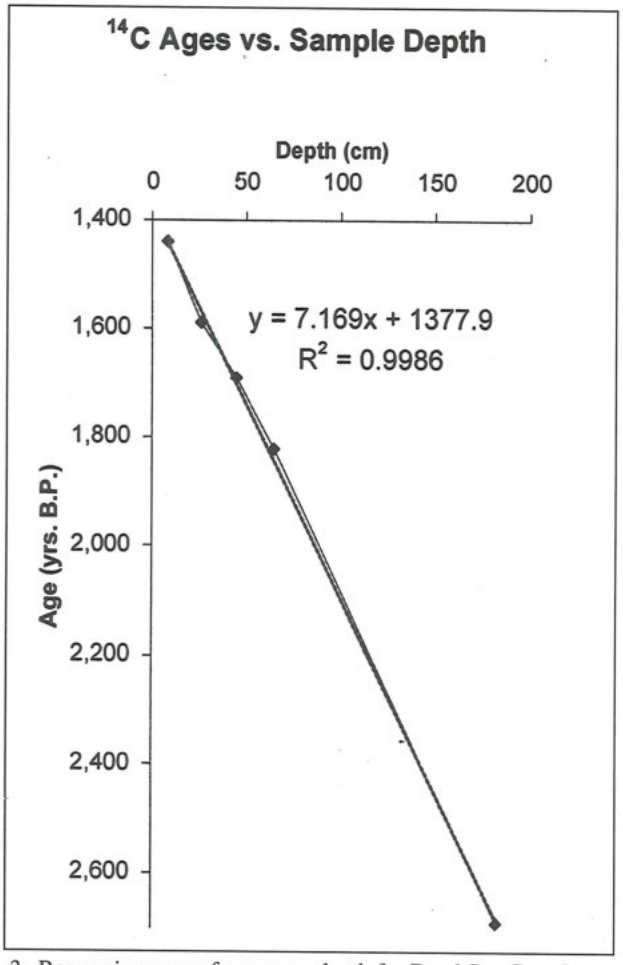
*These two AMS ages are interpreted to represent reposition of older wood into these massive and possibly reworked clays. OZG296 was a very small twig weighing 7mg. A third sample from 268cm produced too little carbon to age (Beta-160108).

clays and aragonite below the massive clays with halite crystals were deposited in deeper water. Both Dead Sea Cores 1 and 2 show evidence of tectonic activity. The laminae in DS 1 are offset; laminae in DS 2 are overturned. Based on AMS ages from DS 2 the tectonic event(s) occurred in the late Roman/Byzantine period. The more massive clays without distinct laminations were deposited prior to the Roman period, in a moderate water depth. The lowermost sediments in both DS 2 and 3 contain sand sized ooids suggesting that they were deposited at the beach edge of the Dead Sea where wave action could rework the sediments into small spheroids. Based on two AMS ages from DS 2 these lowermost sediments were deposited near the end of the Chalcolithic period.

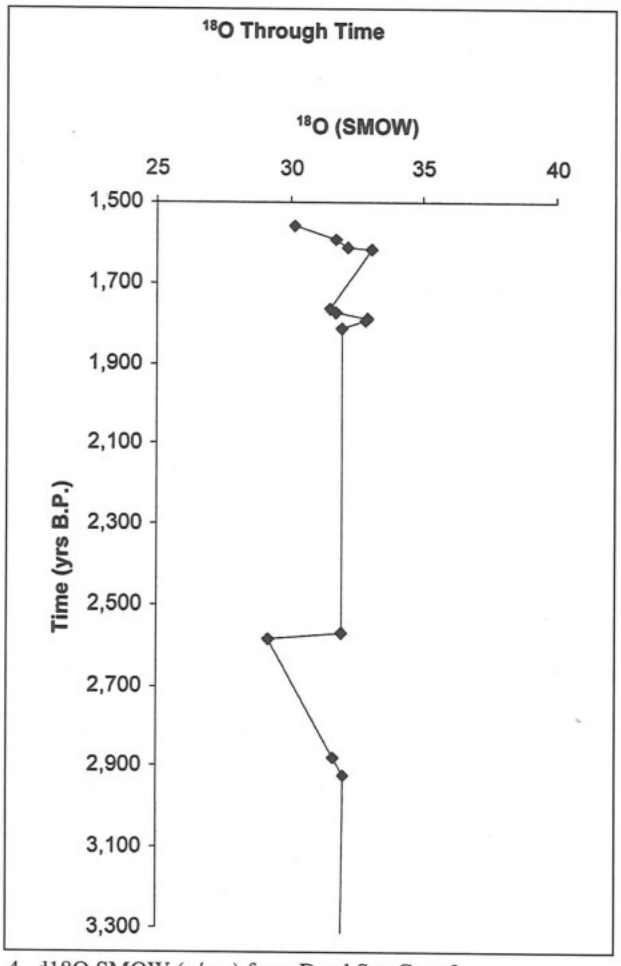
Carbon and Oxygen Isotope Analyses of Dead Sea Core 3

Isotope analyses were conducted at Arizona State University by Swoveland. Based on the regression curve of AMS ages we calculated the age/depth relationship for DS 3 to compensate for the water table and lack of sediments deposited between 58-100cm below the modern surface (**Fig. 3**). Thus, for depths below 100cm we subtracted 42cm from their actual depths (**Table 3**). The deposition rate for DS 3 is about 6.6 years/cm. No isotope samples could be analyzed between 107-221.5cm depth (64-178.5cm corrected depth), from about 2660 to 1800 BP.

Analyses of carbon and oxygen isotopes were undertaken on the aragonite layers in DS 3. It is



3. Regression curve for age vs. depth for Dead Sea Core 3.



4. d18O SMOW (o/oo) from Dead Sea Core 3.

assumed that 13C can be used as a proxy for past precipitation, and that 18O is a proxy for paleotemperature. 18O becomes enriched as temperatures increase and 13C becomes enriched during dry periods. Isotopic results cover the time period from about 3290 to 1560 BP, from the Iron Age through the Byzantine period (**Table 3**). Variations in ^{18}O and ^{13}C are presented in **Figs. 4 and 5**.

A relative temperature curve was created from the 18O data using Craig's 1965 formula:

$$T(c)=16.9-4.2(d_c- d_w)+0.13(d_c- d_w)^2$$

where d_c indicates the ^{18}O value of the mineral and the d_w value indicates the ^{18}O value of the water from which the mineral precipitated. Without a clear d_w value, no absolute temperature numbers can be predicted. However, a relative temperature curve can be created comparing each mineral value to each other (**Fig. 6**).

The variations for the carbon and oxygen isotopes in DS 3 are relatively minor. ^{13}C values lie between -1.99 to 2.17 PDB, and ^{18}O values range between 33.06 and 29.23 SMOW. Much larger variations for these isotopes (between about -16 and 2 PDB for ^{13}C, and from about 20 to over 38 SMOW for ^{18}O) are seen in Lisan Core 3 between 20,000 and 12,000 BP (Swoveland 2001; Edwards *et al.* 2002). Values for ^{13}C between about -2 and +2 in Lisan Core 3 were interpreted as relatively dry conditions; and values of ^{18}O between 33 and 29 SMOW were interpreted as relatively warm conditions. Isotope trends in DS 3 are relatively minor. Based on single data points, wetter conditions might be interpreted at about 2900 BP and warmer temperatures at around 2600 BP (both during the Iron Age). The isotope records show variability in temperature and precipitation from about 1800 to 1500 BP (late Roman/Byzantine) with perhaps a slight warming trend during the Byzantine period. Although the Roman/Byzantine era is interpreted here as warm and dry compared with the late Pleistocene (glacial), Dead Sea lake levels were higher than during the ensuing Islamic periods. Thus, the climate during the Roman/ Byzantine era was cooler and wetter than today.

(PLF and TKS)

Table 3: 13C and 18O isotopic analyses from Dead Sea Core 3.

Depth (cm)	Depth* (corrected)	Estimated Age (yr BP)	$d^{13}C$ (pdb)	$d^{18}O$ (SMOW)
12	12	1560	-0.46	30.2
30	30	1590	0.09	31.69
33	33	1610	-1.2	32.2
34	34	1620	-0.49	33.06
47	47	1700	0.5	31.53
50	50	1724	0.85	31.73
50.5	50.5	1726	-1.99	32.89
53	53	1740	1.22	32.8
107	*65**	1810	-0.17	31.97
221.5	*179.5**	2570	1.29	31.95
225	*183**	2590	1.29	29.23
268	*226**	2880	2.17	31.62
275	*233**	2920	-0.16	32
330.5	*288.5**	3290	-1.37	31.97

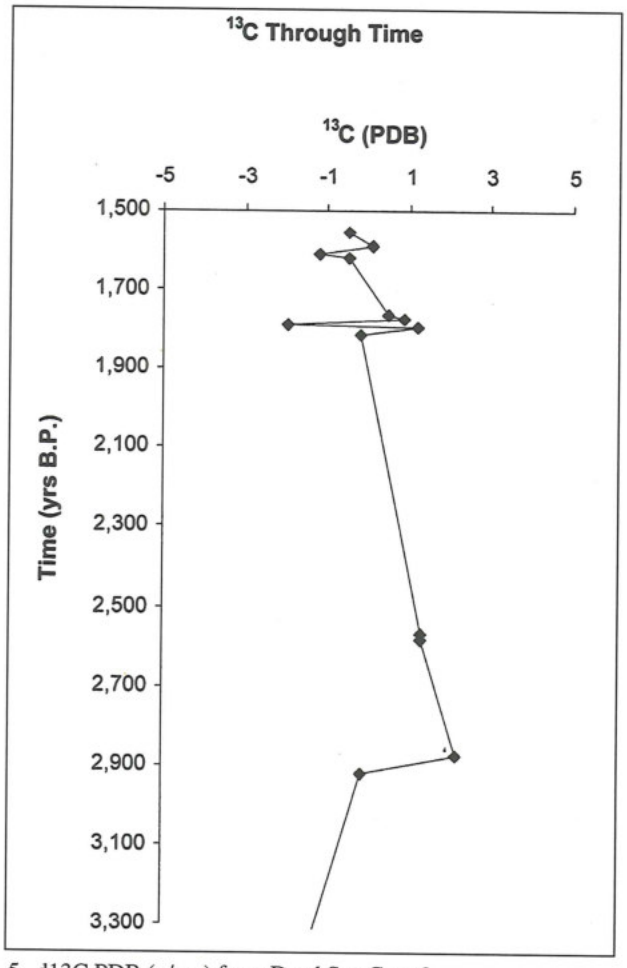
*42cm are subtracted from the depth below ground surface to compensate for the water table and lack of sediments between 58-100cm.

Excavations at the Pre-Pottery Neolithic A Site of Ẓahrat adh-Dhrā' 2 (ZAD 2)

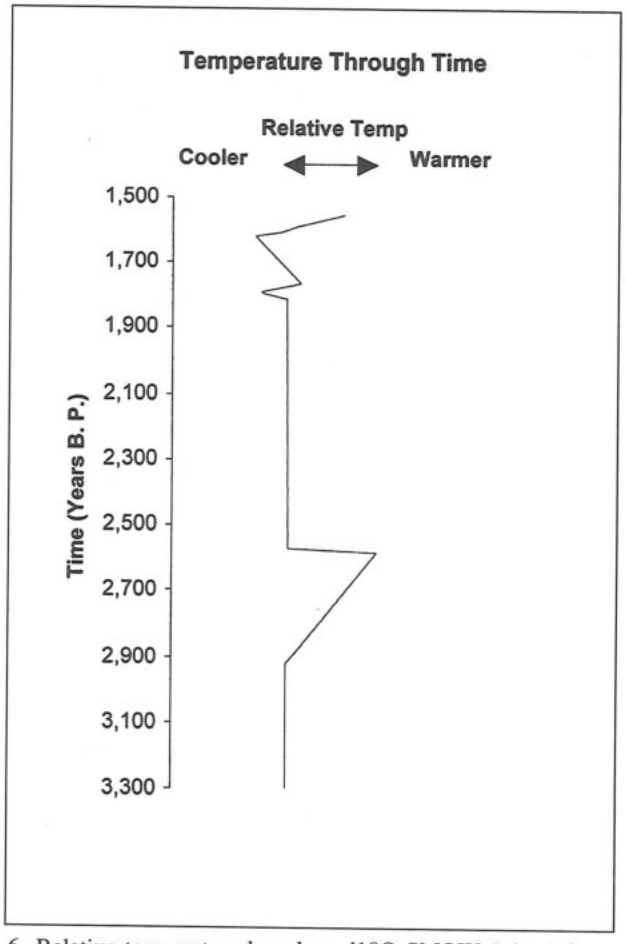
The first two seasons of excavations in 1999 and 2001 revealed ZAD 2 as a small, low occupation mound containing an array of curvilinear architectural remains, distributed over an area of about 2,000 square meters. Three soundages excavated to the natural sediments at a maximum depth of 1.5 metres (in Structures 1, 2 and 3), revealed a single phase of curvilinear huts, containing a maximum of four successive floor layers in Structure 2. Nine radiocarbon dates demonstrate a relatively short-lived settlement dating to 9,600 – 9,300 BP, or from 9,250 Cal BC to 8,330 Cal BC. Since the vertical stratigraphy of the site had been fully investigated in the previous two seasons, the current season concentrated on horizontal exposure of the uppermost floors in Structures 2 and 4 (**Fig. 7**).

Accordingly, excavation in Structure 2 proceeded to expose the uppermost (Phase 1) floor south of the F. 4 (=Feature 4) hearth (**Fig. 8**). Square L25 revealed an oval cuphole mortar (F. 8) also set into the floor and framed by a surround of cobbles and pebbles (**Fig. 9**). To the south of this in turn was found a pestle fragment, and a fragmentary incised limestone plaque just above it. From Square M26 the floor gently dipped in an easterly direction, giving way to an earthen floor strewn with stone pebbles and fragments.

A hearth (F. 9) represented by stones strewn about an area of burnt and discoloured sediments



5. d13C PDB (o/oo) from Dead Sea Core 3.



6. Relative temperature based on d18O SMOW (o/oo) from Dead Sea Core 3.

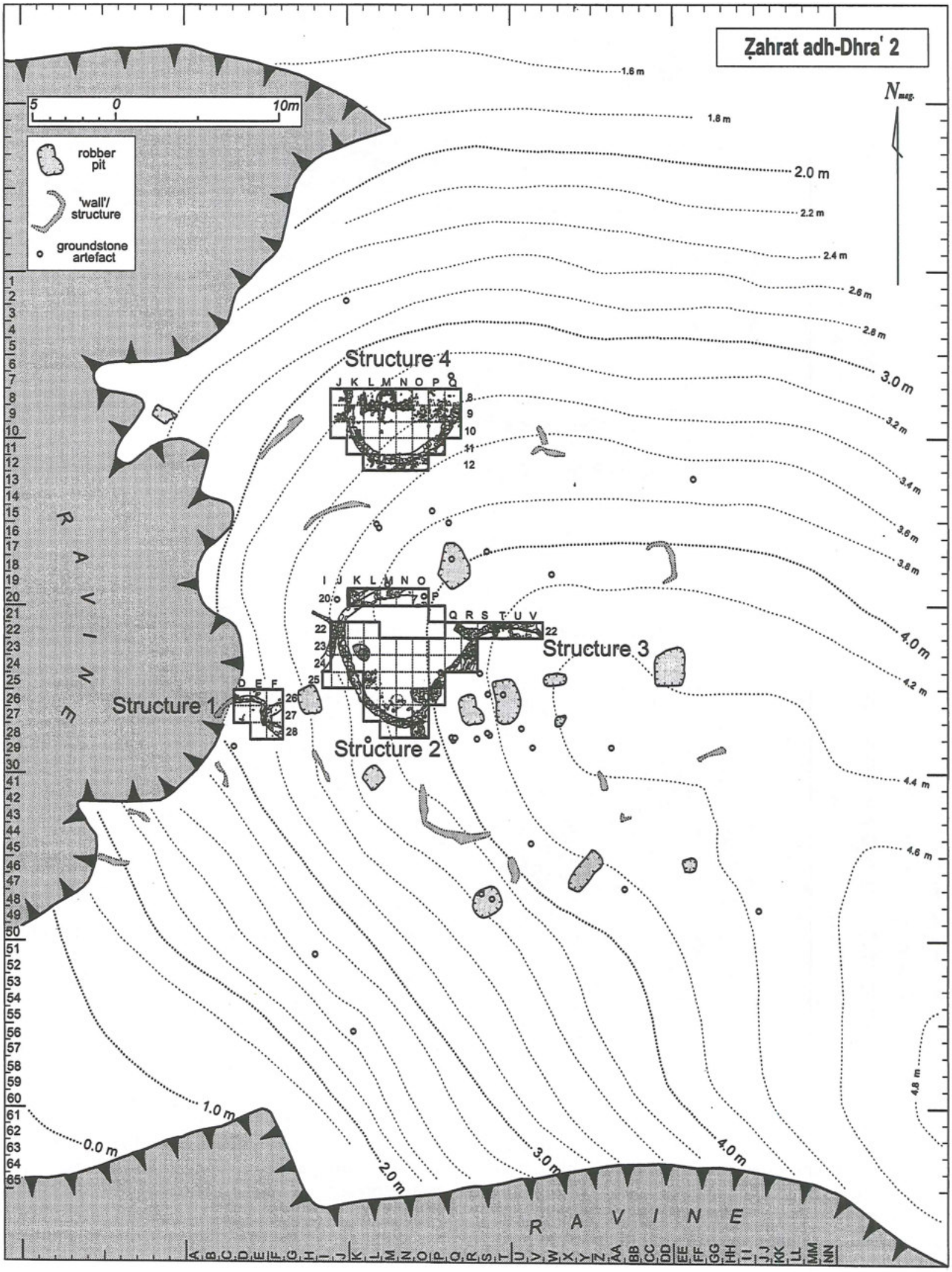
in Squares M/N 26 yielded a rich trove of objects (**Figs. 8, 10**) including a complete pebble incised with a cross-hatched, geometric design on one face; two blank but shaped limestone plaques; a fragmentary ceramic figurine incised with a design of parallel short strokes, a fragment of a large bone haft, bone needles, pestles, hammerstones, edge-ground axes, large and small flaked tranchet axes, picks and cores. The concentration of artefacts thus included the first substantial numbers of bone tools found at ZAD 2. Many of the flaked artefacts here were made on a distinctive light grey flint, hitherto not encountered at ZAD 2. Many animal bone fragments were also recovered from the feature. The shaped limestone plaques are particularly interesting because they indicate an *in situ* workshop for the types of elaborately incised stone items found at ZAD 2 and more generally across PPNA sites in the Levant. Between F. 9 and Wall 1 lay an oval hearth (F.10) formed by an inset layer of burnt and fragmentary stones.

The relationship of Structures 2 and 3 was elucidated by the excavation of Square T22 (**Fig. 8**), which revealed that the structures are linked by a single long outer wall which follows a sinuous path, first curving to the north-east in Structure 2 and then returning to the south-east in Structure 3. The excavation of Square P21 encountered no architectural remains, thereby strengthening the likelihood of a doorway to Structure 2 in this area (**Fig. 10**), a possibility first indicated by the abrupt termination of F. 7 in Square Q22.

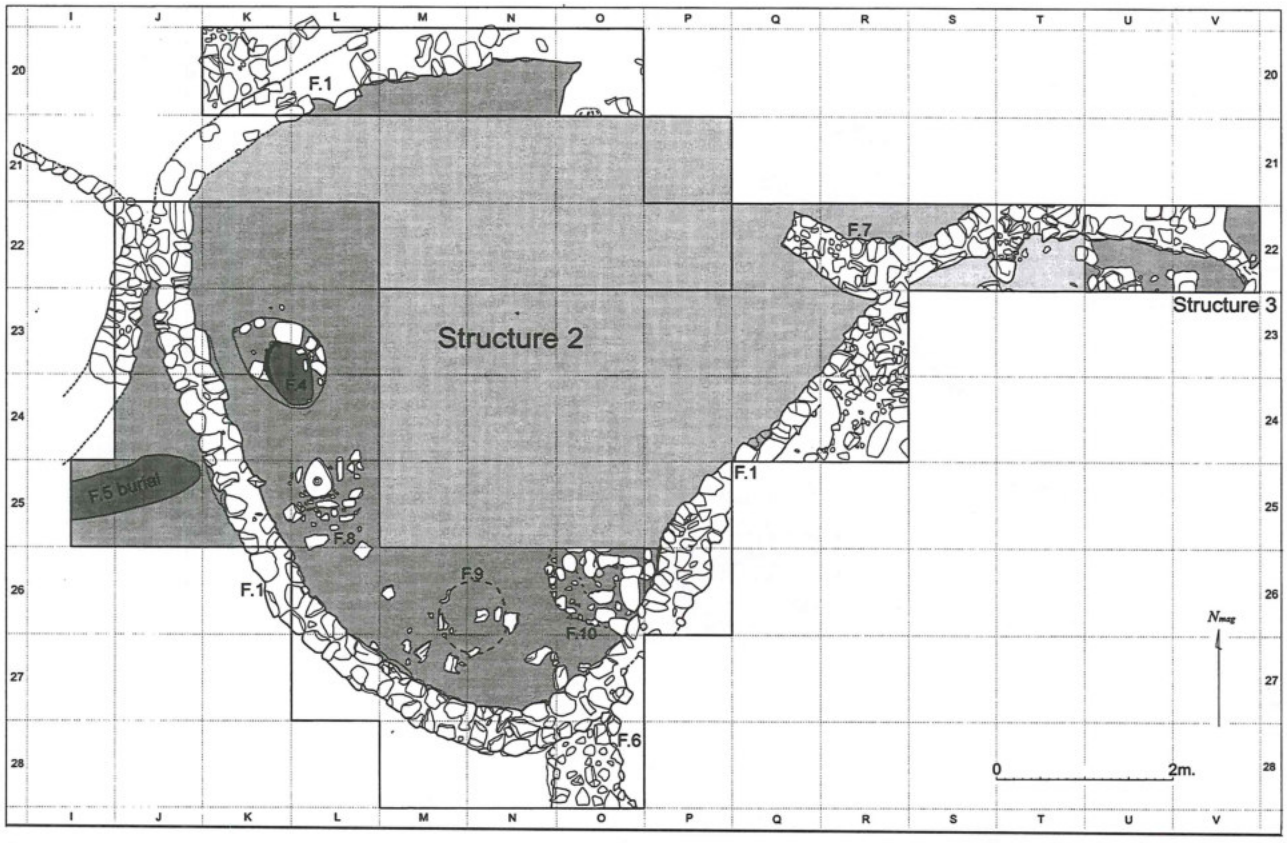
Excavation of the much shallower deposits in Structure 4 (**Fig. 11**) continued in a northerly direction this year. The cobblestone floor associated with Wall 1 in 2001 was found to continue over a broad area (Squares L/P-8/11). Wall 1 also continued to the north through Squares J/K-8/10 to the limits of excavation. Three oval to oblong circular stone installations were positioned in Squares L/M-8 (Fs 2-4). The middle one (F.2) consisted of limestone cobbles and fragments fixed with mortar, forming an enclosed ovoid area.

Artefacts from ZAD 2

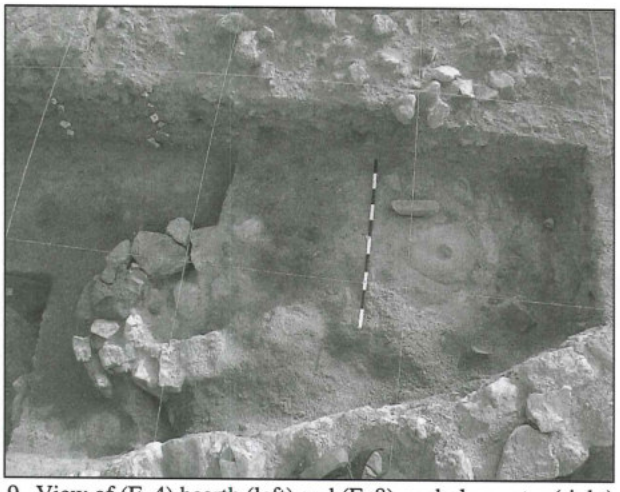
A wide variety of small finds were made in



7. Ẓahrat adh-Dhrā' 2 after three seasons of excavation.



8. Structures 2 and 3, ZAD 2. Darker shading indicates areas excavated to the uppermost (Phase 1) floors. Lighter shading denotes incomplete excavations above these.

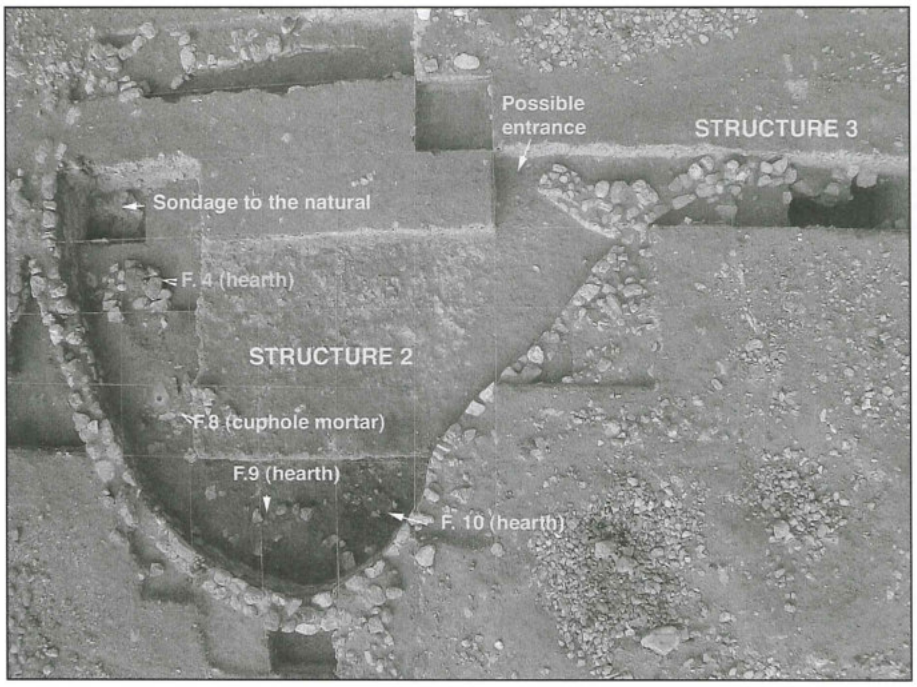


9. View of (F. 4) hearth (left) and (F. 8) cuphole mortar (right) in Structure 2, ZAD 2.

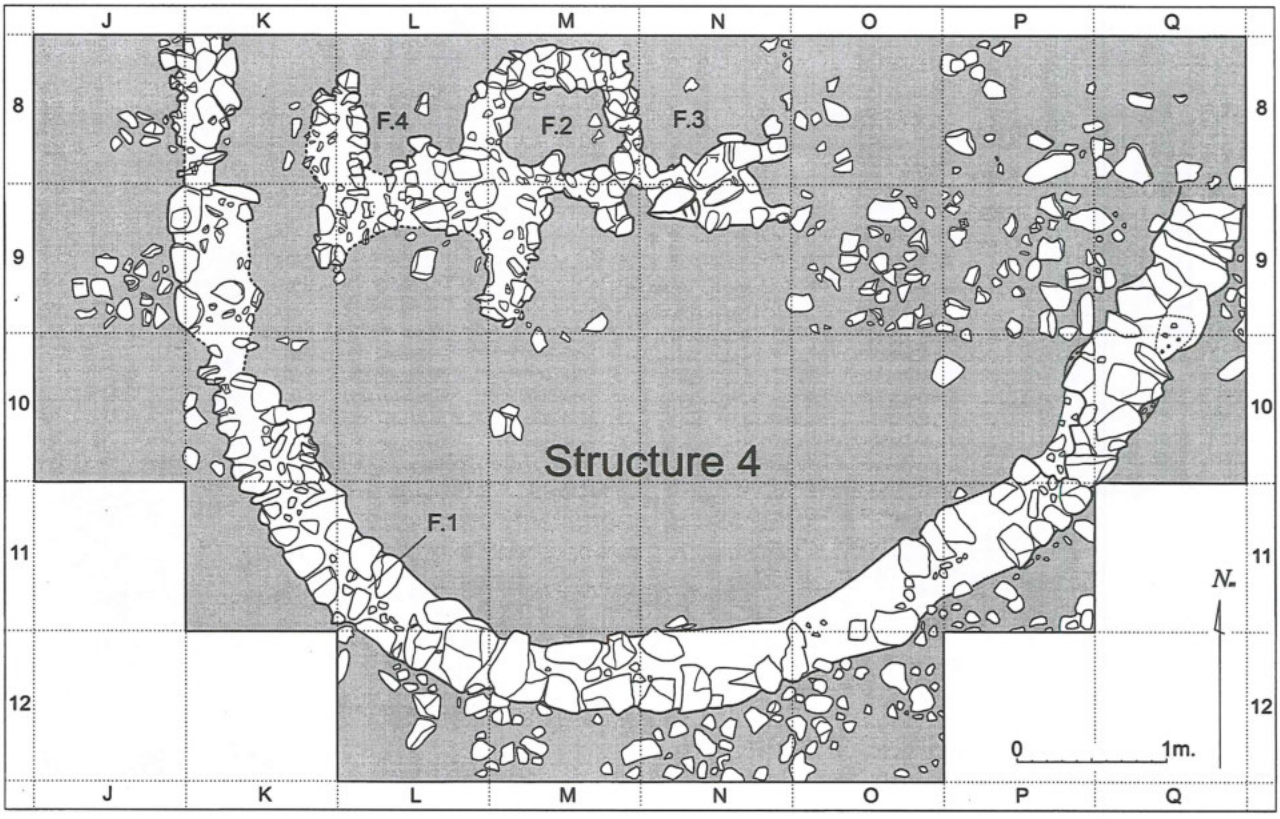
2002, including several types not previously discovered at ZAD 2. Two incised pieces were found; the first a broken limestone fragment (Registration Number [= RN] 02005) etched with five vertical lines pendant from a horizontal line (**Fig. 12c**) and the second a complete pebble (RN 020060) incised with a cross-hatched design of horizontal and vertical strokes on one face (**Fig. 12d**). The latter came from the rich F. 9 feature, which also yielded two shaped but plain limestone pieces in the form of an ovoid plaque (RN 020063, **Fig. 12a**) and a rectangular piece (RN 020065, **Fig. 12b**), together with a fragmentary ceramic figurine (RN 020061, **Fig. 13**). The figurine was incised with a delicate double-band of dashed lines.

Bone tools were found in numbers at the site for the first time (**Fig. 14**), in the form of needles (e.g. RN 020082), and a large fragmentary bone shaft, possibly a handle (RN 020081), associated with the nearby hearth, F. 10. Groundstone items included a basalt pestle with a flared termination (RN 020058), and a broken limestone bowl (RN 020011). Rare sickle blades with silica gloss were retrieved, including a broken fragment of a Beit Ta'amir sickle (RN 020015), and an unusual, small backed and bi-truncated example (RN 020088). A newly encountered type was a small, concave-based and bilaterally backed piece that resembles a blunted Salibiya point, but which, alternatively, may represent an unused Hagdud truncation (RN 02007). A complete obsidian bladelet (RN 02009) was the largest obsidian piece yet discovered from the site.

(PCE)



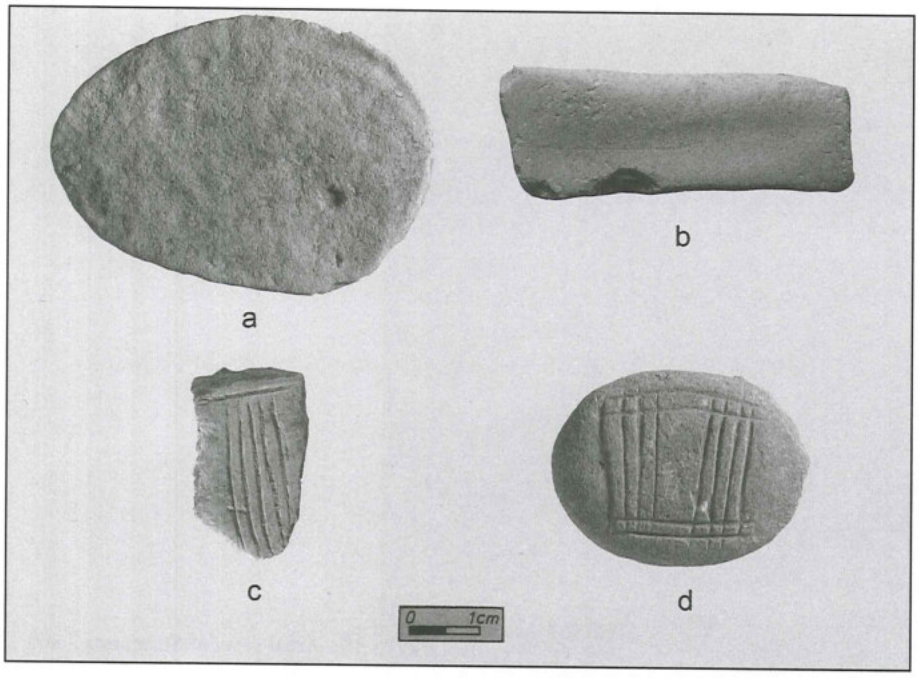
10. Areal view of Structures 2 and 3, ZAD 2.



11. Structure 4, ZAD 2.

Reconnaissance of the Plain of Dhrā'

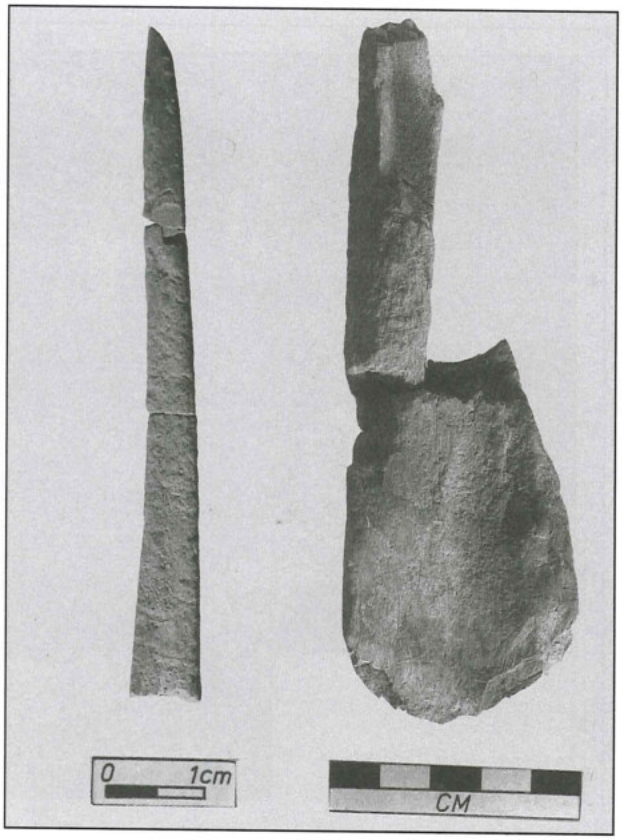
Between December 10 and 13, 2002 Falconer, accompanied by other project members, reconnoitered an extensive ritual landscape of cairn tombs and monumental features lying south of Wādī al-Karak (وادي الكرك) and extending east and southeast of Potash City, which had attracted our attention during the previous excavation seasons at Ẓahrat adh-Dhrā'. The only previous systematic reconnaissance of the southern portion of the Plain



12. Objects associated with the hearth (F. 9) in Structure 2; (a) Plain ovoid plaque RN 020063, (b) shaped rectangular limestone piece RN 020065, (c) Broken, incised limestone plaque RN-02005; (d) incised limestone pebble RN 020060.



13. Obverse and reverse views of fragmentary ceramic figurine (RN 020061), associated with the hearth (F. 10) in Structure 2.



14. Bone tools associated with the hearth (F. 10) in Structure 2; (left) bone point (RN 020082) broken into three fragments and (right) fragmentary bone handle (RN 020081).

of Dhrā', a survey of the proposed Potash City town site in 1977 (McCreery 1977/78; Clark 1979), characterized the roughly 60 hectare expanse of the townsite as a 'necropolis' probably dating to the Chalcolithic Period. This survey, an outgrowth of the Bāb adh-Dhrā' (باب الذراع) excavations, had special interest in any possible evidence of Early Bronze Age burials, since "the southern boundary of the Bāb adh-Dhrā' cemetery has never been defined" (McCreery 1977/78: 150). The surveyors noted that most surface pottery lay in the northern portion of the township, most notably in two concentrations of Chalcolithic and Early Bronze I-II sherds at its northernmost periphery,

about one kilometer south of Bāb adh-Dhrā' (McCreery 1977/78: 151; Clark 1979: 57). However, in contrast to the charnel houses and subterranean shaft tombs that constitute the Bāb adh-Dhrā' cemetery (e.g., McCreery 1977/78: 161; Schaub 1981: 45; Schaub and Rast 1989), this burial ground featured 30 poorly preserved, above-ground tumuli or cairn tombs. These tombs had one or two central burial cavities defined by one or two concentric stone rings ranging between two and six meters in overall diameter (McCreery 1977/78: 154; Clark 1979: 61-67). All but one of the tombs lay south of an enigmatic one meter-wide, east-west stone wall that was traced for more than two kilometers. Both ends of this wall were eroded or disturbed, so its full length remained uncertain (Clark 1979: 58). The most prominent features of this cemetery were two large stone circles (Clark's "Ring 1" and "Ring 2"), each measuring approximately 25 meters in diameter, bisected by two parallel lines of stones and punctuated with two to three tumuli along their perimeters (McCreery 1977/78: 154-155, fig. 3; Clark 1979: 70-73, fig. 10; Worschech 2002: abb. 17.2).

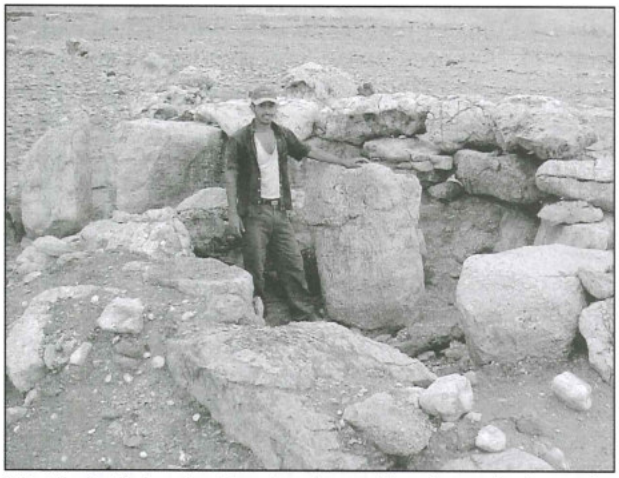
Our 2003 reconnaissance suggests that this ritual landscape once extended over a much larger area between the foot of the mountains of Karak to the western edge of the Plain of Dhrā', positioned south of Wādī al-Karak, and to the south and southeast of present-day Potash City. Isolated cairn tombs were located north and northeast of ZAD 1 and 2, some not far from the Wādī al-Karak's south bank. More numerous tombs lie over an area extending two to three kilometers south and southeast of Potash City, especially along prominent ridgelines (**Fig. 15**). Falconer visited at least 50 tombs beyond Potash City that clearly represent an extension of the cemetery reported previously by McCreery and Clark. In keeping with their published descriptions of the Potash City cemetery, these additional cairns include one or two concentric stone circles, usually defining a single central chamber, occasionally a double chamber, running the gamut of Worschech's (2002: 107) R2A, R2B and R3 cairn typology. A clear bisecting wall marks the double-chambered tombs. The most monumental of the cairns lies atop a large basalt ridge south of Potash City. With two clear concentric wall alignments of massive stones and an exterior diameter of 10 meters, it would have been a topographically prominent edifice. Virtually all the tombs visited in 2003 have been eroded or robbed, most reveal poorly preserved human bone fragments, and very few provide material culture.

The most notable feature among these newly reported tombs is a large stone oval lying approximately 1 kilometer south of the Mazra'a-Karak road. This oval, measuring approximately 80 by 100 meters, is a larger version of Clark's Rings 1 and 2. Its northern arc incorporates a single-chambered cairn measuring five to six meters in diameter (**Fig. 16**). To the east-southeast of this oval lies a very rubbly large square structure with sides roughly defined by four pairs of parallel walls. Regrettably, both this structure and the stone oval with its cairn tomb provided no surface material culture.

In conjunction with these cemetery explorations, Falconer and Christopher Day visited the Monolithic Pillar Site reported by Körber (1993) roughly 500 meters south of the Wādī adh-Dhrā' at the foot of the mountains of Karak. Although



15. Cairn tombs along a ridgeline south of Potash City. Note tomb in foreground and upright stones of two tombs on the horizon, facing west.

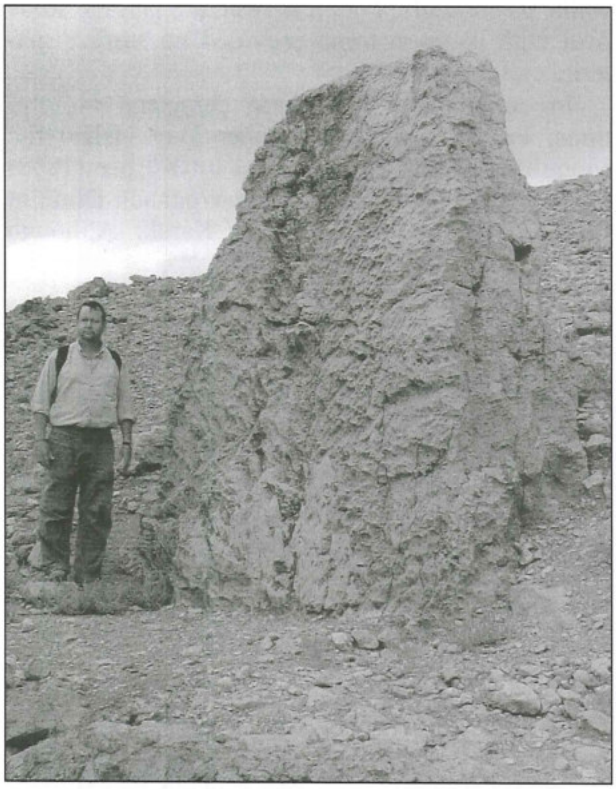


16. Yunis Salameh Abu Arqub standing in a circular cairn tomb incorporated into the northern arc of the large stone circle south of Potash City. Note central pillar and stones of large circle in the background; view east.



18. View north to a portion of the 400-metre long wall associated with the Monolithic Pillar Site.

Körber coined the site's name from a nearly three meter tall stone monolith (**Fig. 17**), its most substantial feature is a nearly 400-meter long stone wall that descends to the west along a ridgeline toward the Plain of Dhrā' between two small but severely incised wadis (**Fig. 18**). Körber (1993: 551) described tumuli associated with the wall, including a semicircular stone structure "pieced on to the monolith." Our visit identified another circular stone alignment at the foot of a second standing stone erected to the north of the wall. We also noted that the site's wall still stands up to three courses high, with well-laid flat faces. Abundant large rock fall suggests this wall once stood considerably higher. It is tempting to speculate that this boundary marker may have once linked with the east-west wall reported by McCreery and Clark. At the very least these walls clearly are integral features of a varied and widespread ritual landscape on the Plain of Dhrā'.



17. Christopher Day standing next to the Monolithic Pillar reported by Körber (1993); view southeast.

The dating of this landscape and its integration with the ancient communities of Dhrā' remains elusive. The Potash City survey excavated 14 cairns and three soundings along the two kilometer east-west wall that produced a modest ceramic collection made up primarily of small body sherds (Clark 1979: 73). Unfortunately, no pottery figures from this survey have been published (although Clark refers in his article to a pottery figure which remained inadvertently unpublished, but which he has since graciously allowed us to inspect). McCreery (1977/78: 161) summarizes the Potash City pottery as unpainted coarse ware "with large calcite inclusions and … steep angled, simple rims, rope molding decoration and loop handles." Clark describes it as "poorly made," low fired, "hand-made and very coarse with much grit tempering," and points to a major diagnostic characteristic of "applied bands of finger-moulded clay" (Clark 1979: 73-74). Both McCreery and Clark (1993: 552) propose a Chalcolithic date for this pottery, and by extension the entire Potash City burial complex, based especially on its coarse, heavily tempered ware and finger impressed rope molding. Körber similarly labels the pottery associated with

the Monolithic Pillar Site as Chalcolithic and Early Bronze Age without discussion or illustration. These chronological inferences must have considered the apparent absence of local settlement from the Middle Bronze Age through the Hellenistic Period (e.g., McCreery 1977/78: table 1; McConaughy 1981; Rast and Schaub 1974; Schaub and Rast 1989: 45), but they offer at least two clear caveats. McCreery (1977/78:161) notes that Jim Sauer, a leading authority on the pottery of ancient Jordan, considered the assemblage to be "atypical," presumably for the Chalcolithic. In addition, Clark (1979: 77) suggests prudently that "so little is known of the Chalcolithic material remains in this region that it would be rash to speculate too far at this stage".

Several other threads of evidence suggest that this presumed Chalcolithic date should be reconsidered. First, Schaub and Rast (1989: 489, fig. 283) raise the possibility of an alternate date for Tomb B1, a circular tumulus in Area B along the Karak road east of Bāb adh- Dhrā'. They note, "an unusual sherd [unavailable] recorded from the area around Tomb B1 was part of a cooking pot with simple vertical rim and small holes around the side just below the rim. The type is illustrated in Megiddo Stratum XVI [Loud 1948: pl. 7:11], and dates to the early part of MB II" (Schaub and Rast 1989: 489). Second, Worschech (1985: 28-34, figs. 7-9) reports approximately 50 circular tumuli along the Wādī Jarra, about five kilometers north of Wādī al-Karak, which he interprets as similar to the tombs described by Clark (1979). Worschech's excavation of one tomb and exploration of about 30 others produced no chronologically diagnostic material culture. While acknowledging the lack of conclusive evidence, he dissents from Clark's suggested Chalcolithic date for the local tombs of this type, suggesting "a date to the MB period seems more likely" (Worschech 1985: 31). Third, Clark (1979: 67) describes pottery "mingled" with human bones inside Potash City Cairn 1 that belonged "to the same vessel, or one very similar, as a number of sherds which were found on the surface outside the cairn." He posits that these sherds were either broken in the cairn at the time of burial or already lay on the ground at the time the cairn was built over them, "finding their way into the chamber when the burial was made" (Clark 1979: 69). In either case, as Clark notes, the sherds provide a *terminus post quem* for the burial. Two of these sherds (to have been illustrated in Clark 1979: fig. 11) are described as pieces of a handmade "pithos-type" vessel with walls 7-11 millimeters thick and a "flat" rim, below which are "a series of deep finger impressions" and "a raised applied clay band" (Clark 1979: 73). This description and our subsequent inspection of drawings of the pottery excavated from Cairn 1 (courtesy of V. Clark) suggest the strong possibility that these sherds represent Middle Bronze Age cooking pots similar to those excavated in abundance from Ẓahrat adh-Dhrā' 1 (Edwards, *et al.* 2002: fig. 24), therefore implying that Cairn 1 dates to the Middle Bronze Age at the earliest.

During our 2003 reconnaissance we inspected abundant sherds in the vicinity of the Monolithic Pillar Site, and very little pottery anywhere else. Associated with the pillar and its wall we found one clearly Roman sherd, one modern jar fragment and numerous generically Bronze Age sherds, but nothing diagnostic of a specific period. Otherwise our wide-ranging visits to the cairns south of Potash City produced a total of two to three Roman sherds and a handful of possible Bronze Age ceramic fragments.

The identification and excavation of Ẓahrat adh- Dhrā' 1 (Edwards *et al.* 2001; 2002) now dispels the presumption that the Plain of Dhrā' was uninhabited during the Middle Bronze Age. It now seems clear that the Dhrā' cairn tombs are unlikely to date to the Early Bronze Age and that at least some of them (e.g., Tomb B1, Cairn 1) probably date to the Middle Bronze Age. Moreover, the published descriptions of pottery associated with these cairns coincides remarkably with our analyses of the major pottery components excavated from Ẓahrat adh-Dhrā' 1: coarse-tempered, plain rim, straight-sided, flat-bottomed cooking pots (Edwards *et al.* 2001: 152-153; 2002). The ZAD 1 assemblage clearly dates to Middle Bronze II A and early Middle Bronze II B. These tantalizing lines of evidence raise the distinct possibility that an elaborate ritual landscape, perhaps dating to the Middle Bronze Age and involving the occupants of Ẓahrat adh-Dhrā' 1, was a major expression of Bronze Age life and death on the Plain of Dhrā'.

(SEF)

Investigations into the Roman/ Nabataean Complex at Qaṣr al-Bulayda

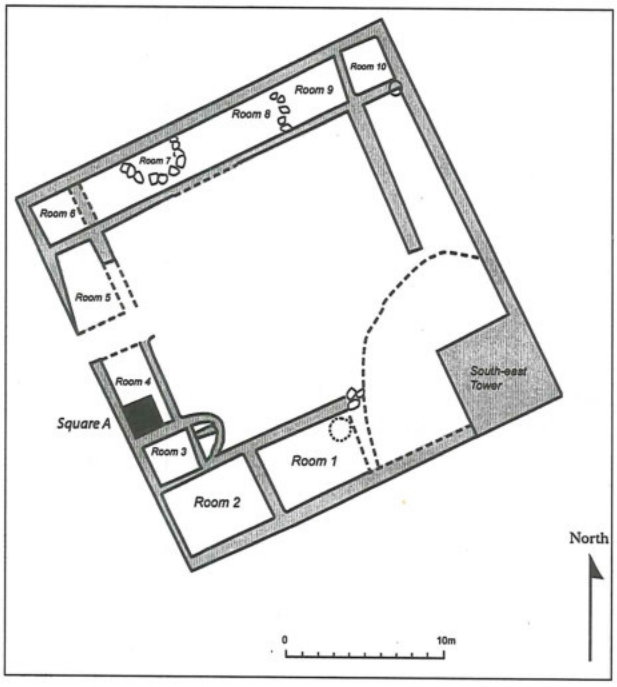
A number of architectural complexes and surface features located at Qaṣr al-Bulayda (QB) reveal an extensive Nabataean and Roman (ca. 312 BC- 324 AD) presence nestled under the steeply rising Jordan Valley margin on the north bank of Wādī al-Karak (**Fig. 1**). Qaṣr al-Bulayda ('the country palace [or] fort') includes a small hamlet comprising the remains of three fortified architectural complexes that have not been previously

investigated, as well as a number of other features positioned within a one and a half square kilometre area. Even though the QB complexes have not been intensively studied, they were nevertheless subject to a survey in 1983 and 1984 by Worschech (1985) as part of the 'Northwest Ard Al-Karak Project'. Worschech referred to the three structures in question as 'Sites 45', '46' and '47', terms which have continued in use as part of this investigation.

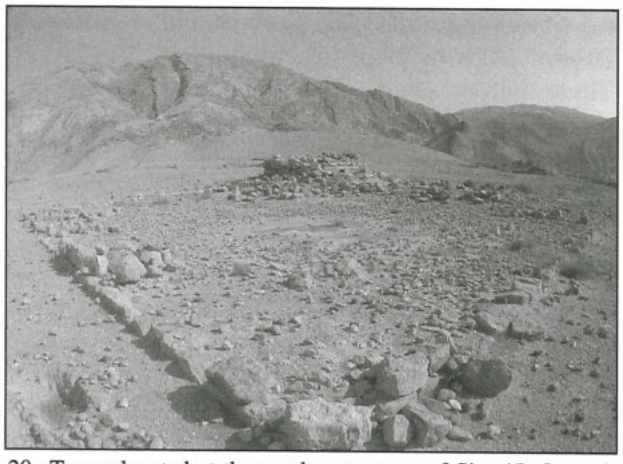
The aims of this fieldwork season were to plan and record in detail the three complexes; to survey the QB localities to produce a base map making clear the exact position of the complexes in relation to the natural landscape, to each other, and to additional man-made features such as ancient roads, dams, aqueducts and terraces; and to combine surface survey with small-scale excavation.

Qaṣr al-Bulayda Site 45

Site 45 is a square building measuring 26.7m x 26.4m located in the middle of a dry and arid plain immediately below the final escarpment of the edge of the Jordan Valley (**Fig. 19**). Site 45, the best preserved of all three structures, features a tower (6.1 x 5.9 m) in the southeast corner which stands five to six courses high, with the lintel of the entrance visible above rubble from the tower's collapsed upper section (**Fig. 20**). The rectangular stone blocks are well-dressed with small limestone chips filling the interstices, rendering each course balanced and symmetrically aligned. On the west-



19. Plan of Site 45, Qaṣr al-Bulayda.

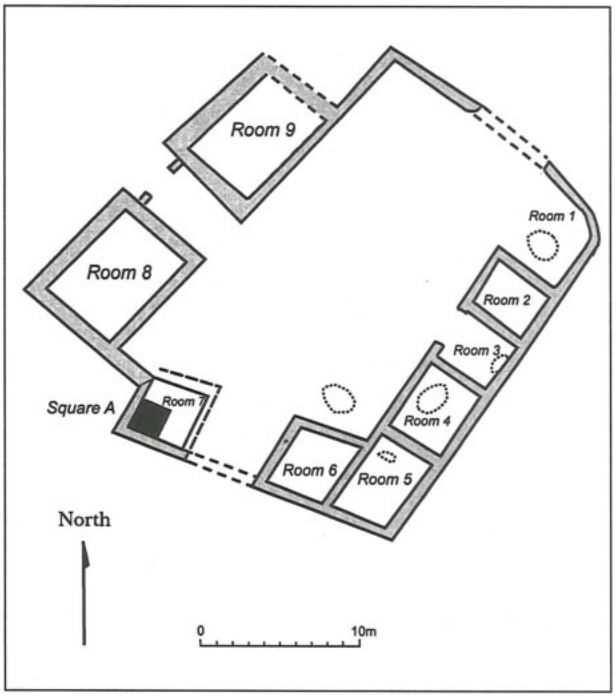


20. Tower located at the southeast corner of Site 45, Qaṣr al-Bulayda.

ern face of this tower, the exterior surfaces of the stone blocks are carved in 'boss' relief. An inscribed single letter, either Thamudic or Nabataean, was recorded on the exterior surface of a limestone block on the tower's northern face. The perimeter wall lines (0.95m-1.05m in width) are symmetrically aligned and are composed of irregular-shaped medium to large sized blocks of undressed limestone and pink sandstone measuring 0.87m x 0.38m to 0.48m x 0.35m in size. These enclosure walls are two to three courses high and reveal an interior open courtyard around which rooms of varying sizes (ranging from 3.8m x 3.1m to 6.6m x 6m) are positioned. Lining the southern perimeter wall, one of these rooms contains an intact olive or wine press (1.4m in diameter) that suggests this area may have been used for industrial purposes. Since rooms with similar dimensions to the SE tower are positioned in each of the other corners, it is likely that these were also corner towers built to heights of at least two stories. Along with the thick and solidly built enclosure walls, it is clear that Site 45 was well fortified and may have served a defensive purpose. There are many Nabataean/ Roman potsherds scattered over the site and three coins were found on the surface.

Qaṣr al-Bulayda Site 46

Site 46 is situated approximately 1 kilometre to the south of Site 45 in an open area presently surrounded by cultivated plots of land (**Fig. 21**). It is positioned on a slightly elevated artificial mound where traces of terracing are visible to the north and west of the structure. Site 46 is not well-preserved: the centre of the complex has been flattened, removing the middle sections of the east and west perimeter walls and displacing the stones so that these, as well as other interior walls, are not in situ. There are also a number of circular and ovoid-

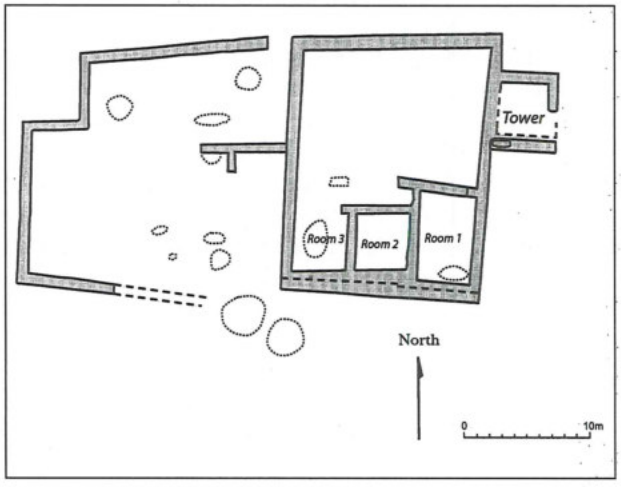


21. Plan of Site 46, Qaṣr al-Bulayda.

shaped pits and depressions dotted throughout the structure that may be graves of a more recent date. Site 46 measures 26m x 24m in size and is slightly irregular in plan. The perimeter walls are 0.75m to 1.15m wide, comprised of medium and large-sized blocks of undressed limestone, chert and pink sandstone (0.4 x 06m to 0.45m x 0.65m) that stand two to three courses high. Like Site 45, small limestone chips fill the interstices of the walls so that the courses appear even and straight. A series of interior rooms of similar size (5m x 5.5m to 5.05m x 6.4m) are built against the south and west perimeter walls (the eastern part of the structure is too damaged to trace any wall lines). In the northern part of the complex are two large rectilinear rooms measuring roughly 9m x 7m that flank the building's entrance (3.7m wide) and a passageway that leads to an internal open courtyard. There may be two occupational phases at Site 46 as evidenced by differences in the types of masonry used in certain sections of the structure; for example, the southern boundary wall of Room 9 is constructed with small stones (0.10m x 0.15m) rather than the medium and large-sized blocks used elsewhere at the site. The surface pottery scattered across the site has been identified as Nabataean/ Roman and two coins were recovered at surface level. Like Site 45, it is clear from the ground plan and masonry that Site 46 was well-fortified with the addition of possible watchtowers, but its function remains a matter of conjecture.

Qaṣr al-Bulayda Site 47

Located about 400m to the southeast of Site 46 and 150m to the north of Wādī al-Karak on a slightly raised artificial mound is Site 47 (**Fig. 22**), a fortified complex with much evidence of post-occupational disturbance. There are a number of circular and ovoid-shaped pits and depressions throughout the site which may be graves of a more recent date (there is also a grave in east-west alignment situated near an adjoining tower in the northeast and constructed from the tower's southern boundary wall) and some modern walls built from reused stone blocks. Site 47 features solidly-built encasement walls (0.75m- 0.87m in width) in regular alignment which stand three to four courses high in some places, as well as a northeast tower two courses high and measuring 5.5m x 5.3m in diameter. There appear to be two phases of construction at Site 47: the main rectilinear complex (measuring 15.9m x 14.55m in diameter) with the tower, an interior courtyard and three rooms of varying sizes (5.3m x 6.4m to 5.65 x 8.2m) lining its southern perimeter wall; and an (earlier?) complex positioned on a slightly lower, plateau-like area immediately to the west and measuring 21.7m x 21.1m in diameter. Here, the perimeter walls are in different alignment to the main structure, with the southern wall running to the south of this complex. Only one internal contemporaneous wall line is visible within the central enclosure which is surfaced with a gravely deposit. The walls are composed similarly to Sites 45-46 and the main structure of 47 stands one to two courses high, with a maximum width of 0.77m. The surface material scattered throughout Site 47 is Roman with very little Nabataean pottery identified. Given its architecture and its location next to Wādī al-Karak, it may be that Site 47



22. Plan of Site 47, Qaṣr al-Bulayda.

served a defensive purpose and is possibly later in date than Sites 45 and 46.

(AA)

Additional Sites and Features at Qaṣr al-Bulayda

A number of other archaeological features and sites have been surveyed and documented in the QB locality. These include the remains of an aqueduct built with large, dressed limestone and sandstone blocks (1.03m x 0.70m) and measuring 1.4m-2.16m in width with traces of plaster visible on its upper exterior surface. This aqueduct can be followed, in sections, following a narrow wadi to the west and south of Site 45 and then along the bottom of a ridge to the east of Sites 46 and 47 where it runs in a north-south direction. It terminates at the edge of Wādī al-Karak next to the remains of a possible dam. Along the north and south ridges of Wādī al-Karak to the east of Site 47 are a number of complexes which may be broadly dated to the Roman period and which can be assigned a defensive or military function on the basis of their location, architectural form and surface scatter material. Site 47.1 is located about 1 km from Site 47 on the upper northern ridge of the *Wadi* and appears to be a watchtower (5m x 5m) consisting of four neatly aligned walls (0.65m in width) standing four to five courses high with the same type of masonry as the other QB sites. A further 700m along this ridge on a flat plateau is a large L-shaped structure with solid encasement walls and a tower standing four to five courses high. The walls of Site 47.2 are 1.03m-1.12m in width and are composed of large square and rectangular limestone boulders (0.4 x 0.6m) arranged in straight courses. There is a dense concentration of Nabataean and Roman pottery scattered over the surface. As this site occupies a strategic position with a clear view looking down Wādī al-Karak, it seems certain that it served in antiquity as a small fort.

Further along the northern ridge of the wadi is a possible Nabataean aqueduct cut into the sandstone face. The surface of the aqueduct is well-finished in some portions and some stones bear the characteristic Nabataean oblique-angled dressing. On the south side of Wādī al-Karak near Site 47.2 is a rectilinear structure (Site 47.3) with solid walls (0.75m in width) built from very large irregular limestone boulders (1m x 0.56m) that stand five courses high and encircle four interior rooms. Site 47.4 is situated about 50m to the west and features a number of interrelated wall lines over a 150 square-metre area scattered with many sherds (Bronze Age and Roman). Its walls are preserved from one to three courses high.

Site 47.4 appears to be the same site identified by Körber (1993: 553) as "a major Early Bronze Age II/III city" lying "on the southern bank of the mouth of Wadi el-Karak into the Ghor." Körber named the site "Buleda," though Worschech's survey apparently did not encounter it. Our inspection of the settlement and its surface pottery corroborated an EB II-III date, with the more reserved suggestion that this settlement was a moderately sized village. Today this site perches on the steep southern cut bank of Wādī al-Karak, with no nearby plain of flat, potentially arable land such as that found on the north bank around sites 45, 46 and 47. This site location suggests a higher stream level during the Early Bronze Age, with subsequent severe downcutting.

(AA and SEF)

Excavations at Qaṣr al-Bulayda

Qaṣr al-Bulayda Site 45

A 2m x 2m trench was laid out alongside the southern and western boundary walls of Room 4 in the best preserved complex, Site 45, to obtain an occupational history of the site. Five layers of heterogeneous natural and cultural deposits were encountered, contained 385 Nabataean/Roman sherds (38 diagnostic), five coins, two beads, glass and (animal) bone fragments and deposits of mudbrick and charcoal. Traces of an occupational surface of hard compact clay associated with Wall 1 were identified. Of interest, this excavation showed that Site 45 has at least two phases of construction: the southern boundary wall of Room 4 (Wall 1) is an earlier wall built directly on top of the natural bedrock surface, while the western perimeter wall of Site 45 (Wall 2) was built from a higher surface, and thus belongs to a later constructional phase.

Qaṣr al-Bulayda Site 46

A 2m x 2m trench was also laid alongside the northern and southern boundary walls of Room 7 in Site 46. Five layers were excavated, which yielded 367 sherds (39 diagnostic) of Nabataean/Roman date, as well as two coins, *ṭābūn* fragments, glass and animal bone fragments and charcoal that, together with some soil samples, have been collected for post-excavation analysis. A compact clay occupational surface was identified that appeared to be contemporaneous with Walls 3 and 4. These walls were engaged and built directly on top of the underlying natural gravel sediment.

Qaṣr al-Bulayda Site 47

A sample of surface pottery was collected from

Site 47 for post excavation analysis, as there was no time to conduct a small excavation during this fieldwork season. Two samples of diagnostic material (mainly Roman) were collected from the main complex (11 sherds), as well as the 'west plateau' structure (26 sherds) to assess whether these parts of Site 47 are contemporaneous in date to Sites 45 and 46.

(AA)

Carbonized Plant Remains from Qaṣr al-Bulayda Sites 45 and 46

Carbonized plant material was recovered from the excavation trenches effected at Site 45 and Site 46 at Qaṣr al-Bulayda. A total of twelve liters of sediment, from two sample localities: QB 45, Area A, Locus 4, bag 1 (3.5 liters) and bag 2 (3.5 liters); and QB 46 Area A, Locus 3, bag 1 (3 liters) and bag 2 (2 liters), was processed by water flotation at ACOR in Amman. After measuring the sample volume, each sample was poured into a bucket of clean water and then gently mixed by hand to loosen the plant material from the soil matrix. A clean piece of cloth (mesh 0.5mm) fitted over a strainer was used to collect the buoyant seeds and plant fragments. This was repeated until all plant material was collected. The dried flotation samples were then sorted under low magnification (10-40X) at Arizona State University.

A modest number of seeds, wood fragments and snail shells were found in these samples. The results of the seed analyses document that cereals and legumes were components of the diet of the inhabitants of Qaṣr al-Bulayda (**Table 4**). Food plants include bread wheat, emmer, and hulled barley seeds, as well as both lentil and pea. Field weeds and wild grass seeds suggest the presence of local fields. The most common wild seed is *Aizoon. Aizoon hispanicum* is common on saline and gypseous soils, characteristic of the Dead Sea region (Zohary 1973: 443, 466).

(PLF)

Acknowledgements

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Phillip C. Edwards
Alexandra Ariotti

Archaeology Program
La Trobe University,
Victoria 3086, Australia

Steven E. Falconer
Department of Anthropology
Arizona State University
Box 872402, Tempe, AZ 85287-2402
USA

Patricia L. Fall
Department of Geography
Arizona State University
Box 870104, Tempe, AZ 85287-0104
USA

Thomas K. Swoveland
Department of Economics and Geography
US Air Force Academy
Colorado Springs, CO
USA

Table 4: Carbonized plant remains from Qaṣr al-Bulayda sites 45 and 46.

Plant material	Sample QB:46 3.0A	Sample QB:45 4.0A
Nutlet fragments	4	-
Cultivated legume fragments	2	-
Lentil (*Lens esculenta*)	-	1
Pea (*Pisum sativum*)	2	1
Bread wheat (*Triticum durum/aestivum*)	-	1
Emmer (*Triticum dicoccum*)	1	-
Undifferentiated wheat (*Triticum* sp.) fragment	1	-
Hulled barley (*Hordeum*) fragment	-	1
Cereal grain fragment	1	-
Phalaris sp.	1	-
Undifferentiated wild grass	1	-
Aizoon cf. *hispanicum*	11	3
Chenopodium sp.	-	1
Unidentified seeds	2	-
Volume of sediment floated	5 liters	7 liters

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CLEANING AND EXCAVATION OF THE RENAISSANCE TOMB AT PETRA

Caroline Huguenot, Mahmoud Mohammed al-Bdool and Stephan G. Schmid

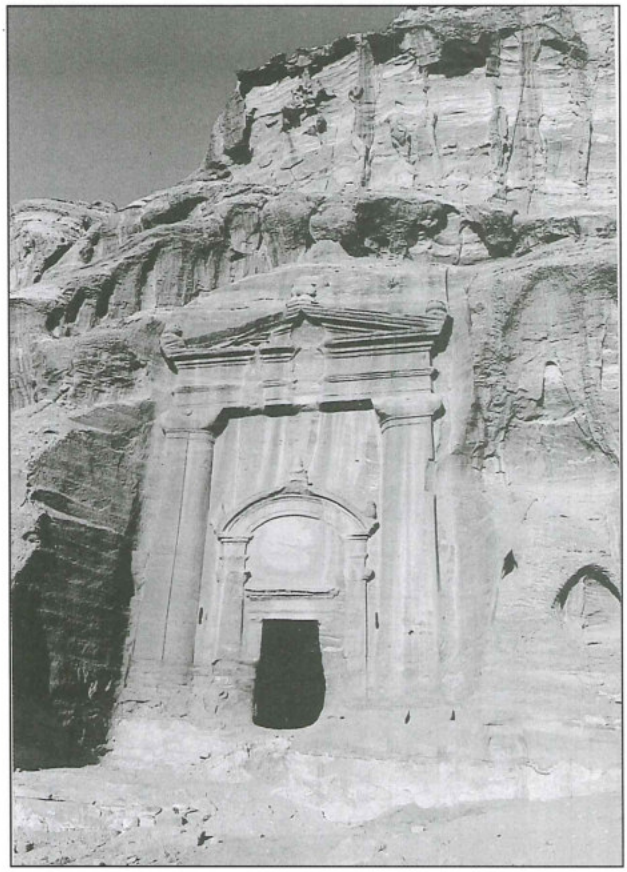
Introduction

During several months within 2003, a World Bank supported project took place in Petra. Up to 60 members of the Bdool tribe were employed in order to clean in a systematic way the cavities of the ancient city, that is tombs, living caves, banqueting halls and the like. The project was carried out under the direction and supervision of the Department of Antiquities. Overall director of the project was Suleiman Farajat from the Petra office of the DoA, while the local supervision was assured by Mahmoud Mohammed al-Bdool.

By coincidence, the cleaning of the "Renaissance Tomb" (**Fig. 1**; BD 229) at the entrance to the Wādī Farasa took place at the beginning of the 2003 season of the International Wadi Farasa Project (IWFP)[1]. During the cleaning of the tomb it became soon apparent that the interior of the rock cut space contains a large number of shaft graves with at least parts of the original covering *in situ* (**Fig. 2**). In order to prevent illicit excavation of these tombs it was agreed with Suleiman Farajat, responsible for the above mentioned cleaning project, to join forces and to excavate and document the tombs. We are very grateful to Suleiman Farajat for this exemplary cooperation. Mahmoud Mohammed al-Bdool (MA), Caroline Huguenot (MA, Lausanne), André Barmasse (MA, Basel) and Stephan G. Schmid (Montpellier) were responsible for the works carried out, assisted by up to four workmen from the International Wadi Farasa Project.

Cleaning and Excavation of the "Renaissance Tomb"

The opportunity for cleaning and excavating the interior of the "Renaissance Tomb") on the tomb see McKenzie 1990: 166f.; Brünnow and Domaszewski 1904: 158 no. 229) has to be hailed all the more since so far only a few Nabataean tombs from Petra have been excavated more or less in context and according to modern archaeological standards (Bikai and Perry 2001; Zayadine 1986: 224-237, 248-258; 1982: 365-373; 1979: 185-192; 1974: 139-150; Murray and Ellis 1940: 7. 12f.). The funerary customs of the Nabataeans still remain rather enigmatic, not the least related to the strange testimony by Strabo 16, 4, 26 stating that "[The Nabataeans] esteemed the dead like dung" on this see the controversial discussion by Hackl) *et al.* 2003: 96-98, 615-617; Zayadine 1986: 221;



1. Wādī Farasa East, Renaissance Tomb (Schmid).

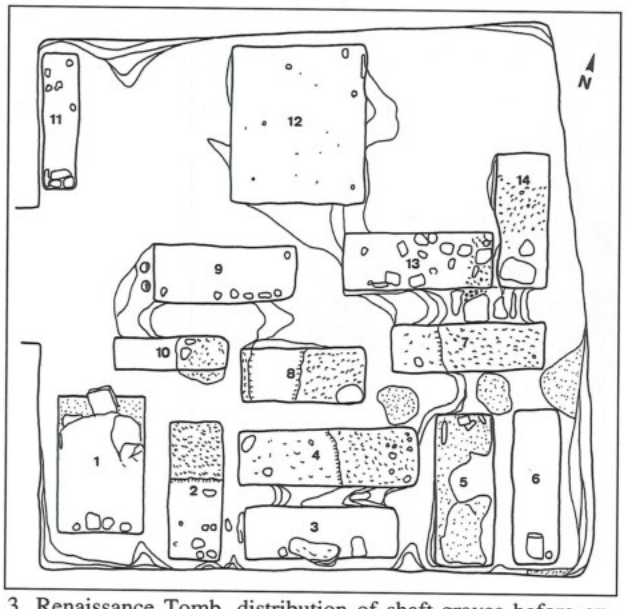
1 On the International Wadi Farasa Project (IWFP) see http://home.tiscalinet.ch/iwfp and the preliminary report on the 2003 season by S. G. Schmid and A. Barmasse in this volume.



2. Renaissance Tomb, interior after cleaning of the surface (Schmid).

Wright 1969). 14 graves were counted inside the Renaissance Tomb (**Figs. 3. 4**), out of which no. 1 (**Fig. 5**) for sure and no. 12 perhaps did contain two or more burials (cf. **Fig. 3**). The complete study, including a detailed paleoanthropological analysis of the bones collected will take some time, for the moment we present only a brief summary.

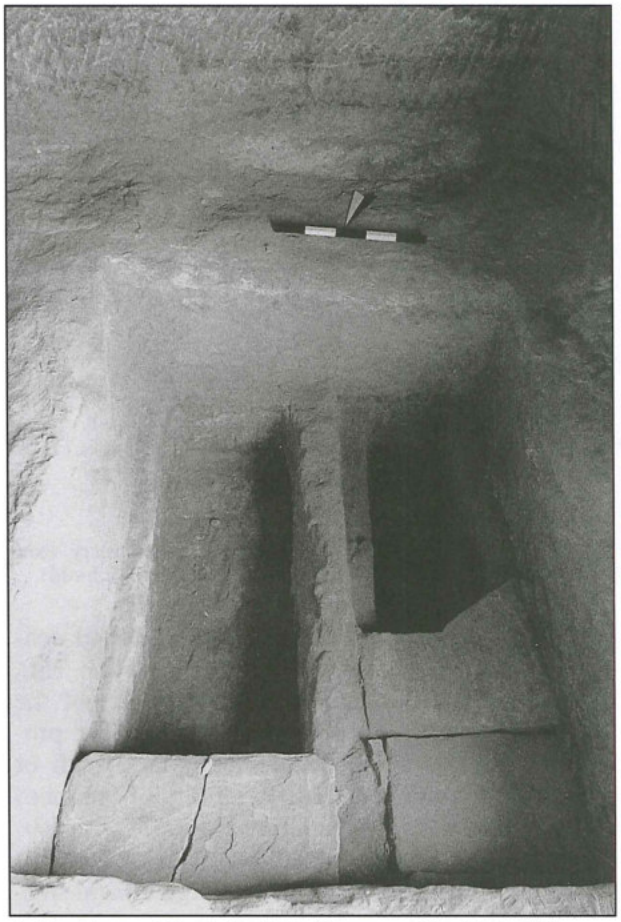
All the graves were looted and this most probably already occurred during the Medieval period as is indicated by the important amounts of Medieval pottery found on the surface and inside most of the tombs, such as the jug illustrated on **Fig. 6.** Most of the tombs were constructed as shafts with a kind of shoulders in about half the height of the grave onto which the covering slabs were applied, as can be seen for instance in the case of tomb 1 (**Fig. 5**). On the top of the slabs smaller stones and sand were added in order to completely cover the tomb. The cavity forming the *loculus* is in some cases slightly rounded at both ends. In some cases the pottery and other finds collected from *beneath* the level of the slabs were sufficiently homogeneous in order to allow some further thoughts as to their chronology. As an exemplary case we shall briefly discuss tomb no. 8 (cf. **Fig. 3**). Upon the level of the covering slabs, Nabataean pottery was mixed with Medieval sherds (**Fig. 7**), while beneath the level of the slabs the finds were exclusively Nabataean (**Fig. 8**). The Nabataean pottery from upon the slabs as well as all the pottery from beneath the slabs belongs exclusively to phase 3b (last quarter of the first century AD) as does a complete lamp of the Negev 1a type (**Fig. 9**; on Nabataean pottery see Schmid 2000 passim; for phase 3b and its chronology ibid. 28f. 38; on Negev 1a lamps see I. Zanoni in Bignasca *et al.* 1996: 314-316; new research by M. Grawehr shows that Negev 1a lamps continue well into the second half of the first century AD, personal communication). The same picture is provided by other tombs containing sufficient material. Within all the material collected in the "Renaissance Tomb" there were very few Nabataean sherds belonging for instance to phase 3a (ca. AD 20-75), the vast majority of pottery belongs to the last quarter of the first century AD (with the exception of the Medieval pottery, of course). Although disturbed and in very



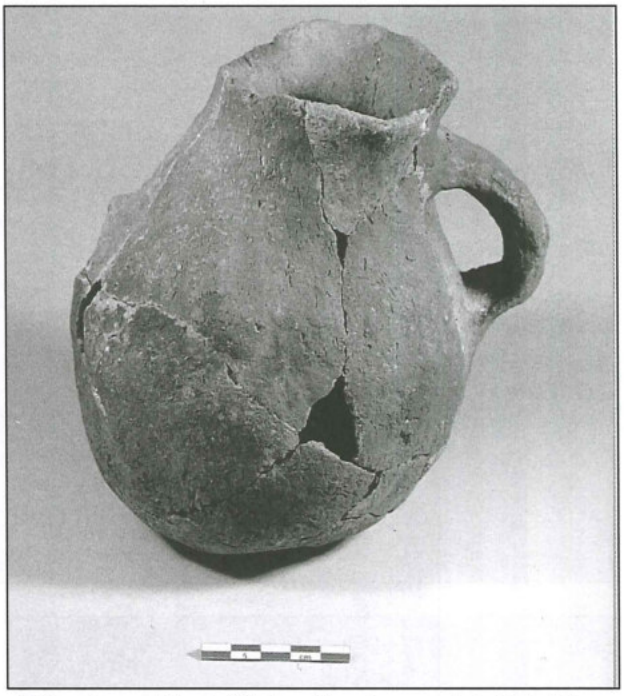
3. Renaissance Tomb, distribution of shaft-graves before excavation (Barmasse and Schmid).



4. Renaissance Tomb, interior after excavation of the tombs (Schmid).

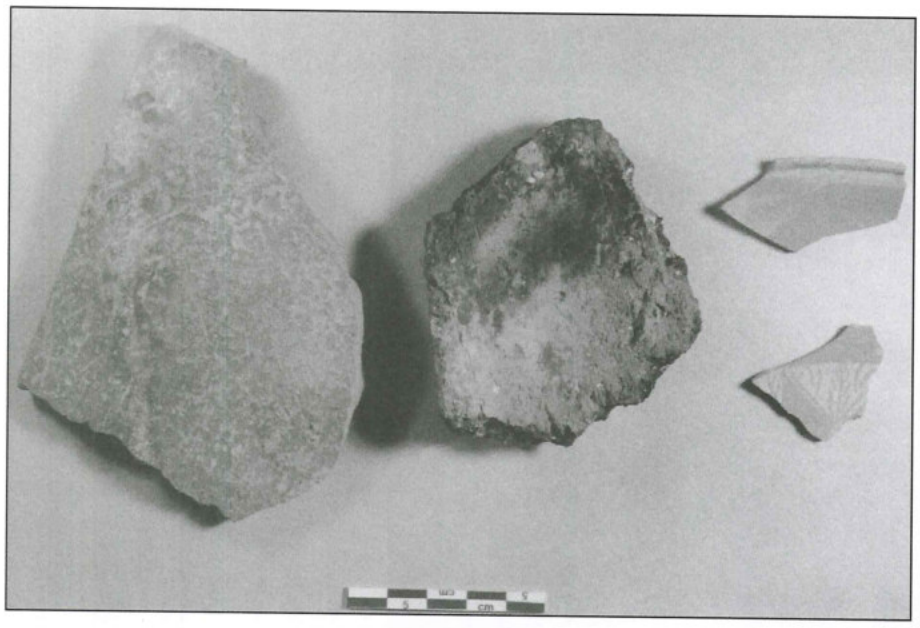


5. Renaissance Tomb, tomb 1 after excavation (Schmid).

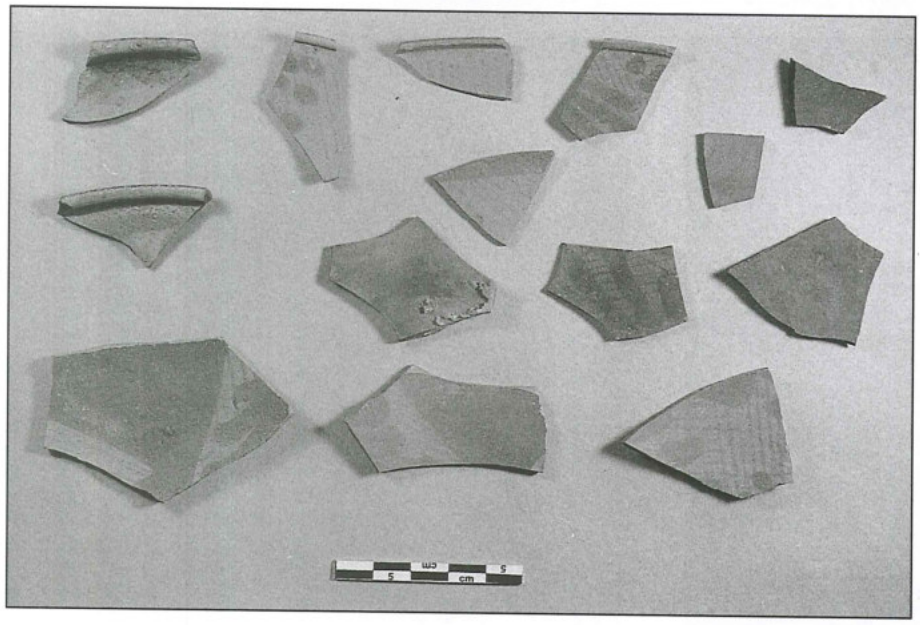


6. Renaissance Tomb, Medieval jug from tomb 3 (Schmid).

fragmentary state, the pottery from the *loculi* in the Renaissance Tomb do confirm observation from other tombs, such as the so-called North ridge tombs 1 and 2 (Bikai and Perry 2001), that contain a rich selection of Nabataean pottery. In general terms the same types can be found within the Renaissance Tomb. Tomb 1 from the North ridge contained mainly pottery of phase 3a, i.e. from the second and third quarter of the first century AD, with some painted and plain vessels from earlier periods, mainly 2b, that is the third quarter of the first century BC (Bikai and Perry 2001: 68, fig. 4; 70f., figs 5. 6). Tomb 2 from the North ridge did contain pottery from phases 3a to 3c, that is from most parts of the first century AD including some



7. Renaissance Tomb, pottery from upper level of tomb 8 (Schmid).



8. Renaissance Tomb, pottery from lower level of tomb 8 (Schmid).



9. Renaissance Tomb, lamp from tomb 8 (Schmid).

bowls and plates from the very early second century AD (Bikai and Perry 2001: 73, fig. 7; 75f., figs. 8. 9). What is interesting in the case of the two North ridge tombs is the evidence for providing services to the deceased. In fact, both of these tombs contained a good quantity of (painted) drinking bowls, some plain fine plates/dishes probably used for eating as well as plain and coarse ware pottery for serving (jugs and juglets) and storage/preparation of food (cooking pots). Although in a more fragmented state, the same tendency can be observed within the Renaissance Tomb (on the services of the Nabataean pottery see Schmid 2000: 91f., fig. 422).

Two of the tombs contained tombstones with

carved inscriptions in Nabataean, rather unusual finds as no freestanding inscribed Nabataean tombstones have been reported for Petra and are rare elsewhere in the Nabataean sphere of influence with the exception of the Ḥawrān and other specific locations (cf. for instance the tombstones from Khirbat adh-Dharīḥ :L. Nehmé in Lenoble and al-Muheisen and Villeneuve 2001: 128-132). In Petra several rock-cut funerary or memorial nefesh have been found (Starcky 1965); 10 of them were inscribed in Nabataean, one could not be deciphered and one was inscribed in Greek. The inscribed tombstone on **Fig. 10** was found in tomb 4; the reading of the inscription provides some problems, the most probable reading could be[2]:

ḤGYT	ḤAGYT	Ḥagyt,
BR THN'	BAR TAHN'	daughter of Tahn'

It can, however, not be excluded that the name in the first line should read HGYRW, that is Hagir and would be a man's name, and in the second line one could also read BR RBHW, son of Rābih. Hagir and Rābih are otherwise known names in Nabataean (Negev 1991: nos. 415 and 1050), and Rābih has already been attested elsewhere in Petra (Starcky 1965: 46f. nos. 3. 5), whilst Hagyt or Haggyt would be a new name. TAHN' is attested in Thamoudic but not in Nabataean so far (TIJ 281; Harding 1971: 140).

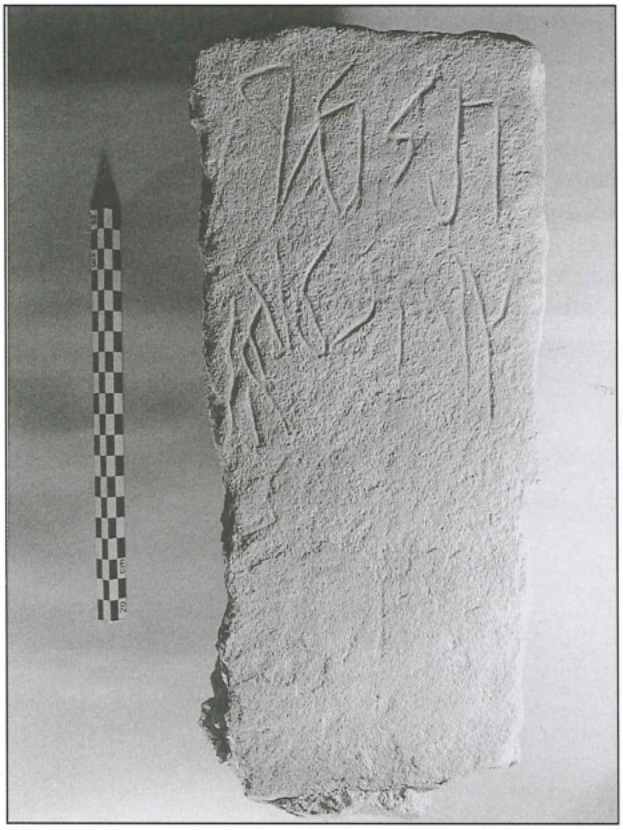
The stelae on **Fig. 11** was found in tomb 8 and reads:

TYMW	TAYMU	Taymu,
BRWHB'LHY'	BARWAHBI'LLAHY'	son of Wahbi'llahy'

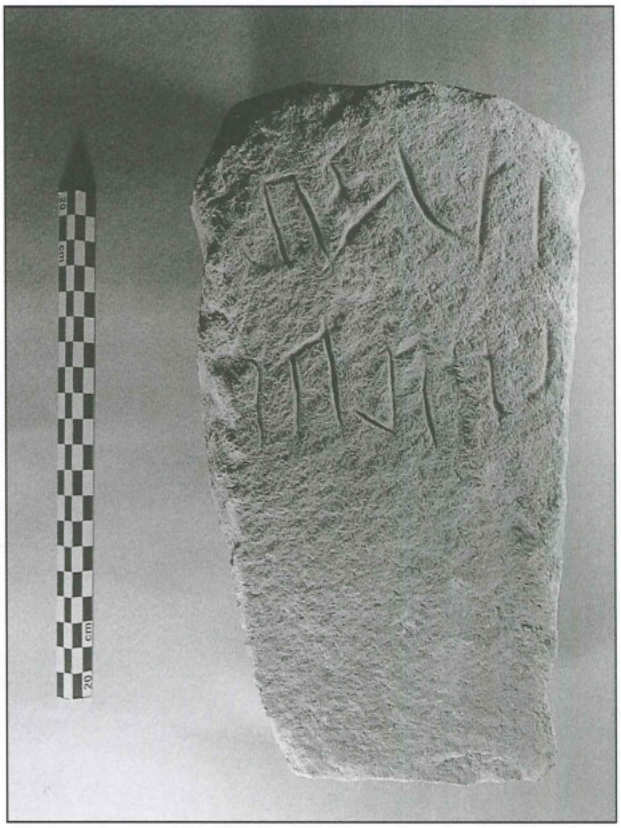
The reading of this stone is somewhat easier; both names are already attested within the corpus of Nabataean names (Negev 1991: nos. 1218 and 337 respectively) but the *aleph* at the end of the second name has not been reported so far.

Both inscribed stones still conserve a cluster of mortar on the bottom of their backside that suggest it was used in order to fix them on top of or near by the *loculi* to which they belonged. This gives them an overall form similar to some of the Nabataean tombstones from Khirbat adh-Dharīḥ) Lenoble and al-Muheisen and Villeneuve 2001: 93, fig. 2, 1. 3. 5).

The skeletal remains were in all cases disturbed,



10. Renaissance Tomb, inscribed tombstone from tomb 4 (Schmid).

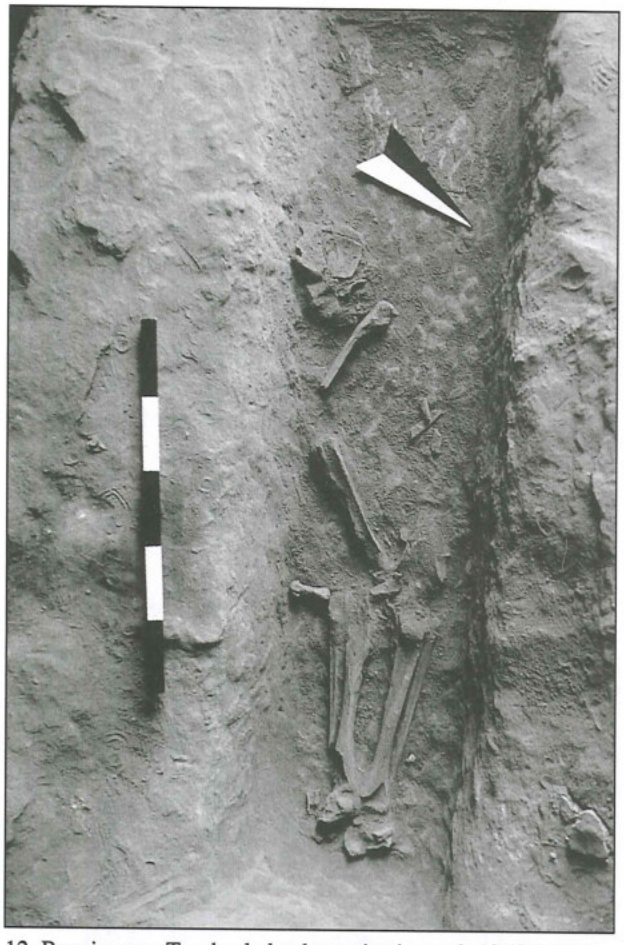


11. Renaissance Tomb, inscribed tombstone from tomb 8 (Schmid).

2 We would like to thank D. F. Graf (Miami), F. Zayadine (Amman) and H. Jenni (Basel) for commenting on the two *stelai.*

but several bones remained within the single tombs so that a determination of age, sex and eventual diseases should be possible (**Fig. 12**).

The nature of the activities that took place in the Renaissance Tomb during the Medieval period are difficult to determine. However, the jug on **Fig. 6** as well as the mortar with a grinding stone (**Fig. 13**) indicate that there was probably a kind of permanent use of the rock cut structure in later times, despite the obvious presence of the Nabataean tombs.



12. Renaissance Tomb, skeletal remains in tomb 10 (Schmid).



13. Renaissance Tomb, Medieval (?) stone mortar and grinding stone found in tomb 3 (Schmid).

General Observations

The Renaissance Tomb offers some peculiarities, especially concerning its façade (see McKenzie 1990: 166f.). Some minor errors can be observed within details of the façade; further, the entire façade is somewhat warped as can clearly be seen on **Fig. 14**. It is, however, not clear whether this is an error by the stonecutters or whether it happened in order to avoid weaker parts of the sandstone. Another peculiarity is the not complete-



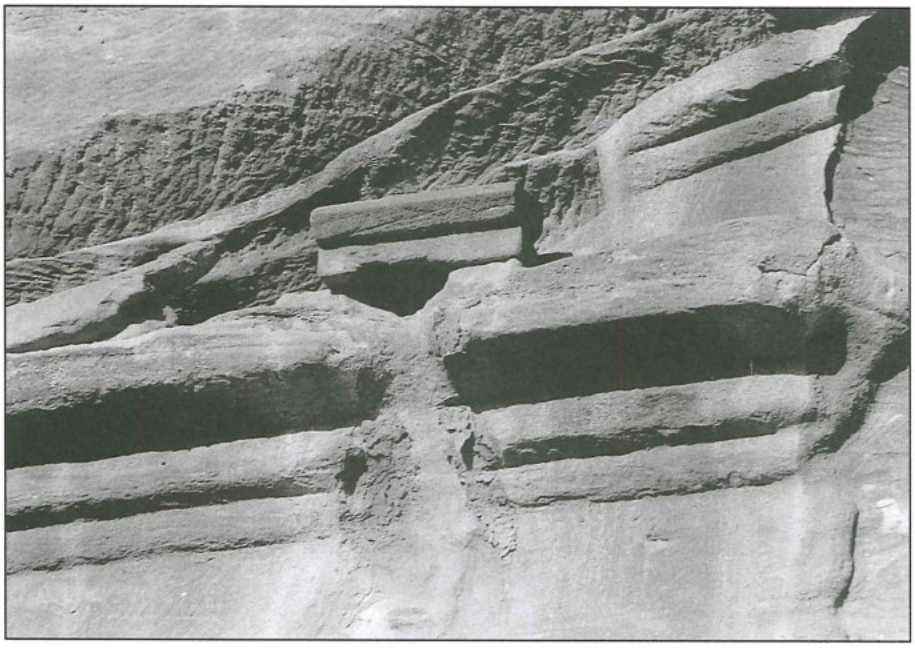
14. Renaissance Tomb, detail of façade (Schmid).

ly finished part of the space in front of the tomb (**Figs. 1, 15**). As can be seen on Fig. 1, the area south of the entrance is about one and a half meter higher than the area to the north of it and the traces of the stone extracting activities are still clearly visible (**Fig. 15**). Although all these elements could indicate an abandonment of the tomb before it was completely finished, the shaft-graves excavated in 2003 clearly show that the Renaissance tomb truly fulfilled its purpose. One other peculiarity of the Renaissance Tomb is the partially inset raking cornice of the left part of the pediment (cf. McKenzie 1990: 166). Whilst one fragment of the inset part remained in the pediment (**Figs. 1, 16**), another one fell down and was found inside the tomb (**Fig. 17**) together with other architectural fragments.

Beside further insight on Nabataean funeral practices, the results from the excavation of the Renaissance Tomb are also likely to change the chronology of the monument. With most of the graves apparently belonging to the last quarter of the first century AD, the Renaissance Tomb must have been constructed towards the third quarter of the first century AD at the latest. In her architectural study of the Petra monuments, Judith McKenzie compared the Renaissance Tomb to the Sextius Florentinus Tomb and dated both of them in the second quarter of the second century AD ac-



15. Space in front of the Renaissance Tomb showing traces of stone extracting (Schmid).



16. Renaissance Tomb, detail of pediment (Schmid).



17. Renaissance Tomb, separately worked part of pediment found inside the tomb (Schmid).

cording to the inscription on the latter (McKenzie 1990: 46f. 165-167). However, it has been supposed that the inscription of Sextius Florentinus only belongs to a secondary reuse of that monument and that the tomb may date to the late first century BC or very early first century AD (Freyberger 1991; Negev 1977: 598). By comparing its architectural features, K. Freyberger would like to date the Renaissance Tomb to the early first century AD the latest (Freyberger 1991: 5). On the one hand the finds from the 2003 excavation (cf. above) are not substantial for dating in the early first century and they suggest prudence for such an early date. On the other hand it is clear that the Renaissance tomb must have been accomplished shortly after the middle of the first century AD at the latest.

Caroline Huguenot
IASA –BFSH 2
Université de Lausanne
CH-1015 Dorigny, Switzerland
chuguenot@wanadoo.fr

Mahmoud Mohammed al-Bdool
Bdool Housing
Wadi Mousa –Petra
Jordan
albtrawe@maktoob.com

Stephan G. Schmid
Dépt. Histoire de l'art et Archéologie
– UMR 5140
Université de Montpellier III
Route de Mende
F-34199 Montpellier, France
stschmid@aol.com

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Study of the Rhodian Amphorae Handles Stamps From 'Ammān Citadel

Sahar Mansour

With a Contribution by Wedad Said and Husam Hjazeen

Our knowledge of the Hellenistic Period in 'Ammān has been gained mainly from a limited number of archaeological excavations, that have revealed remains of Hellenistic occupation. The lack of both architecture and artifacts of the early Hellenistic era is a noticeable phenomenon in all classical sites in Jordan, in comparison with the remains of the late Hellenistic Period.

Furthermore the literary records that shed any light on this period are rare: Polybius (Hist.V,71,9) relates that Antiochus III the Great launched his troops to conquer Coele-Syria after learning that his enemies were concentrated in Philadelphia. He besieged the city and installed his siege machines. The defenders surrendered when a captured prisoner revealed to the besiegers the location of an underground passageway leading to a hidden water supply. They blocked the tunnel with wood, stones and all such kind of things. These events took place in 218BC. The records of Zenon's visit to Trans-Jordan around 256BC contain no suggestion of impressive economic, demographic or cultural conditions. Therefore we cannot disregard any of the Hellenistic artifacts if we wish to create clearer information of this period.

The purpose of this study is to focus on the Greek amphora handles which were discovered during the excavations at the 'Ammān Citadel. In Jordan there are few sources that describe the stamped handles, so much so that the small collections in the Jordanian archaeological museums and stores have not, as yet, been studied.

Even though some of the handles from the 'Ammān Citadel have little chronological significance for the stratigraphy of the site, either because they were discovered in a mixed contexts or surface location, they nevertheless do provide interesting information on the prosopography of the Hellenistic Period. The study of these amphorae can provide important information for our knowledge of Rhodian fabricants and devices used in the stamps. Also they add significantly to the relatively small but growing number of published stamps from Jordan.

We cannot draw much information on commercial relations from this small group, or about the prominence of the site in the Rhodian economy. Nevertheless in neighboring sites, like Syria, Palestine, and Egypt, these commercial containers make potentially good evidence for mapping the history of trade. A line can be drawn from their place of origin to the site where they have been found. It is known that in the Hellenistic Period, major trade routes ran south from coastal Syria through Palestine and Trans-Jordan. The Greek historian Herodotos (III, 5-7) reports the large-scale employment of second hand wine jars from Egypt used for carrying water to serve travelers on the desert road to Syria, Zenon (76-77, no.23) papyri mention that Milesian, Samian, Lesbian and Chian jars were reused in various ways, including shipment to other countries.

We cannot tell whether these amphorae reached 'Ammān with their original contents. Presumably they had been shipped to Egypt or Syria from their place of origin, we know, from the papyri that in Hellenistic Egypt jars of many foreign types were used to hold a variety of goods.

The results of excavations in the vicinity of 'Ammān record the presence of numerous rock-cut wine presses of varying shapes and dimensions. As is the case with other agricultural installations in these areas, it is not possible to say exactly when these wine presses were built and used. Some of them predate the Greco-Romān Periods, having been built some time during the Iron Age, like those found near al-'Umayrī. Judging by three wine presses and several storage caves surrounding the administrative complex, al-'Umayrī comprises a farm for the production of wine. Larry Herr suggests "that the administrators at al-'Umayrī were organizing wine-production at the farmsteads for the Ammonite monarchy, hinter land regions attest to fairly extensive wine production activities in this area in the Iron Age IIC/ Persian Period, and the production of wine for export to Babylon as trib-

ute. This practice continued later and wine was sent their protection to Persia as taxes"(Herr 1995a&b).

In the historical sources there are no records supporting Herr's suggestion that Ammonites paid wine tributes to the Babylonians then to Persians.

Another Ammonite site, Rujum Abū Nuṣayr, a wine press was found (Abu-Shmais 2002-3). From a nearby site, Tall Sirān, an inscription on a bottle contains eight lines of Ammonite writing dated to around 600BC (Zayadine and Thompson 1973; Cross 1973b) with references to the centers of farming production, which including cisterns, springs, gardens and vineyard. Siran, an Aramaic word, means gardens, and is still used in Arabic dialect today (Abu-Shmais: 2003). The presence of winepresses in the regions: Ḥisbān (Ibach 1987: 199), and al-'Umayrī (Younker 1991b: 337; Herr 1995a: 121-25; 1997d: 170; 1999b: 231-32) and Khirbat Umm al-Qanāfidh (Ibach 1987: 12, 14) attest to fairly extensive wine production activities in this area in the Iron IIC/ Persian Period, therefore an intertwined question arises about the reasons behind the import of wine from the Aegean Islands.

On the basis of the presence of wine presses in the region, the fruit of the vine and the olive are two traditional staple products of our region through the Ages. We think it is possible to conclude that the existence of these stamped Hellenistic Rhodian handles in the 'Ammān Citadel and at all the Hellenistic sites indicates a Greek settlement during the Hellenistic Period. And also wine and oil were imported from Rhodes for the garrisons posted in the region. Personal taste exercised by consumers in accordance with the fashion in wine consumption was likely to be a minor factor in the import pattern of any state, at least in comparison with economic and political factors.

Rostovtzeff states that "in Trans Jordan side-by-side with the native shaykhs and their tribes, group of towns with a mainly Greek population were in existence during the Seleucid reign" (1928b: 192). Among these was Philadelphia, which was founded on the site of ancient Rabbath-Ammon, and was later brought into the league of the ten cities, the Decapoils, and remained the case until it was annexed by the Romans.

Rhodian Amphorae

Rhodian amphorae usually had two handles both of which were customarily stamped: one bearing the name of the priest during whose term of office the potter's license to manufacture such items was obtained and dated, and the other bearing the name of the potter (Grace 1934: 197-99, 1961: 10-11, 1979: 204, 1970: 280-81). "A comparatively large number of complete Rhodian amphorae are preserved. This is particularly fortunate, because the information is regularly divided between the two handles, one given the fabricant's name, the other that of the eponym or official in that year, who in this case is the priest of Helios, plus that of the month, a feature peculiar to Rhodian seals" and respect to the fabricant, "one is not, however, to imagine a craftsman, like the men who signed Attic vases, but a person responsible for an output of standard products, perhaps a pottery operator appointed as a commissioner, as we know bankers some times served as coin magistrates" .

Those amphorae were employed to transport and store wine. They may have been used for other purposes. While most Rhodian amphorae were used for the transport and storage of wine, many were used for transport and storage of oil, preserved fish, pitch, water, and the like (Grace 1979: 1).

Most of the stamped handles bear the Greek formula [ΕΠΙ] followed by a personal genitive. According to Grace "a name accompanied by [ΕΠΙ] in the term of, is the principal expression which has been recognized as a date"(Grace 1979) and the formula was probably intended to date the license which permitted the concerned potter to manufacture and sell his wares according to specific governmental regulations regarding capacity. The reason for dating amphorae is still not well understood, it is suspected that the primary purpose was tax control based upon standardized capacities, while the secondary purpose was to date the contents and identify the vintage (Grace 1934: 198-99, 1962: 113, 1979).

Those amphorae originate in the Aegean Islands and the surrounding coastal regions, Rhodes, Thasos, Chios and Kos.

The wine of Rhodes was poor, though the pottery was fine, in contrast the wine of Chios, Lesbos and Thasos, were considered fine wines, which improved with age (Grace 1934: 198-199). The most popular imported wine jars to Jordanian sites were Rhodian.

In this article we provided only Grace's period dates, (Grace 1985: 42), following her revision in (1974: 192-200). In this way as more archaeological evidence becomes available and absolute dates for the period change, it will be possible to easily re-date previously published material. Grace's dates were based on a thorough study of Rhodian amphorae and their stamped handles. A good introduction to the making, use, and history of amphorae can be found in Virginia R. Grace's Amphora's and the Ancient Wine Trade, Picture Book

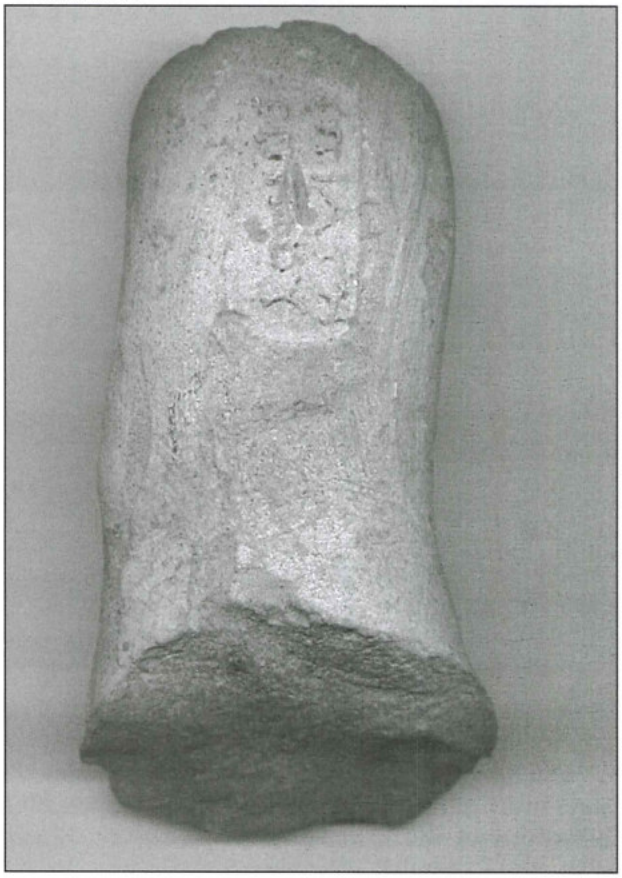
6 in the series of excavations of the Athenian Agora, and especially exports to Athens and Attica, Delos, Pergamon and Alexandria. The material from Alexandria shows a gradual increase in the production of Rhodian amphorae from Period III, culminating in Period V, after which there is a drop, but still with figures higher than any time before the middle of the second century BC. Grace spent a lifetime studying plain, transport amphorae from all over the Mediterranean, particularly those made in Greece. She developed a card-file at the American School of Classical studies in Athens of over 150.000 amphorae or amphora fragments. Her chronology of Greek commercial amphora stamps has been developed on the basis of stamp pairs' changes in the shape of the amphorae and their handles were discovered in archaeological contexts. The periods established by Grace (1970: 286, 301) and revised for the third century BC. In her revision, the earlier Hellenistic chronology (Grace 1974: 193-200) is as follows:

Period I. ca. 289-240 BC.
Period II. ca. 240-210 BC.
Period III. ca. 210-175 BC.
Period IV. ca. 175-146 BC.
Period V. ca. 146-108 BC.
Period VI. ca. 108-shortly after 80BC.
Period VII. Up to ca. 30 BC. (?)

Of the 26 Greek amphorae stamped handles recovered during the excavations at the Citadel of 'Ammān between the years 2000-2001, 24 of them are of Rhodian origin, and they were temporarily identified within the periods defined by Grace on the basis of their legends. Seven handles were found to date to Period I, with one of them to continue to Period II, two fell within Period II, with one to continue in Period III, two fell within Period III, with one to continue in Period IV and two within Period IV, five fell within Period V, and one fell within Period VI. Two handles could not be so confidently dated, and their ware and devices may date three unreadable handles to the second century BC. These handles may be attributed to the period between the third century BC and the late second century BC. These handles seemingly match the early scholarly consensus in that the primary volume of Rhodian trade took place between 225-150BC and mainly in second century BC (Grace 1934: 200).

It seems that they fall within the third century through second century BC. These handles reflect the import of predominantly Rhodian wine to 'Ammān between the third and second centuries BC.

1-ΕΠΙΑΓΗ / Αγήσιππου
ΣΙΠΠΟΥ



Rectangular stamp measuring (3x1.5cm) on a curved horizontal part of the handle. The handle displays the qualities of the typical Rhodian amphora fabric: hard clay that fractures smoothly and feels harsh. Some small inclusions the surface is pinkish white, the core is reddish yellow (5YR6/6), and the slip is reddish yellow (5YR6/8). Small voids and very small inclusions are visible.

Αγήσιππου, a stamp bearing this name was found in the dump of the Athenian Agora and was dated to the third century BC (Rotroff 1982: 99, F.5: 1). In here revision Grace dated this eponym to the third century BC (240-225BC) (Grace 1974: 194, 199, no.126), Αγήσιππου have been found at 'Ammān Citadel (Russell 1997: 44, no.9) Samaria (Crowfoot 1957: 380), Ophel, Jerusalem (Macalister 1926: 204) Umm Qays (Weber 1986: II.F.42), and Umm Qays (Rousan 1998: 60-61, no.7)

2-ΕΠΙΑΓΩ / Επίαγλωκρίτου
ΚΡΙΤΟΥ

Stamp: rectangular (4x1.9cm) found on a handle with a curved profile, legend giving Rhodian eponym in two lines and the head of Helios placed



to the left of the eponym's name. It is clear that the die struck the handle twice.

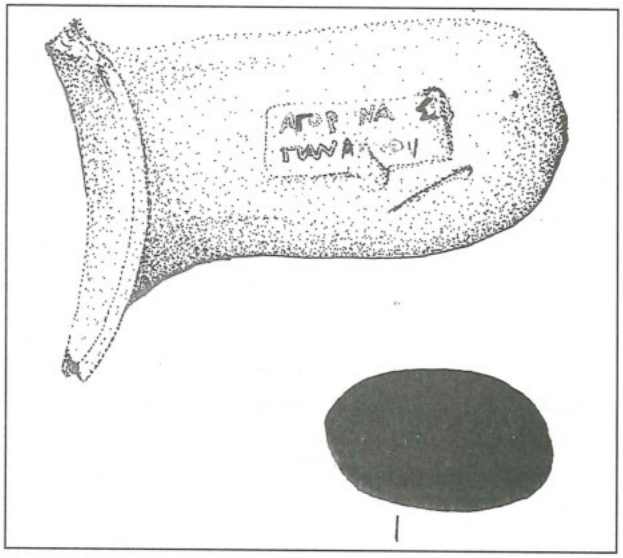
The fabric is typically Rhodian: hard smooth clay, with a harsh feel, some voids are visible. Small cracks and inclusions are infrequent. Some very small rounded pale brown and white, probably limestone inclusions are visible. The surface is very pale brown (10YR7/3) the core is (7.5YR6/6) and so is the slip

The eponym's name is uncommon. One example of the same name comes from the lower fill of an Agora cistern, dated to the fourth century BC, an early date suggested according to the amphora ware is in early third century (Grace 1934: 222, no.22). An eponym Επίαγλωκρίτου is mentioned in an inscription, Collitz-Bechtel, SGDI, 3486, dated by the editors to the second century BC by Van Gilder, ca. 227. (From Hiller's list.)

3- ΑΓΟΡ[Α]ΝΑ[ΚΤΟ]Σ	Αγοάνακτος
ΠΑΝ[ΑΜ]ΟΥ	Πάναμους

A rectangular stamp with a portion of rim preserved. It is hard clay with smooth fractures and a harsh feel. The core is red 2.5YR5/6, the external is pink 5YR8/4, and the slip is yellowish red (5YR 5/8). Sparse small voids and small dull brown inclusions are visible.

In this fabricant's type the name of the month always follows his own name in the same stamp. The evidence suggests that he regularly placed a

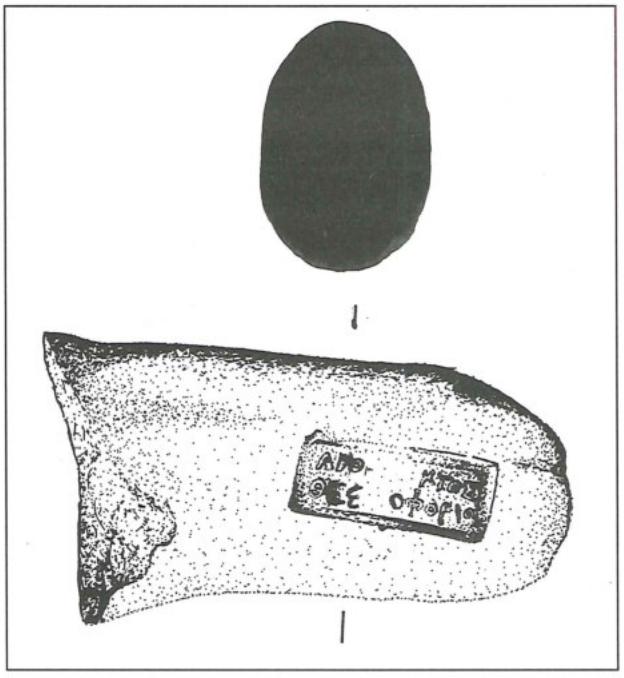


head of Helios to the left of the eponym's name in the companion type on the other handle of the amphora.

Stamps of Αγοάνακτος are known from a number of sites across the Mediterranean, including at Delos where they are associated with the month Πάναμος. Grace dated the period of this fabricant's activity to the second half of the third century BC (Periods II-III, 220-180BC) based on parallel examples from the Athenian Agora and Pergamon deposits (Grace and Petropoulakou 1970: 302, E.I). Another example comes from Rhodes with the month which, follows the fabricant's name on one handle, while on the other is inscribed the eponym accompanied with the image of god Helios (Grace 1979: fig. 25) Delos (Grace, 1970: 314, no.33). Other examples are from Umm Qays where the fabricant's name was followed by the month Αγριάνου (Rousan 1998: 112-113, pl.23, no. 48), Umm Qays (Weber 1986: II, F.16), 'Irāq al-Amīr (Lapp 1983: 22, no.125), Jabal Ophel, Jerusalem (Macalister 1926: 204), and Samaria (Crowfoot and Kenyon 1957: 382).

4-ΑΓΟ[ΡΑΝΑ]ΚΤΟΣ	Αγοάνακτος
ΘΕ[ΣΜΟ]ΦΟΡΙΟΥ	Θεσμοφόριος

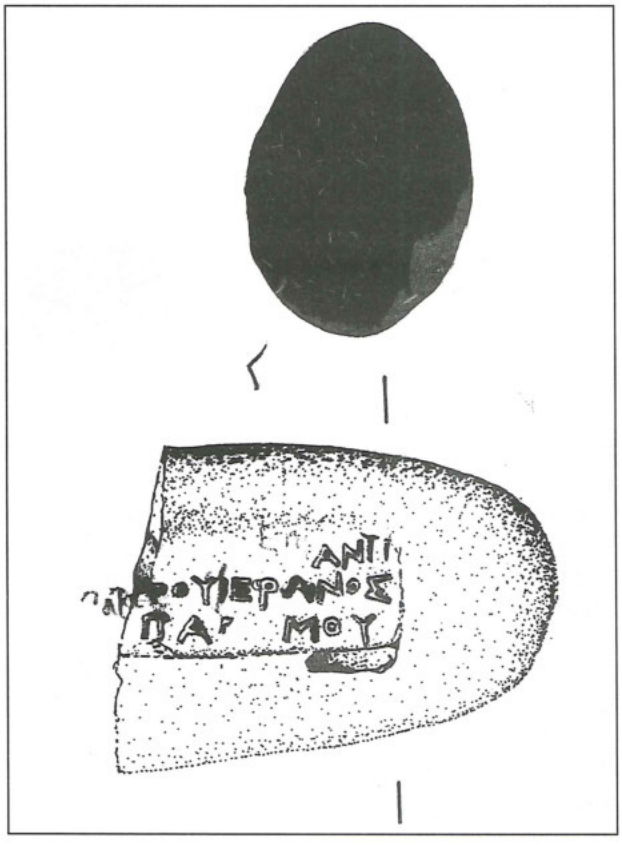
The stamp is rectangular (3.2x1.5cm) with a legend giving, in two lines, a fabricant name Αγοάνακτος, followed by the name of the month Θεσμοφόριος set within a frame in the same stamp, there are no missing letters but the die is not pressed well, the handle itself is of an oval cross section (3.8x3.2cm). It is made of hard clay with smooth fractures; the slip is (5YR7/8), the core (5YR 5/8) is yellowish red, and the external is pinkish grey (5YR7/2). A few white inclusions are visible and there are infrequent very small rounded



dull brown inclusions. For dating and parallels see preceding artifact.

5-Ε[ΠΙ]ΑΝΤΙ/
[ΠΑΤ]ΡΟΥ/ΙΕΡΩΝΟΣ
ΠΑΝ[Α]ΜΟΥ

Επι Αντίπατρος/Ιέρωνος
Παναμος



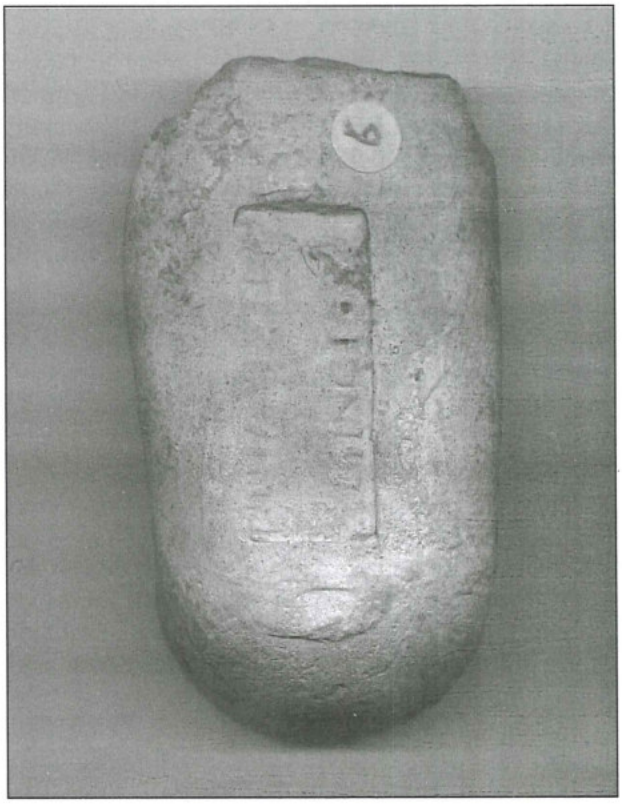
An eponym stamp belonging to Αντίπατρος followed by the fabricant name Ιέρωνος stamped in month Παναμος on the same handle in three lines. The impression is faint especially in the beginning of the first line, and broken at the beginning of the second line, uncertain reading.

A rectangular stamp measuring (3.5x1.5cm) is found on a curved horizontal part of the handle that is broken at the joint with the neck, it is of hard clay with smooth fractures and a harsh feel. The core is red (2.5YR5/6), the external is pink (5YR8/4), and the slip is yellowish red (5YR5/8). Sparse small and medium voids and small dull brown inclusions are visible.

The eponym Αντίπατρος is generally dated to Grace's Period V (146-108BC) and more specifically to 115BC by G. Finkielsztejn. Rectangular stamps of Αντίπατρος have been found at Delos, (Grace 1952: 528) Tall 'Anafa, (Finkielsztejn: 192-3) Kition (Calvet 1993: 64, fig. 36) and Rhodes including Lindos (Nilsson 1909: 372). Grace dated the farther name Ιέρωνος to late Period V or early Period VI, we also note the name Ιέρωνος as eponym (Grace 1970: 305 E. 15) in the list of (Ophel) Jerusalem (Maclister 1926: 208), and (Tall Istabah) Beth Shean (Landau and Tzaferis 1979: 155, no.10).

6- ΕΠΙ[ΑΡΙ]ΣΤΕΙΔΑ
ΣΜΙΝΘΙΟΥ

Επι Αριστείδας
Σμίνθιου



The stamp is circular with a rose of Rhodes in the center, with the legend giving Rhodian eponym (preposition eponym) and the month framed between inner and outer circles, beginning in the upper left.

The fabric is hard clay with smooth fractures and a harsh feel. The core is red (2.5YR5/6) the external is pink (5YR8/4) and the slip is yellowish red (5YR5/8). Sparse small voids and small dull brown inclusions are visible.

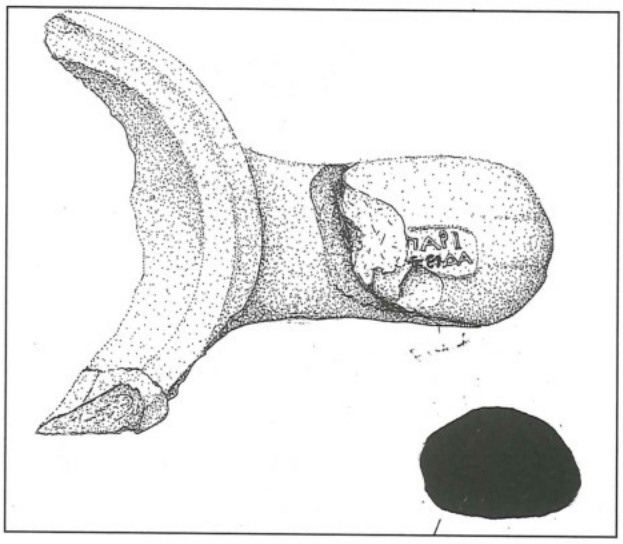
Rhodian amphorae are regularly dated annually according to the change of priest at Helios. Αρίστείδα was one such priest (Grace 1948: 17). This eponym is corresponds with the fabricant Ναvιός appearing in the Pergamon deposit but not in the (slightly earlier), middle Stoa building in Athens. Ναvιός probably he worked into the second quarter of the second century BC (Grace and Petropoulakou 1970: 304, no. E.II). The eponym Aristeivda dated much earlier Rhodain stamps (Grace1970: 304, 291) and dated to the last quarter of the late third century and probably to early second century BC where this name appeared on a Knidian handle in the Athenian Agora (Grace 1968: 230, no. 57).

On another Rhodian handle, with a month Αρταμτίου (Grace 1968: 240, no.96) from the Pergamon an Αριστείδα named on a single handle was readily distinguished by the shape and the finish of the handle as a homonym of the third century BC (Grace 1985: 32, E.8). In Samaria two eponyms Αριστείδα were dated according to Grace chronological divisions: the first to Period I (end of the fourth century BC 280 BC), while the second dated to Period III 220-180BC (Crowfoot 1957: 381). Also two eponyms Αριστείδα I were dated to 220-180BC, and Αριστείδα II was left without dating (Hiller Von Gaertringen 1931: 836, nos. 59, 60) Also see 'Ammān Citadel (Russell 1997: 48, no. 28), Umm Qays (Rousan 1998: 52, no.1), Kition (Calvet 1982: 19, no. 26), Samaria (Crowfoot 1957: 381) and Jerusalem (Macalister 1926: 205).

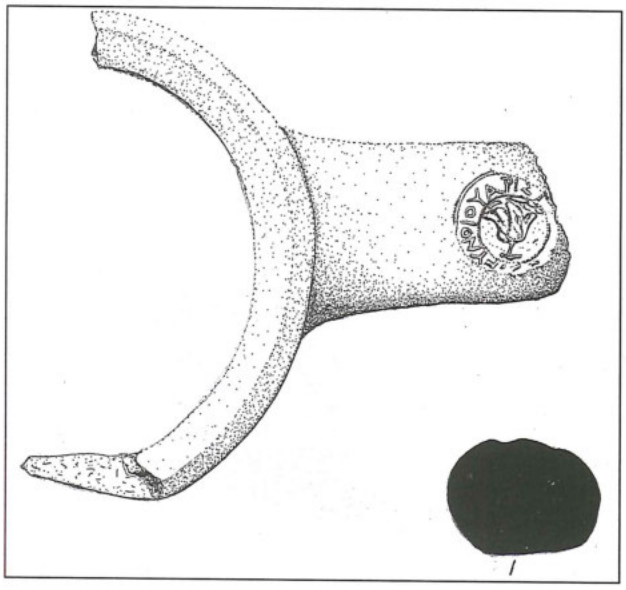
7-[E]ΠΑΡΙ/ Αριστείδα
[Σ]ΤΕΙΔΑ

This is a rectangular stamp with a portion of the rim preserved. Two lines bear the Greek eponym Αριστείδα we noted that the stamp bears the Greek formula (ΕΠ) without the letter (I: Iota) like the other stamps, this has appeared in many other examples (Macalister 1912: 363) (Liddell and Scott 1968: 821).

Fabric of handle: hard clay with harsh and smooth fractures. External fabric is red (2.5YR5/6) with reddish brown core (2.5YR5/3). Very frequent small brown inclusions are visible. For a parallel example see the preceding number.



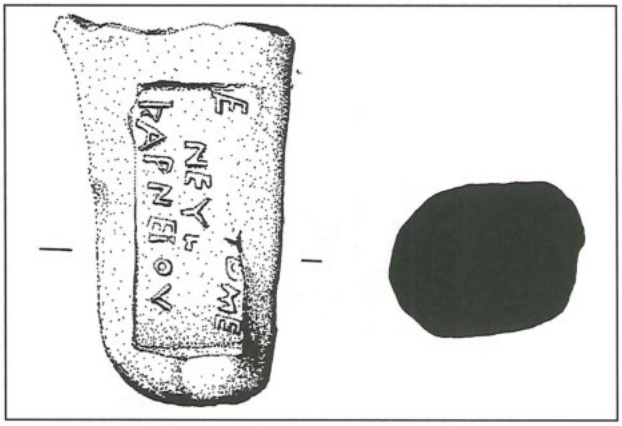
8- ΑΠΙΣΤ[ΟΔΑΜ]ΟΥ Αριστοδαμός
ΣΜΙΝΘΙΟΥ Σιμνθίου



Who uses a circular stamp with the rose above the legend and survives on a portion the preserved rim. It is on hard clay with smooth fractures and harsh feel. The core is red (2.5YR5/6), the external is pink (5YR8/4), and the slip is yellowish red (5YR5/8). Sparse small voids and small dull brown inclusions are visible.

From the Pergamon deposit the year of the Rhodian eponym Αριστόδαμος is probably between the 182-175 BC (Grace 1985: 8-9). Many examples are from Delos (Grace 1970: 334, 341 E.136 E.100), and from the Pergamon deposit (Grace 1970: 291, 304. E.11). See also Ophel, Jerusalem (Macalister 1926: 205).

9- Α[ΠΙΡ]ΤΟΜΕΝΕΥΣ ΕπιΑριστομένευς
ΚΑΡΝΕΙΟΥ Καρνείου



Rectangular stamp measuring (5x2cm) on a curved horizontal part of the handle is broken at the joint with the vertical and the neck of the amphora. The stamp is in three lines, the certain letter-traces in the end of the first line, and the second had suggested a reading Αριστομένευς and the month Καρνείου. The fabric of the handle is Rhodian: hard clay with a harsh feels and smooth fractures. The external color is pink (7.5YR8/4), the core is reddish yellow (5YR6/6), and the slip is yellowish red (5YR5/8). There are many white inclusions mostly very small to small.

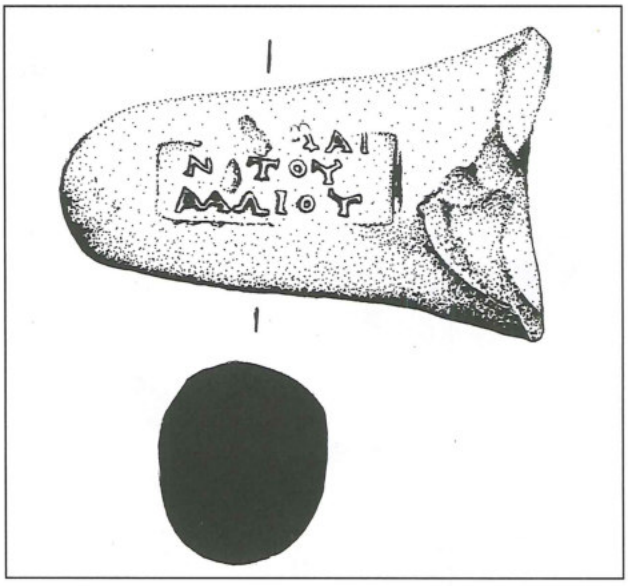
This stamp had been attributed to Period V (Grace 1952: 528) but a later date is more probable, Period VI, based on the appearance of two examples from Delos, and handles from Alexandria (Grace 1970: 314-315, no. E.39, E.41) (Grace 1968, no.5).

10- ΕΠΙΔ[ΑΜ]Α/ ΕπίΔαμοαίντου
ΙΝ[Ε]ΤΟΥ
ΔΑΛΙΟΥ Δαλιου

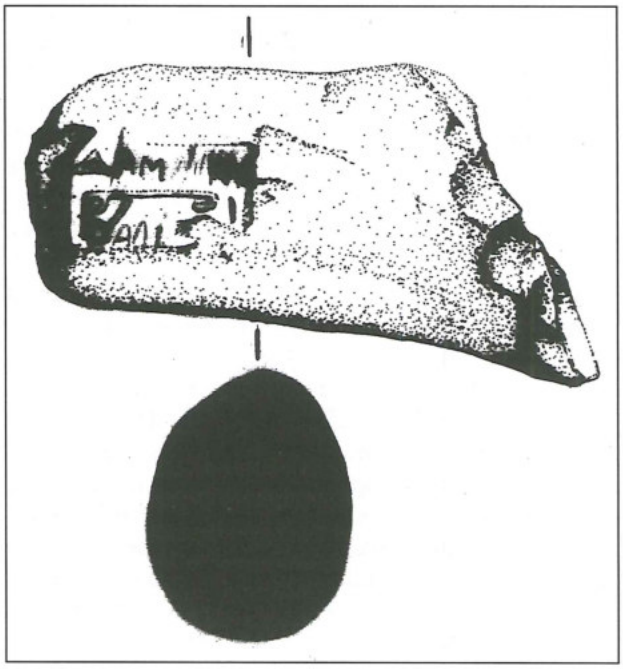
A rectangular stamp given in three lines, with a legend giving the Rhodian eponym and the month. Some of the letters are worn, the handle cross-section is oval, and of a hard and well-levigated clay. Some small inclusions that are probably grog or clay pellets. The external color is pink (7.5YR8/3), slip is reddish yellow 7.5YR7/6, and core is (7.5YR 5/5).

(Grace 1950: 143, no. 48; Grace and Petropoulakou 1970: 305 no. E.7), dated to 180-150BC (Grace and Petropoulakou 1970: 304; corrected according to Grace 1974).

Additional published stamps of the eponym Δαμοαίντου are from the 'Ammān Citadel, with the month Αρταμίτιου (Russell 1997: 48, no.32), Samaria, (Crowfoot 1957: 382) and Ophel, Jerusalem (Macalister 1926: 207).



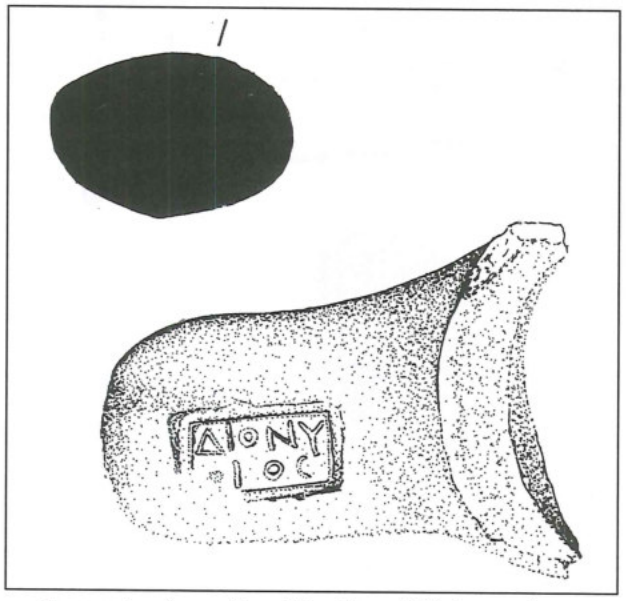
11- ΔΑ[ΜΟΝ]ΙΚΟΣ Δαμόνικος
ΔΑΛΙΟΥ Δάλιου



Rectangular stamp with a device, but the impression is very faint. The jar is a product of the Rhodian fabricant, Δαμόνικος stamped of month Δάλιους, the fabric is typically Rhodian: hard smooth clay, with a harsh feel. Clay color: the external is pink (7.5YR8/3), the core is reddish yellow (7.5YR6/6), and slip is yellowish red (5YR5/6). More than 50 amphorae of this type were found from the Soleil deposit in the city of Rhodes. This fabricant is cited with patronymic: Πυσανιας ὁ Τελέωνος. It is dated to the third century BC (Grace 1970: 293, E.12). Also this fabricant name

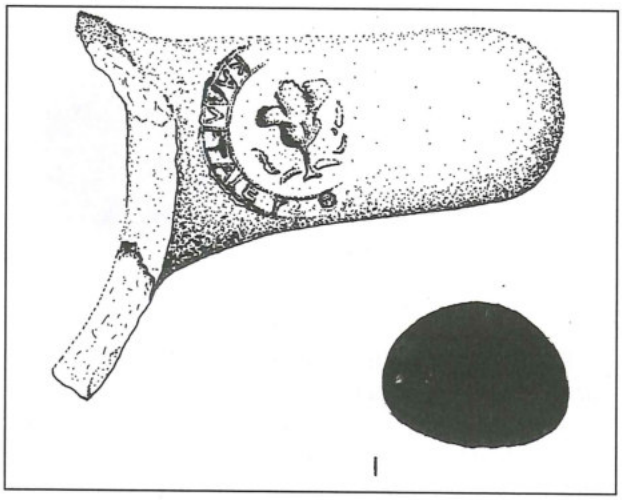
was found in Samaria (Crowfoot 1957: 383) and Ophel Jerusalem (Macalister 1926: 207).

12-ΔΙΟΝΥCΙΟC Διονύσιου



Legend gives the Rhodian fabricant in two lines. It is a rectangular (3x1.5cm) stamp with a portion of rim. The fabric: external is reddish yellow (7.5YR7/6) slip is very pale brown, and the core (7.5YR7/6) reddish yellow. The handle displays the qualities of the typical Rhodian amphora fabric: the clay is hard and well levigated, small voids are visible and infrequent very small rounded white and brown inclusions are visible. Fabricant Διονύσιου dated to Period I-II (Grace 1950: 135, no.2, 139, no.2). An identical stamp was published by Grace in (1934: 251, no. 131). The potter's name transcribed should probably be read Διονύσιου on our example the final S of the potter's name is clear. The dates proposed for this potter Διονύσιου (there was also a later one) and the group of eponyms and potters to which he belongs, is the late third to early second century BC (Grace1934: 241). This was later revised by Grace to the second half of the second century BC, (Knidian Group C, contemporary with Rhodian Period V (Grace and Petropoulakou 1970: 320, 323-324, 328, E.70, naming the eponym Φίλιππος). For other stamps of this type, with the name of the potter in the nominative or the genitive case, see (Dumont 1871: 208, nos.390-391), and for further stamps of the potter Διονψσιοσιν the term of another eponyms (Grace 1970: 383, no.7, 384, no.15) and without the amphora device (Grace 1970: 208, nos. 392-393.). Another identical example comes from the great temple excavations at the 'Ammān Citadel (Russell 1997: 44, no.6), and other parallel examples were found at Samaria (Crowfoot 1957: 383).

13- ΕΠΙΑΛΛΙ[Κ]ΡΤΕΥΣ Επικαλλικράτευς
ΘΕ[....]



A stamp of the eponym καλλικρατευς is on a circular stamp with a rose of Rhodes in the center with a portion of rim preserved. The legend gives the Rhodian eponym and month Θεσμοφόριος or month Θευδίσιος framed between inner and outer circles, beginning in the upper left. It is of hard clay with smooth fractures; slip is yellowish red (5YR7/8), core color is (5YR 5/8) and the external is pinkish grey (5YR7/2). Infrequent very small rounded dull brown inclusions, and a few white inclusions are visible. Many examples come from Pergamon, Carthage. Hiller dated this eponym to 220-180 BC. In Thasian this stamp found with many fifth to fourth century pottery (Grace 1934: 210). There may have been more than one καλλικράτευς year (Grace 1934: 224, no.29), Grace 1974: 197, note 17). Grace dated this stamp to Period V (Grace 1952: 529). See also Jerusalem (Macalister 1929: 208) and Kition (Calvet 1982: no.49).

14- ΜΑΡΣΥΑ Μαρυσύα
ΑΓΡΙΑΝΙΟΥ Αγριανιου

A fabricant's stamp, which belongs to Μαρυσύα in two lines and is stamped with the month of Αγριανιους in a big legend, the impression is clear except the letter [Υ] Epsilon in both lines. The stamp, rectangular in shape (4x2cm), is on the horizontal part of the handle and is long and flat. It is broken at the joint with the vertical part of the handle and the joint with the neck. The handle displays the qualities of the typical Rhodian amphora fabric of well-levigated, hard clay, with smooth fractures



and harsh feel, and small rounded dull brown inclusions are visible. The stamp impression of the fabricant Μαρυσύα is very common. They have been found in Delos, Athens, Pergamon and Rhodes (Grace, 1970: 314, E.37) Alexandria and Lindos. Additional published stamps of this fabricant are in Samaria list (Crowfoot 1957: 383), Jerusalem (Macalister 1923-25: 209), and Kition (Calvet 1982, no.68).

Usually this fabricant is linked with both eponym's Πεισιστρατου and Δαμοκλες Μαρυσύας is dated to Grace's Periods III and IV. This date has been determined by finds of intact amphorae linking Μαρυσύας with both Period III and Period IV eponyms (Grace 1970: 314, E.37). See also Kition (Calvet 1982, no.68).

15- ΜΕΝΕΚΛΕΥ[Σ] Μενεκλευς

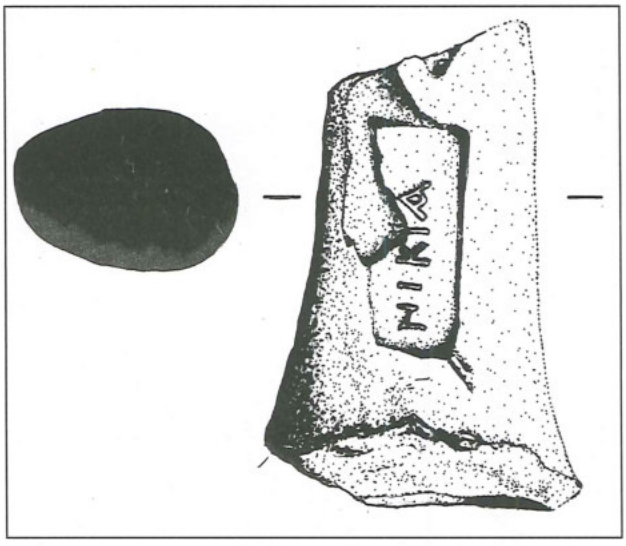
This rectangular stamp belongs to a number of slightly different readings of the name, usually accompanied below by a cluster of grapes, in this example accompanied with a hook set below horizontally. A flaw in the die is noticeable in the lower left corner of the seal. The fabric is typically Rhodian of hard smooth clay, with a harsh feel. Clay color: the surface is very pale brown (10YR 8/3), the core is reddish yellow (7.5YR 7/6), and slip is reddish yellow (7.5YR6/6).

For the name with the device see Nilsson (1909:



158) where examples from Alexandria are cited. In the Grace archive there are further examples from Alexandria, Jerusalem, Beirut, Cyprus, Delos and Rhodes. Grace saw a whole amphora of the fabricant dated in the term of Αρίστρας month Αγριάνος 1949 in Beirut museum, Period V (Grace 1970: 332, E.85) in her revision she dated it to the first century (Grace 1962: group L. P.II4).

16-NIKIA Νίκια



A rectangular stamp measuring (3.3x1.6cm): legend is a fabricant's name, the letters are complete and clear, the handle's cross-section is oval, external color is pink (7.5YR8/4), slip color is reddish yellow (7.5YR7/6), and the core is light reddish brown (5YR6/4). It is on the flat horizontal part of the handle, broken at the joint with the ver-

tical part of the handle, the die is impressed well, with no letters missing. The handle is made of hard clay, with smooth fractures and a harsh feel, well-levigated clay, inclusions are rare in white and brown color.

A context for this fabricant found in a storeroom in the Citadel of Ankara, the same name endorses stamps on handles from Carthage of an earlier period, having with it as devices of piloi with stars, or a cluster of grapes or caduceus dated to Period 1V (Grace 1970: 331, E. 30).

The same stamp handles bearing this name were found at Samaria (Crowfoot and Kenyon 1957: 381) and Kition (Calvet 1982, nos.70.71.72).

17- ΕΠΙΞΕΝΑΡΕΤΟΥ Επίξενάρτος

18- ΧΑΡΗΤΟΣ Χάρητος
ΠΑΝΑΜΟΣ Πάναμος

Restorable jar with two inscribed handles, found in a small room at the west part of the casemate wall over a plastered floor with a large amount of Rhodian jar sherds and another 6 stamped handles.

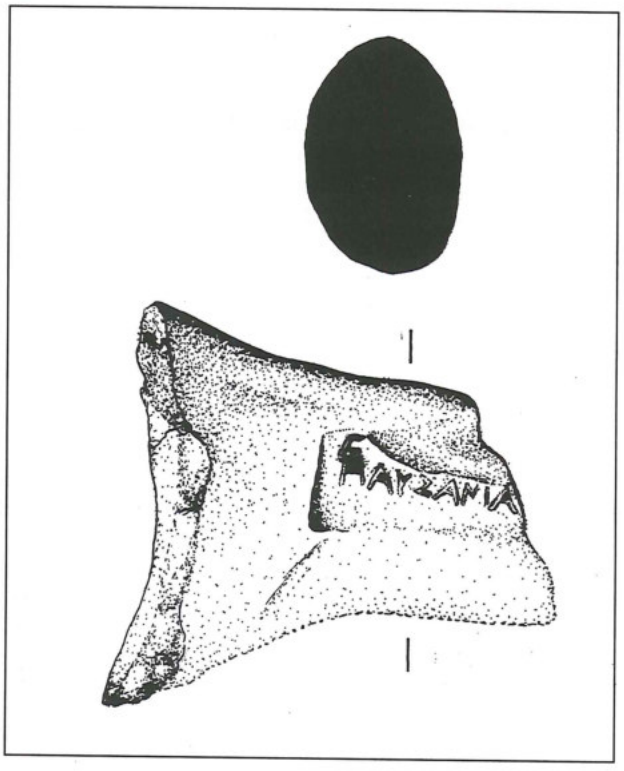


The stamps are rectangular, with the two impressions have the same measurement (2.9x1.2cm), the reading is fairly certain, the right stamp bears a legend giving the Rhodian eponym Ξενάρτος in two lines to the left of a schematic device of wreaths. The second stamp on the left handle belongs to the Rhodian fabricant Χάρητος and month Πάναμος in two lines, the fabric is typically Rhodian: hard smooth clay, with a harsh feel. Clay color: the external is reddish yellow (7.5YR6/6), the core reddish yellow (5YR6/6), and the slip is very pale brown (10YR7/4). Inclusions are infrequent and well sorted. A very small rounded dull reddish brown inclusions.

The eponym Ξενάρτος is dated to the third century BC end of Period I beginning of Period II (Grace 1970: 301; 1985: 52, nos.16, 34) and 'Ammān Citadel (Russell 1997: 44, no.7).

The fabricant name Χάρητος is rare. Nilsson mentions example from Lindos (Nilsson 1909, no. 433) and 4 examples are in Grace's list (Grace 1970: 335, nos. E.245, E.246, E.247). See also Kition (Calvet 1982: 14, no.96).

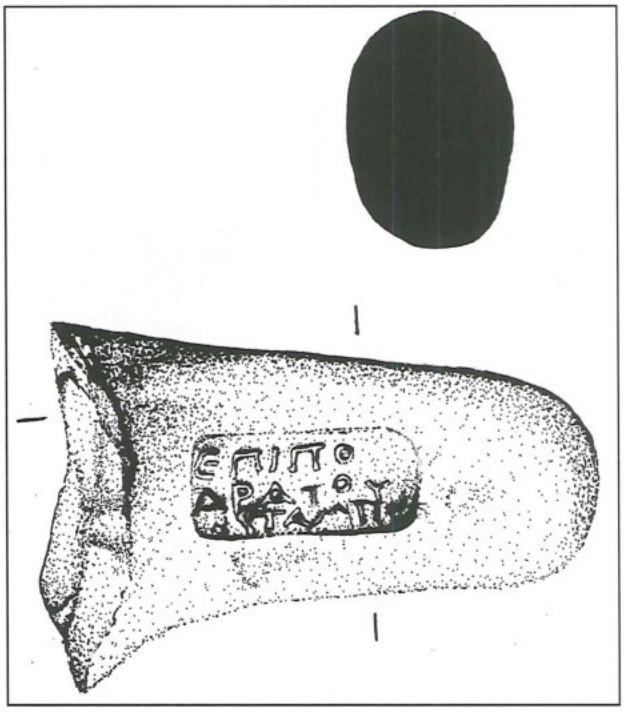
19- Ε[...]
ΠΑΥΣΑΝΙΑ[Σ] Παυσανίας



The stamp is rectangular, scratched and broken from the right side and measures (3.3x1.6cm). The object was found in a mixed dump. Legend is of an eponym only Παυσανίας. The letters are complete and clear except of the last letter S, located on the upper curved bend of the handle. The handle cross-section is oval. The object was found in a mixed dump. The fabric is of hard clay with smooth fractures, infrequent very small rounded white and dark brown inclusions. The Slip color is reddish yellow (7.5YR6/6), and the external color is pink (7.5YR7/4) and so is the core.

There are different examples of this eponym Παυσανίας from different periods of time, the first is datable to about the period of Thompson's Hellenistic group B end of the fourth century BC (Grace 1963: 424, note 12, and 326, note 16.), (Grace 1960: 200-201, fig. 231, 1961: 881, fig. 5) (Grace 1968: 224-225, no.30-37). The second eponym Παυσανίας II, that identified later in the third century BC in the base of name association and shape of whole jar (Grace 1970: 304, E.12.). The third is named on many handles in the first half of the second century. Of this name Grace dated many examples respectively in Period late II and IV. Examples are from Corinth and Carthage (Grace 1970: 304-305, E.12). From the Athenian Agora came an example with the same eponym, the fabricant and month were dated to the period between 180-150BC (Grace 1934: 302, nos.5, 6). This eponym was dated by Hiller to the period between 180-150BC, (Hiller von Gaertringen 1931: 839, no.239). Publications stamps from Jordan include: two stamps from the 'Ammān Citadel, the first with the inscriptions Παυσανίας; Υακνθιος dating to the middle of the second century BC, it was found in the strata which represent the Hellenistic phase (Seleucid Period) that started in Philadelphia in the year 218BC, when Antiochus II occupied the city from the Egyptian king Ptolemaic IV. In this strata were also found two coins of the Emperor Antiochus Epiphanies era, which dated back to the period between 175-164 BC (Zayadine 1973: 28, 30). The second one came from the upper terrace of the 'Ammān Citadel with the legend ΕπίΠαυσανίας Σμίνθιου dated to the period between 180-150BC (Zayadine 1977-78: 37). Another example from Pella, (Ṭabaqat Faḥl) holding eponym Παυσανίας, was dated to the period between 180-150 BC (Hennessy 1980: 17), Umm Qays (Weber 1986: 11. F.14.73) provides another example holding the same legend and dated to the second half of the second century BC was found in Umm Qays (Rousan 1998: 82, no.22). See also Samaria (Crowfoot 1957: 382) and Kition (Calvet 1982: 31, nos.79,80).

20- ΕΠΙΠΟ[Λ] / ΑΡΑΤΟΥ ΑΡΤΑΜΙΣ — ΕπίΠολυαράτους Αρταμίτιος



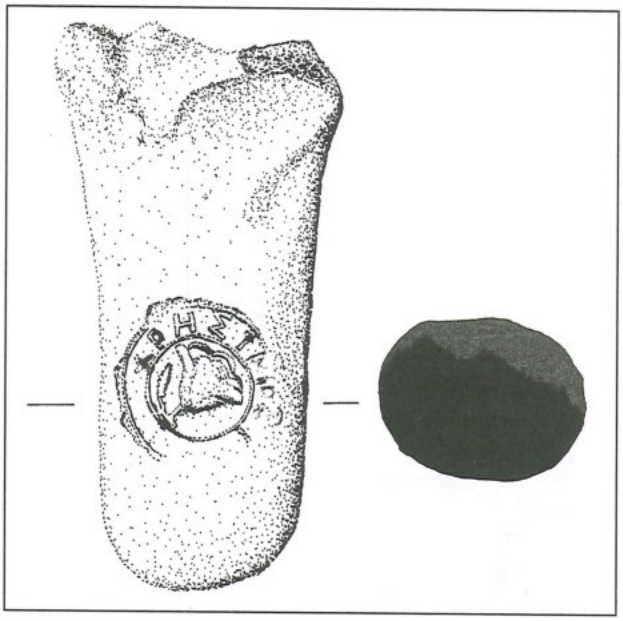
Legend in large letters gives the Rhodian eponym Πολυαράτου and the month Αρταμίτιος in three lines on a rectangular stamp measuring (4x1.8cm). The fabric of the handle is hard clay, with a harsh feel and smooth fractures. There are some small and medium voids, little inclusions are visible are mostly very small and rounded. Dull brown in color, some less frequent white inclusions possibly limestone are visible but are very small. The slip is reddish yellow (5YR7/6), the core is pink (5YR8/3), and the external is pinkish white (7.5YR8/2). Handle cross-section is oval (3.9x3.5 cm).

Grace dated this Rhodian eponym Πολυαράτου from impression stamp from Delos to Period V was followed in office by the eponym Κληνόστρατος II (Grace 1970: 316, 317 and E.45: 300).

The second example bears the Rhodian eponym Πολυαράτου I is known and is datable to the second half of the second century BC (Grace 1963: 333).

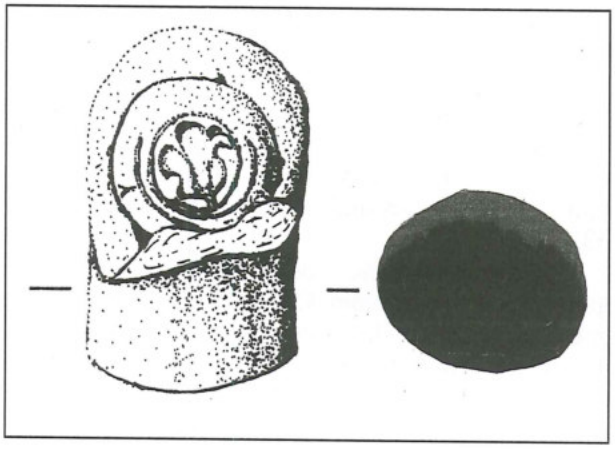
The third example from the excavation of the great temple at 'Ammān Citadel has the month Βαδρόμιος dated to the same period (Russell 1997: 49, no.34). Also this eponym appeared in Samaria list (Crowfoot and Kenyon 1957: 383) and Jerusalem (Macalister 1901: 128-29, no. 188).

21- ΧΡΗΣΙ[ΜΟΣ] Χρήσιμος



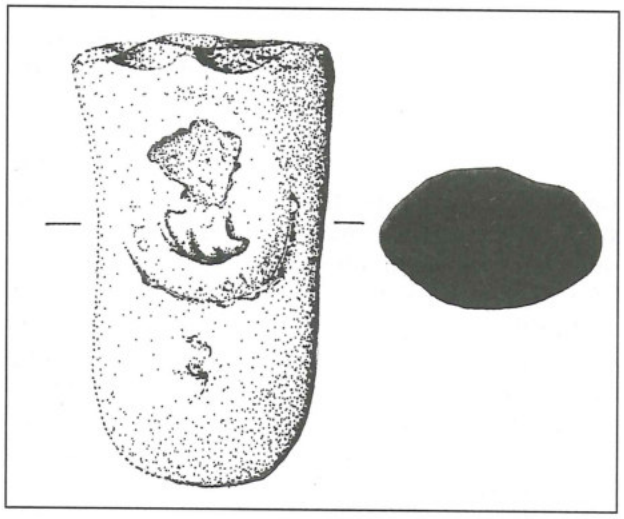
A circular stamp with a rose of Rhodes in the center of the legend gives the Rhodian name Χρήσιμος. The impression is faint especially in the right part towards the neck of the vessel. The fabric is typically Rhodian and is of hard clay that fractures smoothly and feels harsh. The core is light red (2.5YR7/8), slip is light red (2.5YR6/6), and the external is pink (2.5YR8/3). It is of well-levigated clay with few visible inclusions, some infrequent, very small rounded white inclusions are visible. Χρήσιμος name is rare on Rhodian amphorae, only four examples from Agora in Athena dated by their context to the third century BC (Grace 1934: 237 nos. 83, 84). Another Χρήσιμος comes from Samaria list (Crowfoot and Kenyon 1957: 384) and Kition (Calvet 1982: 35, no.97)

22- ΕΠΙ[...]ΟΥ[...]ΟΥΣ[...]



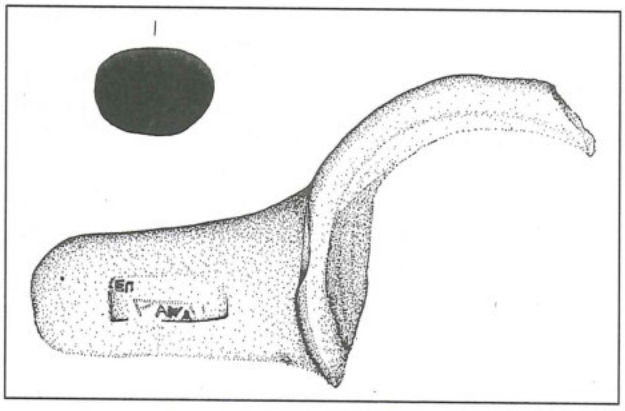
The letters are not legible. A circle stamp with a rose of Rhodes in the center of the stamp is faint and a part toward the neck is broken. It is probably dated to second century BC. For types of Rhodian's rose see Grace (1985: pl. 1: nos. 2a, 2c, 3a, 3c). The fabric is Rhodian: hard well-levigated clay, with a harsh feel, and small voids in the surfaces, from rounded to large sub-angular pale yellow-white inclusions. The core is red (2.5YR5/6), the external is pink (5YR8/4), and the slip is yellowish red (5YR 5/8).

23-Χ[.]Ο[...]ΜΑΥΛ[...]ΝΩΝ



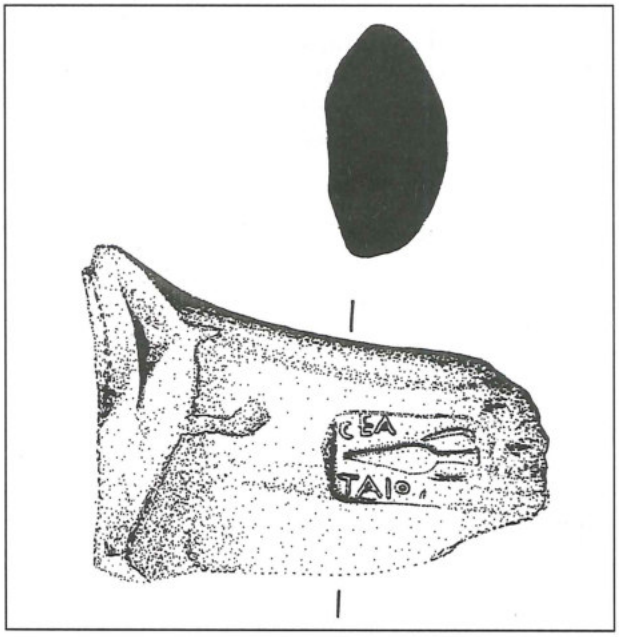
This stamp is rounded, with a faint circular, legend and rose of Rhodes in the central device. Probably dated to second century BC. The fabric is Rhodian: hard well-levigated clay with smooth fractures and a harsh feel. Small voids and very small dull reddish brown and white inclusions are visible. The color of the core is reddish-yellow (7.5YR7/6) also the slip, and the external is pink (7.5YR8/3).

24- ΕΠ[...]
ΠΑΝ[.]Μ[..]



Probably an eponym name (stamp impression is very faint) the name is not restorable. A portion of the rim is preserved, and is stamped in the month Πάναμος. It is of a hard clay and well-levigated, with no inclusions visible. The fabric: external is pink (7.5YR8/3), the core is reddish yellow (7.5YR6/6), and the slip is yellowish red (5YR5/6).

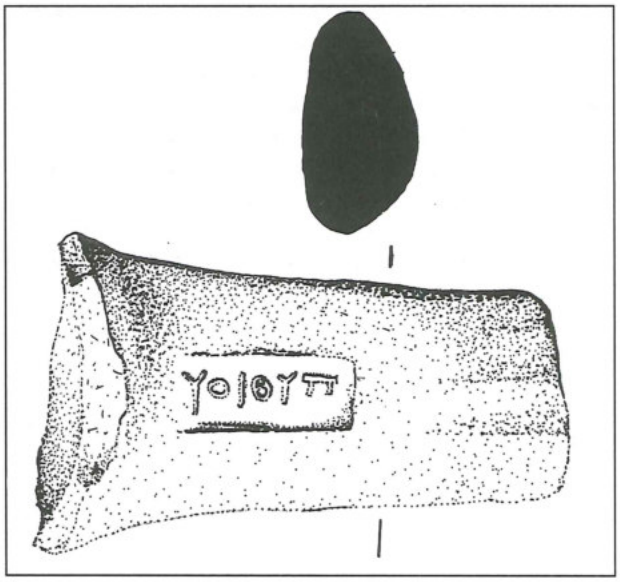
25- CEA /
TAIO (Origin uncertain)



No parallel is noted for this stamp and the further one (no.26) though the letters are readable they do not correspond with any name of Grace's list. The handles are different in the clay and fabric. They are probably derived from a single clay source. This clay source did not precisely match any known Rhodian clays or known local clays. The silica temper in the clay indicates that the clay sources as well, should be on or quite close to the coast.

Grace in her study indicates that the idea of two-handle pottery container made especially for transporting it seems to have originated with the Canaanites, further of the Phoenicians, in the coastal area of later Syria (Grace 1979: 1-3). A rectangular stamp measuring (3x1.5cm) has the amphora as a device on the amphora between the two lines. The handle is different to the others as it is flat and of a coarse fabric compared with the most of the other handle in the collection. The clay is well-levigated, a crack is visible in the core, also small size angular sparkling white inclusions (quartz) is common, as are rounded yellowish cream inclusions.

26- ΥΟΙΘΥΠ (Origin uncertain)



Like stamp no. 25, no parallel is noted for this stamp, nor can the origin of the handle be determined. They do not correspond with any name on Grace's list.

A rectangular stamp measuring (3x1.3cm), the handle is different to the others: it is flat, and of a coarse fabric compared with the most of the other handle in the collection. The core is light red (2.5YR7/8), slip is light red (2.5YR6/6), and the external is pink (2.5YR8/3). The clay is hard and well-levigated; a crack is visible in the core of the handle, also small size angular sparkling white inclusions (quartz) is common, as are rounded yellowish cream inclusions.

General Notes on the Rhodian Stamps

24 of 26 stamped Greek amphora handles recovered during the project excavation at 'Ammān Citadel possess legends, devices, or their fabricant attributes which suggest their Rhodian origin. Seven of them bear the Rhodian rose, one bears the head of Helios, one bears the hook, and another bears a wreath within the legends. All ten of the eponyms and nine of the probable ten fabricant names identified were previously known from other contexts as Rhodian priests of Helios or as potters (Grace 1953: 122-24). Twelve handles bore the name of Rhodian months. It is now uncommon to find a new name except on very early or very late handles (Grace and Pertropoulakou 1970: 300) but we have example no.15 which bears the name Ιερωνος as a fabricant followed by the eponym Αντίπατρος and he is known as a priest of Helios in Grace list and other publications.

Two example are not of Rhodian origin nos. 25

and 26 are different in clay and fabric. They do not correspond with any name on Grace's list, and are of undetermined origin, the Rhodian handles all have a fairly uniform fabric and slip (readings from the Munsell Soil Color Charts 1994). The Rhodian fabric consists of well-levigated clay with some small grit inclusions. The color of the fabric ranges from light red 2.5YR5/6 to reddish brown 2.5YR6/6 and reddish yellow 5YR7/6 various shades 5YR7/4,8/4 of pink and 7.5YR in various shades. The color of the slip ranges from shades of pink 7.5YR in various shades to very pale brown 10YR 8/3-8/4.

The percentage of the handles datable at various periods generally follows the pattern shown in Delois, Pergamon, and Rhodes. The earlier Periods (I and II according to Grace's divisions) are sparsely represented. These earlier handles nos. 2, 18 and 21 are rarely represented in the Rhodian handles.

Regardless of the contents of the amphorae, or whether they arrived to 'Ammān with their original content or a refill, the fact remains evident that 'Ammān enjoyed a prominent position with vital trade connections in this time with the Hellenistic world.

List of the Greek Stamps

This list only covers names, letters, months and devices, which have been read in the group of stamps, recovered during the 'Ammān Citadel excavations 2000-2001

1-Αγήσιππους Rhodian eponym, no. 1.
2-Αγλωκρίτους Rhodian eponym, no. 2
3-Αγοράνακτος Rhodian fabricant, no. 3 and 4
4-Αντίπατρος Rhodian eponym, no. 5
5-ΕπιΑρίστείδα Rhodian eponym, nos. 6 and 7
6-Αρίστόδαμος Rhodian fabricant, no. 8
7-Αριστομενευς Rhodian eponym, no. 9
8-Δαμαίνετους Rhodian eponym, no. 10
9-Δαμόνιτκος Rhodian fabricant, no. 11
10-Διονυσίους Rhodian fabricant, no. 12
11-καλλικράτευς Rhodian eponym, no. 13
12-Μαρυσύα Rhodian fabricant, no. 14
13-Μενεκλεύς Rhodian fabricant, no. 15
14-Νίκια Rhodian fabricant, no. 16
15-Ιέρωνος Rhodian fabricant?, no. 5
16-Ξενάρετος Rhodian eponym, no. 17.
17-Παυσανίας Rhodian fabricant, no. 19.
18-Πολυαράτους Rhodian eponym, no. 20.
19-Χάρητος Rhodian fabricant, no. 18
20-Χρήσιμος Rhodian fabricant, no. 21

The Rhodian months

Χειμερινή έξάμρηνος (Winter months)
1- Θεσμοφόριος (October - November) no 4(?) 13
2- Διόσθυος Not represented November - December)
3- Θευδαίσιος4?(December - January)
4- Πεταγείτνυος (January - February) Not represented
5- Βαδρόμιος February - March Not represented
6- Σμίνθιος March - April no. 7.
Θερινή εξάμηνος (summer months)
7- Αρταμίτιος (April - May) no,20
8- Αγριανιος (May - June) no.14
9-΄Υακνθιος (June - July) Not represented
10- Πάναμος (July - August) nos. 3,5,18,24
11- Καρνείος (June - July) no. 9
12- Δάλιος (September - October) nos.10, 11
13- λ Πάναμος β leap month, intercalary month.

The devices

Rhodian, rose. Nos. 7, 8, 13, 21, 22, 23, 24
Helios head. No. 2
Wreath. Nos. 17, 18
Amphora. No. 25
Hook. No. 15

Sahar Mansour
Department of Antiquities
P.O Box 88

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THE 2003 SEASON OF THE RABBATMOBA/AREOPOLIS AND QAṢR AR-RABBA PROJECT

Jacqueline Calzini Gysens

Introduction

The fourth field season of the Rabbatmoba/ Areopolis and Qaṣr ar-Rabba (قصر الربة) Project of the Italian Institute for Africa and the Orient (Is.I.A.O, Rome) was conducted in the winter for 2003 under the auspices of the Department of Antiquities of Jordan. We thank in particular Dr. Fawwaz al Khraysheh, the Director General of the Department of Antiquities, for permission to proceed the project and we acknowledge Mr. jihad Darwish's participation in fieldwork as the representative of the Department (Karak Office). We also wish to express our gratitude to H.E. Stefano Jedrkiewicz, the Italian Ambassador to the Jordanian Hashemite Kingdom, for his support.

Funding for this fourth season was provided by the Italian Ministry for Foreign Affairs, Cultural Directory, the Italian Institute for Africa and the Orient (Rome), and the University of Florence.

The participants in the multidisciplinary research were: architects Ombretta Dinelli and Roberto Sabelli (Florence University), geologist Giovanna Cecchi (Florence University) and surveyor Fabio Rossi, all under the direction of the author.

Research at ar-Rabba (JADIS 2207.002)

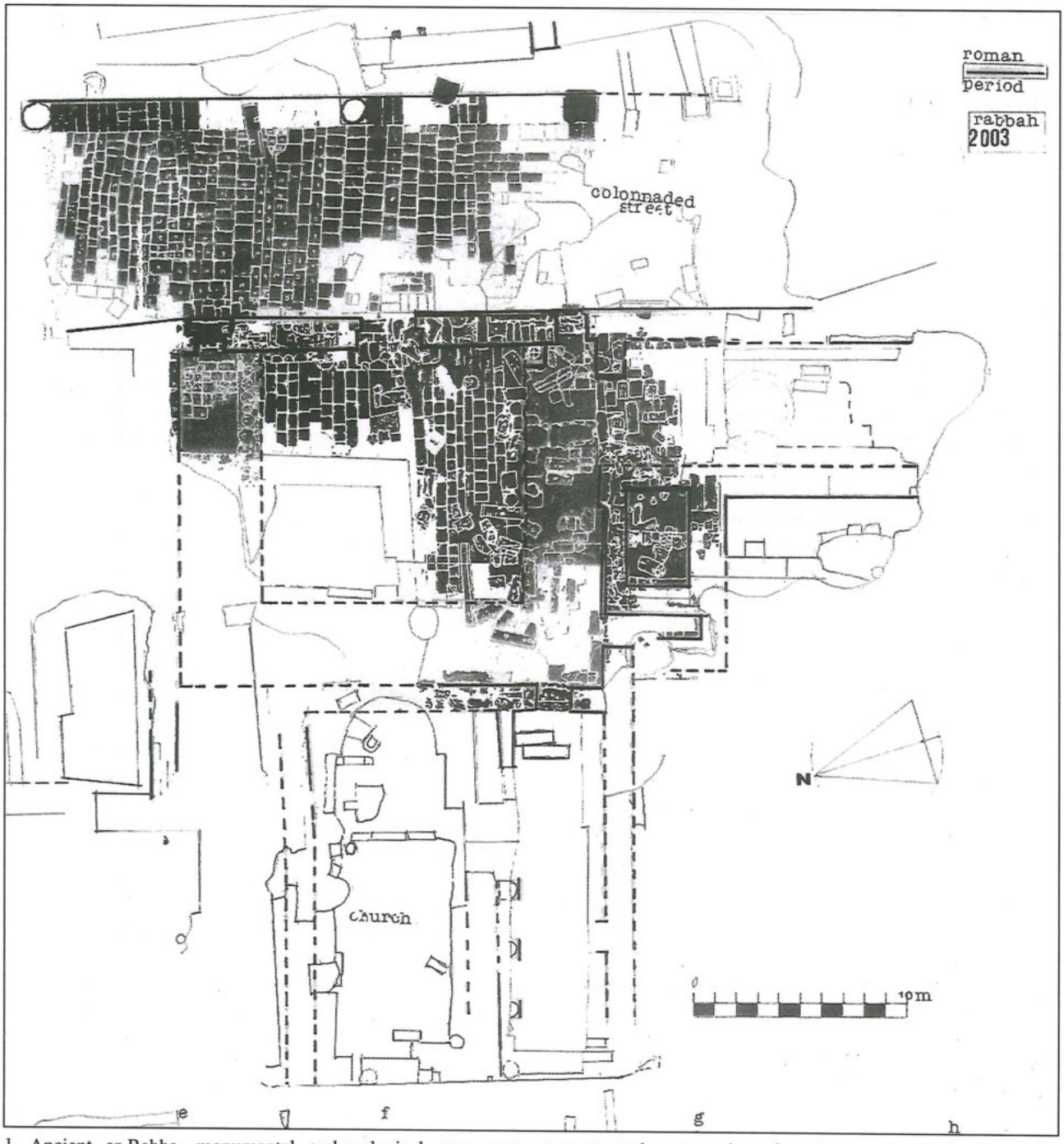
This season's programme focused on completing an architectural survey and drawing of a sector in the western monumental archaeological area, and on preliminary research of excavation, restoration and enhancement (Calzini 2002, 2003; Marino *et al.* 2003). At the same time fieldwork and a geomorphologic survey was conducted in the immediate surroundings of ar-Rabba. A summarized form of the significant results will be presented here. Interpretative data from laboratory analysis of lithic and plaster sampling from selected architectural features from ar-Rabba's archaeological area and of Qaṣr ar-Rabba's isolated "Nabataean" temple have been studied by Giovanna Cecchi and are presented in this volume of ADAJ.

During the course of the 2003 season, attention was given to the detailed drawings of features originally belonging to the layout of a Paleochristian church of the monoapsidal type. It is oriented to the east and located in the sector west to the colonnaded Roman street. Apparently the standing architecture had been exposed, in the course of time to a series of complex structural transformations (from functional alterations to modern quarrying). The actual location shows a sector of ruins, located between the colonnaded street and the Tetrarchic period Roman temple and is partially cleared of its ancient debris, in an operation conducted by the Department of Antiquities in the early 1960s (Zayadine 1971). One third of the ruins (the north aisle of the church) is still buried and will be the object of stratigraphic excavations. In the meantime, drawings and a preliminary phasing of construction sequences was attempted in the framework of architectural analysis and in concomitance with a programme of mortar and stone sampling for chemical tests (Cecchi 2004). Seemingly little of the standing architecture was part of the original layout of the carefully built church, little remains of the liturgical or sacred furniture; a segment of the lower steps of the *synthronon*; a stone columnar post with an engraved cross; a fragmentary stone lintel, with traces on its front side of an encircled cross. The relationship within the original church layout of the three column bases built into the wall dividing the nave from the south aisle, is still to be verified. Fragments of a plain white mosaic paving the lateral (south) aisle have been noticed. The complexity of the surviving features and the impressive structural interventions suggest a radical transformation of the building's functions prior to its final abandonment.

Also on the program for this season was the resumption of previous topographical investigations at adjacent features located between the church's apse and the colonnaded street. As indicated in the reconstructed ground plan of the sector elaborated

by architects Roberto Sabelli and Francesco Ciampinelli (**Fig. 1**), hypothetical construction phases and functions fit into the Roman period urban context. Apparently the area presented a square open air paved space, located 180cm above the colonnaded street level, and covered a monumental underground water reservoir that has been investigated. Standing architectural features, including rows of column bases *in situ*, had been successively integrated into vast rebuilding interventions, characterized by defensive works. The peculiar character of this architecture is the object of a thematic research (**Fig. 2**).

Proceeding with the examination of surviving features of the ancient defensive urban walls in ar-Rabba, we made a survey at the northern outskirts of the municipality public garden. We had previously noticed some interesting ancient walls and



1. Ancient ar-Rabba, monumental archaeological area west, reconstructed topography of central sector (arch. R.Sabelli, F.Ciampinelli 2003).



2. Ancient ar-Rabba, monumental archaeological area west, monumental entrance to church sector.

it was described by Alois Musil (1907). The remains have been mapped and will be investigated in the future. The ruins in ancient ar-Rabba are extremely variegated, reflecting the urban centre's long historical importance in the region and we are grateful for this unique research opportunity offered to us by the Jordanian Authorities.

A Geomorphological Survey in ar-Rabba's Surroundings

One of the main tasks set for this project is providing a comprehensive inventory of the emplacement of archaeological remains in the area. The methodological and archaeological implications of the expected results might provide a basis for future cultural resources management projects, the creation of a national archaeological park, and will be submitted to the local Authorities. In keeping with these objectives — (a consideration of the endangerment to archaeological remains in the area by the rapid expansion of urbanization) — the order of precedence in survey has been tracing the remains of the major ancient Roman road, the *Via Nova Traiana.* Upon which, according to the ancient sources and records of 19th and 20th century European explorers[1], ancient ar-Rabba was located. A verification on the ground of a set of aerial photographs purchased through the Royal Geographic Centre in 'Ammān was conducted by geologist Dr. A. Ercoli using stereoscopic reading. The readings gave good results and we acknowledge our gratitude to Dr. A. Ercoli. Preparatory geo referencing of the hypothetical features, or "anomalies", adapted to GPS technology and surveyor Fabio Rossi elaborated on fieldwork (**Fig. 3**).

The initial focus of the survey was the area south west of the monumental archaeological centre, and the examination of a linear "anomaly" starting at the principal ancient urban reservoir and running nearly parallel at a constant distance of ca.150m to the modern Mādabā-Karak road. The first segment of ca.500m gave no results on the ground, because it is wholly occupied by housing. After crossing a shallow wadi depression with remains of a dam, the landscape turned into fields, characterized by limestone bedrock outcroppings over the entire area. Most noteworthy was the discovery of a nearly 2km long straight stretch of fully paved ancient road oriented north south, and following the highest geographic level (**Fig. 3**, 1A). Its configuration on the ground was clear, its preservation nearly perfect, with its central spine of well-worked flat stones and traces of larger blocks at the edges, directly quarried on the spot (**Fig. 3**, 1d). Its width, circa 6m, conforms to traditional Roman period road building. We continued with the survey until we noted a bifurcation, where a branch of the road became a track and proceeded in the direction of Rakin (**Fig 3**, 1b) and where the main paved stretch continued south eastwards but disappeared inside a private agricultural (or industrial) estate, established near the modern Mādabā-Karak road. We hope to continue our investigations in the near future. The conjectured location of the original itinerary of the *Via Nova* in ar-Rabba's territory leaves the possibility open for identification. We are well aware that a rather complex road network of the Roman period existed in the region, as attested by literary sources and archaeological survey. In particular we refer to the survey ancient Rakin – ar-Rabba road by Ernest Axel Knauf, with whom we would like to present our documentation and express the hope that the "*Nordwestlichen Ard el-Kerak*" reconnaissance might resume in the near future (Worschech and Knauf 1985).

The next site recovered through GPS mapping was already an existing objective of a previous survey in the area where our mission had identified pre-classical perhaps Iron Age features. "Anomalous" features 2 a-b-c and d are situated at the south eastern slopes of the modern village of ar-Rabba, along a section of a flat depression of wadi bed, 500m east of ar-Rabba, and crossed by the road to al-Judayyda (and to al-Lajjūn, the Roman

1. R. E., Bruennow and A. von Domaszewski, *Die Provincia Arabia auf Grund Zweier in den Jahre 1897 und 1898 unternommen Reisen und der Berichte frueherer Reisender,* I, Strassburg 1904-1909: 56-59; A. Musil, *Arabia Petraea* I (Moab), Vienna, 1907: 126; R. Canova, *Iscrizioni e monumenti protocristiani del Paese di Moab,* Rome 1954: 258. The southern sector of the *via Nova* (Traiana), in particular as located in Central Jordan's highlands, is not yet fully investigated: cfr. Th. Bauzou, *A Finibus Syriae.* Recherches sur les routes des frontiers orientales de l'Empire Romain, Th. Doct. Paris I 1989: ibid. La Province romaine d'Arabie et son réseau routier, *Studies in the History and Archaeology of Jordan*, IV, Amman, 1989.



3. Surroundings of ar-Rabba. Aerial photographs (Courtesy Royal Geographical Centre 'Ammān). Stereoscopic reading A. Ercoli. Elaboration F. Rossi.

legionary fortress). 2a and 2d show stretches of an ancient paved road, maybe among those already noted by Reginetta Canova in the 1930s, and described as "a secondary parallel and to the east of the *via Nova* (which in that period was still well visible) leading to al-Yādūda, and proceeding until Lajjūn, where a milestone has been found"[2]. Most interesting was our discovery following Ercoli's reading of aerial photos of a large square enclosure nearly invisible at ground level (2d). It is associated on its north side to (the remains of) the ancient road and thus to the Roman road system. The topographic geometrical plan provided by GPS indicates the measurements of ca. 120m for each surviving side on a north-south orientation. The extremely decayed stone mixed with scarce ceramic material remains of this large compound configure regular internal rectangular division buried under sand deposits. A straight line of relatively deep ditches is visible on its southern and eastern sides and there are feeble remains at the south eastern corner of what might have been a circular tower. This conjectural identification will have, of course, to be verified by soundings. Significant comparisons with late antiquity military camp layouts in the region are not to be excluded [3]. The geographical location of the site is well adapted for a military base guarding the approach from the East to the *via Nova* because its commands a view over the wadi valley. Moreover, it is close to a major well preserved Wadi fed open-air water reservoir (2c; measures: ca.107 x 64m). The masonry technique can be ascribed to the same late antiquity period. On west side, the traces of the rectangular compound are less visible and the area incorporates a monumental tomb described an Islamic memorial.

Between the water reservoir and the 2d "camp" site at site 2b we noticed also the presence of a great number of underground structures (we counted at least 10 bottle-shaped cisterns). By walking in a northerly direction we located the overall presence of large quantities of Nabataean fine and coarse ware. These were not associated with visible structures.

Other field activities refer to sector 3 of (**Fig. 3**), an area located to the east of the structural remains of the pre-classical watchtower (**Fig. 3**, 3a and 3b). Indicates the approximate alignment of a double row of vertical orthostats. 3d shows bedrock outcrop and ancient quarries.

Sectors 4 and 5 gave no result on the terrain.

Regional Survey

A limited regional survey was organized and a first expedition was conducted by surveyor Fabio Rossi with the participation of geologist Giovanna Cecchi and the author. This was to provide the mission with complementary documentation on regional ancient architecture, and in particular those identified in major published surveys (Musil 1907; Glueck 1934; Miller 1991) as pre-Roman.

Our party visited archaeological sites WPT 3 (Miller 17), Majdalayn (Miller 16), Shaḥtūr (Miller 54), Khirbat Tadūn (Miller 56), Khirbat Mudaynat al-'Ālya (Miller 143 and 144), Lajjūn (Miller 239), and Beineh (Miller 242). Presented with Miller's observations we note the precarious situation of some of these archaeological sites, when not threatened by intensive agriculture.

Jacqueline Calzini Gysens
Istituto Italiano per l'Africa e l'Oriente
Via Ulisse Aldrovandi 16
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www.isiao.it

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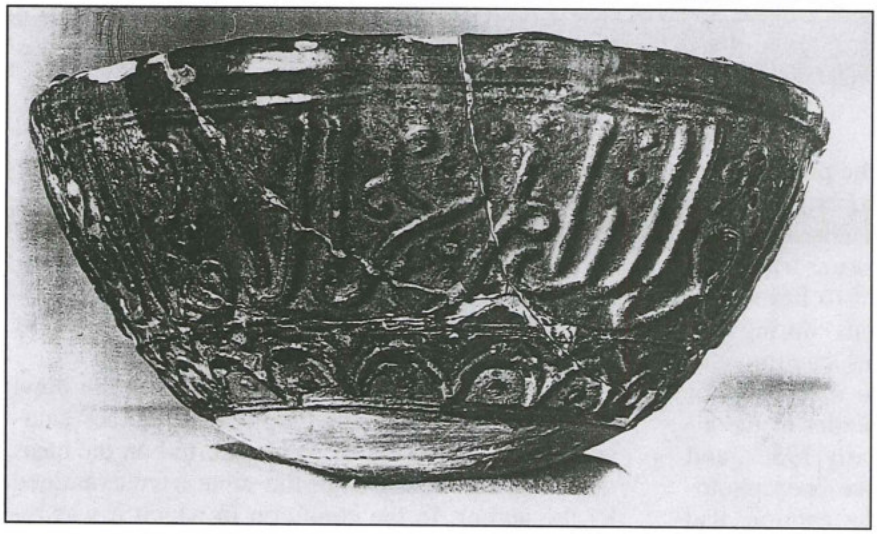
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2. R. Canova, *supra*, p.lvii.
3. cfr. D. Kennedy and D. Riley, *Rome's Frontier From the Air*, London 1990: 189, Figs. 136 (Sa'neh, Syria) and Pp. 171, Fig. 115 (Avdat, Israel), Pp. 209, Fig. 160 (Gharandal, Jordan).

AN INSCRIBED POTTERY BOWL OF THE MAMLUK PERIOD

Marcus Milwright

This note is concerned with an inscribed glazed pottery bowl of the Mamluk period recorded in the photographic archive of the Department of Antiquities in 'Ammān, Jordan. The present whereabouts of the bowl are not known and the only current record is in the form of a series of black and white photographs. The images of the artefact appear in one of the albums of photographs stored in the archives of the department taken before 1980 (reference: Album no.5, negatives 1297-1304). The illustrations (**Figs. 1-3**) used here have been reproduced from the negatives by the Department of



1. View of relief-moulded lead-glazed bowl from the collection of 'Abdallah Bey Rihani. Photograph courtesy of the Department of Antiquities of Jordan.



2. Detail of the inscription band. Photograph courtesy of the Department of Antiquities of Jordan.



3. Detail of the inscription band. Photograph courtesy of the Department of Antiquities of Jordan.

Antiquities.

According to the caption facing the photographs in the album, the bowl was the property of 'Abdullah Bey Rihani. The Rihani are a Christian family who hail originally from al-Ḥuṣn near Irbid, and members of the family were known to have been collectors and dealers in antiquities during the twentieth century. Appended to this caption is a handwritten note that gives the date of the photographs as 25th July 1974. The remainder of the album contains images taken in the early 1950s, and it is possible that the bowl may have been photographed sometime before 1974. The caption also states that the bowl was found in 'Dāmiya' (i.e. the town of Dāmiya (داميـة) about 37km due north of the northern tip of the Dead Sea). The modern settlement is located on the southern side of az-Zarqā' River about 3km east of the Dāmiya bridge that crosses the Jordan River. Clearly, the provenance of the vessel should not be regarded as conclusive on the basis of such evidence. Allowing for this important qualification, in the last section of this paper I will make some comments concerning the potential significance of the location of Dāmiya for the understanding of the distribution of this ware in the Mamluk period.

Black and white photographs do not form an ideal basis for the description of a ceramic vessel. The reason for devoting attention to the images from this album lies in the fact that the bowl carries a complete Arabic inscription moulded in a band around the exterior. Inscriptions are an uncommon feature of lead-glazed earthenwares produced in Bilād ash-Shām during the Mamluk period, and to have an example surviving in this complete form is particularly rare. Another point of interest lies in the fact that it is possible to link the Rihani bowl with other whole and fragmentary examples of the same ware from private collections and from excavations conducted in the south of Bilād ash-Shām.

Some observations can be made about the bowl on the basis of the photographs, while other characteristics of the vessel can be inferred on the basis of similarities to sherds of the same ware examined by the author. In the condition in which it was recorded the bowl has a diameter of approximately 25cm and a height of 12cm. Originally, the vessel would have possessed a high, flaring pedestal base, nearly doubling the total height. The bowl has evidently been reconstructed from a large number of fragments, but the photographs indicate that the individual sherds probably all came from one vessel. The rim of the bowl has an in-turned lip, and there are numerous drips of glaze around the rim. This latter feature indicates that the bowl was fired upside-down in the kiln. The lead glaze is glassy with some crazing in the thicker areas, and has been applied over a pale slip. The interior was painted with a darker glaze (probably green), some of which has dripped onto the exterior. The exterior glaze is lighter, and is probably yellow-ochre in colour. The inside of the bowl was not photographed, but the interior is unlikely to have carried any decoration (simple graffito designs are sometimes found on examples of this ware, however).

The most striking feature of the bowl is the moulded ornament running in a band around the exterior. This was achieved by pressing the unfired bowl into a carved mould (made of plaster or ceramic) while the clay of the bowl was still wet. This technique leaves a pattern in relief that can then be slipped and glazed. The method of mould casting is well known in Islamic pottery, and was most commonly employed in Bilād ash-Shām in the manufacture of unglazed lamps, jugs and water flasks. The combination of mould casting and glazing is less common in this part of the Islamic world, although examples in earthenware and stone paste are reported from the ninth to the twelfth century in Egypt and Syria.

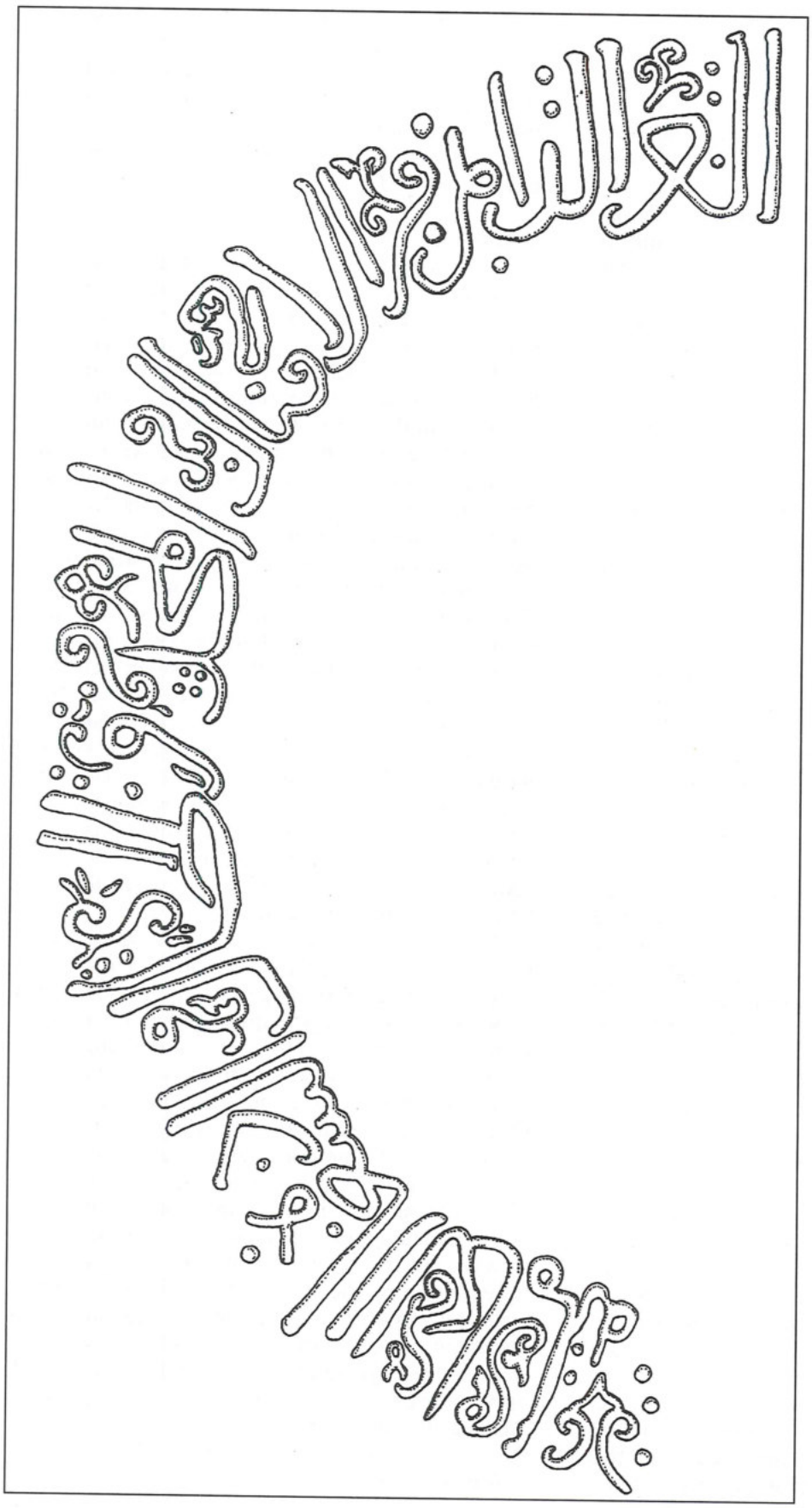
The Rihani bowl belongs to a type of decorated lead-glazed ware that can be securely dated to the Mamluk period (see discussion below). Examples of this group of relief-moulded lead-glazed earthenwares carry a wide range of decorative motifs. The elements seen on the Rihani bowl — a wide inscription band with a simple geometric band below — find close parallels in numerous published pieces. In this case, the lower band is made up of a continuous zigzag design. The inscription is written in a bold cursive hand around the exterior. The terminals of letters do not have serifs and the profusion of dots above the letters do not function as diacritic points. The spaces left within the text band are filled with simple ornamental curvilinear devices (**Fig. 4**). The inscription itself reads: *al-'Izz ad-Dāyim wal-'Iqbāl wal-Majd* العز الدايم والإقبال والمجد *wa wal-Ḥāl was-Sa'ādatu al-kāmila* (والحال والسعادة الكاملة). Removing the repeated use of the definite article, this may be translated as 'perpetual glory and prosperity and (?) and perfect happiness'.

Only one word — which appears to read as *al-ḥāl* الحال — is difficult to decipher. The first letter after the definite article could perhaps also be read as an incorrectly rendered *ṣād or ḍād* . In the context of the inscription the word has no clear meaning, and the arrangement of the *alif* and the *lām* with the following letter is also curious. It is possible that the vessel was clumsily restored in this section, though the close-up photographs do not support this interpretation. It is worth noting that the remainder of the inscription contains errors including the two *waw*(s) before and after *al-majd* المجد and the numerous dots placed in incorrect positions. These features call into question the literacy of the craftsman who designed the mould from which this vessel was made. Significantly, there exist other examples of relief-moulded bowls — glazed and unglazed — of this period that carry inscriptions that are only partially legible (for instance, see Ben-Tor *et al.* 1996, photo XIII.26, fig. XIII.43.1). It may be that the maker of the mould used in the manufacture of the Rihani bowl made a mistake in copying an inscription from another source, in which case, *al-afḍāl* الافضال ('the benefits') is likely to have been the term originally employed.

Discussion

The characteristics of the Rihani bowl correspond well with a type of relief-moulded lead-glazed earthenware that appears relatively frequently in excavations of Islamic contexts in the south of Bilād ash-Shām. The scale and profile of the Rihani bowl can be compared to publish examples, and the lower decorative band is also of a familiar type. The inscription on the Rihani bowl takes the form of a generic good luck message and has some close parallels. A bowl from the Keir collection carries the legend, *al-'izz wa'l-iqbāl wa'l-majd wa'l-afḍāl wa lahu 'l-sa'ādat al-kāmilat al-dā'im* (Grube 1976: 155-56, pl. facing 137). A similar inscription can be found on a bowl excavated in Ḥama, Syria (Riis and Poulsen 1957: fig. 398). A bowl now exhibited in the Archaeological Museum on the citadel in 'Ammān contains a partial inscription reading, *...al-dā'im (?) wa'l-iqbāl wa'l-majd wa'l-afḍāl al-sa'āda...* (illustration in Milwright 2003: fig. 3). It is probable that these types of non-specific benefaction reflect the fact that potters were seeking to imitate the inscriptions found on other decorated pottery and on low quality metalwork produced in provincial centres in Bilād ash-Shām during the fourteenth century.

The Rihani bowl fits into a known subset of relief-moulded lead-glazed wares carrying inscription bands. The precise wording of the inscription is also familiar, but what is perhaps more significant here is the manner in which the words are arranged and the presence of numerous ornamental devices attached to letters or filling up the remaining spaces. Extensive use is made of an upper register in a manner that is not commonly encountered in the inscription bands from the remainder of this group. Most striking are the additional ornamental features, including the elaborate tails added to the waw(s) and the devices located in the spaces between some of the letters. There is considerable technical and stylistic continuity between all of the published examples of relief-moulded lead-glazed ware, but idiosyncratic features on the Rihani bowl provide persuasive evidence that there existed a number of skilled craftsmen at work in the design of the decorative moulds used in the production of relief-moulded lead-glazed bowls.



4. Inscription band reconstructed from the photographs (not to scale).

I have discussed the dating and distribution of this ware in greater detail elsewhere (Milwright 2003: 91-101), but a few relevant details can be highlighted here. The available archaeological evidence indicates that this type of relief-moulded lead-glazed earthenware was being manufactured in a period from the end of the thirteenth century through to the last quarter of the fourteenth century. Importantly, sherds of this ware were found in an excavated context in the 'Armenian Garden' in Jerusalem with coins from the reign of the Mamluk Sultan Sha'ban (r.1363-76) (Tushingham 1985: 141-42, 148). The occasional presence of simple Mamluk blazons on bowls is another factor that reinforces the late thirteenth — or fourteenth century dating. Whether relief-moulded lead-glazed ware continued into the fifteenth century is not clear from the archaeological evidence. As to the distribution, the published finds from excavations and surveys are concentrated in an area east and west of Jordan Valley and Dead Sea Aghwār. A very small number of finds is reported outside of this range, including Damascus and Ḥamāh to the north and the Mediterranean coast of the Sinai to the southeast. One significant aspect of the distribution pattern is the clustering of finds around Jerusalem, suggesting this city as the main centre of manufacture (Ben-Tor *et al.* 1996: 102; Milwright 2003: 93, n.62). In the absence of solid archaeological evidence, however, this must remain only a hypothesis.

In the context of the distribution pattern outlined above, the apparent find location of the Rihani bowl at Dāmiya provides interesting additional evidence. A variety of routes would have been employed in the dispersal of relief-moulded lead-glazed ware bowls from their place(s) of manufacture in central and southern Palestine east into Jordan. The finds from the Karak Plateau, and further south, presumably were carried on the trade route that originated at Gaza and then ran via al-Khalīl (Hebron) around the south end of the Dead Sea (Popper 1955: 47, fig. 13). There were well-established routes that started from Gaza and ran to the central part of Palestine before turning east, crossing the Jordan River at Jisr al-Majāmi' on the way to Irbid (Popper 1955: 48, fig. 13; Kareem 1992). A quantity of relief-moulded lead-glazed ware sherds has been recovered from the khān associated with this important bridge (Katia Silverman, pers. comm.). This was not the only bridge crossing the Jordan River in the Mamluk period, however. Another bridge over the river was constructed at Dāmiya by sultan Baybars (r.1260-77) in 664/1266, and repairs on the structure were conducted in the following year (Meinecke 1992, II: 22 no.86). The governor of Jerusalem did further work to the bridge in 687/1288 (Kareem 2000: 11). The continuing importance of this route in the latter part of the fourteenth century is indicated by the fact that reconstruction work on the bridge was ordered during the reign of Sultan Barqūq (r.1382-99) (Meinecke 1992, II: 277 no.25A/60).

Historical sources of the Mamluk period indicate that Dāmiya was one of the principal towns on the eastern side of the Jordan valley, along with Quṣayr (North ash-Shūna) and Ṭabaqat Faḥl (Pella) (Kareem 2000: 80, 294). Presumably, the trade passing east-west via the bridge contributed to the prosperity of the Dāmiya area during this time. Located south of Wādī az-Zarqā' the bridge at Dāmiya provided a convenient route from the towns of central Palestine to the east side of the Jordan valley and the plain of al-Balqā'. The main settlements of al-Balqā' during this period were as-Salṭ, 'Ammān and Ḥisbān. Little excavated material of the thirteenth and fourteenth centuries has been published from either as-Salṭ and 'Ammān, but archaeological work in Ḥisbān has led to the recovery of a number of relief-moulded lead-glazed fragments comparable to the Rihani bowl (Sauer 1973: fig. 4.138-40; LaBianca and Walker 2001: 9; Milwright 2003: fig. 3). Further excavations and field surveys in al-Balqā' would contribute to our knowledge of trade with Palestine in this period. The Rihani bowl points to the significant role played by the Dāmiya bridge in connecting these two regions during the Mamluk period.

Acknowledgements

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Marcus Milwright
Department of History in Art,
University of Victoria, B.C., Canada

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JOHN THE BAPTIST CHURCH AREA
NEW EVIDENCE
Regarding The Basilica and Four Piers

Rustom Mkhjian

Introduction

The report published by the author and Chrysanthos Kanellopoulos in ADAJ 47/2003 focused on the analysis of the Architectural Evidence in an area of unique importance concluding that memorial churches were built in the original site of the Baptism of Jesus (John The Baptist Church Area).

Further investigation and excavations associated with the intended restoration works for 2004 have brought to light new evidence as regards the basilica and four piers (Mkhjian and Kanellopoulos 2003: figs. 2, 7, 9, 12, and 13) that in turn suggested a unique design of the basilica connected through a staircase to the east with a cruciform baptistery (4 piers) (**Fig. 1**).

The present study focuses on the validity of this theory concentrating on the recent finds, comparative studies and pilgrims' accounts.

Results of Excavations/ June 2003

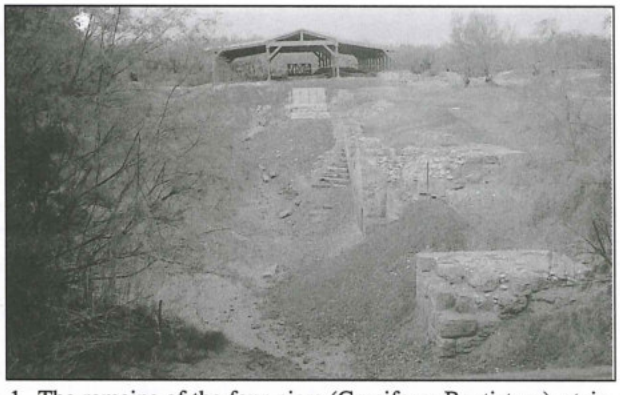
Excavations were carried out at the eastern end of the Basilica to investigate its eastern end before its restoration, in order to protect the inner floor remains and arrive at a better understanding of the basilica and its plan.

The most important results were:

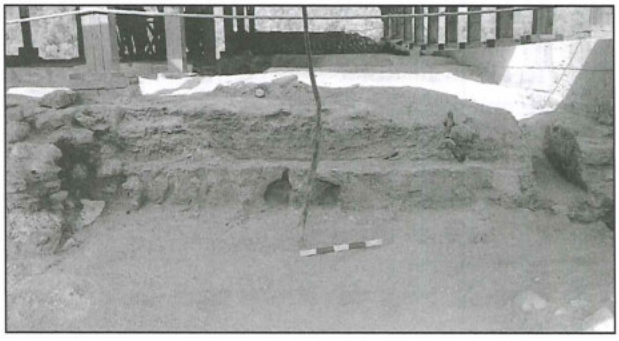
1- The discovery of the original mortar with clear indications of the stones that had disappeared at the eastern end of the northern aisle, hence leading to a more precise end of the basilica's eastern walls for both the northern and southern aisles. (**Fig. 2**)

2- The discovery of two relatively large masses of the bedding of the central aisle disconnected from its original floor by 20 centimeters (horizontally) and settled by about 30 centimeters (**Figs. 3, 4**).

Hence indicating devastating earthquakes[1] that disconnected the central aisle from the staircase.



1. The remains of the four piers (Cruciform Baptistery), staircase and basilica (from the east).



2. The original mortar at the eastern end of the northern aisle (from the east).



3. The bedding of the central aisle disconnected by 20 centimeters horizontally.

1 A field research through a cooperative agreement between DoA. and ACOR conducted by Dr. Tina Niemi and Alexander Dahne /University of Missouri (May 2004).



4. The bedding of the central aisle settled about 30 centimeters (from the south).

3- The discovery of the original mortar at the northeastern corner of the central aisle running eastward (at 90 degrees to the above mentioned mortar of the northern aisle). Hence showing that the central aisle did not stop where both the northern and southern aisles ended, but extended further east (**Fig. 5**).

Comparative Studies

Basilicas

Many different forms of basilicas evolved throughout history. Whereas early Christians had different ground plans for their basilicas, (St. Stefano Rotondo in Rome / round building; St. Vitale in Ravenna /octagonal building; Church of the Nativity in Bethlehem /octagonal central space over the Cave of the Nativity on to a five-aisles basilica, and many other forms), today a basilica is understood to be a church building which has the following main properties:

- It must be longitudinal and must have several aisles.
- The nave must be raised, with a clerestory, an area with windows.
- The main entrance must be at one narrow end and the sanctuary at the other.

Baptisteries

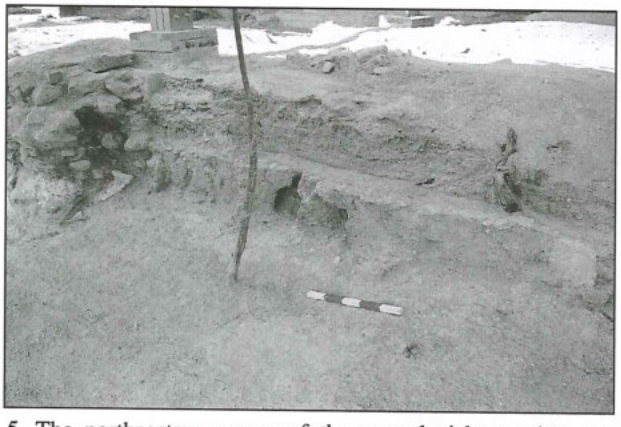
Baptisteries had different sizes and shapes too. Originally baptism could take place anywhere that running water could be provided, but later, as baptisms were performed in groups and for adults, they had to be of a certain minimum size and varied in shape and design (octagonal, round, square, cruciform, etc.).

In centralized buildings the baptismal font was set into the floor, frequently being cruciform having steps at the western and eastern ends. However, baptisteries could also be independent buildings, free-standing, or attached to a church, (S. Giovanni in Fonte / Rome; Hagia Sophia/ Constantinople, Qal'at Sam'ān/ Syria, etc.).

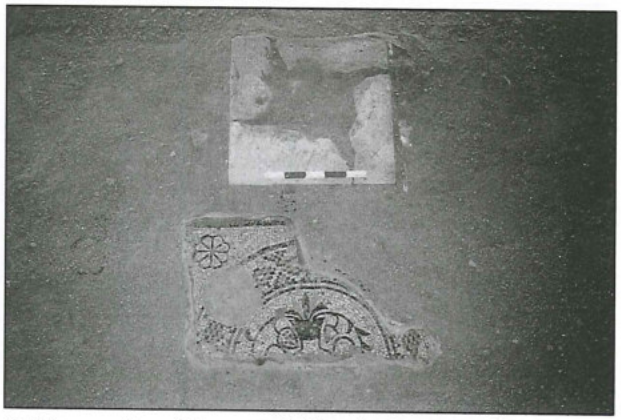
Pilgrims Accounts

Arculfus (AD. 670, PPTS Vol. 3: 36- 38) said: "... a stone bridge is carried on arches to the bank, across which men go to the cross and **descend by a slope to the bank** as they return. At the edge of the river is a small square church, built, as is said, on the spot where the garments of the Lord where taken care of at the time He was baptized. This is raised, so as to be uninhabitable, **on four stone vaults, standing above the waters, which flow below**. It is protected above by slacked lime, and below, as has been said, is supported by vaults and arches. **This church is in the lower ground of the valley through which the river Jordan flows...**".

Epiphanius (AD 675, p. 74) said: "To the East of Jericho about eight miles away is the Jordan, and there is **a small fort containing a large church, The Holy Trinity. On the riverbank is a church of The Forerunner**".



5. The northeastern corner of the central aisle running east (from the northeast).



6. The remains of the mosaic floor in the apse of the basilica just to the west of the altar.

St. Willibald (AD 754, PPTS Vol. 3: 27) said: "**A church** stands there now, **raised up high on stone columns**, and **underneath the church is now dry ground. Where our Lord was baptized in this very spot**".

Abbot Daniel (AD 1106-1107, PPTS Vol. 4: 27) said: "...upon an elevation **on the east side, there is a little chapel with an altar. This marks the place where John the Forerunner baptized our Lord Jesus Christ.** The place where Christ was baptized is **distant from the river Jordan as far as a man can throw a small stone** ...".

Conclusion

- The description of Arculfus of a slope, and a small square church built on four stone vaults standing above the waters which flow below might fit well with the four piers, staircase and ramp that was used as a cruciform baptistery at the place where the Lord was baptized. This theory would be reinforced by the fact that hundreds of cross marks where found in the lower parts of the two Northern piers that survived.
- The large church (the Holy Trinity) on a small fort described by Epiphanius might fit with the Basilica (the only piece of mosaic remaining in the apse area depicts a vase out of which 3 Palmette leaves appear, that might resemble the Holy Trinity/ **Fig. 6**). The Church of The Forerunner on the riverbank also fits the description of Arculfus.
- The church described by St. Willibald being raised up high on stone columns, with dry ground underneath at the spot where our Lord was baptized, also fits well with the descriptions of both Arculfus and Epiphanius adding that there is dry ground underneath, an indication, perhaps, that the river had moved away.
- Abbot Daniel's reference to a little chapel with an altar at the place where John the Forerunner baptized our Lord might well fit the Chapel located over the northwestern pier. But it is interesting to note the distance from the river being as far as a man can throw a small stone. Because it is a clear indication that the river constantly changed its coarse. This was also documented through the floods in February and March 2003. At the same time, the persistence of the believers to build churches in this specific point (the four piers) and to use it as a baptistery shows that they believed it was the spot where Jesus was baptized by John.
- All the above leads us to suggest that a unique monumental cruciform baptistery was built with a church on top linked through a staircase with the Basilica to allow believers to descend with their sins to be baptized with running water at the spot they believed Jesus was baptized.

Acknowledgements

The author is grateful to H.R.H. Prince Ghazi Ben Mohammad, Head of the Royal Commission for The Baptism Site, for his support for the scientific works carried out by the Department of Antiquities of Jordan at the site. Her Excellency Dr. Alia Boran, Minister of Tourism and Antiquities for her trust in the team. His Excellency Dr. Fawwaz al-Khraysheh, Director General of DoA. for his continued guidance and support, Salt Office for their Co-operation in the excavations, and for the editorial board for their patience and assistance.

Rustom Mkhjian
Department of Antiquities
P.O.Box 88
Amman-Jordan
rustommkhjian@hotmail.com

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RECENT DISCOVERIES IN BETHANY BEYOND THE JORDAN

Mohammad Waheeb

Recent archaeological discoveries during 2001 revealed the presence of architectural remains related to the Byzantine Period. Several rooms built on the eastern bank of Jordan River are thought to be where St. Mary the Egyptian (*Maqām*) lived in the eastern side of the river is where she used to lived where the monk Zosima visited her and tells of her journey from Egypt to Jerusalem and then to the eastern side for the calling of the spirit. It is where she dreamed of Mary the Egyptian, were she crossed the sacred river, and where worship to God was according to the fortune's of the patriarch of Jerusalem. The story is as follows:

In her youth Mary chose to live a disreputable life in Alexandria. One day, out of curiosity, she joined some Christian pilgrims who sailed to Jerusalem. During the voyage she seduced many of the pilgrims. She kept living this kind of destructive life even in Jerusalem. Until, on the day of the Honor of the Holy Cross, she joined the pilgrims in the church of the Holy Sepulcher where the relic of the cross of Jesus Christ was displayed.

When she reached the church door, she suddenly felt herself repelled by some secret force, and having vainly attempted three or four times to enter, she retired to a corner of the church yard, and was struck with remorse for her wicked life, which she recognized as the cause of her exclusion from the church. Bursting into bitter tears and beating her breasts, she began to bewail her sins. Just then her eyes fell upon a statue of the Blessed Virgin above the spot where she was standing, and in deep faith and humility of heart she besought our Lady for help and permission to enter the church and venerate the sacred wood on which Jesus had suffered, promising that if her request was granted, she would then renounce forever the world and its way, and forthwith depart with her so ever our lady might led her. Encouraged by prayer and the mercy of the mother of God, she once more approached the door of the church, and time succeeded in entering without the slightest difficulty. Having adored the holy Cross and kissed the pavement of the church, she retuned to our Lady's statue, and while praying there for guidance, she heard a voice from a far telling her that if she crossed Jordan, she would find rest. That same evening Mary reached Jordan, and the following day crossed the river and wondered eastward into the wilderness that stretches towards Arabia.

Here she lived alone for forty seven years, apparently subsisting on herbs, when a priest and monk, named Zosimus, who, after the custom of his brethren, had come out from his monastery to spend Lent in the desert, met her and learned from her own lips the strange and romantic story of her life. As soon as they met she called Zosimus by his name and recognized him as a priest. After they had conversed and prayed together, she begged Zosimus to meet her at the Jordan River on Holy Thursday evening of the following year and bring with him the Blessed Sacrament. When the appointed evening arrived, Zosimus came to the spot that had been indicated. After some time Mary appeared on the eastern bank of the river, and having made the sign of the Cross, walked on the western side. Having received communion, she raised her hands towards heaven, and cried aloud: "Now thou dost dismiss thy servant O lord, according to thy word in peace, because my eyes have seen thy salvation". She then charged Zosimus to come in the course of a year to the spot where he had first met her in the desert adding that he would find her then in what condition God might ordain. He came but only to find the poor saint's corpse, and written beside it on the ground a request that he should bury her with a statement that she died a year before on the very ground on which he had given her Holy Communion far away by the bank of the Jordan River aided, we are told by a lion.

He prepared her grave and buried her. He returned to his monastery, where now for the first time, he recounted the wondrous story of her life.

Site of St. Mary of Egypt (*Maqām*)

The site, discovered over two years ago, was lo-

cated 50m east of the river and was surrounded by tamarisk trees all sides. The structure is bordered by Lisan marl cliffs to the east, the Jordan River to the west and the remains of John the Baptist church 100m to the south.

The surface survey in 1999 revealed the presence of a few Byzantine pottery shreds mixed with sherds of modern pottery. The team decided not to excavate the site at first, because its architecture and other artifacts such as pottery sherds suggested that they were relatively modern remains from the turn of the century, and piles of stones and sand on the top of the structure were the remains of recent activities of the Jordanian army (**Fig. 1**).

The site was reexamined during the 1999-2000 season. Several test trenches were dug in different locations on and near the site, revealing more Byzantine pottery sherds and well-cut ashlars (**Fig. 2**).

A systematic and comprehensive excavation started at the site aiming to discover the lower remains and to understand the correlation between the site, the Jordan River and other Byzantine building remains discovered at the site of Jesus' baptism. The excavation has revealed two rooms from the 5th-6th century (Byzantine period) and two other rooms, which were added later, probably during the Ottoman period (**Fig. 3**).

Room No. 1

It is located in the western section of the structure. It is square shaped, measuring 5.55m x 6.10m, and was built of well-cut dressed sandstone ashlars. The doorway, 1.00m wide, was built in the southern wall (**Fig. 4**).

Room No. 2

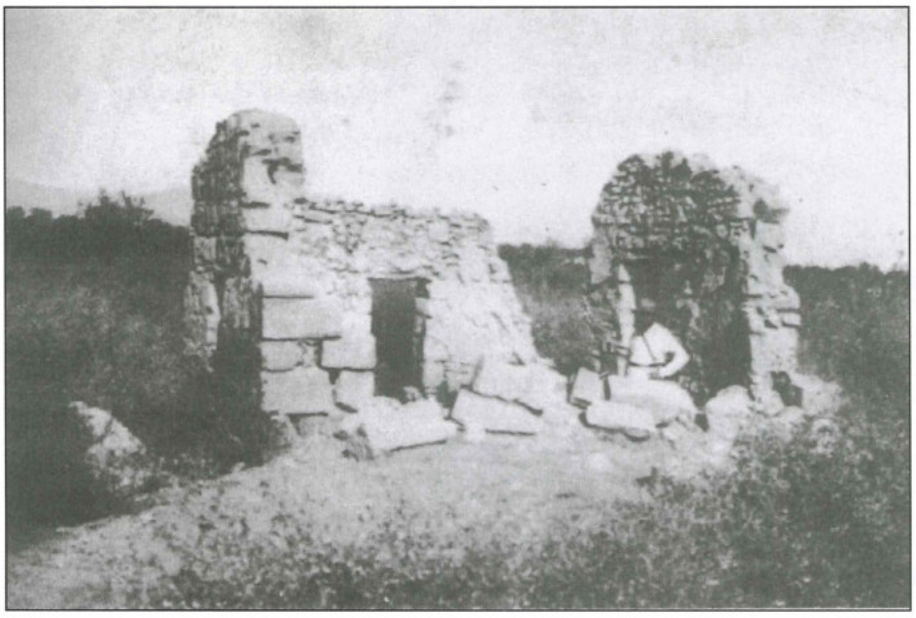
This room was built adjacent to room No. 1. The western wall of this room, which measures 0.75m, was probably added in a later period, and served as a division wall between the two rooms.



1. The site before excavation.



2. The site during the survey.



3. Remains of St. Mary house (Abel 1932).



4. A nearby structure.

The rectangular room measures 4.44m x 6.10m. The walls of the room were built of well cut dressed sand stone ashlars. The doorway, 1.00m wide, was built in the southern wall (**Fig. 5**).

The two originally connected rooms were reused in the Ottoman period. Two rectangular rooms were added to the eastern side of the structure during this period

Room No. 3

Room 3 measures 6.00m x 3.30m and was built of stones from local fields and small pieces of broken sandstone ashlars. A small square structure of 1.85m x 1.65m was located in the north-western corner of the room (**Fig. 6**).

Room No. 4

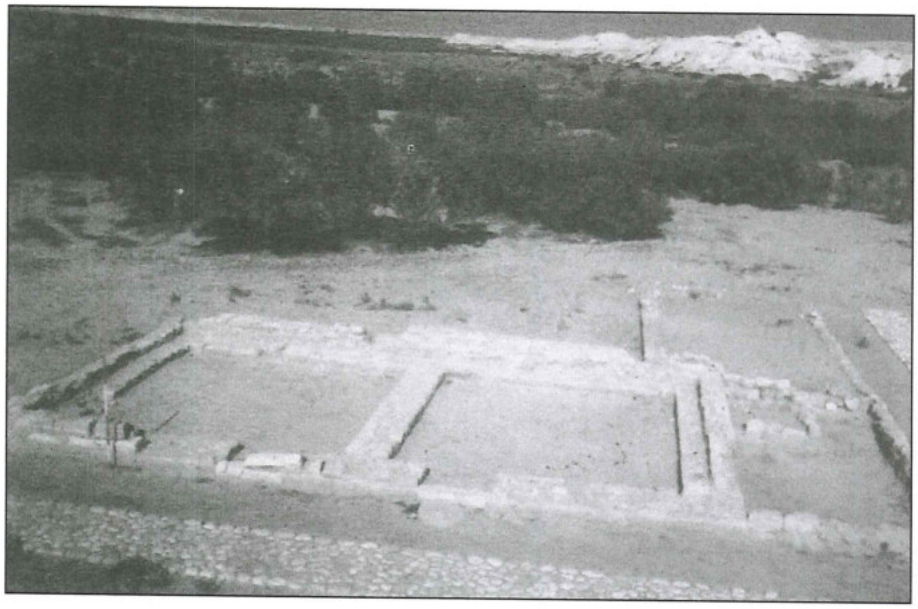
This room measures 9.00m x 4.90m and was built of stones from the local fields and small broken pieces of sandstone ashlars. A small square structure measuring 1.00m x 1.20m, located in the south-western corner, was probably used as a fireplace, some charcoal pieces were found during the excavation.

The later Ottoman rooms may have served as a part of the Ottoman security network in this region, since it was located near several strategic fords across the Jordan River (**Fig. 7**).

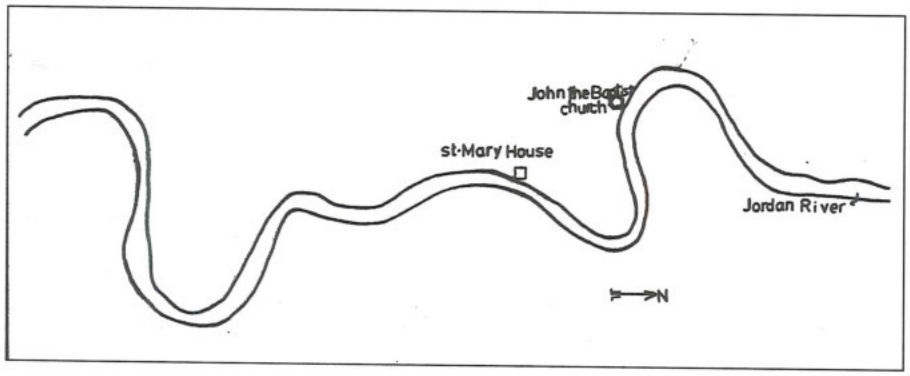
The Byzantine rooms were rebuilt and expanded in the Ottoman era, using stones that were robbed out of the nearby Byzantine church of John



5. The site after excavation.



6. General view of the site.



7. A map showing the location of the site.

the Baptist. This church, know from pilgrim's accounts from the Byzantine and medieval periods, has been rediscovered and is being excavated by the author. Several black marble blocks from John the Baptist church were found reused in the entrance and walls of the two rooms. In addition to

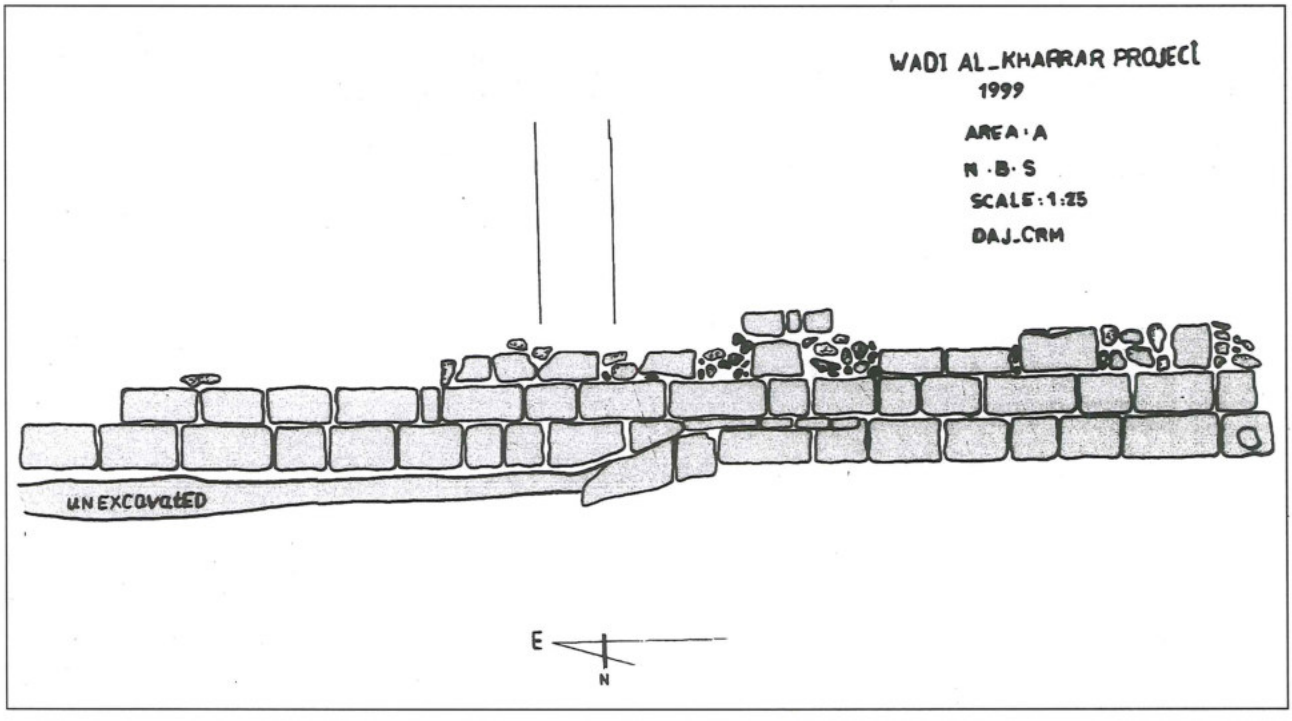
that, some other fragments were found reused in the courses of the walls of the Ottoman building. This indicates the continuous destruction of John the Baptist church even during the Ottoman period and later by the floods of the Jordan River (**Fig. 8**).

One of the aims of excavating this site is to study the possible correlation of the original two rooms with the story of the life of St. Mary of Egypt. This link is largely based on the work of French scholar F.M. Abel, who suggested in the turn of the century: that either she used the rooms herself or that they were built after her death in the Byzantine era to commemorate the spot where she is thought to have lived and had been buried (**Fig. 9**).

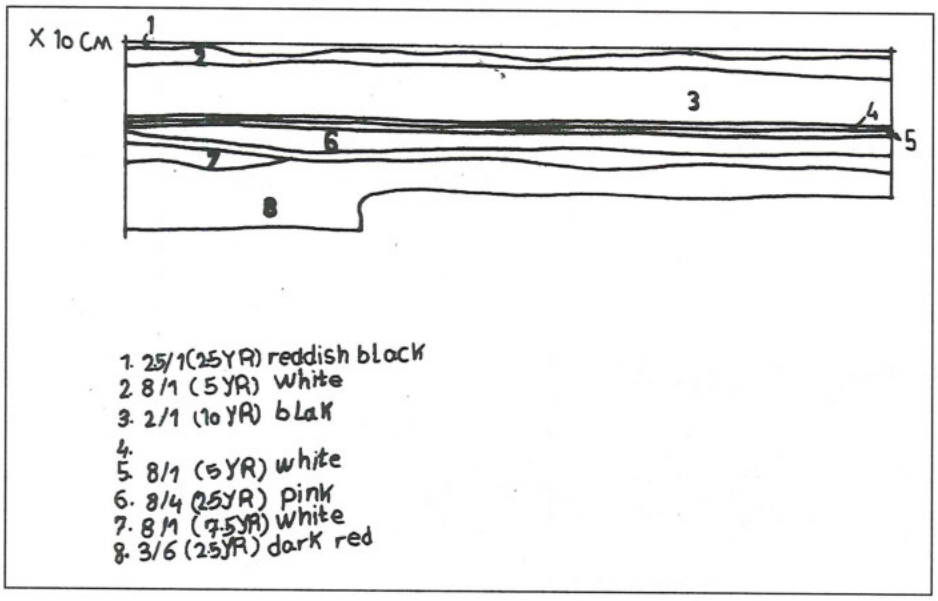
The local people who lived in the area during the period between 1930 and 1967 still called the two original rooms the "Palace of the Lady" (*Qaṣr as-Sitt*). Due to the recovered architectural remains and other datable material, it is strongly suggested that the site that of Laura of St. Mary of Egypt,



8. Part of the site during excavation.



9. Cross section.



10. Stratified layers.

built during the Byzantine period and destroyed by the earthquakes and the floods of the Jordan River in the late Byzantine period. During the nineteenth century the site was rebuilt and reused by local settlers (**Fig. 10**).

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VINGT-CINQ ANS DE RECHERCHE À PÉTRA
Hydrologie - Habitat - Espaces cultuels

Zeidoun al-Muheisen and Dominique Tarrier

Bien que la capitale des Nabatéens ait été reconnue depuis 1812 et que de nombreux voyageurs s'y soient rendus au cours du XIXe siècle en nous laissant des récits souvent pittoresques, ce n'est cependant pas avant les premières décennies du siècle suivant que les premières véritables recherches ont été conduites grâce aux savants allemands qui se sont succédé afin d'effectuer le relevé des principaux monuments et installations identifiables. Si l'on excepte quelques fouilles et travaux ponctuels, l'aménagement du site, et plus particulièrement son mode d'urbanisme et ses dispositifs à caractère hydraulique, n'ont longtemps fait l'objet d'aucune étude spécifique ou de remise en question, ce qui contraste nettement avec l'intérêt manifesté récemment envers ces domaines largement ignorés jusqu'ici.

C'est dans une telle perspective que nous voulons replacer le programme de recherche conduit par nous depuis la fin des années soixante-dix sur les thèmes complémentaires des aménagements rupestres répartis sur l'ensemble du site et des systèmes destinés à assurer l'alimentation en eau du site et la protection de la ville, permettant ainsi de mettre en évidence et de définir les différentes phases et secteurs d'occupation du site ainsi que de mettre un terme aux doutes élevés encore récemment par certains chercheurs concernant le peuplement de la ville.

Avant ces recherches, la documentation concernant les aménagements hydrauliques était extrêmement fragmentaire. Les vestiges paraissaient même si peu évidents aux premiers visiteurs que Henry Layard, qui devait découvrir Ninive, s'était étonné de la fortune d'une ville installée au cœur d'une région apparemment dépourvue de toute ressource en eau. Au début du siècle, les archéologues allemands avaient pour leur part réussi à effectuer plusieurs relevés d'aménagements hydrauliques, mais sans parvenir toutefois à en établir un schéma cohérent.[1] Ainsi les points de départ et d'aboutissement des rares canalisations identifiées demeuraient hypothétiques, voire totalement ignorés. Pour surmonter cet obstacle, il a donc été nécessaire d'entreprendre de longues et souvent difficiles recherches, étant donné la topographie du site, afin de préciser le parcours exact de chacune de ces canalisations et de relever l'ensemble des dispositifs hydrauliques aménagés le long de leur passage. Nous remarquerons ici que ces difficultés ont été sensiblement accrues du fait que le manque d'intérêt manifesté alors par les autorités a malheureusement privé ces recherches de toute aide technique. Cependant la cartographie de l'ensemble du site conduite par l'Institut Géographique National a été d'un précieux secours en permettant d'y reporter les observations effectuées sur le terrain.[2]

Le premier résultat de cette étude a été de mettre en évidence l'existence d'un réseau de captage et d'adduction des sources qui jaillissent à la périphérie du site à une altitude d'environ 1200m, donc bien supérieure à celle du bassin de Pétra qui n'est que de 900m. On remarquera ainsi que, bien que la région de Pétra soit située à l'intérieur d'une zone où la pluviométrie n'excède pas 200-250mm par an, les ressources permanentes en eau ne lui font pas défaut. Cependant il convient de signaler à propos de ces sources que leur débit, si l'on se réfère aux dimensions des sections de canalisations qu'elles alimentaient, devait être bien supérieur à celui d'aujourd'hui. Différentes hypothèses peuvent être avancées, mettant en cause notamment l'insuffisance actuelle des précipitations, mais nous savons par ailleurs que la région n'a pas connu du point de vue climatique de changement notable depuis la période antique. Une autre raison plus probable doit tenir à la présence de stations de pompage

1. Il s'agit ici essentiellement des travaux de R.E. Brünnow et A. von Domaszewski (1904-1909) et de G. Dalman (1908 et 1912). Nous citerons également l'importante contribution de G. Horsfield (1938).

2. L'ensemble de ces recherches a fait l'objet d'une thèse de doctorat (al-Muheisen 1986), ainsi que de plusieurs articles: voir notamment l'ouvrage cité infra (al-Muheisen 1990).

localisées au nord de Pétra qui ont dû faire baisser le niveau de la nappe phréatique.

Le complexe d'adduction comprenait trois branches principales aboutissant toutes dans le centre de la ville.

Le branchement sud-est demeure le plus apparent puisque, divisé en deux sections, il longe les parois du as-Sīq. Mais avant de rejoindre ce secteur, il suivait un long parcours dont il subsistait de nombreux vestiges il y a encore une quinzaine d'années : ils ont disparu aujourd'hui à la suite des nouvelles constructions édifiées à l'entrée du site. Cette branche sud-est acheminait l'eau des sources de la région du Wādī Mūsā, dont l'une, dite 'Ayn Umm Sarab عين أم سرب (**Fig. 1**), reconnue par nous en 1984, a conservé son aménagement d'origine,[3] jusqu'à une grande *birkah* comprenant deux bassins d'où partaient deux grandes canalisations. La première suivait le cours du Wādī Mūsā puis, après avoir dépassé le secteur de Bāb as-Sīq (باب السيق), empruntait le chemin du as-Sīq où l'on reconnaît



1. Source d'Umm as-Sarab à l'intérieur du village de Wādī Mūsā.

deux conduites aménagées selon des techniques distinctes le long des parois. La canalisation la plus apparente était creusée dans la paroi de gauche tandis que la seconde, formée de tuyaux de poterie, était insérée dans la paroi de droite. Les variations du niveau du as-Sīq au cours des siècles ont entraîné la disparition de sections importantes de ces canaux tandis que la pente naturelle du as-Sīq creusée par les eaux du Wādī Mūsā explique les différences d'emplacement de la canalisation de poterie par rapport au niveau du sol. Cette conduite, comme en témoignent quelques éléments demeurés en place, franchissait le secteur de Bāb as-Sīq en contournant la hauteur dans laquelle a été creusé le tunnel de dérivation du Wādī Mūsā. La canalisation n'était donc pas en relation avec un quelconque dispositif permettant de franchir ou de détourner le lit du wadi. Bien que, dans son cours inférieur, des sections de ce canal se trouvent liées à des aménagements datant du Ier siècle de notre ère, il est vraisemblable qu'il ne s'agit que de simples remaniements, ce qui permet d'avancer que cette canalisation pourrait être antérieure. La seconde canalisation suivait un parcours presque identique à la précédente, à cette différence près que la trace du canal s'interrompt brusquement face à l'entrée du as-Sīq pour reprendre le long de la paroi gauche du as-Sīq où il est creusé dans le roc et recouvert par des dalles encore en place par endroits. Comme cette canalisation empiète sur divers aménagements dont certains sont liés à l'aménagement du barrage-viaduc que l'on date de la seconde moitié du Ier siècle de notre ère, elle ne peut donc être que postérieure à cette période. La date assez tardive de ce barrage peut s'expliquer si l'on considère qu'il agit d'un aménagement d'aspect monumental succédant à des dispositifs de protection moins élaborés[4] (**Fig. 2**). Les deux canalisations du as-Sīq desservaient respectivement les installations situées le long des rives nord et sud du wadi. Le second canal partant de la *birkah* de Ramlah contournait au nord la hauteur d'al-Khubtha pour rejoindre le Wādī al-Maṭāḥa وادي المطاحة au moyen d'un aqueduc (**Fig. 3**) et parvenir ainsi jusqu'au centre-ville.

Le second branchement de ce réseau d'adduction partait de la source de Brak, située à 5km au sud du bassin de Pétra, à proximité de laquelle ont été reconnues plusieurs structures à caractère cultuel comprenant notamment des blocs sculptés rep-

3. Les sources de la région sont au nombre d'une trentaine, mais celle d''Ayn Mūsā demeure de loin la plus abondante.
4. La restitution proposée par W. Bachmann et le commentaire de P. Parr dans son article sur la date du barrage du as-Sīq (Parr 1967: 45-49) ne s'appliquent qu'au dernier état de ce barrage. D'autres aménagements, sans doute assez proches du dispositif moderne qui fermait le as-Sīq jusqu'à ces dernières années, ont pu être mis en place bien avant cette date.

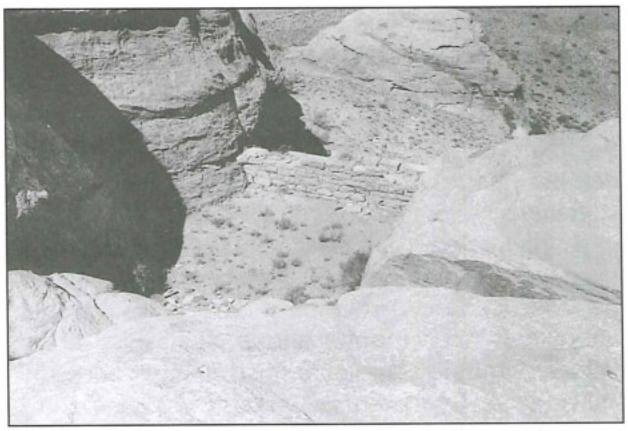


2. Barrage de dérivation mis en place dans les années soixante.



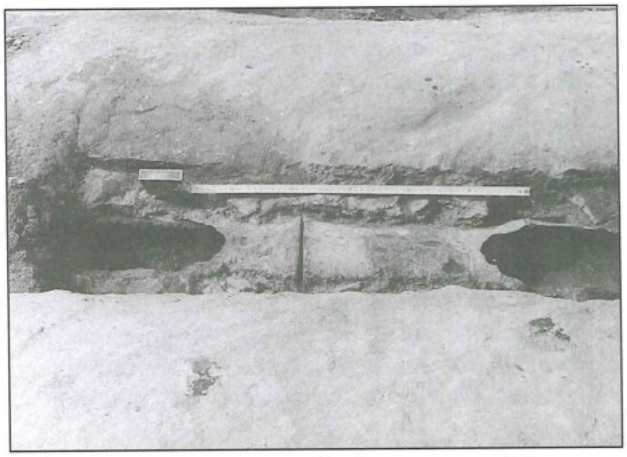
3. Aqueduc franchissant le Wādī Sheb Ques.

résentant des dauphins (Glueck 1965: 319-320). Cette branche alimentait sur son passage, au moyen de deux canalisations secondaires, la région du Wādī Farasa et la Fontaine du Lion pour aboutir dans un secteur proche du Qaṣr al-Bint (قصر البنت). De nombreux réservoirs et citernes étaient aménagés le long de son parcours, permettant de stocker d'importantes quantités d'eau et d'approvisionner certains secteurs d'habitation (**Fig. 4**). Il est intéressant de noter qu'une légende locale se rapportait à l'existence de cette canalisation mais, bien que les archéologues allemands en aient eu connaissance par les habitants de la région et l'aient même rapportée dans leurs ouvrages, ils n'ont pu cependant prouver l'existence de cette canalisation (Dalman 1912: 16). Ce dernier fait se comprend d'ailleurs aisément si l'on songe que les différentes sections de ce canal sont souvent fragmentaires et qu'il est donc très difficile sur le terrain d'en percevoir la continuité.



4. Réservoir aménagé sur le parcours du canal de Brāq.

Le troisième branchement appartenant au réseau d'adduction provenait de la source de Debdebah, dite aussi Bedebdah, située dans la région qui s'étend au nord-est du site. La canalisation, demeurée inconnue jusqu'aux présentes recherches, était longue d'environ 5km et suivait en partie le cours d'une ancienne voie de circulation reliant la région de Ramlah à celle de Debdebah. Cette dernière constituait, comme de nos jours, un vaste secteur agricole mis en valeur au moyen de terrasses et de canaux et rigoles d'irrigation. De nombreux vestiges de cette canalisation, en partie constituée de tuyaux de poterie (**Fig. 5**), étaient encore visibles lorsque nous avons effectué nos relevés, quoique à cette époque la section située au nord du centre-ville ait déjà disparu depuis une dizaine



5. Tuyaux appartenant à la canalisation provenant de la source de Debdebah.

d'années. Aujourd'hui, son parcours se trouve presque entièrement effacé en raison de la construction de routes conduisant à al-Bayḍa et dans le centre du site et de l'aménagement du secteur d'Umm Ṣayḥūn (ام صيحون) destiné au relogement des Bédouins. Cette canalisation desservait les installations situées au nord du Wādī Mūsā.

L'élaboration d'un réseau aussi complexe se divisant en de nombreuses branches et nécessitant par endroits la construction d'ouvrages d'art ainsi qu'un entretien constant atteste l'existence d'une autorité centrale assurant la mise en œuvre des aménagements hydrauliques, notamment ceux dont dépendaient la sécurité des voies de circulation comme le as-Sīq et l'alimentation en eau des nombreuses structures édifiées le long du Wādī Mūsā. Le réseau d'adduction se trouve donc ainsi étroitement lié pour l'époque nabatéenne au mode d'urbanisme de Pétra.

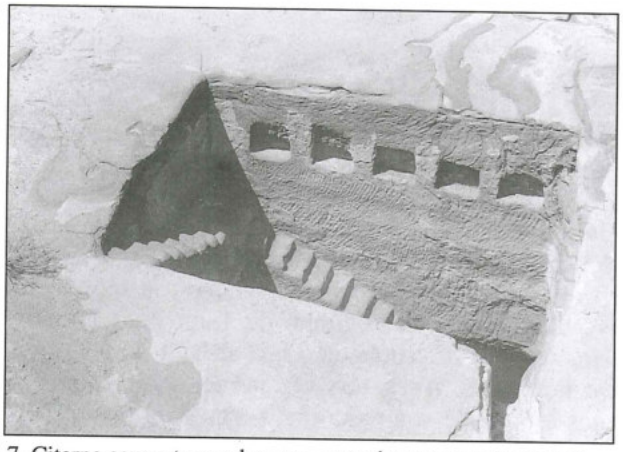
De tels travaux d'adduction étaient d'ailleurs indispensables à la création d'un centre urbain s'inspirant des modèles classiques. Les ressources en eau à l'intérieur du site sont en effet extrêmement médiocres, si l'on excepte la source du Wādī Aṣ-Ṣiyyagh (وادي الصيّغ) située un peu en aval du cours du Wādī Mūsā. Cette source, qui a longtemps constitué le seul point d'eau permanent, était encore utilisée récemment par les résidents du site qui venaient s'y approvisionner quotidiennement. Elle est alimentée par la nappe qui s'étend sous le sol sablonneux du bassin de la ville, elle-même approvisionnée par les infiltrations d'eau provenant des précipitations ou du cours temporaire du Wādī Mūsā.

C'est aussi un phénomène d'infiltration qui est à l'origine du filet d'eau du Qaṭṭār ad-Dayr (قطّار الدير), à une centaine de mètres en contrebas du plateau du ad-Dayr. Cette résurgence passant à travers une faille rocheuse devait sembler quasi miraculeuse dans l'Antiquité, ce qui explique probablement le nombre d'installations cultuelles relevées à cet endroit.

Les premiers habitants connus de Pétra, à savoir les Édomites, avaient aménagé sur la hauteur d'Umm al-Biyāra (أم البيارة) une série de citernes creusées en contrebas du plateau sommital, pouvant ainsi recueillir les eaux pluviales qui s'écoulaient le long des pentes. Ces citernes en forme de bouteille, qui rappellent la description de Diodore de Sicile concernant les dispositifs aménagés par ceux qu'il nomme les Nabatéens,[5] se retrouvent aussi dans d'autres secteurs de Pétra, notamment sur le plateau du ad-Dayr. On peut y reconnaître le premier modèle de collecte des eaux de ruissellement, et d'ailleurs les exemples de conservation de ces eaux en climat semi-aride sont connus pour des sites bien plus anciens,[6] mais l'ingéniosité des Nabatéens dans le domaine des techniques hydrauliques leur a permis de développer un vaste réseau de canaux et de rigoles creusés dans le roc, couvrant l'ensemble des secteurs du site (**Fig. 6**). Ces aménagements, que l'on reconnaît sur l'ensemble des sites occupés par les Nabatéens et qui, au même titre que la céramique, signent leur présence, font appel à des techniques spécifiques mais empruntent aussi à d'autres domaines. C'est notamment le cas des arcs de couverture (**Fig. 7**), caractéristiques de l'architecture domestique de Délos au IIe siècle avant notre ère (Vallois 1944). Surtout, la mise en place progressive de ce réseau répondait à deux besoins essentials: assurer la sécurité du site et l'approvisionnement en eau de la



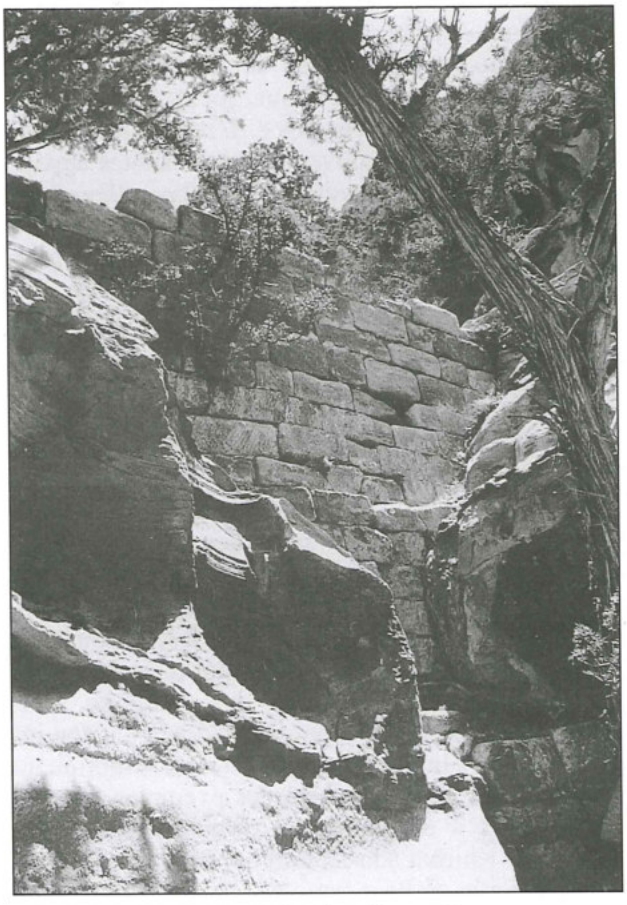
6. Citerne alimentée par les eaux pluviales dans le secteur d'al-Madras.



7. Citerne couverte par des arcs, creusée en avant d'une maison rupestre.

5. Diodore de Sicile, Bibliothèque historique, XIX, 94, 6-8.
6. Il s'agit particulièrement des barrages aménagés en travers de cours d'eau temporaires comme celui édifié à Jāwā, qui remonte au IVe millénaire : voir Helms 1981.

population. Ce dernier était la seule difficulté qui se posait aux premiers temps de l'occupation du site, mais l'extension de celui-ci a nécessité la construction de moyens de protection contre les ruissellements dévastateurs qui s'écoulaient des hauteurs ou le long des wadis. De nombreux barrages ont ainsi été mis en place afin de fermer les wadis et les failles qui pouvaient endommager les aménagements situés en aval ou rendre impraticables les voies de circulation (**Fig. 8**). L'exemple du as-Sīq est particulièrement significatif à cet égard puisque le barrage édifié en amont ne pouvait assurer une quelconque protection contre les eaux ruisselant du haut des falaises qui dominent le passage, ce qui a nécessité de construire différents murs de retenue le long de cette voie. Ces dispositifs destinés à fermer les wadis étaient également utilisés afin d'emmagasiner les eaux qui étaient ensuite acheminées au moyen de canalisations rupestres vers des citernes parfois aménagées en série, comme au sommet du ad-Dayr où le même canal alimentait quatre citernes communiquant entre elles. De tels exemples se retrouvent aussi dans le Sīq al-Bārid (السيق البارد) au nord de Pétra. Dans ce dernier secteur, l'alimentation des demeures rupestres aménagées de chaque côté de ce passage était assurée par un ensemble de citernes, dont trois ont l'aspect de pièces creusées dans le roc auxquelles on accédait par des portes. Une seconde solution consistait à repérer sur les plateaux la présence d'un bassin naturel que l'on fermait ensuite afin de diriger les eaux vers des réservoirs couverts creusés dans le sol, comme sur le sommet d'al-Khubtha (الخبثة). L'eau pouvait alors être conservée à cet endroit à des fins de stockage ou dirigée à proximité des secteurs d'habitation. Ces derniers ont ainsi pu être mis en évidence, grâce au report des aménagements hydrauliques sur les documents cartographiques et à la confrontation de ces données avec les informations sur le terrain. Une tentative d'évaluation prenant en compte la capacité de tous les dispositifs de conservation de l'eau pluviale permet d'assurer qu'ils pouvaient subvenir aux besoins d'une collectivité rassemblant plusieurs milliers de personnes.

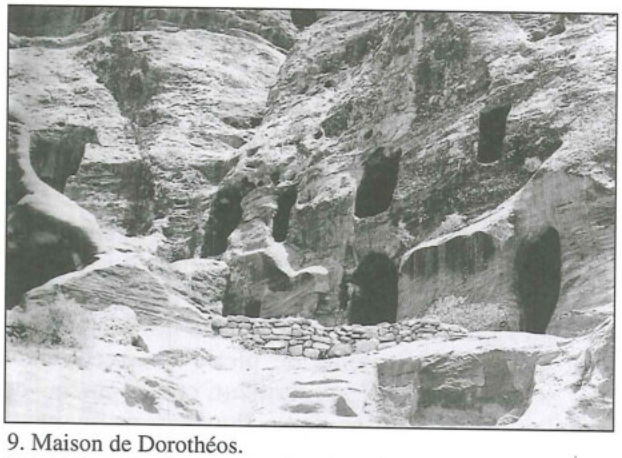


8. Barrage de protection en bordure d'un wadi.

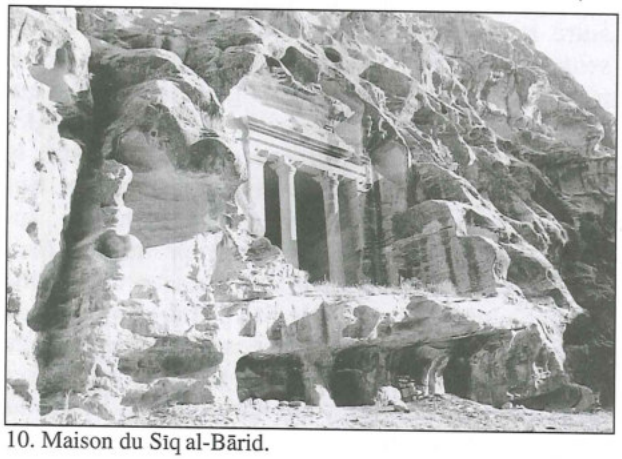
La question de l'habitat à Pétra a longtemps posé un problème aux chercheurs en raison du faible nombre de vestiges identifiables et du manque de prospections dans ce domaine. La description de Strabon[7] qui parle des somptueuses demeures de pierre des Nabatéens a parfois été contestée devant le peu de documentation concernant l'habitat construit relevé jusqu'ici.[8] Cette situation est en grande partie la conséquence des différents séismes qui ont ruiné le centre-ville, et l'on doit considérer que les amoncellements de pierre qui recouvrent les secteurs voisins renferment certainement de nombreuses structures domestiques dont quelques exemples ont été mis au jour récemment. Mais une autre raison tient à ce que l'habitat à Pétra présentait des aspects très divers. Les hauteurs du centre-ville, d'un accès commode grâce aux wadis qui les entaillent, permettaient l'aménagement de demeures de type construit ou de type rupestre le long des terrasses et des parois qui les bordent. Sur ces hauteurs, on ne peut guère identifier aujourd'hui que les aménagements rupestres qui étaient parfois complétés par des espaces construits, comme c'est le cas dans le Sīq al-Bārid où l'un de ces ensembles comprend une structure aménagée en avant de la paroi rocheuse et recouverte à l'origine par des arcs. Cet habitat comprend au plus deux ou trois pièces auxquelles venaient s'adjoindre éventuellement quelques espaces sec-

7. Strabon, Géographie, XVI, 4, 21.
8. Ce point de vue a notamment été exposé par Abraham Negev (Negev 1986). L'auteur y propose de ne voir dans Pétra qu'un simple espace cultuel et funéraire, les Nabatéens vivant sous la tente du côté du Wādī 'Araba.

ondaires destinés aux activités domestiques ou à des fins de stockage, ce qui le rend assez malaisé à identifier si l'on songe à la multitude de pièces rupestres qui s'échelonnent dans certains secteurs. Quelques ensembles mieux caractérisés ont été reconnus dans la paroi nord-ouest d'al-Khubtha et le long du Wādī aṣ-Ṣiyyagh. Il s'agit notamment de la maison dite de Dorothéos, qui comprend deux salles de réception et deux petites chambres annexes ainsi qu'une citerne privée, l'ensemble étant disposé autour d'une vaste cour à l'air libre (**Fig. 9**).[9] On retrouve les mêmes caractéristiques d'aménagement de l'espace dans la demeure située à l'entrée du Sīq al-Bārid (**Fig. 10**). Certaines de ces habitations, dans une proportion impossible à évaluer en raison des nombreuses déprédations qu'elles ont subies au cours du temps, étaient pourvues d'un décor intérieur peint. Des exemples sont encore visibles dans quelques maisons du centre-ville, notamment en face du théâtre ainsi que dans le Wādī aṣ-Ṣiyyagh (Horsfield 1938: 20). Ce décor peut présenter de simples panneaux ou des médaillons stuqués bichromes, mais l'une des demeures du Wādī aṣ-Ṣiyyagh comporte une pièce dont le caractère presque inaccessible lui a permis de conserver son décor mural très proche des modèles du IIe style pompéien.



9. Maison de Dorothéos.



10. Maison du Sīq al-Bārid.

Les parois extérieures pouvaient, elles aussi, être revêtues d'un décor imitant un appareil de maçonnerie isodome, comme en témoignent quelques rares vestiges reconnus dans la région de al-Bayḍa. Ce décor, dont l'exécution ne présentait pas de grandes difficultés techniques, et qui a également été relevé sur une paroi en face du théâtre (Tarrier 1988), est peut-être à l'origine du commentaire de Strabon.

Un des traits les plus caractéristiques des installations que nous avons recensées à Pétra consiste en la présence de banquettes aménagées à l'intérieur de pièces rupestres ou à ciel ouvert.[10] Ces installations peuvent être classées dans la catégorie des triclinia ou salles de banquet, telles qu'on les connaît dans le monde gréco-romain, mais dont l'origine est à rechercher dans le monde oriental.[11] Une partie de ces salles munies de banquettes se rattachent aux ensembles domestiques — c'est notamment le cas de la maison de Dorothéos, mentionnée plus haut, qui abritait deux triclinia — et ne sont donc pas différentes des salles à manger que l'on retrouve sur d'autres sites appartenant à la période classique. De même, divers dispositifs sont intégrés à un ou plusieurs ensembles funéraires et servaient à accueillir les repas rituels qui se déroulaient à proximité des tombeaux. Cependant, parmi la centaine d'installations que nous avons relevées à Pétra, plus de la moitié appartiennent à une catégorie dite cultuelle, bien que ces dispositifs se réfèrent à des modèles différents. Parmi ceux-ci, on reconnaît des aménagements assimilables aux hauts-lieux fréquemment mentionnés dans la Bible mais dont il ne subsiste sur le terrain que des vestiges assez décevants. Le principal haut-lieu de Pétra, situé sur le sommet du Djabal al-Madhbaḥ et taillé dans un espace aplani, correspond très exactement aux descriptions des textes antiques (**Fig. 11**).[12] L'importance de cet espace cultuel caractéristique des religions sémitiques est rendue plus manifeste encore par son intégration à l'intérieur de sanctuaires empruntant aux modèles classiques. Un des exemples les plus significatifs à cet égard est celui du temple nabatéen de Khirbat adh-Dharīḥ qui présente une version élaborée du haut-lieu des religions sémitiques

9. Ce mode d'aménagement est également similaire à celui des maisons identifiées à Khirbat adh-Dharīḥ.
10. Sur ces installations, voir Tarrier 1988.
11. Sur les banquets orientaux et leurs origines, voir Tarrier 1995.
12. Cf. les mentions de hauts-lieux dans la Bible, plus particulièrement I Samuel, IX, 12-23 et II Rois, 17, 10.

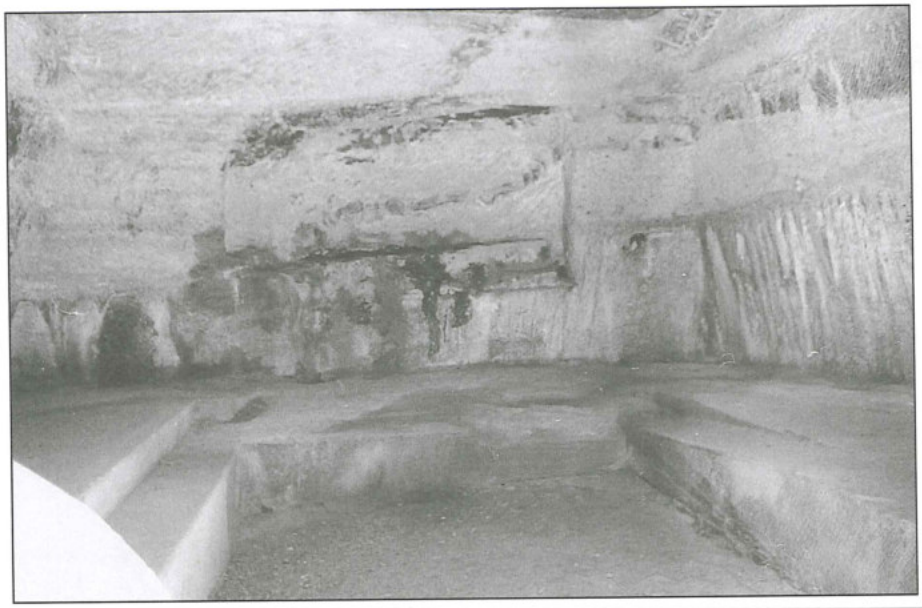


11. Le haut-lieu du Madhbaḥ à Pétra.

dont il reprend tous les aménagements caractéristiques, tels que bassins de lustration et reposoirs pour bétyles, ainsi que les espaces destinés aux repas rituels (al-Muheisen et Villeneuve 1994: 742-744). À ces espaces, ouverts à l'ensemble d'une communauté ou d'une collectivité, s'opposent les dispositifs aménagés à l'écart dans des salles rupestres (**Fig. 12**). Ainsi que l'indiquent les inscriptions relevées à l'intérieur ou à proximité de ces salles, celles-ci étaient destinées à accueillir des confréries à caractère religieux, connues dans le monde sémitique sous le nom de *marzeha*. Le plus connu de ces collèges se réunissait au ad-Dayr en l'honneur du roi divinisé Obodas Ier, ainsi qu'il est précisé dans une inscription retrouvée dans ce secteur.[13] Le témoignage de l'épigraphie s'est trouvé confirmé par la mise au jour de banquettes à l'intérieur de la salle du monument rupestre. De la même façon, un collège de prêtres, semblables à ceux des grands centres orientaux comme Palmyre, s'assemblait dans la pièce gauche de la cella du Qaṣr al-Bint. Cette dernière ne comprenait pas d'aménagements permanents, mais les pieds de lit retrouvés à l'intérieur de la pièce indiquent que l'on y utilisait des dispositifs mobiles.

Grâce à ces recherches, il nous a donc été possible de préciser les grands secteurs d'habitat qui, en raison de la topographie particulière du site, constitué de hauteurs entaillées par des wadis plus ou moins profonds, diffèrent considérablement de ceux que l'on connaît pour les autres sites classiques. C'est d'ailleurs ce qui explique que l'aspect urbain de Pétra ait été si mal perçu, et même nié par certains chercheurs. En dépit des temples et des nombreuses tombes monumentales qui jalonnent les voies d'accès et de circulation, le site ne se réduit pas aux seules données cultuelles et funéraires et, malgré son caractère morcelé, l'organisation de l'espace urbain présente une cohérence dont témoigne le modèle d'urbanisation suivi. Aux secteurs aménagés sur les hauteurs et le long des principaux wadis, sont venus s'ajouter de chaque côté du Wādī Mūsā divers bâtiments officiels ou religieux ainsi que des constructions privées. Ce programme n'a pu se réaliser cependant que grâce à d'importants travaux de protection souvent conduits en parallèle avec ceux concernant l'alimentation en eau du site, comprenant la mise en place d'un dispositif pour détourner le cours du Wādī Mūsā ainsi qu'un grand nombre de barrages.

Les recherches que nous avons également conduites autour de Pétra ont permis de reconnaître divers faubourgs qui servaient de stations caravanières pour certains d'entre eux, mais aussi de centres de production agricole comme en témoigne



12. Triclinium cultuel du Qaṭṭār ad-Dayr. L'arcosolium dans la paroi du fond est un aménagement postérieur.

13. Répertoire d'épigraphie sémitique, 1423.

le nombre des aménagements hydrauliques destinés à l'approvisionnement en eau, tant pour les usages domestiques que pour l'irrigation des champs en terrasses. Ainsi différentes installations agricoles, telles que fermes et pressoirs à vin, ont été relevées dans les secteurs septentrionaux de al-Bayḍa et de Ba'ja dont nous avons effectué la prospection en 1984-1985. Pour ce dernier, nous avons mis en évidence le dispositif destiné à l'alimentation en eau du village ainsi qu'à l'irrigation des champs attenants (al-Muheisen 1990: 507-513). Au sud, le secteur de Sa'da a fait l'objet d'une première reconnaissance en 1984 qui a révélé l'existence à cet endroit d'importants aménagements hydrauliques et agricoles. Ces recherches ont été suivies par des prospections conduites dans le Wādī 'Araba, notamment dans les régions de Faynān et d'et-Tilāḥ situées le long des voies de communication nabatéennes entre la mer Rouge et la Méditerranée. Autour des bâtiments d'habitation, des réseaux d'alimentation en eau ont été développés afin d'approvisionner des réservoirs pour la consommation des résidents mais aussi, comme à Faynān, le centre le plus important de cette région, afin de faire fonctionner des moulins. Ces postes nabatéens faisant office de stations caravanières comprenaient aussi des installations agricoles permettant de faire vivre de petites collectivités. Ces vestiges constituent autant de précieux indices sur l'extension et le développement de ces centres où l'on reconnaît les mêmes techniques et procédés que ceux élaborés dans la capitale nabatéenne.

Zeidoun al-Muheisen
Faculty of Archaeology and Anthropology,
Yarmuk University, Irbid

Dominique Tarrier
Faculty of Archaeology and Anthropology,
Yarmuk University, Irbid

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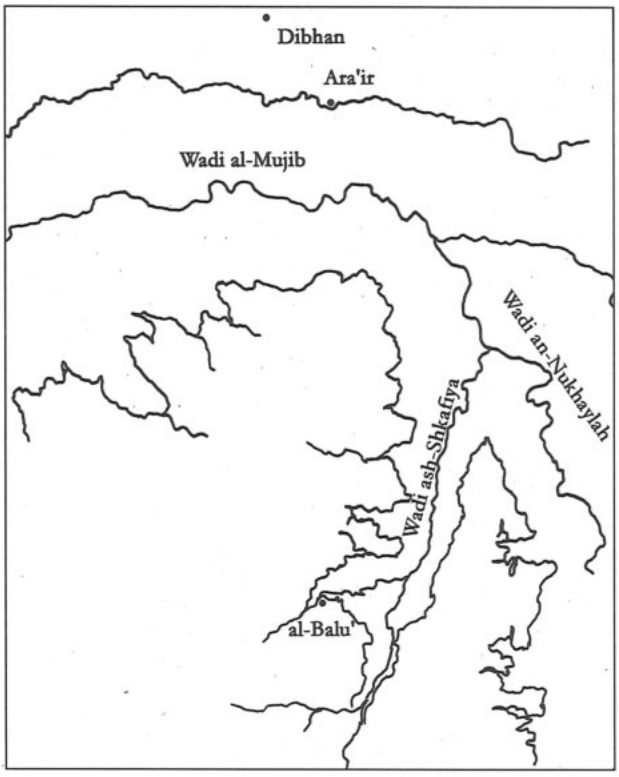
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FIRST SOUNDINGS AT KHIRBAT AL-MU'MMARIYYA IN THE GREATER WĀDĪ AL-MŪJIB AREA

Friedbert Ninow

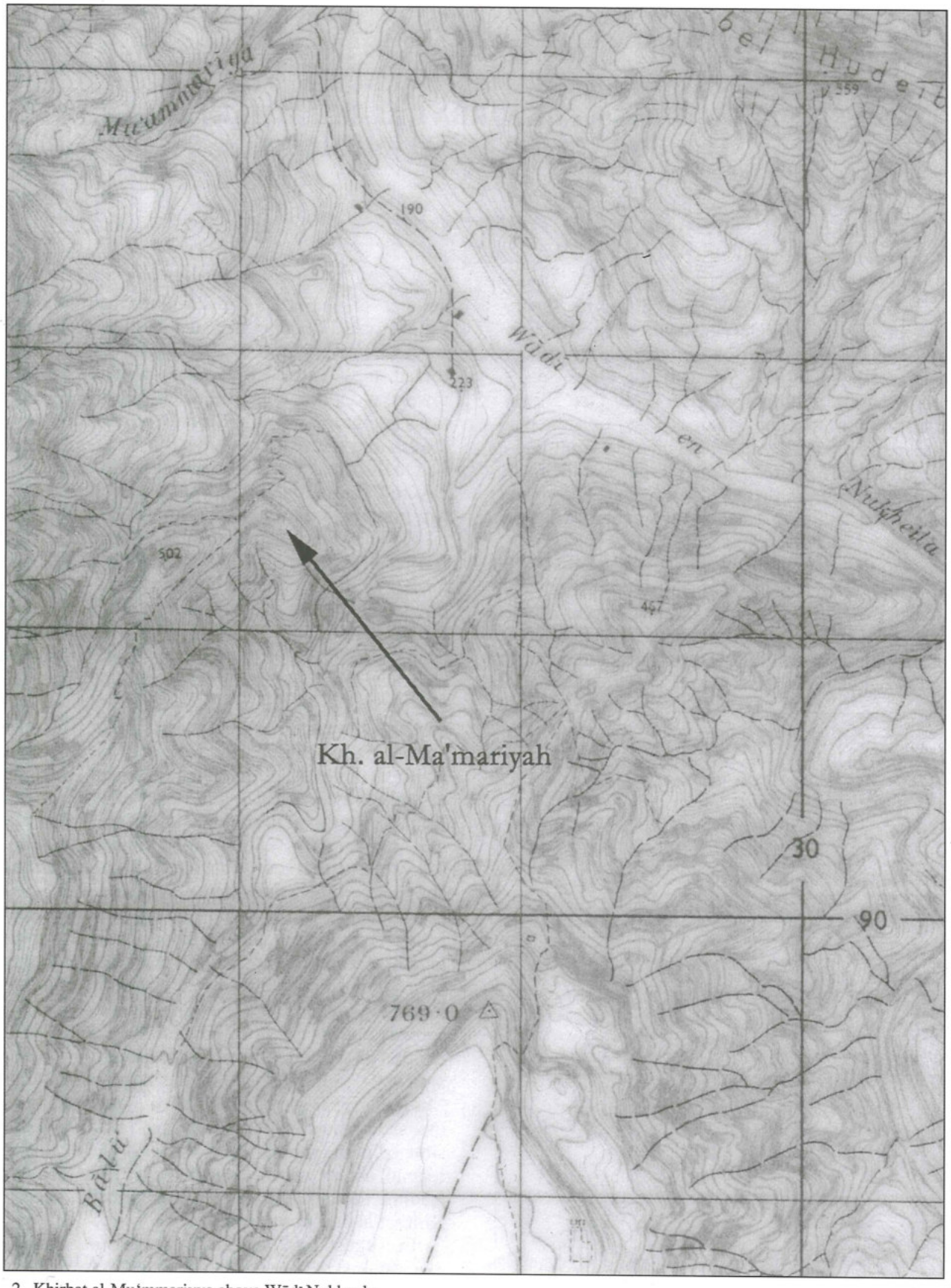
In the course of the Wādī ash-Shuqayfāt Survey Project which was established to collect archaeological data from one of the main tributary wadis of Wādī al-Mūjib east of the Dead Sea, a number of new sites were discovered (see Ninow 2002). Wādī ash-Shuqayfāt (وادي الشقيفات) is the major southern tributary that branches off Wādī Nukhaylah (وادي النخيلة), the southern branch of the main wadi system; from there Wādī ash-Shuqayfāt leads southward and cuts deep into the central Moabite Plateau (Arḍ al-Kerak; see **Fig. 1**). The survey showed that the various wadis that lead into Wādī al-Mūjib were widely frequented during ancient times. Especially in the wider vicinity of Wādī ash-Shuqayfāt, a number of strong fortifications indicate that this wadi served as one of the major routes leading up to the Central Moabite plateau. A number of important sites (more than 50 altogether) could be identified and studied during this survey, among them various larger and smaller ruined sites, cairns, wall lines, water reservoirs, towers, etc.), that could be dated to a range of periods beginning with the Early Bronze period up to the Islamic age.



1. Wādī ash-Shuqayfāt and the Upper Wādī al-Mūjib Area.

One of the most important sites that were discovered during the initial survey is Khirbat al-Mu'mmariyya خربة المعمرية (Ninow 2002: 153; site no.9). This site is situated on a hillside that rises from the wide bed of Wādī al-Mūjib/Wādī Nukhaylah near the point of confluence of Wādī ash-Shuqayfāt and the main wadi (see **Fig. 1 and 2;** Position: GPS N 31 24' 41-46; E 35 49' 17-24; Palestine Grid: 28.2/91.4). Khirbat al-Mu'mmariyya stretches from the summit plateau of Jabal al-Mu'mmariyya (جبل المعمرية) downward along the eastern slopes in form of a huge triangle. The massive city walls formed by a casemate wall with a width of almost 5m are already visible from the distance. One can get a good overview of the site from the northern tip of the Khashm as-Sanṣna plateau southeast of Khirbat al-Mu'mmariyya (**Fig. 3**). Whereas the southern city wall is still almost complete, some parts of the northern wall – especially in the lower part of the city – have eroded away. The northern and southern city walls have a length of about 300m, while the citadel and most parts of the upper city are situated on a slightly sloping plateau, the remaining area of the city spreads out over a steep descent. The approach to Khirbat al-Mu'mmariyya leads through a western pathway winding its way up the slopes of Jabal al-Mu'mmariyya, surrounding the site and leading up to a saddle from which a small path leads to a gate situated in the southern city wall near the citadel. A second ascent approaches the city from the east leading through the steep slope directly beneath Khirbat al-Mu'mmariyya.

In August 2002 and 2003 two seasons of small excavations were conducted by a team from Theologische Hochschule Friedensau (Germany), at



2. Khirbat al-Mu'mmariyya above Wādī Nukhayla.



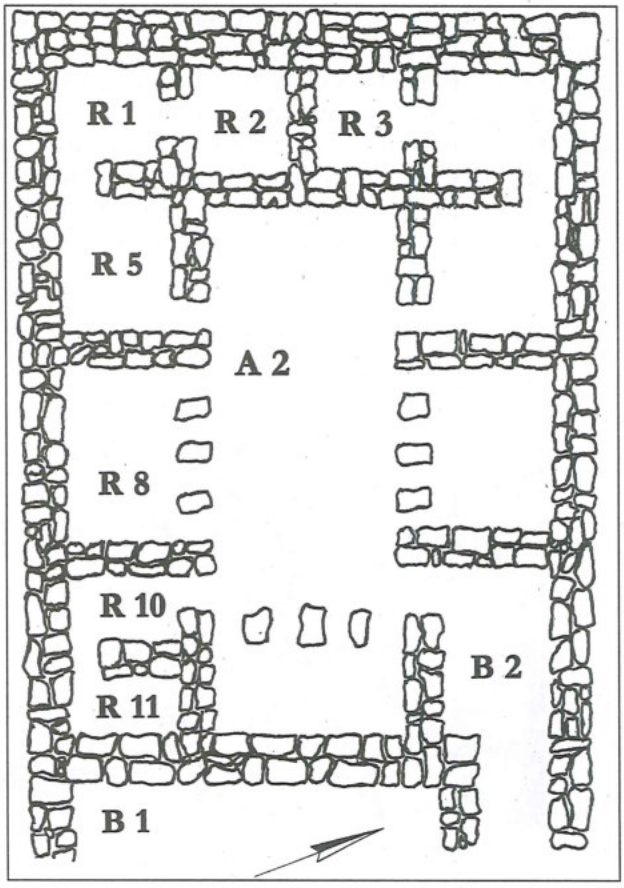
3. Khirbat al-Mu'mmariyya as seen from the Khashm as-Sanīna plateau.

Khirbat al-Mu'mmariyya. The work concentrated on the citadel which commands the site from the highest elevation of the site. The goal was to get a clearer picture of the outline of the site in general and the citadel in particular, and to get insights into the occupational history of the site.

The Citadel

The citadel is situated on the highest point of Jabal al-Ma'mariyeh. Its outline is almost symmetrical (see **Fig. 4**). It has a rectangular shape; the smaller sides between 17.00 and 18.00m, the longer sides between 24.00 and 25.00m in length. The entrance gateway is located in the area where the northern casemate wall connects with the citadel. The outer casemate wall continues as the outer wall of the citadel. The center of the citadel consists of a large courtyard that was surrounded at three sides by what appears to be pillars with attached rooms. The rooms in the rear of the citadel could be reached through two side-rooms that lead into two small chambers at the back of the citadel. The outer walls of the citadel were constructed with massive stones. The width of these walls is up to almost 2m.

In 2002 we opened two 5 x 5m squares within the citadel (leaving bulks of 1m at the northern respectively at the western side): Square A1 inside one of the small back rooms (room R1) and part of the courtyard; (Square A2) along the outer eastern casemate wall we opened a search trench (B1). In addition we opened one of the casemates of the southern wall situated about 35m from the citadel (C1). In 2003 three other rooms within the citadel were cleared: one adjacent to the first excavated room (Square A3; room R2), and two others (B3 and B4; rooms R10 and R11). In addition, the entrance gateway to the citadel was excavated (B2). At the point where the citadel-plateau dips into a



4. Outline of Citadel.

somewhat steeper slope, yet another room was excavated (E1).

A1

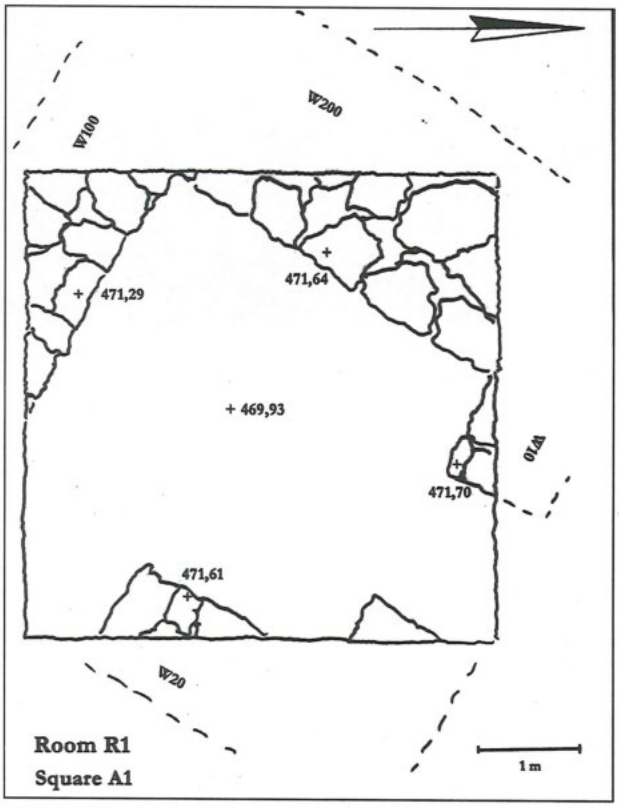
This square concentrated on room R1, one of the four small rooms in the back of the citadel. It appeared that this room was full of stone debris of collapsed walls. Taking the great amount of the debris into consideration one could conclude that the citadel must have consisted – at least in this area – of two different floors, the upper of which had collapsed into the lower room. The walls are well constructed with larger stones (some of them very well hewn) and smaller stones that supported the larger ones and gave them the necessary steadiness. The walls stand up to almost 2.00m. The elevation of the walls is between 471.70m and 471.29m. The floor elevation in the middle of the room amounts to 469.93m. There are two doorways that lead into this room: the first one leads from room R5 into R1 (formed by wall W100 and W20); the other leads from room R1 into R2 (**Fig. 5**)

A2

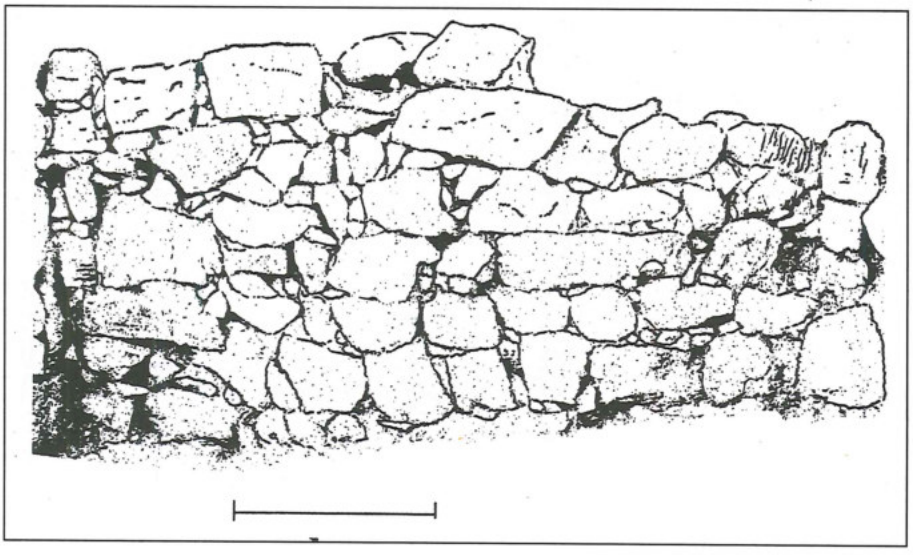
This square concentrated on the courtyard of the citadel, in contrast to Square A1, this square did not have the same amount of debris. This is probably due to the fact that it was an open courtyard. Since we opened this square very late we could not yet reach the floor. In order to find out if the stones visible at the surface were part of pillars we extended our search outside the square parameters, from what we found so far it appears as if the courtyard was indeed surrounded by pillars.

A3

This square is limited by the walls of room R2, both rooms are connected by a doorway. Room R2 and room R3 were the most inner rooms of the back part of the citadel (see **Fig. 4**). They could only be entered by passing through the inner courtyard and two other rooms. The walls of this room as well as room R1 are well-constructed with larger and smaller stones that supported the larger stones and gave them the necessary steadiness sometimes forming horizontal layers (see **Fig. 6**,



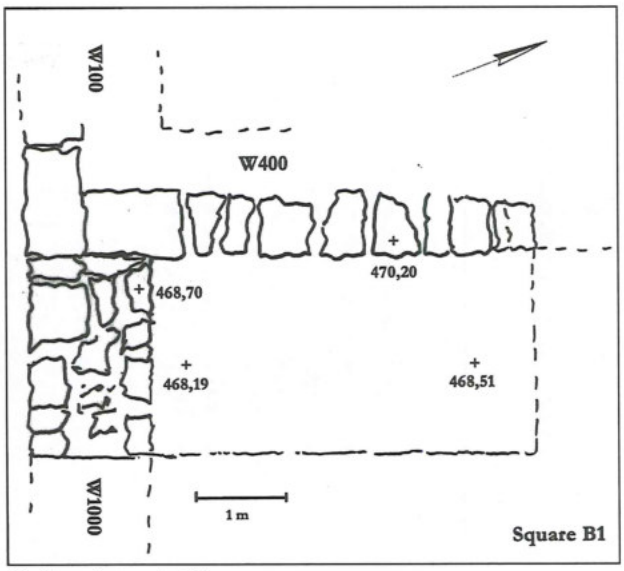
5. Room R1.



6. Wall separating room R2 and room R3.

wall separating room R2 and room R3). The elevation of the floor is somewhat higher than the floor level of room R1 due to the elevation and form of the bedrock underneath. The entrance way connecting room R1 with room R2 is also very well constructed, especially the *Laibung* (reveal; see **Fig. 7**). We also found this room filled with enormous debris. The floor consisted of a mud-layer that had been partially destroyed by the falling blocks of the debris.

Once we had reached the floor we removed it and found that, where necessary, it was carefully leveled with flat stones. The varying levels of the bedrock needed to be taken into consideration, whilst the citadel was being constructed. The floor of room R1 in square A1 was also removed and the bedrock reached.



8. Search trench B1.

B1

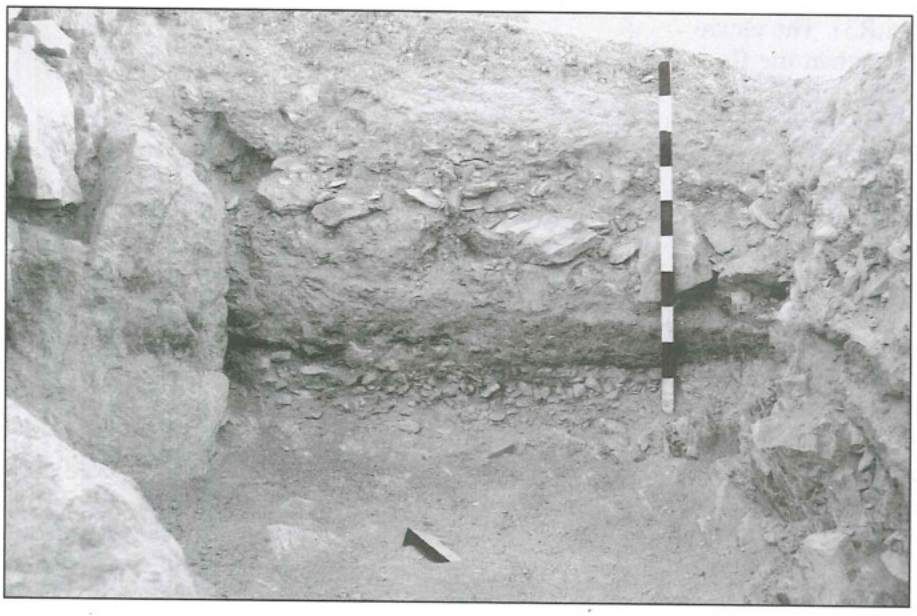
In Area B1 we opened a search trench along the eastern wall W400 where the outer casemate wall (W1000) runs against the citadel (**Fig. 8**). This trench was 5.5m x 2.2m which includes wall W1000. The fill consisted of sand and smaller stones together with a few larger blocks. After 0.80m an ash-layer appeared throughout the entire search trench. This ash-layer was about 0.25m thick (**Fig. 9**). The elevation stretched from 468.51 in the northern part to 468.19 in the southern part near wall W1000. This sloping is due to the natural surface. Immediately underneath the ash-layer was the floor. Near wall W1000 a huge rock that is part of the natural surface penetrates the floor. Further digging revealed that the rough surface of the natural rock floor was filled with small stones and earth to form a relatively even surface for the floor of this first casemate. No sherds were found in the fill underneath the floor. Wall W1000 was built against the citadel, since no remains of the inner casemate wall W2000 were found it appears as if this wall did not run against wall W400 but ended outside the trench to give room for an entrance into the casemate.

B2

The citadel was to be entered by an entrance at the SE corner. This gateway was incorporated in the wall system of the northern casemate wall that runs from the citadel down to the SE corner of Khirbat al-Mu'mmariyya. The main outer wall of the gateway and the citadel is formed by the outer



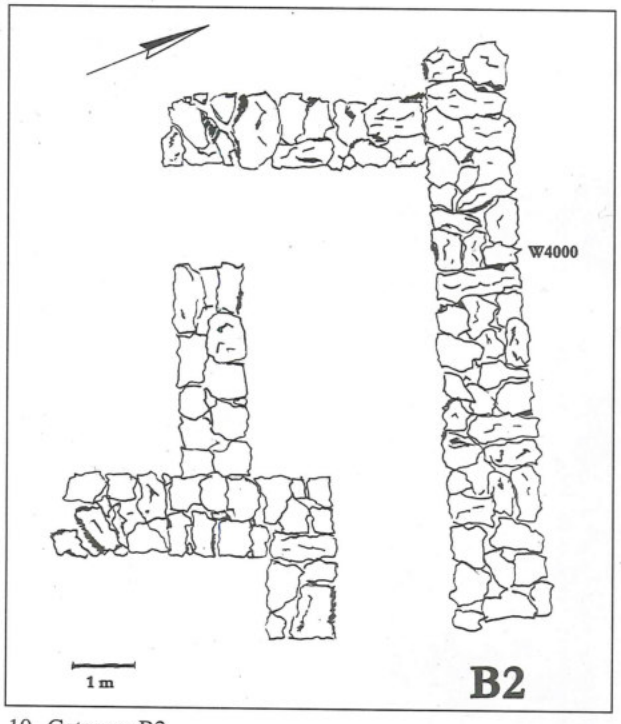
7. Entrance way to room R2.



9. Ash-layer in search trench B1.

casemate wall W4000 (**Fig. 10**). This wall has a width of about 1.30 to 1.40m. The breadth of the outer entrance is about 1.65m. The gateway broadens after ca. 2.5m to a width of almost 3m. After 4m the entrance way takes a 90o turn to open into the inner part of the citadel. The floor ascends slightly up to the inner gateway.

Similar to the various rooms of the citadel we could detect no more than one level of occupation. The entrance way was not filled by huge amounts of debris, instead it was filled by a well packed layer of sand (HUE 2.5Y 8/4; pale yellow). The inner gateway was formed by a step that led into the inner citadel (**Fig. 11**).



10. Gateway B2.

B3 and B4

The excavation of room R10 and room R11 brought new insights into the overall outline of the citadel. Whereas we previously thought that the southern part of the citadel had a somewhat similar outline (i.e., the entrance way matches another room at the opposite site), now we discovered, that the alleged one room is in reality two smaller rooms (**Fig. 12**). When one wanted to enter room R11 from room R10 one had to pass a step. While the floor of room R10 has an elevation of 469.56m the floor of room R11 has an elevation of 469.23m. The entrance to room R11 is situated between wall W1000 and the end of wall W111.

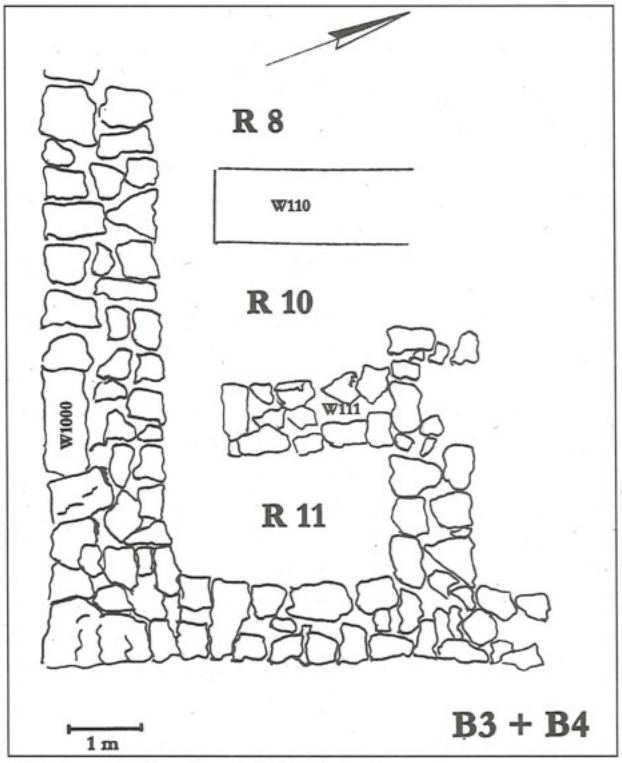
Further excavation revealed that wall W110 did not reach wall W1000 but instead ended (similar to wall W111) to leave an entrance from room R10 into room R8. The entrance was also formed by a step to take the different floor level elevation into account.

C1

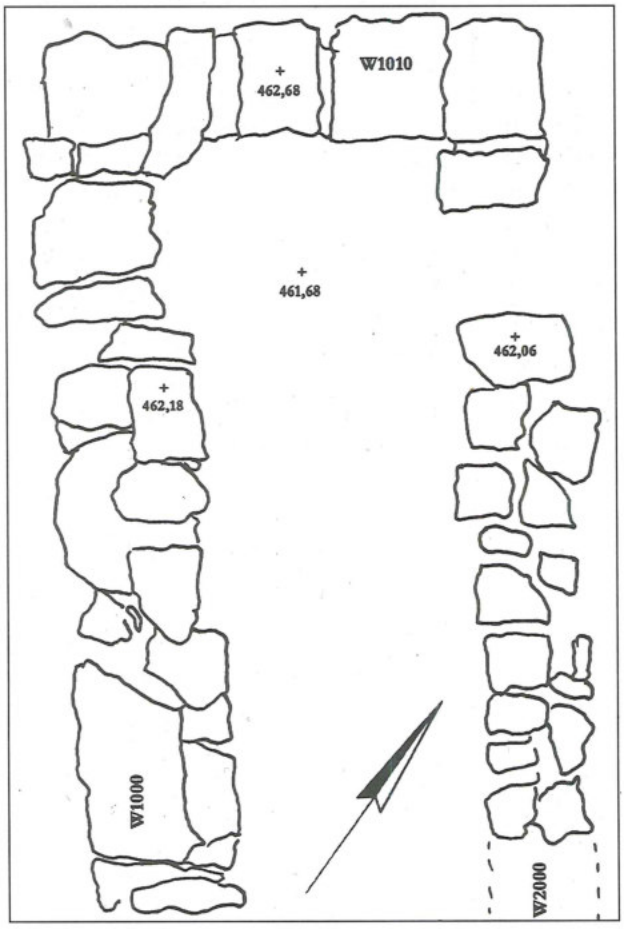
Following the southern casemate wall W1000/ W2000 we chose a casemate in a distance of ca. 35m from the citadel. The fill was cleared working from the separation wall W1010 towards the other separation wall that we did not reach. The casemate is formed of huge blocks (**Fig. 13**). The entrance of the casemate is almost in the corner of the separation wall W1010 and the inner casemate wall W2000; it has a width of about 1.00m. The case-



11. Step of inner gateway B2.



12. Room R10 and room R11.



13. Casemate C1.

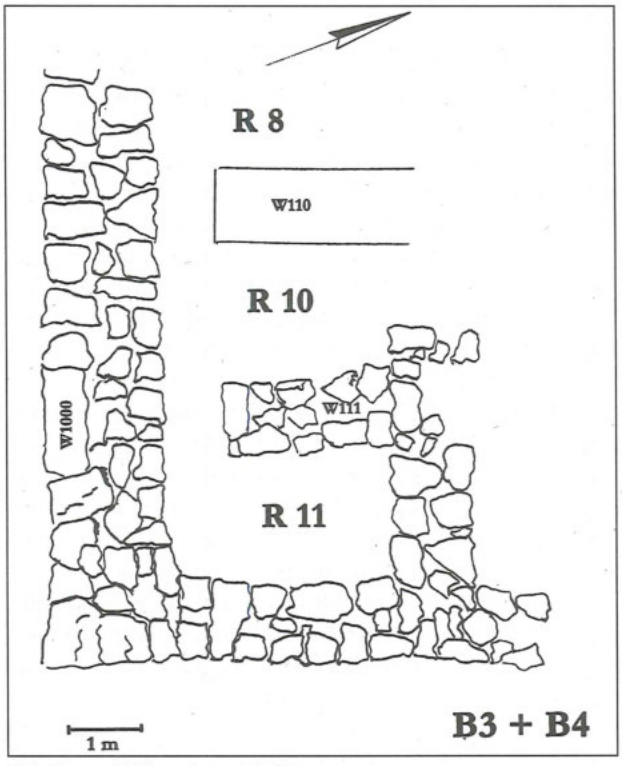
mate itself has a width of almost 5.00m. The length of the excavated part is almost 7.00m (wall W1010 included).

E1

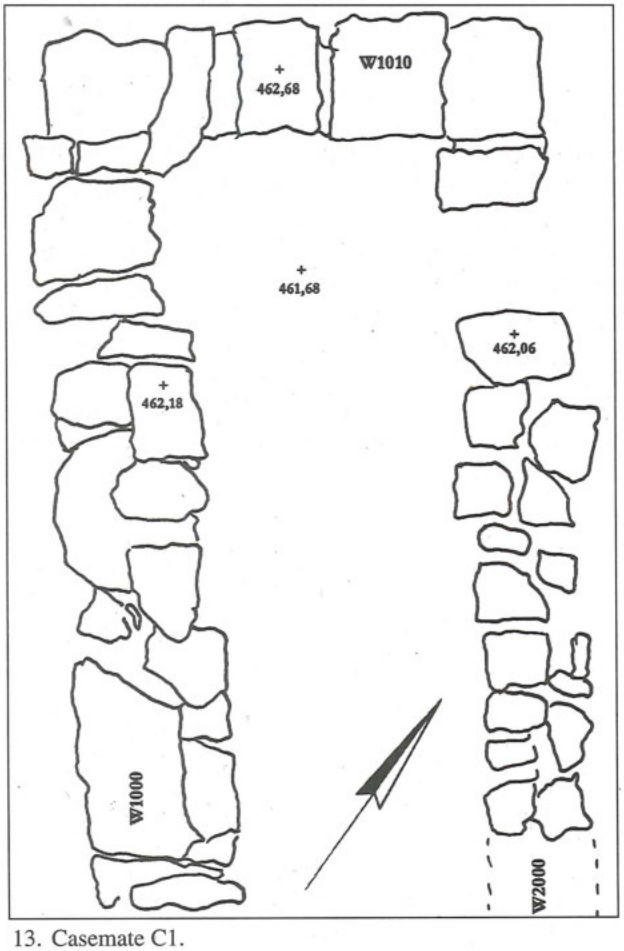
The point where the plateau dips into a somewhat steeper slope marks a kind of demarcation that separates the upper from the lower site. This area is protected by a strong fortification. We started to excavate a room whose two upper corners were formed by walls that have the width of ca. 1.80m. During the process of the excavation it became clear that we dug an elongated room with a breadth of ca. 3m, up to now we opened this room along wall W5100 (**Fig. 14**) and wall W5102 ex-



11. Step of inner gateway B2.



12. Room R10 and room R11.

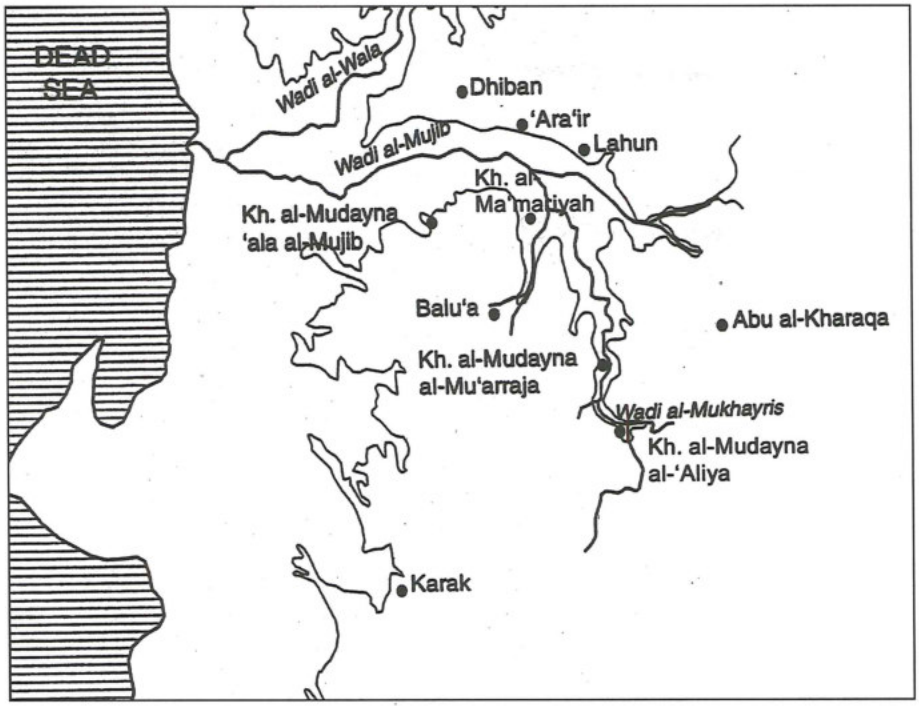


13. Casemate C1.

mate itself has a width of almost 5.00m. The length of the excavated part is almost 7.00m (wall W1010 included).

E1

The point where the plateau dips into a somewhat steeper slope marks a kind of demarcation that separates the upper from the lower site. This area is protected by a strong fortification. We started to excavate a room whose two upper corners were formed by walls that have the width of ca. 1.80m. During the process of the excavation it became clear that we dug an elongated room with a breadth of ca. 3m, up to now we opened this room along wall W5100 (**Fig. 14**) and wall W5102 ex-



16. Northern Karak plateau.

468.3; Palestine Grind: 232.2/081.3), and "Khirbat al-Mudayna South" or Khirbat al-Mudayna al-'Ulyā (UTMG: 773.4/464.5; Palestine Grid: 233.0/076.8). Both sites are located 5km apart. Khirbat al-Mudayna al-'Ulyā measures 275 x 110m and is guarded by a substantial city wall with a tower-gate complex and a moat. The pottery of this site suggests that the site experienced a single occupational phase towards the end of Iron Age I. Investigation pertaining to the architecture of the site is under way under the direction of Bruce Routledge (see Routledge 2000). Khirbat al-Mudayna al-Mu'rraja further to the north on the west bank of Wādī Nukhaylah has been excavated during two brief seasons by E. Olávarri (Olávarri 1977-78; 1983). This site is also heavily fortified with a huge double wall on its western side along with a tower-gate complex. The results of the excavation showed that this site also was essentially a one-period site and dates to the Iron Age I period.

Thus, Khirbat al-Mu'mmariyya fits into this category of sites that display a number of similarities: occupation during the latter part of Iron I ("Khirbat al-Mudayna on the Mugib" is the only site that has a longer occupation history), extensive and massive fortification systems, and similar pottery and architecture; the plan view of the citadel of Khirbat al-Mu'mmariyya shows a significant parallel to the plan view of Building 100 of Khirbat al-Mudayna al-'Uliyā (Routledge 2000: 41, 50). All sites are situated in close proximity to the border of the Central Moabite plateau. Khirbat al-Mu'mmariyya is the only site that did not command its surroundings from the top/edge of the plateau, but rather controlled the wadi bed itself (i.e., Wādī ash-Shuqayfāt and part of Wādī al-Mūjib). Whereas all the other Iron I sites are found in rather remote areas. Khirbat al-Mu'mmariyya is situated on the crossways of important routes that connected the northern Dhībān plateau with the southern Moabite plateau. Most of the traffic had to pass by this site. Further research has to clarify the socio-economic context and the site's function within the concert of its neighboring sites during the Iron Age I period.

Acknowledgments

I would like to thank Dr. Fawwaz al-Khrayshah, Director-General of the Department of Antiquities of Jordan, and his staff for supporting this project and for providing necessary assistance. This project received considerable help and assistance from our Antiquities Representatives, Zuhair Zubi and Bassim Mahamid. I would also like to thank my staff and field crew for their assistance. Funding was provided by Theologische Hochschule Friedensau, Germany.

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REPORT OF 1999 AND 2001 KARAK RESOURCES PROJECT REGIONAL SURVEY

Gregory Linton and Daniel Hoffman

The Karak Resources Project (KRP) Regional Survey conducted an intensive surface survey on the al-Karak Plateau between June 26 and July 24, 1999. The focus of the KRP is to research how inhabitants of the region managed available natural resources. The Regional Survey focused on the region east of the limits of the Miller-Pinkerton Survey (MPS). This area is east and south of Muḍaybi' (المضيبع) and east of Muḥay (المحي), an area of around 35km^2. The Regional Survey identified twenty-two sites that were not included in the MPS. Seventeen of these sites are not included in the Jordan Antiquities Database and Information System (JADIS). Two of the sites had a total of forty-five separate ruins. The twenty-two sites were assigned numbers continuing from the last number in the MPS (**Fig. 1**). The team also revisited seven MPS sites.

Co-directors of the 1999 KRP Regional Survey were Maurice Luker of Emory and Henry College and Daniel Hoffman of Lee University. Team members included Charles Bartlett (Emory and Henry College), John Foss (University of Tennessee), Eley Wagnon, Gregory Linton (Great Lakes Christian College), Jihad Haroun (Department of Antiquities of Jordan), and Monther Tarawneh.

The KRP Regional Survey also conducted a surface survey of the al-Karak Plateau between June 14 and July 24, 2001. The team continued surveying areas east of the 1999 survey area and south of the survey area of the Limes Zone Survey (see map in Miller 1991: 21, Fig. 3). The team systematically covered each sq.km. of the Palestine Grid by vehicle and by foot. The NW corner of the 2001 survey area is PG: 32.0/56.0. The NE corner is PG: 36.0/57.0. The survey area continues in a southeastern direction until it reaches its SE corner at PG: 45.0/45.0. The entire area covered was around 50km^2.

The 2001 Regional Survey identified forty-one archaeological sites that were not identified by the MPS. Of the forty-one sites, thirty-four are not listed in JADIS. At the end of the season, each site was assigned a permanent number following consecutively from the last number assigned in the 1999 survey. Numbers were assigned beginning with the site nearest the MPS area and ending with the easternmost site. The survey team also reexamined nine MPS sites. Also, the team revisited two sites first identified in the 1999 Regional Survey in order to gather more information (**Table 1**).

The 2001 survey was coordinated by Daniel Hoffman (Lee University) and Gregory Linton (Great Lakes Christian College). Other team members were Jihad Haroun (Department of Antiquities representative), Deborah Valiton (student at Lee University), and David Fiensy (Kentucky Christian College). Others participated in the reexamination of MPS sites, including Kevin Wilson (student at Johns Hopkins University) and Heather McMurray (student at Vanderbilt University).

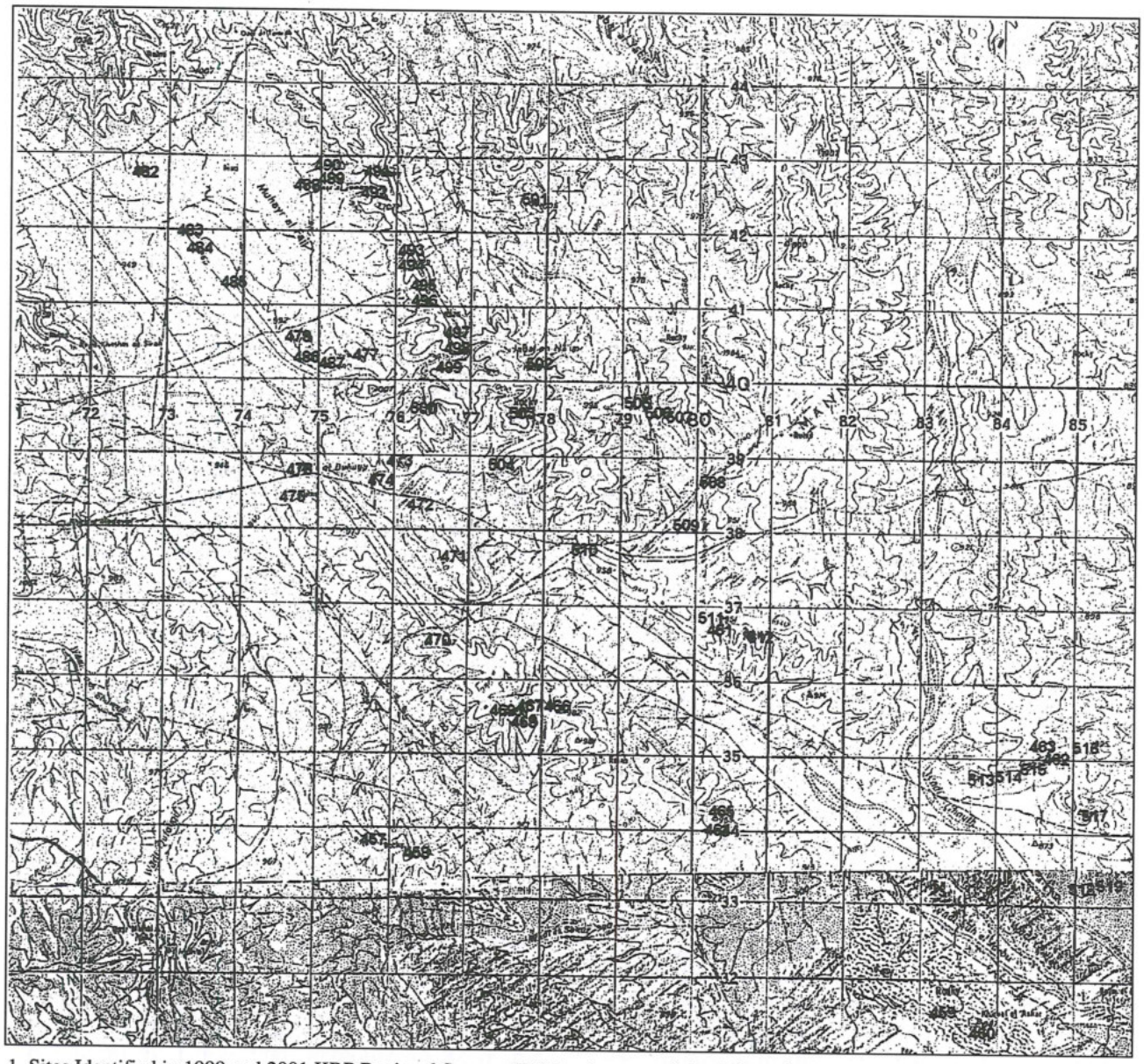
1999 KRP Survey Sites

Site 457

PG: 34.62/46.12; UTM: 76.06/33.64; Elev. 986m. Lithics, Rom, MIs. Non-JADIS. Located 5.5km SE of Muḍaybi' and 3km ENE of Muḥay, this site has two visible wall lines. The N wall is 4.1m, and the W wall is 7.3m. Its position on top of a ridge provides extensive visibility in all directions. A U-shaped dam, 8m long, was located about 60m S of the site. A limestone grinding hole or watering hole was found about 90 meters SW of the site.

Site 458

PG: 35.43/45.68; UTM: 76.49/33.16; Elev. 988m. Lithics, LRom, Byz. JADIS 2304.006, Qaṣr az-Zumaylah (الزميلة). Located .9km SE of Site 457 on top of the same ridge, this site has four walls approximately 6m x 6m with a maximum of two courses still visible. It may have been a watchtower. This site may be Site 70 in Glueck's 1939 report. He described it as "a small, completely de-



1. Sites Identified in 1999 and 2001 KRP Regional Survey (K737 series map of the Adir region).

stroyed tower, with only the foundation stones visible, and a small rujm, perhaps the stones over a grave, in the center." He noted that they were told that the name of it was Rujum Shokhar, but they doubted whether that was correct. He says it is oriented NNE by SSW and is 6m^2, a description that fits this site. They found a few Nabataean sherds at the site (Glueck 1939: 79).

Site 459

Site 459 and Site 460 are known as Khirbat al-'Askar (خربة العسكر), a complex of forty-five separate ruins. It is listed as JADIS 2404.003. Musil mentions this site but does not describe it (Musil 1989: 81). Glueck visited the site but believed that it was "a comparatively modern ruin" (Glueck 1939: 67). It is located on the N side of the road that leads from Muḥay to the Desert Highway, which is visible from the site. To simplify recording of the ruins, the site was divided into two sites (459 and 460) centered on the two most prominent ruins, which have been assigned the letter A. Site 459 is the W side of the complex and consists of thirteen separate ruins. Site 460 is the E side of the complex and consists of thirty-two separate ruins. Only one of the ruins had Nabataean sherds, but forty-one of the forty-five ruins contained Roman ceramics. Every ruin had Byzantine ceramics. Thirty-five had Early Islamic pottery, and fourteen had Middle Islamic pottery.

Table 1: Preliminary Pottery Readings.

Site	IR	IRII	NAB	EROM	ROM	LROM	EBYZ	BYZ	LBYZ	EIS	MIS	LIS
457					X						X	
458						X		X				
459A						X	X	X		X	X	
459B					X			X		X		
459C					X			X		X	X	
459D					X			X	X	X	X	
459E					X			X				
459F					X			X				
459G					X			X		X		
459H					X		X	X	X	X		
459I					X			X		X	X	
459J				X	X			X		X		
459K					X			X		X		
459L					X			X		X		
459M					X			X		X		
460A	X				X			X		X	X	
460B					X			X		X	X	
460C					X			X		X	X	
460D					X			X				
460E								X				
460F								X			X	
460G					X			X				
460H					X			X		X		
460I					X			X		X	X	
460J					X			X		X		
460K					X			X		X		
460L					X			X		X		
460M					X			X		X	X	
460N					X			X		X		
460O					X			X		X		
460P								X				
460Q					X			X		X		
460R					X			X		X		
460S					X			X		X		
460T					X			X		X		
460U					X			X		X		
460V					X			X				
460W					X			X		X		
460X	X				X			X		X	X	
460Y					X			X		X	X	
460Z								X				
460AA					X			X		X	X	
460BB					X			X		X	X	
460CC					X			X		X		
460DD					X			X		X		
460EE					X			X		X		
460FF	X				X			X				
461	X				X			X			X	
462	X				X			X		X		
463								X				
464					X							
465					X							

Con. Table 1: Preliminary Pottery Readings.

Site	IR	IRII	NAB	EROM	ROM	LROM	EBYZ	BYZ	LBYZ	EIS	MIS	LIS
466					X						--	
467					X							
468					X							
469												
470					X							
471												
472	X											
473					X			X			X	
474					X							
475	X				X			X				
476					X			X			X	
477					X			X			X	
478	X				X			X		X		
479	X				X			X				X
480					X							
481					X			X				
482				X	X							
483		X			X			X				
484					X							
485	X				X							
486	X				X							
487	X											
488					?							
489					X							
490					X			X		X	X	X
491					X							
492				X								
493												
494		X										
495		X			X							
496				X								
497					X							
498												
499					X			X				
500				X	X							
501					X							
502					X						X	
503					X							
504					X							
505						X						
506					X							
507		X			X							
508					X			X				
509					X			X				
510					X							
511					X							
512					X							
513					X			X				
514					X						X	
515					X							
516			X		X							
517					X			X				
518					X							

Site 459A

PG: 42.26/43.86; UTM: 83.20/31.52; Elev. 890m. Nab, ERom, Rom, LRom, EByz, Byz, EIs, MIs. Site 459A is the highest point and most visible structure in the E section of Khirbat al-'Askar. The main wall lines are approximately 15.5m x 14.7m. A maximum of three courses were visible. The W wall has two adjacent chambers on its exterior beginning at the SW corner. The southernmost chamber is approximately 3.5m x 4m. The N chamber measures 5.4m x 4m. An additional outlying L-shaped wall on the S side of the main structure measures 20.4m x 18m. This is the only ruin in Sites 459 and 460 that provided evidence of Nabataean ceramics.

Site 459B

PG: 42.17/43.97; UTM: 82.92/21.44; Elev. 885m. Rom, Byz, EIs. 1 basalt grindstone; 1 Rom roof tile, 1 zoomorphic figure. Located NE of Site 459A, this is a multi-chambered, square structure. The four walls measure between 14.5m and 15.5m. Three chambers along the W wall measure roughly 5m x 5m. The E wall may have an entrance.

Site 459C

PG: 42.24/44.22; UTM: 83.09/31.85; Elev. 875m. Rom, Byz, EIs, MIs. 3 basalt grindstones, 1 glass fragment, tesserae. This ruin, located at the N edge of the complex of ruins, has four double walls that measure between 26m and 30m. They are a maximum of two courses high. The NE corner has been bulldozed. A number of interior walls are visible. The SW corner has at least eight separate rooms. A courtyard or terrace extends from the E wall about 10m and is 23m long. A smaller external room that measures approximately 8m x 7.5m extends from the S wall beginning at the SE corner.

Site 459D

PG: 42.28/44.20; UTM: 83.22/31.85; Elev. 880m. Rom, Byz, LByz/EIs, MIs. 1 basalt grindstone. Located SE of Site 459C, this site is trapezoidal. The W wall is 28m; the N wall is 21.2m; the E wall is 22.7m, and the S wall is 27.7m. The ruin has no interior walls. A line of stones 7.7m long extends N from the N wall near the NE corner.

Site 459E

PG: 42.28/44.06; UTM: 83.24/31.71. Rom, Byz. Located S of Site 459D, this site has two roughly square ruins. The easternmost ruin has two discernible walls. The N wall runs E to W and measures 4m. The other ruin is SW of the first one. The walls measure approximately 4.8m.

Site 459F

PG: 42.24/44.01; UTM: 83.23/31.74. Rom, Byz. Located S of Site 459E, this site is an oval enclosure about 30m in diameter. The NE side has parallel stones turned on edge leading into the enclosure.

Site 459G

PG: 42.30/43.87; UTM: 83.26/31.62. Rom, Byz, EIs, UD. Located S of Site 459F, this complex ruin consists of at least a dozen connected chambers or rooms, most of which measure 5m x 5m. It forms a U-shape with the opening to the courtyard on the E side. The N wall is 13.4m. The W wall is 20.9m long. The S side is 39.3m.

Site 459H

PG: 42.14/44.10; UTM: 83.30/31.69. Rom, Byz, EByz/LByz, EIs. 2 basalt grindstones. Located E of Site 459G, this multi-chambered ruin is located E of the previous ruin. Its W wall is 17.1m long, its S wall is 23.1m long, and its N wall is 19.7m. It contains seven rooms.

Site 459I

PG: 42.30/43.98; UTM: 83.30/31.64. Rom, Byz, Byz/EIs, EIs, MIs. Glass cup base. Located S of Site 459G, this ruin is 19.8m x 17.4m. It contains at least six rooms.

Site 459J

PG: 42.33/43.72; UTM: 83.25/31.53. ERom, Rom, Byz, Byz/EIs. 1 basalt grindstone, 2 bases. Located SE of Site 459A, this is a five-chambered ruin. The W wall is 12.6m, and the S wall is 10.1m. The E wall extends N 9.5m, and then it runs 3.2m to the W and turns to the N for 4.5m and then W again for 4.3m.

Site 459K

PG: 42.27/43.93; UTM: 83.24/31.52. Rom, Byz, EIs. Located SE of Site 459A and NW of Site 459J, this small ruin has two chambers. The W wall is 5.8m, and the N wall is 8.4m. It is divided by a wall into two lengths of 4.6m and 3.8m. The E wall extends 3.9 S and then extends to the W 4.3m where it joins a wall that extends 3.8m to the N. The S wall extends from the W wall 3.3m and then ends.

Site 459L

PG: 42.35/43.93; UTM: 83.30/31.52. Rom, Byz, EIs. Located SE of Site 459J, this L-shaped ruin contains four rooms. Its S wall is 12.4m and is

divided by two walls into three sections. The E wall is 7.8m. The N wall extends W 6.3m, then runs S 3.1m and then W 5.0m.

Site 459M

PG: 42.30/44.00; UTM: 83.29/31.65. Rom, Byz, EIs. 1 Byz lamp fragment. This ruin is located E of Site 459H. The W wall of this ruin is 12.3m and is divided by three E-W walls, which are about 5m long. The S wall is 9.8m. The N wall is 7.4m.

Site 460A

PG: 42.70/43.64; UTM: 83.74/31.29; Elev. 900m. Ir, Rom, Byz, EIs, MIs. 1 basalt figurine, 1 basalt grinder base, 1 ceramic lid with a stamp on it, numerous tessarae of various colors, 2 glass fragments. This large, U-shaped ruin measures 48.9m on the W side and 62m on the S side. It is the largest and most visible ruin on the E side of Khirbat al-'Askar. Its W wall is divided by E-W walls into nine rooms. The E-W walls vary in length from 8m to 5.5m. The sixth room from the N has an adjacent room with a mosaic floor on its E side.

The S wall may have eight or nine rooms adjoining it, but not all the walls are clearly visible. Remnants of walls are visible extending toward the interior from these rooms. A wall on the E side of the ruin is 31m long, but no rooms adjacent to it are discernible except in the corner. The NE part of the site slopes down the hillside.

Site 460B

PG: 42.67/43.64; UTM: 83.59/31.29. Rom, Byz, EIs, MIs. 1 basalt platter fragment, 1 steatite box fragment, 1 marble fragment, 1 glass rim. Located SW of 460A, this is a multi-chambered ruin that measures 25.4m x 19.4m. At least ten different chambers of varying sizes are visible.

Site 460C

PG: 42.74/43.57; UTM: 83.79/31.18. Rom, Byz, EIs, MIs. 1 basalt basin fragment, tesserae, inscribed ceramic bowl fragment. This site is a large complex S of 460A and E of 460B. It has three sections and numerous chambers in each section. The sections were possibly connected by walls no longer clearly visible. Altogether, the structure measures about 63m x 46m. Dams are located on the E and W sides of the site.

Site 460D

PG: 43.74/43.50; UTM: 83.73/31.22. Rom, Byz. Tesserae, steatite bowl, bottle stopper. This small site is located E of 460C and S of 460A. The walls were barely discernible, but the structure contains chambers. A wall connects Site 460C and 460D, perhaps forming a dam.

Site 460E

PG: 42.80/43.36; UTM: 84.09/30.95. Byz. This site is located SE of 460D. Much of this site has been disturbed by bulldozing. Two 5m-x-5m chambers are visible.

Site 460F

PG: 42.73/43.59; UTM: 83.78/31.24. Byz, MIs. Tesserae, steatite object, lamp fragment. This site is located N of 460E. It is a multi-chambered ruin that measures 16.3m x 11.5m. The width is divided into two parts of 5.5m and 6.0m by a wall running through the middle of the site. The W half contains five chambers, and at least two chambers are visible in the E half. East of the site are walls that form a courtyard or dam. Another semicircular wall is connected to the SE corner of the structure.

Site 460G

PG: 42.86/43.57; UTM: 83.85/31.19. Rom, Byz. 1 tessera. This small ruin, about 5m x 5m, has two chambers that are barely discernible. It is located E of 460F and SE of 460A.

Site 460H

PG: 42.89/43.49; UTM: 83.90/31.20. Rom, Byz, EIs. 1 lamp fragment, 1 Islamic pipe fragment. This small ruin, located E of 460G and ESE of 460A, has four chambers in L shape. It measures 10.5m x 10.2m.

Site 460I

PG: 42.88/43.55; UTM: 83.88/31.22. Rom, Byz, EIs, MIs. 2 tesserae. This multi-chambered ruin, located S of Site 460H, has an irregular shape. It measures 25m x 17m.

Site 460J

PG: 42.00/43.47; UTM: 83.90/31.14. Rom, Byz, EIs. This small, rectangular ruin is located S of 460I. It measures 12m x 5.5m and has two or three chambers.

Site 460K

PG: 42.87/43.48; UTM: 83.89/31.21. Rom, Byz, EIs. 1 glass rim. Located S of 460J, this multi-chambered, rectangular ruin measures 11.7m x 18.9m.

Site 460L

PG: 42.91/43.62; UTM: 83.91/31.28. Rom,

Byz, EIs. Located SE of 460G and NW of 460K, this multi-chambered, L-shaped ruin measures 11.2m for the E wall, 18m for the S wall, and 18.8m for the W wall.

Site 460M

PG: 42.85/43.62; UTM: 83.84/31.29. Rom, Byz, EIs, MIs. Tesserae. This ruin appears to be two multi-chambered ruins connected by a long wall. The W wall is 42m. It is located close to the SE corner of 460A.

Site 460N

PG: 42.84/43.69; UTM: 83.63/31.41. Rom, Byz, EIs. Tesserae, steatite object. This large, complex site perhaps was connected to the NE corner of 460A.

Site 460O

PG: 42.76/43.76; UTM: 83.73/31.45. Rom, Byz, EIs. Tesserae. This is a multi-chambered ruin located N of the W wing of 460A.

Site 460P

PG: 42.70/43.71; UTM: 83.70/31.37. Byz. Located NW of 460O, this site is a square stone pile, which has been robbed.

Site 460Q

PG: 42.76/43.84; UTM: 83.74/31.46. Rom, Byz, EIs. Located N of 460P, this site is a large, rectangular ruin containing twelve chambers.

Site 460R

PG: 42.73/43.80; UTM: 83.74/31.50. Rom, Byz, EIs. This site is a small, rectangular structure located N of 460Q.

Site 460S

PG: 42.79/43.87; UTM: 83.78/31.55. Rom, Byz, EIs. Tesserae, 1 metal pin, glass fragments, a dark green object (perhaps a button fragment). Located N of 460R, this ruin contains five chambers.

Site 460T

PG: 42.65/43.88; UTM: 83.74/31.56. Rom, Byz, EIs. 1 Islamic lamp fragment, 1 Byzantine lamp fragment. Located NNW of 460S, this site consists of two sections connected by a W wall. The S section has three chambers, and the N section has four chambers.

Site 460U

PG: 42.77/43.86; UTM: 83.78/31.56. Rom, Byz, EIs. Tesserae, lamp fragment, rectangle of marble. Located ENE of 460S, this site is another multi-chambered complex.

Site 460V

PG: 42.76/43.83; UTM: 83.76/31.49. Rom, Byz. 1 flint tool. This small ruin is located S of 460U and contains two or three chambers.

Site 460W

PG: 42.80/43.77; UTM: 83.80/31.45. Rom, Byz, EIs. 1 flint blade. This small, square ruin is located NE of 460A.

Site 460X

PG: 42.73/43.70; UTM: 83.73/31.39. Ir, Rom, Byz, EIs, MIs. Tesserae. Located S of 460W, this site is a two-chambered ruin.

Site 460Y

PG: 42.74/43.76; UTM: 83.79/31.42. Rom, Byz, EIs, MIs, UD. Tesserae. Located S of 460X, this site is a two- or three-chambered ruin.

Site 460Z

PG: 42.72/43.73; UTM: 83.75/31.42. Byz. Located W of 460Y, this site is a small, rectangular ruin.

Site 460AA

PG: 42.58/43.92; UTM: 83.59/31.90. Rom, Byz, EIs, MIs. Tesserae. Located W of 460T, this site contains two adjacent ruins. The E ruin has two chambers, and the W ruin has three chambers.

Site 460BB

PG: 42.65/43.97; UTM: 83.59/31.62; Elev. 910m. Rom, Byz, EIs, MIs. Tesserae, 1 lamp fragment. This site consists of two adjacent, L-shaped ruins that contain multiple chambers. They are located NNW of 460AA.

Site 460CC

PG: 42.60/43.94; UTM: 83.50/31.55. Rom, Byz, EIs. 1 steatite platter fragment. Located SW of 460BB, this site is a rectangular ruin with six chambers. It measures 33.7m x 15.75m.

Site 460DD

PG: 42.60/43.94; UTM: 83.49/31.42; Elev. 806m. Rom, Byz, EIs. Located W of 460CC, this site has four chambers and measures 17.70m x 14.30m.

Site 460EE

PG: 42.60/43.94; UTM: 83.52/32.38. Rom,

Byz, EIs. Glass fragments. Located N of Site 460DD, this five-chambered ruin measures 14.5m x 13.7m.

Site 460FF

PG: 42.29/44.00; UTM: 83.45/31.67. Ir, Rom, Byz. Located N of 460FF, this six-chambered ruin measures 17.5m x 22m.

Site 461

PG: 39.420/48.91; UTM: 80.37/36.63. Lithics, Ir, Rom, Byz, MIs. 1 bottle stopper. Non-JADIS. This site is located on the SE face of a ridge that runs NW-SE along Wādī Ghayth (وادي غـيث). It consists of five rock circles grouped around several caves. Hundreds of lithics were collected from the site. Above the site on top of the ridge are inscriptions on the surface.

Site 462

PG: 43.60/47.03; UTM: 84.47/34.76; Elev. 873m. Ir, Rom, Byz, EIs. Non-JADIS. This is a large, rectangular site that measures 40m x 50m (**Fig. 2**). It contains at least three internal chambers. Its N side abuts the end of a ridge. A wall extends 20-25m E along the ridge.

Site 463

PG: 43.53/47.04; UTM: 84.45/34.76. Byz. Non-JADIS. This site is a 5m-x-5m watchtower located on the ridge above Site 462. It provides extensive visibility to the E and S. At least four courses are visible in the walls.

Site 464

PG: 39.31/46.21; UTM: 80.25/33.72; Elev. 940m. Lithics, Rom, UD. Non-JADIS. Located 4km WSW of Site 463, this site is a rock pile with visible walls in a U-shape. It is located at the SE end of a ridge that continues to run to the NW. The Wādī Ghayth runs along the NE length of this ridge. The N and S walls are 4.8m, and the W wall is 6.8m. Burials are located 1km SE of this site, but no ceramics were found there.

Site 465

PG: 39.33/46.37; UTM: 80.27/33.97; Elev. 955m. Lithics, Rom, MIs. Non-JADIS. Located .1km N of Site 464, this site has square walls 5m x 4.6m and good visibility in all directions.

Site 466

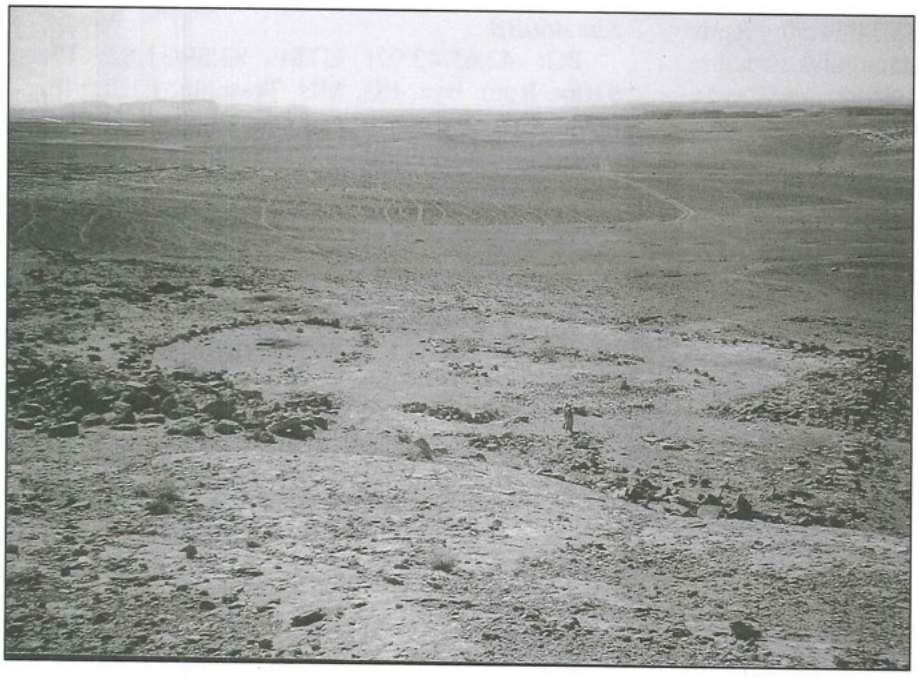
PG: 37.12/47.89; UTM: 78.06/35.43; Elev. 955m. Rom. Non-JADIS. Located 2.6km NW of Site 465 on top of a ridge, this site's walls measure 6.2m x 3.1m. The longer walls run N to S. Two inner walls that run E to W divide the structure into three chambers.

Site 467

PG: 36.95/47.89; UTM: 77.88/35.44; Elev. 950m. Rom. Non-JADIS. Located .2km W of Site 466, this site is a robbed burial.

Site 468

PG: 36.77/47.76; UTM: 77.68/35.34; Elev. 950m. Rom. Basalt grindstone. Non-JADIS. Locat-



2. Site 462 may be an Iron Age fort that was reused by the Romans.

ed .2km SW of Site 467, this site has one visible wall, which is 10.4m long and runs N-S. Three other walls may have formed a rectangular structure. Two robbed graves were located ENE of the site.

Site 469

PG: 36.70/47.80; UTM: 77.61/35.35; Elev. 940m. No ceramics. Non-JADIS. Located .13km NW of Site 468, this site includes a stone enclosure (perhaps modern) and a cistern.

Site 470

PG: 35.67/48.81; UTM: 76.56/36.37; Elev. 967m. Rom, UD. Non-JADIS. Located 1.5km NW of Site 469, this site is a large circular stone pile on top of a ridge from which Muḍaybi' and Muḥay are visible. Three burial cairns were found along the ridge to the NW, one to the SE, and one to the S, but no ceramics were found at any of them.

Site 471

PG: 35.83/49.95; UTM: 76.83/37.25; Elev. 945m. No ceramics. Non-JADIS. Located on top of a short ridge, this site is a burial that has been robbed. Other burials are located NW on top of the ridge.

Site 472

PG: 35.47/50.64; UTM: 76.33/38.19. Ir. Non-JADIS. Located on the valley floor at the N end of the ridge on which Site 471 is located, this site consists of robbed burial cairns.

Site 473

PG: 35.12/51.18; UTM: 76.01/38.77; Elev. 967m. Rom, Byz, MIs. Non-JADIS. Located .63km NW of Site 472 on a hill that projects S from a ridge, this site is a stone pile.

Site 474

PG: 34.90/50.90; UTM: 75.85/38.42; Elev. 945m. Rom. Non-JADIS. Located .3km SW of Site 473 on a knoll, the 5m-x-6m wall lines are oriented N to S. Only one course is visible. A cistern and a dam (10m wide) were located E of the site. Another dam (20m wide) was located at PG: 34.83/51.04.

Site 475

PG: 33.67/50.81; UTM: 74.56/38.30; Elev. 900m. Ir, Rom, Byz. JADIS 2305.047. Located 1.25km W of Site 474, this site has four wall lines with only one course visible. The N wall is 10.1m; the E wall is 5m; the S wall is 10.7m; and the W wall is 5.2m. One cistern was located 15m NW of the site.

Site 476

PG: 33.87/51.17; UTM: 74.68/38.64; Elev. 953m. Rom, Byz, MIs. Basalt grindstone. JADIS 2305.040 incorrectly identifies this site as *Akhawayn al-Khādim*, but that site is the same as 2305.008 (Site 488 in the 2001 Survey). The 1:25,000 map identifies it as Bīr al-Buhay. This site should be identified with JADIS 2305.044, but the coordinates in JADIS for this entry are incorrect. Glueck described this site (141) as a small, completely ruined site at which he found "numerous Nabataean-Roman sherds, including one piece of sigillata and some late painted Arabic ware" (Glueck 1939: 76-77).

Located 3km ENE of Muḍaybi' on the floor of the Fajj and .3km NNE of Site 475, this site is a multi-chambered, rectangular building. The N side is 15.2m; the E side is 9m; the S side is 13m; and the W side is 9.5m. Interior walls divide the structure into at least six rooms. On the S side, two walls .7m apart run parallel from the SE corner and end midway down the S wall to allow an entrance into the structure. Two L-shaped walls are located 7m east of the site. The E wall is 8.3m, and the S wall is 6.9m. Four cisterns were found near the site, one to the E, one to the N, and two to the NW. A broken trough was standing on end at one of the cisterns.

Site 477

PG: 34.78/52.62; UTM: 75.06/40.08; Elev. 1004m. Rom, Byz, MIs. Non-JADIS. This site is located 1.7km NNE of Site 476 at the southern end of a U-shaped ridge. It is a 5m-x-5m watchtower that has extensive visibility to the S and W. At least five courses are visible in the walls. Mu'ai and Muḍaybi' are visible from the site.

Site 478

PG: 33.86/53.10; UTM: 74.74/40.25. Ir, Rom, Byz, EIs. Non-JADIS. Located NW of 477, this is a large sheepfold and camp constructed from stones that were moved from their original settings.

2001 KRP Survey Sites

Site 479

PG: 18.02/45.29; UTMG: 58.98E/32.47N; Elev. 1025m. 113 sherds, 71 diagnostics: Ir, Rom, Byz, LIs. 1 metal fragment, 1 lamp fragment. Non-JADIS. Site 479 is located on top of an E-W ridge opposite Khirbat al-'Akkūza (خربة العكوزة), W of the hairpin curve of the King's Highway. The S side of the ridge slopes down into the Wādī al-Ḥasā, and

the N side of the ridge slopes down into a smaller wadi. Khirbat at-Tannūr is located directly south of the site on the opposite side of the Wādī al-Ḥasā. The Dead Sea is visible to the west. The site was not identified by MPS. The abundance of ceramics and water installations on the site make it one of the most significant finds of the 2001 KRP Survey.

The site contains seven cisterns, two reservoirs, one structure, and several burials. One cistern (PG: 18.22E/45.26N; UTMG: 59.18/32.45; Elev. 1010m) is located on the S slope of the site near the E end. The cistern is 2m x 2m x 1.5m.

Five of the cisterns are located along the N slope of the site. The easternmost cistern (PG: 18.16/45.29; UTMG: 59.12/32.48; Elev. 1004m) has two limestone blocks wedged into its .4m-x-.4m opening. A collar found to the W of the cistern may have originally rested on top of it. Its opening is .25m x .25m. A robbed tomb was located nearby.

The next cistern to the W has a circular, plastered opening (.9m x .9m) in the top of the limestone. A channel was carved in the limestone above it to funnel water into it. It was 2.6m deep.

The next cistern to the W has an upper and a lower opening. The upper opening is .6m x .6m. The depth to the soil from this opening is 1m. The lower opening is .7m x .7m and has a depth of 4m. Several stone slabs have been placed around the lower side of the mouth of the opening.

West of the previous cistern is a reservoir cut into the limestone. It is 2m x 1m and is 1.2m deep. Next to the SE corner of the reservoir, an additional .7m-x-.7m square has been carved in the limestone to a depth of .5m. Above the reservoir is a series of five vertical channels carved into limestone. They may have funneled water down the slope into the reservoir. A cistern collar was also found near the reservoir.

Farther above the reservoir on the side of the slope is another cistern. Its opening is .8m x .8m, and it is 2.1m deep. Above the cistern opening is a trough (1m x .5m) carved into the limestone. Farther up the slope from the trough is a large opening in the ground to collect water. Another reservoir (2m x 1m) nearby was cut into the limestone to a depth of .7m.

West of the previous cistern and farther up the slope is another cistern. Its opening is 1m x 1m, and it was filled with rubble.

On top of the ridge are two perpendicular walls. The N-S wall is 13m long, and the E-W wall, which extends E from the S end of the other wall, is 9m long. Only one course of stones is visible. At the northern end of the N-S wall is a cistern whose opening is .5m x .5m. It was filled with rubble and soil.

Site 480

PG: 17.33/60.93; UTMG: 57.97/48.09; Elev. 902m. 2 diagnostics: Rom, UD. Non-JADIS. This site consists of a small ruin located on a hilltop near al-Karak-aṭ-Ṭafīlah road about 4km south of al-Karak. Sites 269 and 270 of the MPS are located nearby, but this site is distinct from those two sites. Four possible walls in the shape of a square are visible up to one course. Stone tumble surround the walls suggest a burial site. The entire site is about 12m x 12m.

Site 481

PG: 32.45/45.96; UTMG: 73.40/33.43; Elev. 964m. 22 sherds, 5 diagnostics: Rom, Byz. Non-JADIS. This possible reservoir is located 1km NNE of Muḥay. To form the reservoir, soil was removed to a depth of 3m, and stones were placed in the sides up to three courses high. Its dimensions are approximately 18.3m x 9m.

Site 482

PG: 31.90/55.17; UTMG: 72.68/42.60. 5 diagnostics: ERom, Rom. JADIS 2305.053. This burial is located on a small knoll in the gap in the east ridge of the Fajj al-'Usaykir (فج العسيكر).

Site 483

PG: 32.50/54.24; UTMG: 73.27/41.84; Elev. 910m. 2 diagnostics and other sherds: IrII, Rom, Byz. Non-JADIS. This stone pile is located about 1km SE of Site 482 at the N end of a ridge that is oriented NW-SE. To the W of this ridge is the Fajj al-'Usaykir. To the E is the Muhayr al-Fajj (مهير الفج). Discerning visible walls is difficult due to human disturbance.

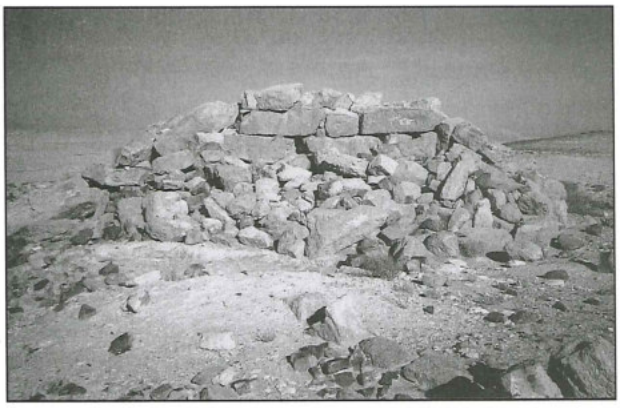
Site 484

PG: 32.63/054.03; UTMG: 73.44/41.51; Elev. 980m. 1 diagnostic: Rom. Non-JADIS. Located .25km SE of Site 483 farther up the ridge, this site also consists of a stone pile that may have been used as a burial.

Site 485

PG: 33.09/53.63; UTMG: 73.90/41.11; Elev. 985m. 1 diagnostic: Rom, sherds: Ir. Non-JADIS. Located about .5km SE from Site 484 on the top of the same ridge, the site consists of a stone pile, which originally may have been a watchtower or a building.

Site 486



3. Glueck called Site 486 "Qeseir 'Amrah" and described it as a "small, box-like tomb".

PG: 34.24/52.49; UTMG: 75.03/40.06; Elev. 1013m. 2 diagnostics: Rom, sherds: Ir. Non-JADIS. Located 1.5km E of Site 485 on top of the same ridge, the site has a collapsed square watchtower (**Fig. 3**). The watchtower is about 4m x 4m. Up to four courses of limestone blocks are visible. The S wall faces toward Bīr al-Buhay (Site 476).

This site is not recorded in JADIS, but it appears to be Site 142 in Glueck's 1939 report. He called it Quṣayr 'Amra and included a picture of it (Glueck 1939: 76, Fig. 34). He described it as a small, box-like tomb. He could detect five courses and reported that "several fine, painted Nabataean sherds were found, in addition to some which could have been Nabataean or Roman, and one glazed mediaeval Arabic sherd" (Glueck 1939: 76). JADIS mistakenly identifies 2305.045 with Glueck's Site 142, but that entry actually refers to the site called Qaṣr at-Tamra (قصر التمره) on the 1:25,000 map (MP Site 379).

Southeast of the watchtower are terraces formed by limestone blocks laid into the S side of the ridge. The N line of stones is 25m long. The E and W walls are 15m long. The S end is open and slopes down the side of the ridge. An additional enclosure is located adjacent to the E wall. Its N and S walls are 15m long, and its E wall is 11m long. The S wall begins 11m from the N end of the E wall of the terraces.

Site 487

PG: 34.54/52.54; UTMG: 75.36/40.05; Elev. 1000m. 1 diagnostic: Ir. Non-JADIS. Located .3km directly to the E of Site 486, this site appears to be a burial. Site 499 is visible to the SE.

Site 488

PG: 34.04/54.95; UTMG: 74.81/42.35; Elev. 963m. 3 sherds: possibly Rom. This site is called Qaṣr al-Juwayn (قصر الجوين). The JADIS entries for the site are 2305.008 (Qasr el-Juwein) and 2305.039 (Qasr el-Khuwein). It is listed as Site 149 in the Limes Zone Survey, which identified it as a large enclosure and a rectangular structure (Koucky 1987: 86-87).

Musil mentions this site but does not describe it (Musil 1989: 81). Glueck visited it and called it *Akhawayn al-Khādim*. He described a square, masonry platform, which had monumental flights of steps leading to the top on its N and S sides. Large, rectangular limestone blocks flanked the lowest steps, and the top of the structure was covered with masses of flat stones. On the east side was a large courtyard, which had an entrance on the N side.

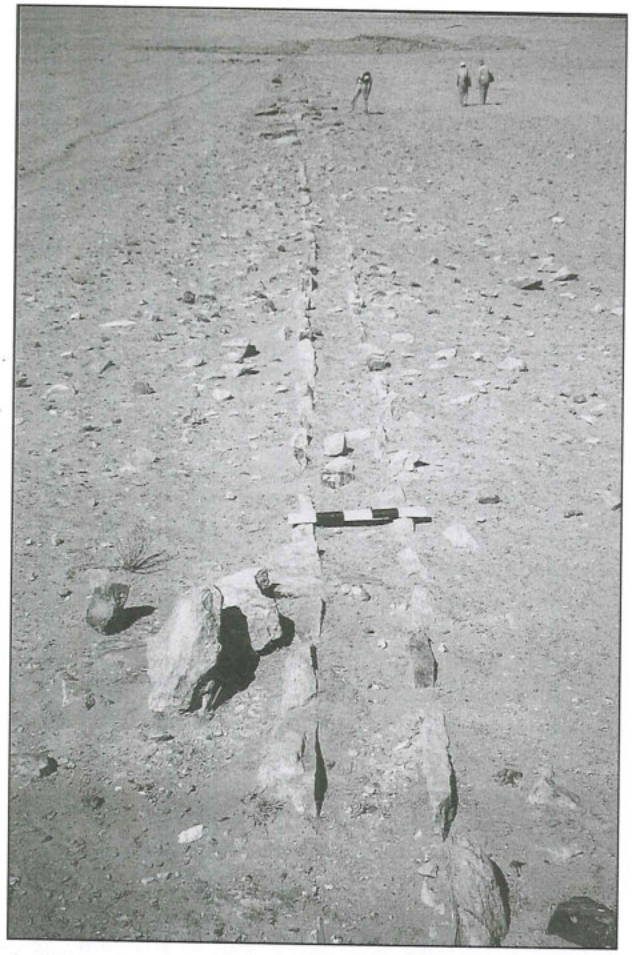
He described the water system located in this area: "On the outside of the entrance, at its right as one emerges from the courtyard, there is a large basin, made of large slabs of limestone. When the basin was almost full, the water in it overflowed through an open stone channel into a large, long watering trough inside the courtyard. Water was supplied to the basin through a conduit, which led northeast up a gradual slope for about 275 metres to a very large, cemented cave-cistern, called Bîr en-Nâyim" (Glueck 1934: 43).

He noted that no pottery was found at the site, but its similarity to other structures caused him to conclude that it was a Nabataean structure. He believed that this site was the burial place of an important personage and that a cult of the dead was practiced there. He conjectured that a priest resided on the site and that pilgrims with their animals were lodged in the courtyards (Glueck 1934: 44). In his 1934 report, he included both a picture (43, Fig. 18) and a plan of the platform (94, Plate 8).

Several years later, Glueck revisited the site but again failed to find any Nabataean sherds (Glueck 1939: 75). On this occasion, he discovered on the ridge E of the site "a number of small, isolated, stone-built burial chambers or tombs, by some of which Nabataean sherds were found" (Glueck 1939: 76). He believed that these tombs confirmed his belief that this site connected with a cult of the dead.

This site is located on the eastern edge of the Muhayr al-Fajj. A ridge runs to the E of it in a NNW to SSE direction. The top of the ridge is about 60m higher than the site. About .25km E of the site and slightly N are sites 489, a watchtower called Quṣayr Bīr az-Zayt (قصير بير الزيت), and site 490, a complex of water channels and cisterns called Bīr an-Nāyim (بير النايم). Qaṣr abū-Rukba (قصر أبو ركبة) is located 3km directly north.

A water channel runs westward from site 490 to the NE corner of site 488 (**Fig. 4**). It begins at PG:



4. This water channel descends westward from Site 490 to Site 488.

34.29/55.13; Elev. 980m. It ends at PG: 34.09/54.99; Elev. 965m. The channel consists of limestone slabs set perpendicular in the ground in two parallel lines about .5m apart. Plaster was still visible in the bottom of the channel at its western end. At the NE edge of the site, the channel adjoins large limestone blocks that have been carved in the middle to form gutters. One block was carved to make a ninety-degree turn to the S. The channel in the blocks runs several meters until it makes another ninety-degree turn to the W at which point it disappears in the rubble.

The middle of the site has been plowed out with machinery. The E wall is 32.5m long and runs NNE to the SSW. The S wall is 48.3m long and runs ESE to the WNW. The other two walls were not easily discerned because of human disturbance. The interior of the site contained large piles of rubble caused by bulldozing.

Site 489

PG: 34.35/55.08; UTMG: 75.12/42.60; Elev. 995m. 6 sherds: Rom. Non-JADIS. No more than one course of stones is visible in the walls. The walls form a square about 5.4m on each side. To the N of the site, Qaṣr at-Tamra and Qaṣr Abū Rukba are visible. The entire Muhayr al-Fajj is visible from the site.

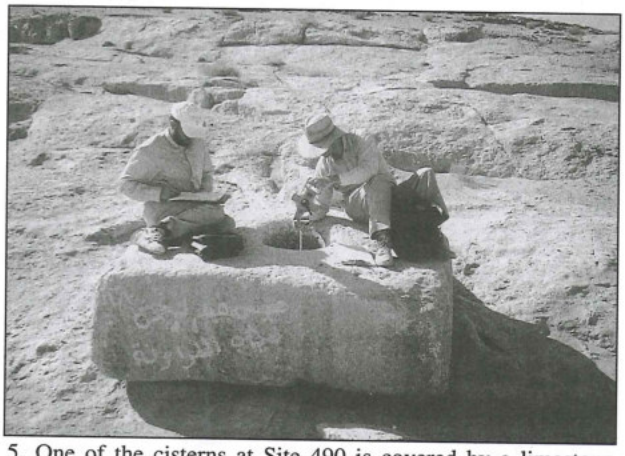
Site 490

PG: 34.30/55.17; UTMG: 75.07/42.64; Elev. 981m. 34 sherds, 2 diagnostic: Rom, Byz, EIs, MIs, LIs. JADIS 2305.007. This site is called Bīr an-Nāyim. This is Glueck's Site 40 in his 1934 report: "The cistern has two openings, a short distance removed from one another. Channels cut into the rock of the hillside above it conducted the rainwater into it. Close to the cistern are two large watering troughs" (Glueck 1934: 43).

Just to the S of site 489 is the beginning of a water channel that winds its way along the W side of the ridge until it turns toward the W and ends at this site. Since this site is located S of site 489, the northern PG reading must be inaccurate. The water channel consists of one row of limestone slabs set perpendicular in the ground so that the water would collect as it ran off the side of the ridge. As the channel approaches the site, it forms a deep rut in the ground. A wadi runs E to W just N of the site.

The site consists of two cisterns, two reservoirs, two water troughs, and a dam. The L-shaped dam is located W of the cisterns and reservoirs and measures 18.8m directly from end to end. The first cistern, located at the bottom of the ridge, has a large limestone cap over it (**Fig. 5**). Water was detected 5.5m below the cap. The bottom of the cistern was 6.3m. The second cistern is located on the flat ground about 4m NW of the first cistern. The opening is partially covered by several limestone slabs. Water was detected 4.5m below the opening.

The first reservoir was a rectangular hole carved



5. One of the cisterns at Site 490 is covered by a limestone cap.

into the limestone ridge about 5m above the first cistern (**Fig. 6**). It is 1m x 4m. A channel carved into the limestone on the E end would direct water into the reservoir. The second reservoir consisted of a groove carved into the side of the ridge in a N-S direction. It is about 3m from the W end of the first reservoir. It was 4.0m long, 1.5m wide (at its widest), and 1.3m deep. A .5m-x-5m limestone block was lying on the ground at the open end of the reservoir. Both limestone water troughs were located next to the second cistern. They were carved into long, narrow limestone blocks.

A second water channel runs S from the site along the western edge of the ridge. The channel begins at PG: 34.82/54.54. Another water channel runs W from the site toward site 488.

Site 491

PG: 34.90/55.27; UTMG: 75.66/42.79; Elev. 1032m. 12 sherds: Rom. Non-JADIS. This site is located .6km E of sites 489 and 490. Both are visible from this site. It is a 5m-x-5m pile of limestone blocks, perhaps a watchtower. Several robbed graves were located both N and S of the site.

Site 492

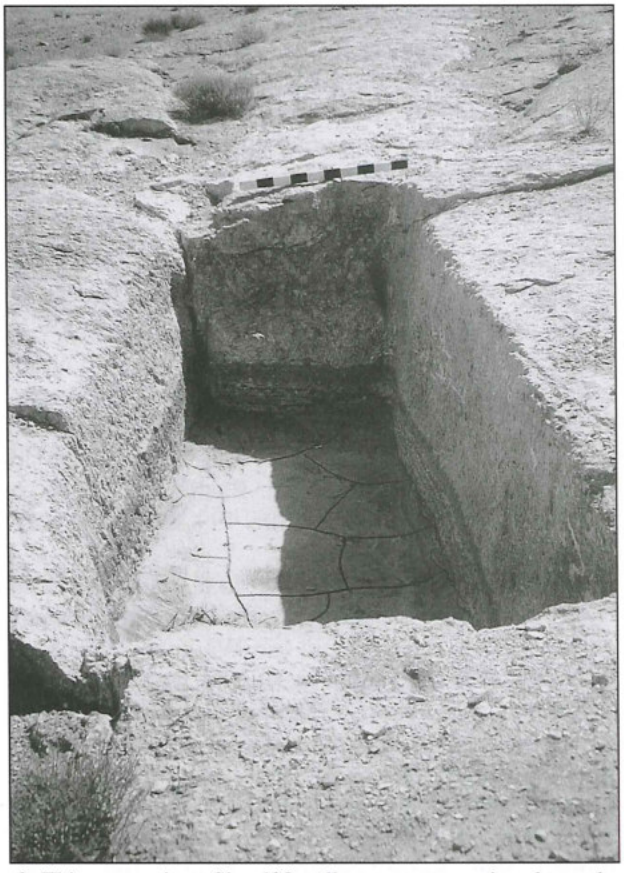
PG: 34.84/54.80; UTMG: 75.61/42.32; Elev. 994m. 20 sherds, 1 diagnostic: ERom. Non-JADIS. South of site 491 begins a water channel that converges at this cistern with another water channel running from the S (**Fig. 7**). A dam constructed from piled soil is located below the cistern to the N. The opening to the cistern is .5m wide and carved into the limestone. Lying above the opening is a limestone boulder about .7m wide and about .7m high.

Site 493

PG: 35.38/53.95; UTMG: 76.17/41.48; Elev. 1030m. No ceramics. Non-JADIS. The site consists of a stone pile oriented N to S. Up to three courses are still visible in the walls. The N wall is 7.2m long, the E wall is 14m long, the S wall is 5.7m long, and the W wall is 13m long. Because of the elevation, visibility to the E and especially to the W is extensive.

Site 494

PG: 35.38/53.88; UTMG: 76.17/41.41; Elev. 1034m. Sherds: IrII. Non-JADIS. This stone pile is



6. This reservoir at Site 490 collects water running down the slope above it.



7. This cistern at Site 492 collects water from two converging water channels.

located S of site 493 at the highest point of the ridge. Up to four or five courses were visible in the walls. The N side is 9m long, the E side is 15m long, the S side is 7m long, and the W side is 16m long. At the SE corner, part of a double ring of limestone blocks was visible. Site 488 was still visible to the NW.

Site 495

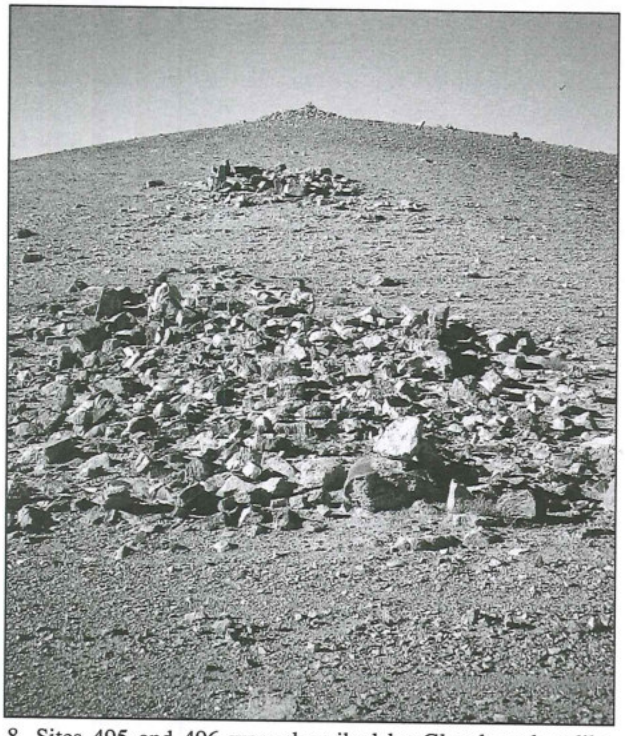
PG: 35.58/53.62; UTMG: 76.37/41.16; Elev. 1011m. Sherds: IrII, Rom. Non-JADIS. Southwest of site 494, the ridge descends and then begins to rise in elevation again. Located about .35km SW of site 494, two stone piles, perhaps burials, are located on the slope of the ridge as it begins to ascend.

Site 496

PG: 35.59/53.51; UTMG: 76.39/41.04; Elev. 1031m. Sherds, 1 diagnostic: ERom. Non-JADIS. Located .11km directly S of site 495 on top of the ridge, this site is another stone pile (**Fig. 8**). Walls are visible up to 2m high. The walls form a quadrilateral oriented E to W. The N wall is 10m long, the E wall is 13m long, the S wall is 9.3m long, and the W wall is 8.3m long.

Site 497

PG: 35.85/52.97; UTMG: 76.66/40.40; Elev. 1032m. Sherds: Rom. JADIS 2305.042. Located about .6km SSE from site 496, this square structure may have been a watchtower reused as a burial. Four to five courses, up to 1.2m high, are still visible in the walls. It is oriented N to S. The N wall was 2.8m long, the E wall was 3.0m long, the S wall was 2.6m long, and the W wall was 3.0m long. Visibility to the E and especially to the W was extensive.



8. Sites 495 and 496 were described by Glueck as box-like tombs that were part of a Nabataean cult of the dead.

The JADIS coordinates for this site are wrong. This is Site 139 in Glueck's 1939 report. Although he says it is located SE of Quṣayr 'Amra (his Site 142; our Site 486), it is actually ENE of it. He calls it Quṣayr Bīr az-Zayt (I). He noted that it was 3m x 3m and was 1.4m high. He found only a "few worn Nabataean-Roman sherds" (Glueck 1939: 77).

Site 498

PG: 35.92/52.78; UTMG: 76.73/40.31. No ceramics. JADIS 2305.043. Located .2km S of site 497, this site is a watchtower reused as a burial site. This site is located at the SE end of the Muhayr al-Fajj. A saddle among the surrounding ridges descends SW from this point and opens out into the beginning of the Fajj al-'Usaykir 1km NE of Bīr al-Buhay. Four to five courses, up to 1.6m high, are visible in the walls. The N wall is 4.3m long, the E wall is 5.0m long, the S wall is 4.4m long, and the W wall is 4.3m long.

The coordinates in the JADIS entry are incorrect. This is Site 140 in Glueck's 1939 report. He calls it Quṣayr Bīr az-Zayt II. He noted that it was 200m to the south-southeast of Site 139 (KRP Site 497). He said that it was 4.2m x 4.2m and was 2.1m high in some places.

Site 499

PG: 35.75/52.63; UTMG: 76.57/40.16; Elev. 975m. Sherds: Rom, Byz. Non-JADIS. The coordinates in JADIS 2305.039 are located about .5km WSW of this site. JADIS calls it Bīr Bashbash (بير بشبش), but it also applies that name to 2305.029. The coordinates of the latter appear to correspond to the actual Bīr Bashbash, which is MPS Site 381. Therefore, Site 499 should be considered a non-JADIS site.

Glueck described the site in connection with Site 140 in his 1939 report. He noted that below Site 140 (our Site 498) in the Wādī az-Zayt were two different dams that deflected water into two different cave-cisterns. He also noted the remains of several other cisterns between these two. He also described two long stone watering troughs near one cistern, one measuring 3.2m and the other 3.7m. They averaged about .6m in width. He concluded that these cisterns "reflect the workmanship, ingenuity, and industriousness of the

Nabataeans" (Glueck 1939: 77).

This site is located .2km SW of site 498. It consists of water channels, two cisterns, a dam, two troughs, and remains of walls. The system is nestled in a swale through which a wadi runs. The first cistern is located at the bottom of the S bank of the wadi. The circular opening, .45m in diameter, was cut vertically into the limestone bank. The cistern is 2.4m deep. On the opposite bank are two perpendicular walls, one oriented NW to SE and the other oriented NE to SW. The corner of the walls faces directly N. Up to six courses, a height of 1.2m, were visible in the walls. They may have channeled water toward the cistern on the opposite side.

On the slope above the first cistern were two water troughs. The higher trough was carved from a limestone block 3.15m long. At one end, it is 1.1m wide, but it tapers on both sides to a width of .7m on the opposite end. At the widest end, a hole was cut through the limestone to form an opening to the cistern below (**Fig. 9**). Water would run down the slope into the hole in the ground underneath the cap, which was about .4m in diameter. The carved trough runs E of the opening in the same limestone block. Below the first trough and slightly to the W of the cap was a second trough, whose end was broken. It was 1.4m x .65m.



9. This combination cistern cap/watering trough at Site 499 reveals the ingenuity of the ancient people who created it.

The second cistern is located SW of the other cistern farther up the slope. Next to the opening was a limestone cap, which was 1.5m x 1m. The opening was .45m in diameter. The bottom of the cistern was 2.6m below the surface. A water channel constructed from limestone slabs set perpendicular into the ground would funnel water from the SW into the cistern opening. The coordinates for the beginning of the water channel were PG: 35.60/52.38; Elev. 1004m.

On the N slope opposite the second cistern is a mound of soil that appears to form a dam. At one time, the dam may have extended across the wadi, but the wadi has eroded the middle of it.

Site 500

PG: 35.47/51.84; UTMG: 76.14/39.10; Elev. 980m. Sherds, 2 diagnostics: ERom, Rom. Non-JADIS. This stone pile is located on the peak of the southernmost end of the E ridge of the Muhayr al-Fajj. Its visibility to the N, W, and S is extensive. Up to two courses are visible in the walls. It forms a circular mound about 6m in diameter. It is probably a burial.

Site 501

PG: 37.02/54.65; UTMG: 77.80/42.21; Elev. 1009m. 12 sherds: Rom, UD. Non-JADIS. This isolated 7m-x-7m stone pile was a watchtower or a burial. From the site, Qaṣr Abū Rukba is visible 4.75km to the NW, and site 502 is visible 2km to the S. It also has at least 3km of visibility to the E, and the N-S ridge that runs E of site 488 is visible 2km to the W.

Site 502

PG: 36.96/52.26; UTMG: 77.86/39.90; Elev. 1030m. 3 diagnostics: Rom, MIs. Non-JADIS. This 4m-x-4m structure had courses in its walls up to eight high. Next to the N wall and the S wall were burials. Because of its high elevation, the site has extensive visibility in all directions. Muḥay is visible 9km to the SW. The 1:25,000 map calls this peak Jabal an-Nāyim (جبل النايم).

Site 503

PG: 36.77/51.73; UTMG: 77.60/39.39; Elev. 1000m. 1 diagnostic: Rom. Non-JADIS. Located .55km S-SW of site 502, this site is a small pile of rubble that measures 6m x 4m.

Site 504

PG: 36.50/51.24; UTMG: 77.35/38.79; Elev.



10. Site 504 is an ancient water-system that is still in use today.

900m. 1 diagnostic: Rom, 1 sherd: UD. Non-JADIS. This water system is located .55km SSW of site 503. It consists of two water channels, a cistern, two troughs, and a dam (**Fig. 10**). The water channels slope toward the site from the E and from the S. On top of the cistern is a limestone cap. Water was discovered 4.5m below the surface of the cap. A rope was lying on the cap and cans were sitting nearby, so the cistern is used currently.

Two troughs carved in limestone blocks were located next to the cistern. They measured 2.4m x .4m and 1.6m x .8m. One of the troughs contained water at one end. To the NW of the troughs was a crescent-shaped dam formed by a pile of soil. The distance was 25m from one tip of the crescent straight across to the other. The 1:25,000 map gives it the name Bīr an-Nāyim, but JADIS gives that name to site 490.

Site 505

PG: 38.30/52.03; UTMG: 79.14/39.61; Elev. 960m. 11 sherds, 1 diagnostic: LRom. 3 chert tools. Non-JADIS. The site has two lines of stones that form an L. The W line, 13m long, is oriented N to S, and the S line, 11.5m long, is oriented E to W. A 6m-x-6m circular pile of stones, possibly a burial, is located N of the center of the S line.

Site 506

PG: 38.54/51.83; UTMG: 79.38/39.42; Elev. 951m. 19 sherds, 4 diagnostics: Rom. Non-JADIS. Located at the base of a ridge, this site consisted of burials, a large reservoir, and a dam. The burials are enclosed by lines of stones that form a rectangle. The N line was 13m; the E line was 6.5m; the S line was 13.5m; and the W line was 5.7m. Another line of stones formed a 6m-x-5.5m rectangle on the N side of the larger rectangle. North of these stones was an oval reservoir, which measured 17.5m x 25m and was 2.5m deep. The dam was 20m long, 10m high, and 13m wide.

Site 507

PG: 38.88/51.74; UTMG: 79.71/39.33; Elev. 978m. 35 sherds, 7 diagnostics: IrII, Rom. Non-JADIS. Located .38km ESE of site 506, this site consists of lines of stones no more than one course high measuring 34m x 17m. It contains an interior wall.

Site 508

PG: 39.25/50.87; UTMG: 80.11/38.48; Elev. 934m. 12 sherds: Rom, Byz. JADIS 2305.048. Located beside a wadi that runs E to W at this point, this site consists of a reservoir, dam, and two troughs. The reservoir measures 13m x 10.7m and is 1.1m deep. The dam, located to the W and N of the dam, is 25m long and 3.5m high. This system would trap water running from the E in the wadi. The two troughs, carved in limestone blocks, are located near the E edge of the reservoir. They measured 2.2m x .65m and 2.2m x .45m.

Site 509

PG: 38.96/50.39; UTMG: 79.82/37.99; Elev. 932m. 27 sherds, 5 diagnostics: Rom, Byz. Non-JADIS. Located .6km SSW of site 508, this water system is located on the SE edge of the same wadi on which site 508 is located. It consists of a reservoir, dam, and up to eleven burials. The reservoir is circular with a diameter of 19.7m. It is 1.7m deep. The dam, located to the W of the reservoir, is 20m long, 20m wide, and 4m high. A water channel 23m long formed by limestone rocks set into the ground was located north of the dam. It would direct water from the west into the dam. The burials are located S of the reservoir.

Site 510

PG: 37.55/49.97; UTMG: 77.54/43.75 (note: this reading is incorrect); Elev. 917m. 5 sherds, 1 diagnostic: Rom. Non-JADIS. This water system consists of a water channel, a dam, and a cistern. It is located beside the Wādī Ghayth in a gap between two ridges. A wadi runs from the NE of this site. Site 509 is 1.5km to the NE along this wadi, and site 508 is .6km NNE of that site. A steep slope is located to the S of the site, but the ground is flat in the other directions.

The water channel begins 1km E of the site at the following coordinates: PG: 38.58/49.98; Elev. 919m. Limestone and chert blocks were set on edge to trap water flowing from the slope to the S

of the channel. The cistern had two openings. The top opening was formed by cutting a .6m-x-.6m opening down through the limestone. The bottom of the cistern was 4.7m below the opening. The other opening was located on the side of the slope 6m to the N of the top opening. It was 1.3m high and 2.3 wide. The interior of the cistern measured 10m x 11m. The walls of the cistern were plastered.

The dam was located N of the lower opening. It was formed by piling soil and stones in a curve that would trap water below the cistern where the water channel ended. It was 13m long, 10.5m wide, and 4m high.

Site 511

PG: 39.41/49.12; UTMG: 80.30/36.73; Elev. 950m. 48 sherds, 2 diagnostics: Rom. JADIS 2304.009, Rujum Ḥijāra (رجم حجارة). From site 510, a ridge runs NW to SE along the Wādī Ghayth. This stone pile was located on top of the ridge 2km SE of site 510. Site 461 is located .5km to the S. The site has extensive visibility, especially to the S. The wall lines, only one course high, form a trapezoid. The N wall is 5.8m long, the E wall is 13.7m long, the S wall is 7.6m long, and the W wall is 13.4m long.

Site 512

PG: 39.93/48.77; UTMG: 78.08/36.41 (note: this reading is incorrect); Elev. 930m. 48 sherds, 2 diagnostic bowl fragments: Rom. Non-JADIS. This stone pile is located .6km SE of site 511, which is visible from the site. Another stone pile was visible to the ENE, but the survey did not cover that area this season. The dimensions of the site were 6m x 7m. No walls were visible.

Site 513

PG: 42.88/46.85; UTMG: 83.81/34.52; Elev. 887m. 37 sherds, 4 diagnostics: Rom, Byz. Non-JADIS. From site 512, the area 2.5km to the SE was not covered by the survey team. Site 513 is located 3.5km SE of site 512. This site is the westernmost of a series of five sites located along the S base of an E-W ridge. From this site, the Desert Highway and the ʻAbayd mine are visible to the E, and the view to the S is unlimited.

The site has visible walls, up to three courses high. Its N side is 25.5m long, its E side is 22.8m long, its S side is 28.3m long, and its W side is 11.7m long. The N wall is formed by stones piled along the side of the ridge. A N-S wall divides the site. On the SE side of the site, wall lines extend to form a rectangular outline measuring 11.1m on the E, 10m on the N, and 13.4m on the W. Three burials within the site had been robbed.

Site 514

PG: 43.09/46.91; UTMG: 84.02/34.60; Elev. 850m. Sherds, 1 diagnostic: Rom, MIs. Non- JADIS. This site is located .23km to the ENE of site 513. It is also located at the S base of the ridge. Courses in the walls were visible up to three high. Its N wall was 24.5m long, its E wall was 17m long, its S wall was 24m long, and its W wall was 15m long. A N-S wall divides it into two parts.

Site 515

PG: 43.27/47.04; UTMG: 84.29/34.73; Elev. 910m. 70 sherds, 17 diagnostics (9 bowl fragments, 1 cup fragment): Rom, UD. Non-JADIS. This site is a collapsed watchtower located .2km ENE of site 514. The watchtower was built on a level place partway up the side of the ridge. It measured about 6m x 6m. The stones tumbled S down the ridge, extending about 30m. Site 460, Khirbat al-ʻAskar, was visible 3.5km to the S. The visibility in all directions except the N was unhindered. Six to eight burials were located near the site.

Site 516

PG: 44.04/47.27; UTMG: 84.96/34.82; Elev. 893m. Sherds: Nab, Rom. Non-JADIS. This site appears to be the remains of a watchtower. Up to four courses are visible in the walls. Beginning at the NW corner and going in a clockwise direction, the first side is 5.3m, the second side is 6.8m, the third side is 6m, and the fourth side is 7.6m.

Site 517

PG: 44.24/46.41; UTMG: 85.18/34.11; Elev. 884m. 28 sherds, 3 diagnostics: Rom, Byz. Non-JADIS. This site is located .9km S and slightly E of site 516. A ridge above the site curved around to the W and N. It has extensive visibility to the E and S. Stones formed a rectangular outline. The N side was 22m, the E side was 22m, the S side was 27m, and the W side was 25.6m. Up to two courses of stone were visible in the SE corner. Several holes had been dug in the site.

Site 518

PG: 44.07/45.35; UTMG: 85.00/33.06; Elev. 905m. 23 sherds, 1 diagnostic: Rom. Non-JADIS. Located 1km S and slightly W of site 517, this site is a small stone pile.

Site 519

PG: 44.24/45.37; UTMG: 85.18/33.13; Elev.

892m. 18 sherds, 4 diagnostics: Rom. Non-JADIS. Located .17km E of site 518, this site is a circle of stones. Up to two courses of stones were visible. The N-S diameter of the site was 21.5m. The E-W diameter was 21.8m. A quarry was located 50m SSW of the site.

Sites Revisited in 2001

Site 106: PG: 22.53/76.70; UTMG: 62.88/63.98. 47 sherds, 28 diagnostics: IrII, Rom, Byz, MIs.

Site 206: PG: 16.02/63.25; UTMG: 56.62/50.39; Elev. 1087m. 8 diagnostics: IrII, Rom, Byz, EIs, MIs, LIs.

Site 207: PG: 17.16/62.64; UTMG: 57.79/49.81; Elev. 1021m. 23 diagnostics: Ir, ERom, Byz, MIs.

Site 259: 70 sherds: Ir, Rom, Byz.

Site 260: 19 sherds, 3 diagnostics: Ir, Rom, Byz.

Site 290: PG: 12.85/56.21; UTMG: 53.59/43.29. 11 diagnostics: MIs, Byz, Rom. The MPS verified Glueck's observation of the site that up to four courses were visible in the wall (Miller 1991: 116). However, we could discern only one to two courses. One cistern is located S of the site, and another is located W of the site.

Site 296: PG: 14.02/55.45; UTMG: 54.77/42.52; Elev. 1200m. 174 sherds, 11 diagnostics: LIs, Byz, Rom, ERom/Nab, IrII. The building ruin described in MPS is still visible (Miller 1991: 118). The W wall was 13.7m long. The E wall was 9.5m long. The N wall was 17m long. No wall is visible on the S side. A wall line runs parallel to the E wall 1.2m to the W. A cistern was located 20m S of the building. Two burial mounds were located about 50m N of the site.

Site 460A: 13 sherds, 4 diagnostics: EIs, Byz. 29 tesserae.

Site 460H: 1 tessera.

Site 460I: 1 tessera, 1 basalt grindstone, and 1 lamp base.

Site 460S: 14 sherds, 2 diagnostics: EIs, Byz, Rom. 1 grindstone.

Site 460T: 20 sherds, 5 diagnostics: EIs, Byz, Rom. 5 glass fragments.

Site 460V: 15 sherds, 3 diagnostics: EIs, Byz, Rom. 3 tesserae.

Site 462: The survey team collected sherds on three different occasions: MIs, Byz, Rom, IrII. Further investigation of this site has raised the possibility that this was an Iron Age fort or settlement that was reused by the Romans. The corner farthest away from the ridge faces S and has remains of a projecting corner or tower. The NE-SW wall is located at the base of the ridge. An additional enclosure extends from the NW-SE wall.

Gregory Linton
Great Lakes Christian College
6211 W. Willow Hwy.
Lansing, MI 48906
USA

Daniel Hoffman
Lee University
1120 North Ocoee Street
Cleveland, TN 37320
USA

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ḤARRAT AL-BURMA K-LINES AND WĀDĪ BURMA KITE-SITE: PRELIMINARY REPORT OF THE 2003 SPRING SEASON OF THE JAFR BASIN PREHISTORIC PROJECT, PHASE 2

Sumio Fujii

Introduction

The first phase of the Jafr Basin Prehistoric Project (JBPP) started in 1997 for the purpose of establishing the chronological framework of the later prehistory of the al-Jafr basin in southern Jordan, and ended in 2002 with the sixth and final excavation season at Qā' Abū Ṭulayḥa West (قاع ابو طليحة) (QATW), the core site for the investigation of this phase (Fujii 1998, 1999, 2000, 2001, 2002a, 2003). The results of this phase have enabled us to outline the chronology of this basin from the Late Neolithic (LN) to the Early Bronze Age (EBA) (Fujii 2003: Fig. 23, 24). The second phase began immediately the following year with a view to re-examining the results of the QATW excavations in a broader context and, in so doing, establishing a more reliable base for tracing the origin and development of the early pastoral nomadism in this basin. The specific goal of this season was to bridge the chronological gap between the Layer 4 LN entity and the Layer 3 EBA entity at QATW. Chosen for the first operation were Ḥarrat al-Burma K-lines and Wādī Burma kite-site 1, both of which had been found in our 2001-2002 winter survey season (Fujii 2002b).

Ḥarrat al-Burma K-lines (حرّة البُرمه) are located on a basalt plain that extends to the southwest of Tall Burma (تل بُرمه), a small volcanic hill ca. 5km northeast of al-Ḥusayniyya (الحسينية) (**Fig. 1**). The excavations of the two K-lines, Ḥarrat al-Burma K-line 1 (HB-KL1) and 2 (HB-KL2), have revealed that the K-Line, or locally called *Khaṭṭ Shabīb* (خط شبيب), is a linear combination of pseudo-wall cairns rather than a boundary or defensive wall built all at once. Typological comparisons with other pseudo-wall burial cairns thus far investigated in this basin suggest the date of the early half of the EBA. Both chronological and functional reassessments of the K-line on the basis of the excavated evidence would throw new light on this enigmatic feature that has long been a subject of controversy in the Badia archaeology.

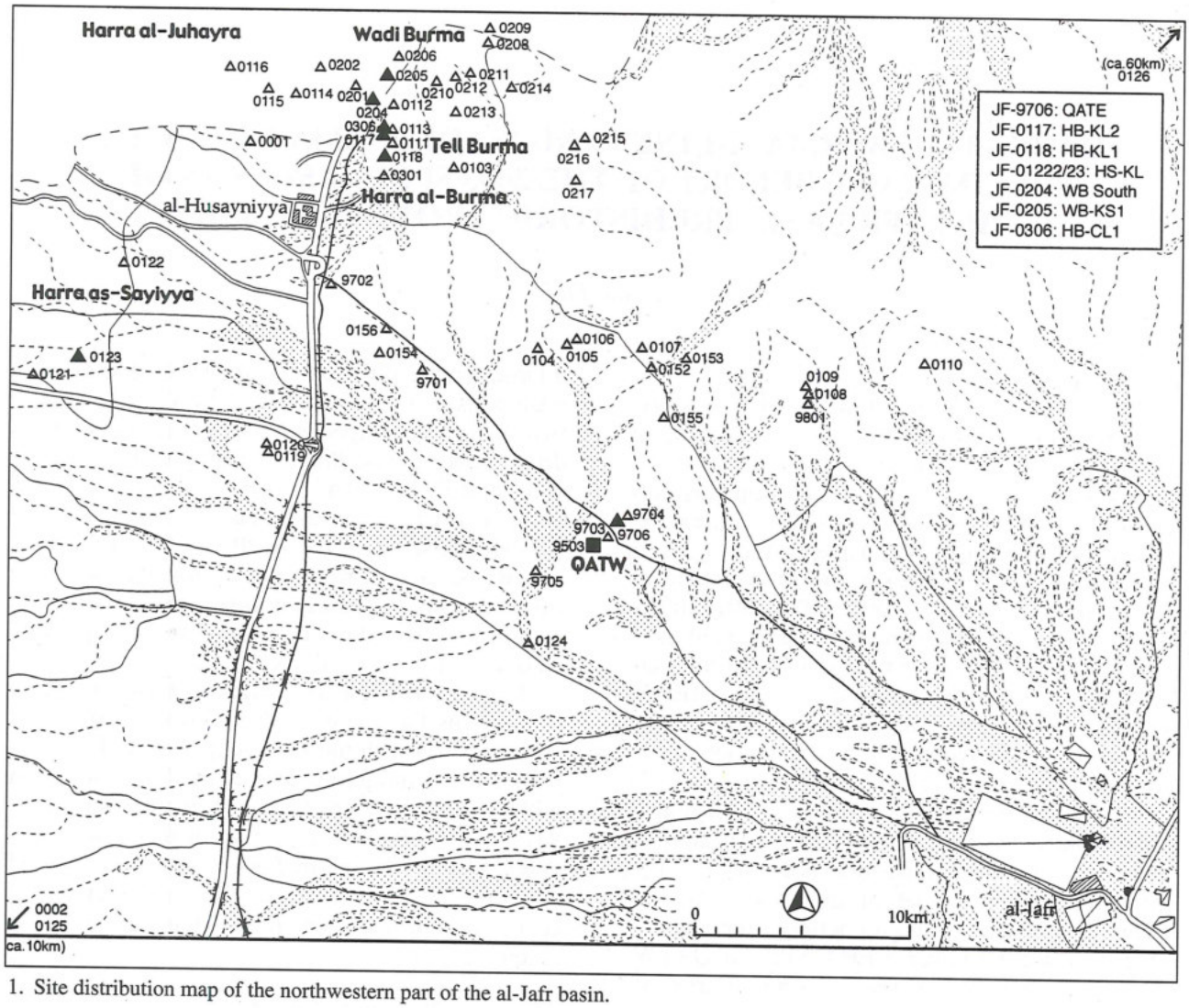
Wādī Burma kite-site 1 (وادي بُرمه) (WB-KS1) is a large-scaled, stone-built structure extending over wadi beds and sandbanks ca. 2.5km north of these two K-lines. Unexpectedly, it turned out to be a drive hunting installation built probably in the Umayyad Dynasty and subsequently reused in the Ottoman period. Although Islamic sites are beyond the original scope of the JBPP, this feature is worthy of special comment in that, together with the fresco at Quṣayr 'Amra, it might reveal a concrete picture of drive hunting that was very popular among men of power in those days.

This report presents a brief summary of these excavations that were conducted from 9 May to 4 April in 2003 with the kind cooperation of the Department of Antiquities of Jordan. The description will follow the order of excavations; namely, HB-KL1 and HB-KL2 will be described first and then WB-KS1 will be referred to. In addition, a brief discussion will be made in the final section focusing on the function and chronology of these unique features.

Ḥarrat al-Burma K-Line 1

Before discussing the details of the excavation, a few remarks should be made about the nomenclature "K-line". This term derives from Dr. Aharoni's designation for a unique structure that was confirmed for the first time in the Negev Highlands in the latter half of the 1950s (Evernari *et al.* 1958: 249; Haiman 2000: note 1). The sign "K" signifies the alphabetical number of the survey area where this unique feature was found; "line" literally means a long, freestanding, stone-built wall. Thus the "K-line" represents a long stone wall that was first identified in the "K" area of their survey sphere. Although no clear parallels have been found in Cisjordan, this term has long been used in the Israel archaeology (Haiman 1986, 1992, 1999, 2000).

It should be noted, however, that about ten years earlier than this first identification in the Negev Highlands, another example had already been reported from Transjordan under the name of *Khaṭṭ*



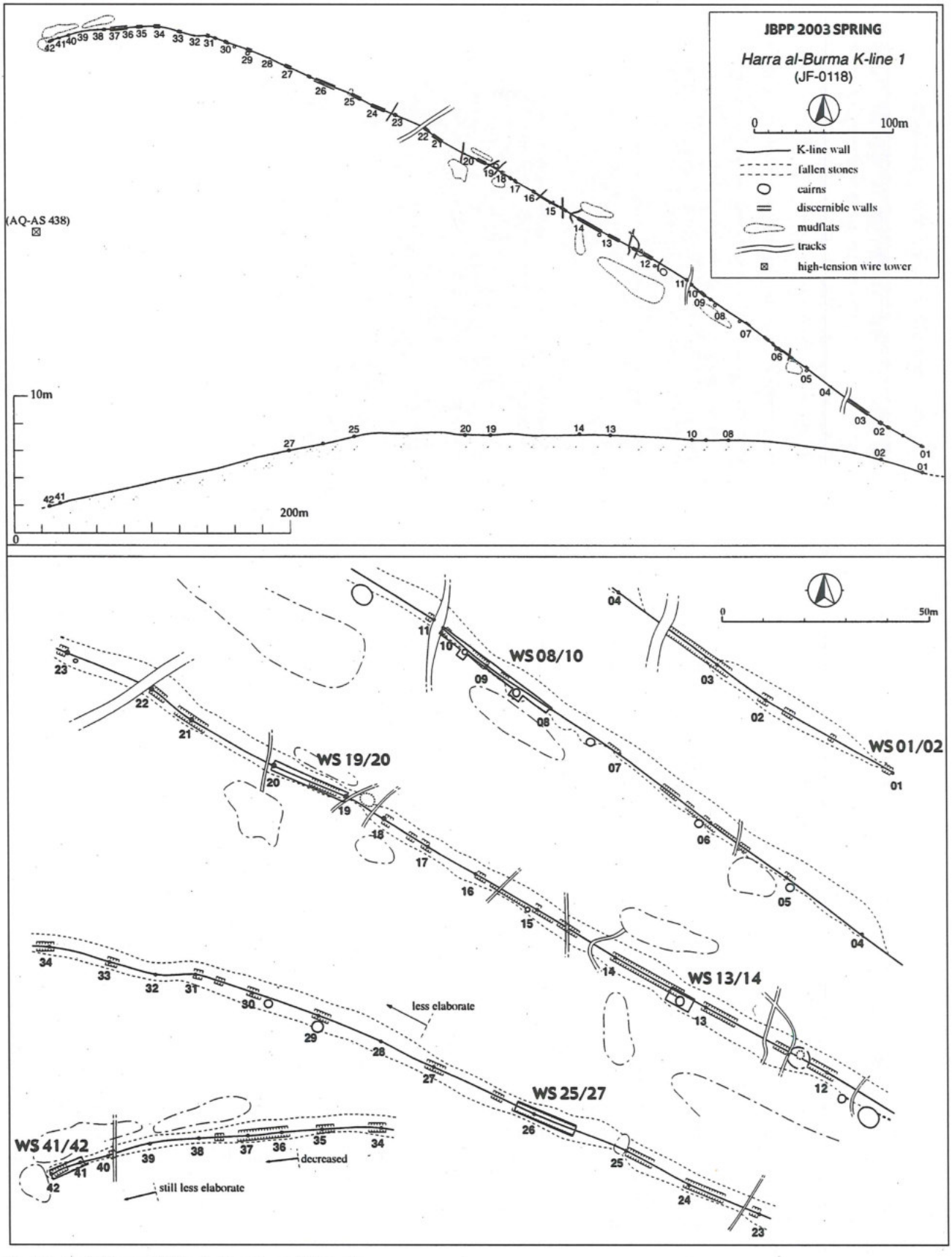
1. Site distribution map of the northwestern part of the al-Jafr basin.

Shabīb (i.e. Shabib's wall) (Kirkbride 1948). Since then, this Arabic term has been used among scholars who are concerned with the Jordan archaeology (Abujaber 1992, 1995; MacDonald *et al.* 2001: 408-409). Here again, no clear parallels have been confirmed for a long time, but a promising candidate was found for the first time near Bußayra in 2000 (MacDonald *et al.* 2001). Subsequently, some clear parallels have been confirmed in our survey area (Fujii 2002b: 45-47). Local inhabitants are well aware of these long walls, calling them *Ḥabalāt Shabīb*, the plural form of *Khaṭṭ Shabīb*.

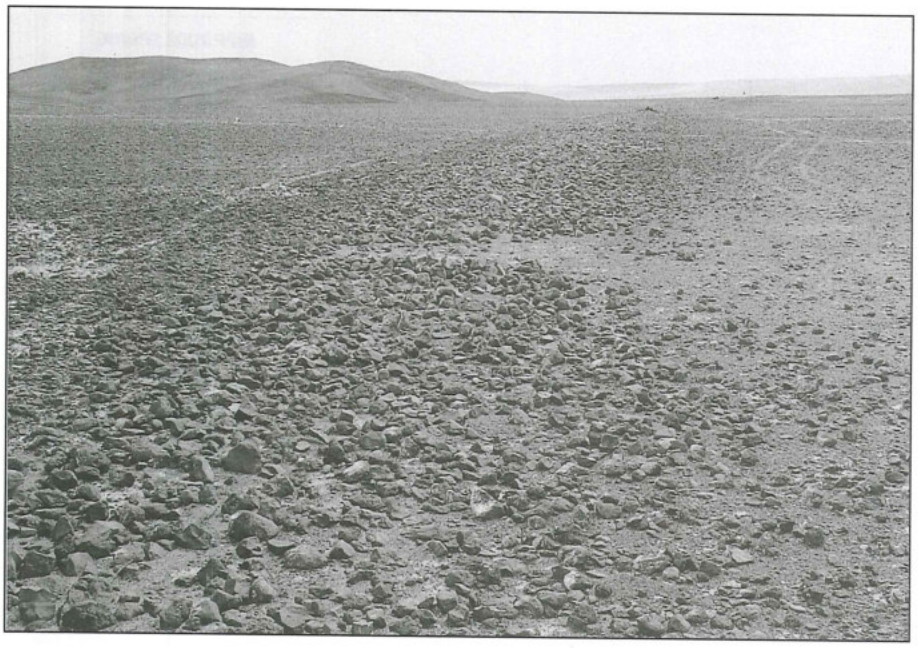
In comparison with the mechanical nomenclature K-line, the Arabic term *Khaṭṭ Shabīb* has its own historical background and, in this sense, should be respected. However, it has a drawback in that it presupposes or implies an Islamic date, a questionable assignment in light of our excavation results. For this reason, this paper uses K-line as a neutral term for chronological discussions.

HB-KL 1 is a small-scaled K-line, measuring ca. 750m in total length and ca. 1 to 2m in width. It is located on the basalt plain west of Tall Burma and stretches roughly in a straight line from the ESE to the WNW with the northwestern end being slightly bent toward the WSW (**Figs. 2, 3**). Mirroring the surrounding geology, unhewn basalt cobbles, ca. 20 to 30cm in maximum length, are exclusively used for the construction material. The excavation has revealed that they were arranged in two rows on the upper surface of Layer 3 of the site stratigraphy, the ground surface in those days, with basalt pebbles being compacted in between. The walls are preserved merely to a height of a single course (ca. 20-30cm), but the volume of fallen stones around them, combined with an experimental reconstruction referred to below, suggests that it was originally some courses high.

Six narrow trenches were opened along the wall, two at both ends and the remaining four in



2. Ḥarrat al-Burma K-line 1: the plan and elevation.



3. Ḥarrat al-Burma K-line 1: the general view (from W).

between. They total ca. 80m in length, roughly one tenth of the whole length of this short K-line. The excavations at these trenches will be briefly described below in order from the ESE to the WNW.

Wall 01/02

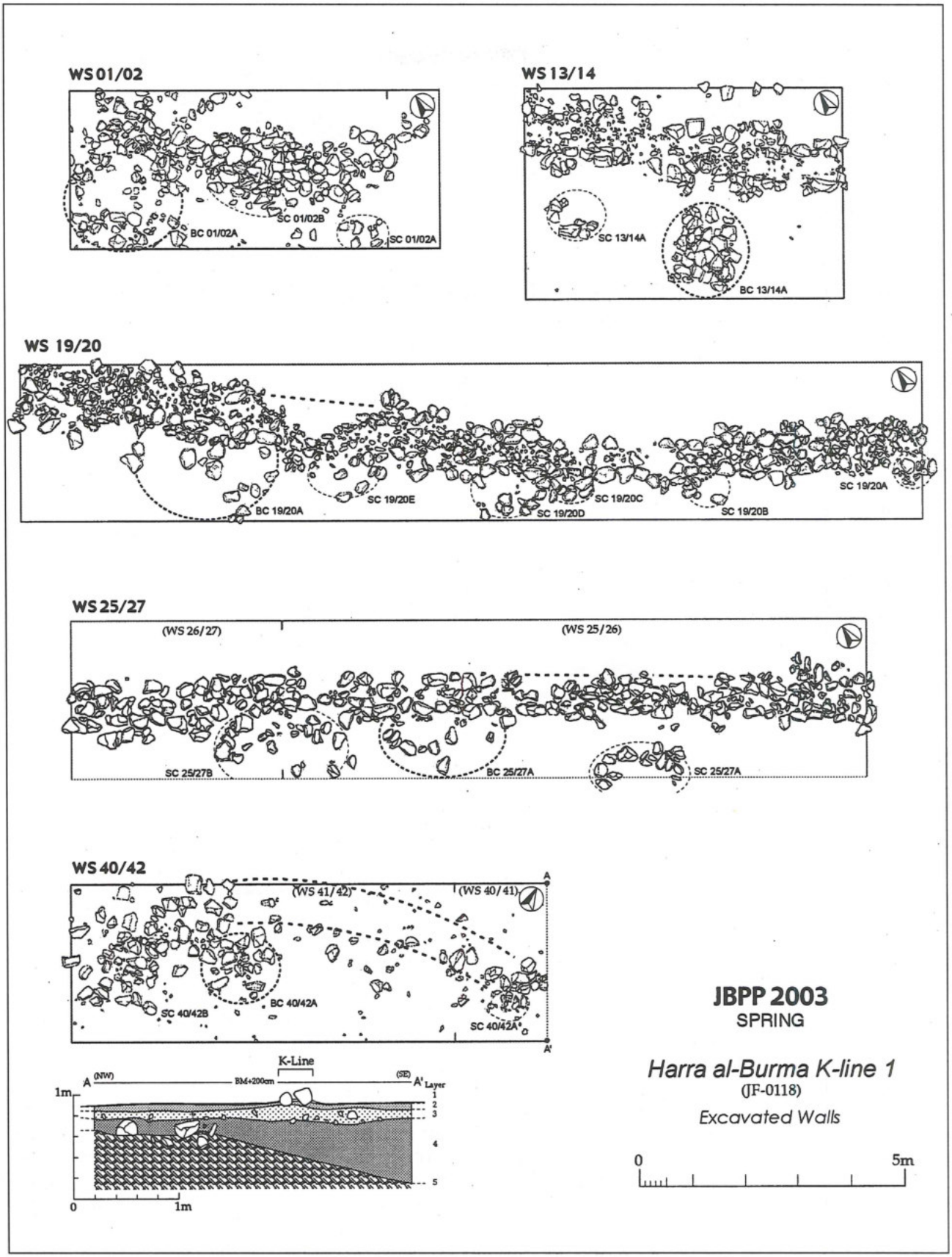
Wall 01/02, a wall segment between Point 01 and 02, is located on a gentle slope facing a small wadi that drains from the southern flank of Tall Burma. In order to clarify what this K-line begins (or ends) with, the eastern part of this wall segment was excavated by 7m in length (**Fig. 4**). Although the poor preservation state made it difficult to grasp the details, the excavation suggested that this K-line begins (or ends) with a two-rowed basalt cobble wall ca. 1-1.5m wide. In addition, a few small stone concentrations were found along the southern side of the wall.

Wall 08/10

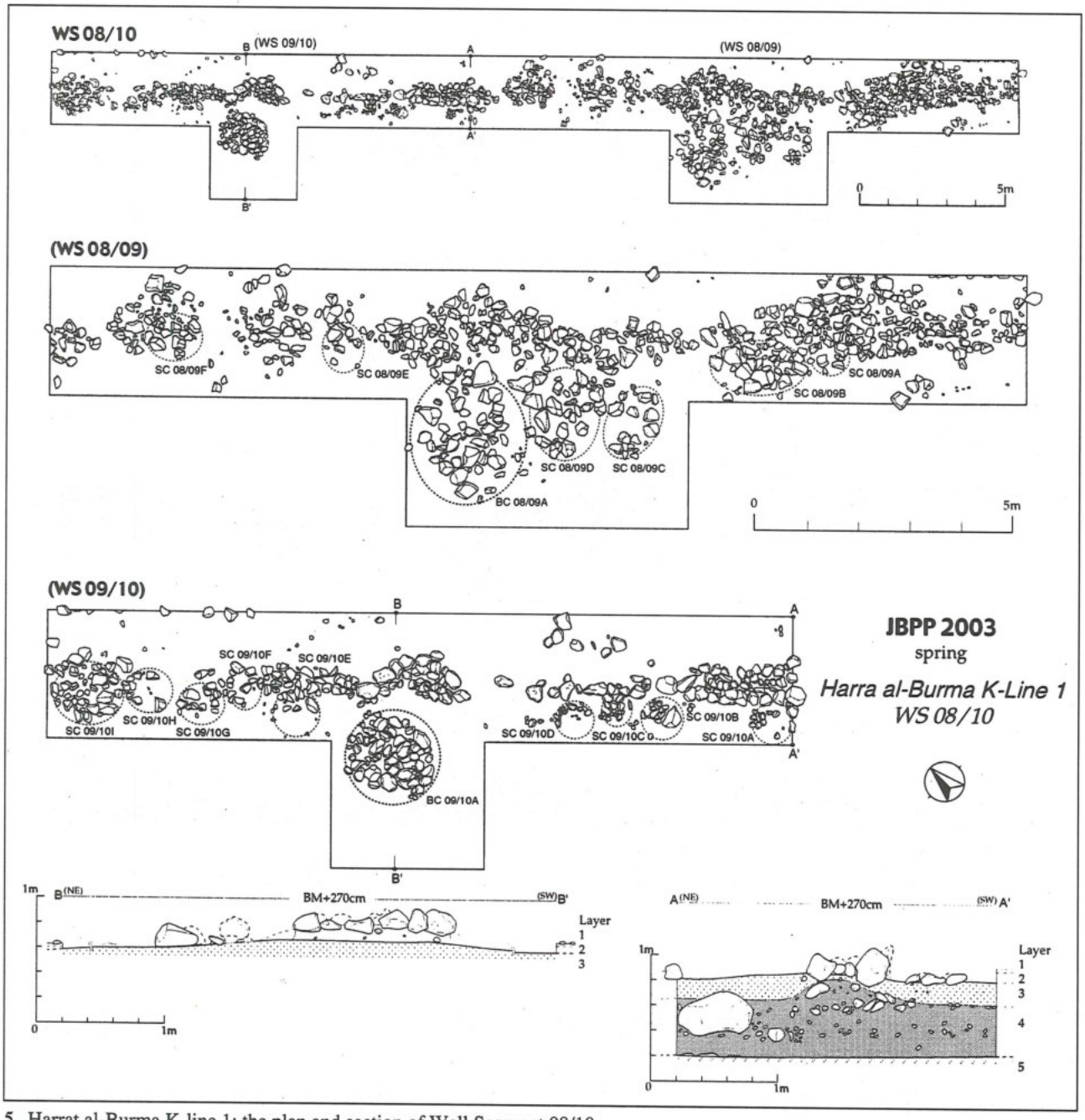
Wall 08/10 is located ca. 150m WNW of Wall 01/02, on the flat top of the basalt plain. In order to explore the stratigraphy and intra-structure of this K-line, these two wall segments, 33.5m in total length, were entirely excavated (**Figs. 5, 6**).

The stratigraphy was examined with a narrow trench 0.5m wide that was opened at the eastern extremity of this long trench. The deep sounding showed that the main wall of this K-line was built on the upper surface of Layer 3 of this site stratigraphy. However, this stratigraphical identification did not directly contribute to the dating of this K-line, because no datable *in situ* finds have been found from this site and no relevant archaeological sites have been excavated in the surrounding area. (Although Layer 3 at QATW can be dated radiometrically to the EBA III, it is unwise to refer to the stratigraphy at a site ca. 20km distant). What interested us instead was the observation that the underlying Layer 5 not only contains a number of basalt pebbles and cobbles but also slightly rises and forms natural foundations for the wall. Although the deep sounding stopped halfway, it seems that a narrow band of lava eruption underlies this layer. Given this, it follows that this K-line was constructed on a narrow, long ridge caused by a linear lava eruption, a reasonable choice for both the procurement of construction material and utilization for natural foundations.

With respect to the intra-structure, this K-line proved to consist of the following three major components: the main wall, larger cairns, and small stone concentrations. The main wall is roughly straight but sometimes slightly curved in general plan, measuring ca. 1 to 1.5cm wide. It is preserved to a single course (ca. 20 to 30cm high). Here again, the excavation confirmed that larger basalt cobbles are arranged in two rows with rubble being filled up in between. Two larger cairns, ca. 3 to 4m in diameter, were found along the southern side of this wall at intervals of ca. 15m. On the other hand, small stone concentrations, less than 1m in diameter, proved to be much larger in number (15 in total) and, consequently, much smaller in interval (ca. 0.3 to 2m). It is important to note that both kinds of small features are aligned along the southern side of the main wall and no clear parallels can be recognized on the opposite side. Also of interest



4. Ḥarrat al-Burma K-line 1: the excavation sectors.



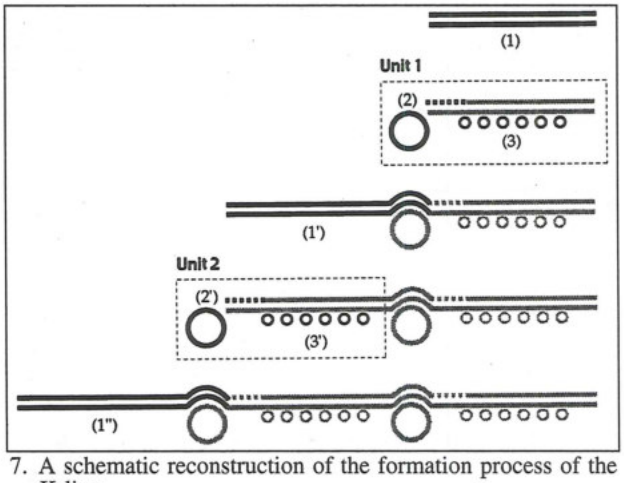
5. Ḥarrat al-Burma K-line 1: the plan and section of Wall Segment 08/10.

is the fact that the small stone concentrations often contain upright stones, a reminiscence of mourning installations identified at EBA enclosures at QATW (Fujii 2002a: fig. 6, 17).

These observations provide a key to the intra-structure and formation process of this K-line. The first point to be noticed is that larger cairns, when taking into consideration surface-examined examples as well as two excavated ones (**Fig. 2**), appear to be arranged at roughly even intervals of ca. 15 to 30m. This probably indicates that the K-line is a linear combination of plural units, each of which comprises the three components mentioned above. Suggestive in this regard is the difference in width of the walls, which is larger in the first wall (i.e. the wall east of the eastern large cairn) but smaller in the next two walls (i.e. the wall between the two large cairn and the wall west of the western large cairn). The same applies to the construction material, which is larger in the first and second walls but generally smaller in the third walls. Likewise, the preservation state varies from wall to wall; the central wall is less preserved than the other two walls. All these observations, together with



6. Ḥarrat al-Burma K-line 1: the general view of Wall Segment 08/10 (from SE).



7. A schematic reconstruction of the formation process of the K-line.

the difference in size and interval of small stone concentrations among units, clearly indicate that this K-line is a long chain of basic units rather than a structural entity built all at once.

Thus the next question is how this K-line was developed. A key to this question is the disturbance of the walls northeast of the two large cairns, which suggests that the construction material of these walls was diverted to somewhere, probably to the adjacent cairns. It is also highly important that the walls north of the two larger cairns are slightly out-curving as if they tried to avoid disturbing these cairns. This phenomenon shows that the larger cairns were built first and then the walls in concern were added beside them.

Considered in this light, the formation process of this K-line can be reconstructed as follows (**Fig. 7**): 1) the chieftain of a pastoral group, while still alive, builds a stone wall ca. 15 to 30m in length; 2) after his death or his retirement from the status, his successor builds a larger cairn at the western end of this wall by partly diverting the construction material from the adjacent wall (which explains the poorer preservation state of this part); 3) likewise, the participants to this funerary ritual add several small stone concentrations, probably mourning installations, along this wall; 1') the successor also builds his own wall so as to join the last wall and, at the same time, so as not to disturb the last cairn (which results in the slight detour of the easternmost part of this newly-built wall); 2') this cycle is repeated up to forming a long wall ca. 750m in this case. This reconstruction, if acceptable, would explain the reason for the aforesaid differences among units. (This process is, of course, subject to minor changes. For example, when a large cairn is built at a sufficient distance from the K-line, the next wall does not necessarily make a detour around it, as evidenced by Wall 13/14 mentioned below. Contrarily, even when the distance is insufficient, it happens that the next wall does not detour and, instead, stretches roughly in a straight line involving the cairn in concern, as exemplified by Wall 19/20 referred to below).

Whatever the case, it is now nearly certain that this K-line is a linearly connected form of pseudo-wall cairns in our terminology and was developed unit by unit from the ESE toward the WNW. Of particular relevance is BC-600s, the last form of the QATW Layer 4 cairn entity, which can be taken as a proto-type of basic units that constitute this K-line (Fujii 2003). Also of significance is the practice that the westernmost part of a wall is partly disturbed due to the construction of a larger cairn, which is reminiscent of the relation between a façade wall and a burial cairn of the Layer 4 structural complex at QATW (Fujii 2002c). Both suggestions lead to the conclusion that the formation process of this K-line can best be understood within the framework of the unique funerary practice in the al-Jafr basin.

Wall 13/14

Wall 13/14 is a wall segment ca. 100m west of Wall 08/10. In order to double-check the intra-

structure of this K-line, it was partly excavated 6m in length (**Fig. 4**). The excavation showed that this wall segment also consists of the three major components noted above. However, no further information was obtained because of the limitation in excavated area, except that, unlike the case of Wall 08/10, the wall does not make a detour beside the large cairn.

Wall 19/20

This wall segment is located ca. 70m northwest from Wall 13/14, roughly in the middle of this K-line. The full range of this wall segment, 17m in total length, was excavated in order to collect further information about this K-line (**Figs. 4, 8**). As a result, small stone concentrations and a probable large cairn (BC-19/20A) were found, here again, along the southern side of the main wall. It is important to note that the cairn is paired with a disturbed wall to the northeast.

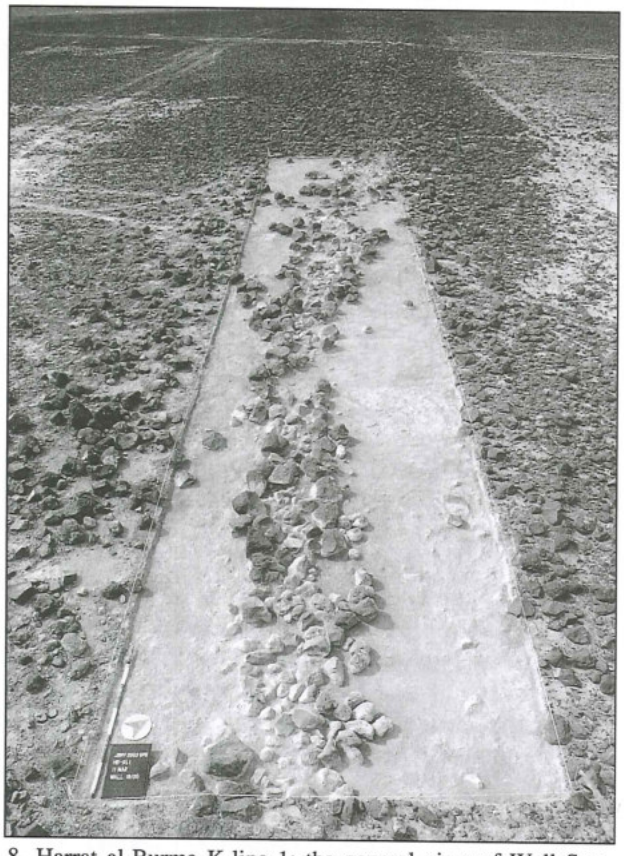
Wall 25/27

Wall 25/27 is located ca. 100m west of Wall 19/20, roughly at the western turning point of the gradient of the basalt plain (**Fig. 4**). Here again, a probable large cairn was found in pairs together with a disturbed wall to the northeast, although the wall detour beside it was not recognized. An experimental reconstruction showed that the original wall was four to five courses high or, more precisely, ca. 0.5 to 0.7m high (**Fig. 9**).

Wall 40/42

In order to examine what this K-line ends with, the westernmost wall segments, Wall 40/42, were excavated by 9m in length. In addition, a narrow trench was opened at the eastern edge of this excavation sector to explore the reason why this K-line terminated at this point and why it is slightly bent at the westernmost part.

The following four components were confirmed (**Figs. 4, 10**): a small stone concentration, a slightly out-curving, heavily disturbed wall, a larger cairn, and a short, relatively well-preserved wall without any clear evidence for small features, listed from the east to the west. In light of the formation process suggested above, it is most likely that the former three components constitute the second last unit and the short, well-preserved wall alone belongs to the last unit. These identifications, if ac-



8. Ḥarrat al-Burma K-line 1: the general view of Wall Segment 19/20 (from SE).



9. Ḥarrat al-Burma K-line 1: an experimental reconstruction of Wall Segment 25/27 (from S).



10. Ḥarrat al-Burma K-line 1: the general view of Wall Segment 40/42 (from W).

ceptable, lead to the conclusion that this K-line begins with Wall 01/02 to the east and ends with this short wall to the west. What is important here is that no larger cairns existed at both ends of this K-line. The reason for their absence at the eastern end is easy to understand, because, as suggested above, a K-line begins with the construction of a wall. Their absence at the western end, on the other hand, probably signifies that this K-line was abandoned for some reason after the construction of the last wall and before the addition of a large cairn and small stone concentrations.

The deep sounding at the trench showed that there is ca. 1m horizontal gap between the K-line wall and the underlying narrow ridge probably caused by a linear lava eruption. A plausible explanation for this discrepancy is that, unlike Wall 08/10, this ridge was not conspicuous enough to be followed precisely. This is likely, all the more because the thick overlying layers appear to have buried it completely before the construction of the K-line. Whatever the case, it seems reasonable to conclude that the disappearance of the ridge as both natural foundations and a major material source resulted in the termination of this K-line at this trench. Conversely, one may say that this K-line tried to follow the ridge so long as it is discernible, a probable reason for the slight bending at the westernmost part of this K-line.

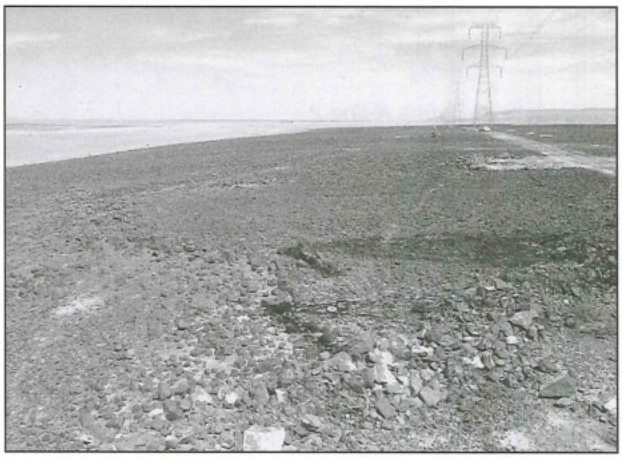
The Finds

Unfortunately, no *in situ* finds were recovered from this K-line. Instead, the finds derived from either the ground surface or fill layers. They are small in number, consisting merely of a few iron horseshoes (**Fig. 23: 1-2**), one iron nail (**Fig. 23: 3**), and a handful of undiagnostic flint artifacts. Since they are obviously irrelevant to this K-line, the description is taken up for the final report.

Ḥarrat al-Burma K-Line 2

Ḥarrat al-Burma K-line 2 (HB-KL2) is located ca. 1.5m northwest of HB-KL1, at the western edge of the Tall Burma basalt plain (**Figs. 1, 11**). In comparison with HB-KL1, it is much shorter in total length, measuring ca. 400m. While HB-KL1 is oriented ESS to WNW crossing the contour lines of the basalt plain, HB-KL2 is oriented SSE to NNW thus stretching roughly parallel to them.

In order to briefly double-check the results of the excavation at HB-KL1, three small trenches were opened in the southern, relatively well-preserved half of this K-line, at intervals of ca. 50m respectively (**Fig. 12**). Since this K-line has much in common with HB-KL1, only a brief summary will be made focusing on the differences from the latter.



11. Ḥarrat al-Burma K-line 2: the general view (from S).

Wall 08/10

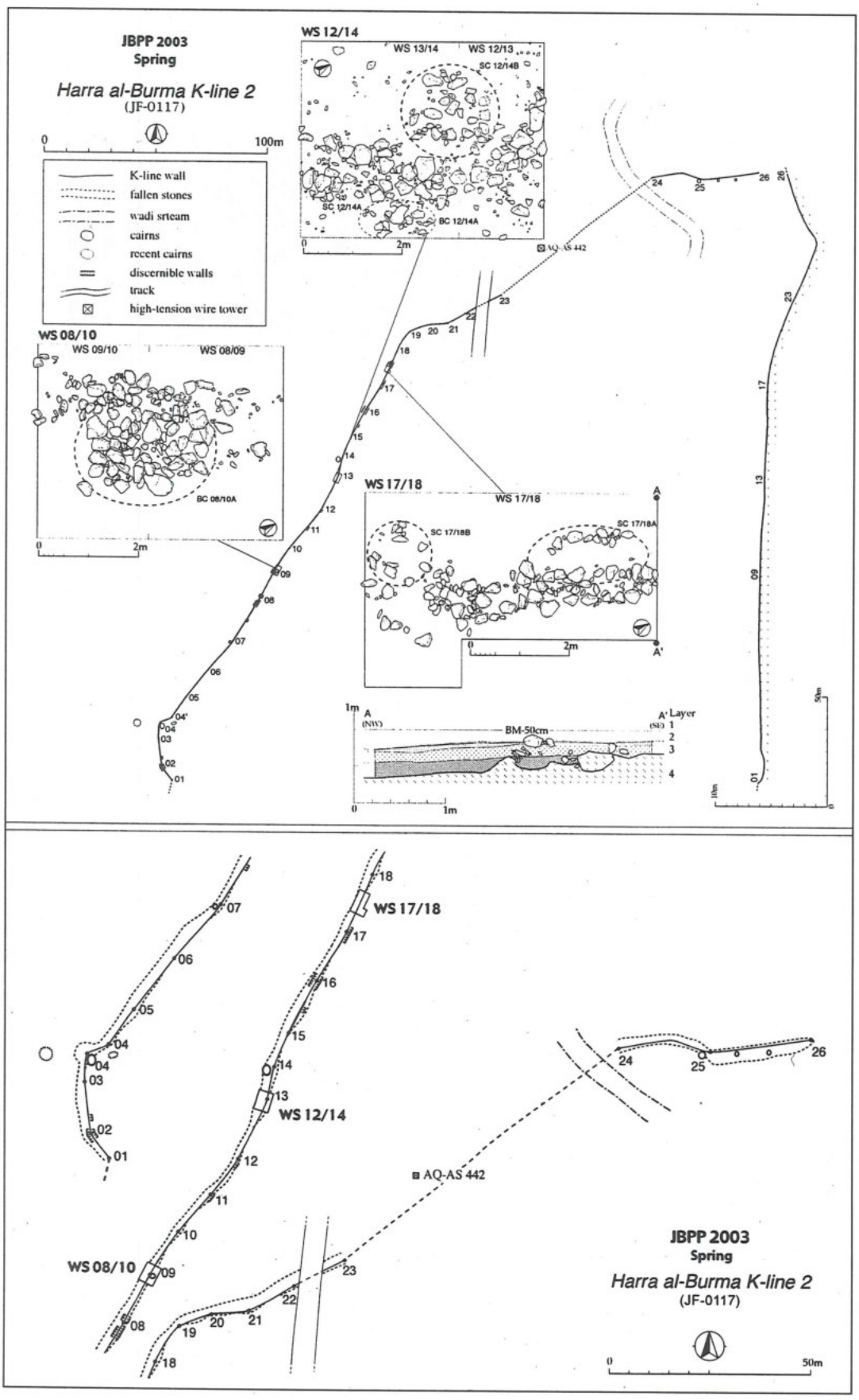
The excavation confirmed a poorly preserved, two-rowed basalt cobble wall ca. 1m wide and a large cairn ca. 2m in diameter. It should be kept in mind that the latter component is attached to the former from the east.

Wall 12/14

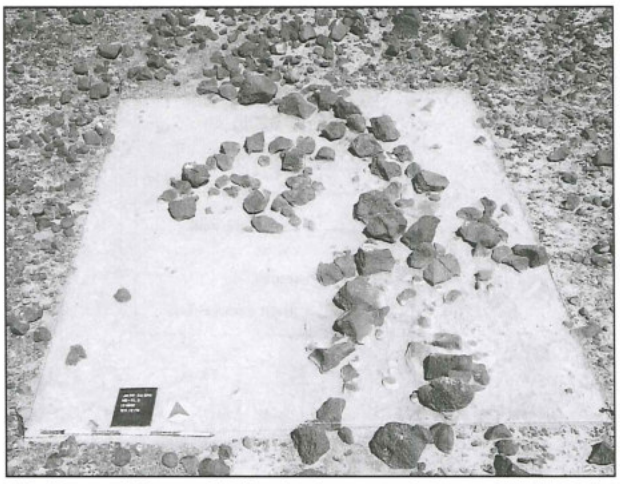
Here again, a two-rowed basalt cobble wall ca. 1m wide and a large cairn ca. 2m in diameter were found. What should be noted is that, as opposed to the large cairn of Wall 08/10, this large cairn is attached to the wall from the west. It is also interesting to note that a few small stone concentrations were located at the opposite, eastern side with the K-line wall in between. Both phenomena illustrate that this K-line is less standardized in the arrangement of small features than HB-KL1, where they are all aligned along the same side. This contrast may indicate that this K-line was constructed slightly earlier than HB-KL1. Also significant is the disturbance of the northern half of the wall, which, coupled with the slight detour beside the large cairn (**Fig. 13**), is suggestive of the development of this K-line from the NNE toward the SSW.

Wall 17/18

This wall segment is located roughly in the middle of this K-line. The excavation revealed a well-preserved, two-rowed basalt cobble wall ca. 0.8m wide and a few questionable stone concentrations attached to it from the west. A deep sounding at the northern edge of this excavation sector, as in the case of Wall 08/10 of HB-KL1, attested to the positional correlation between the K-line wall and



12. Harrat al-Burma K-line 2: the plan and elevation/section.



13. Ḥarrat al-Burma K-line 2: the general view of Wall 12/14 (from S).

the underlying basalt band.

The Finds

The finds from this K-line are still scantier than those from HB-KL1, comprising merely a handful of undatable flint flakes.

Wādī Burma Kite-Site 1

Wādī Burma is a short but very wide wadi that drains northwards from the Tall Burma area into Wādī al-Ḥasā, one of the largest drainage systems in southern Jordan. Wādī Burma Kite-site 1 (WB-KS1), our present concern, extends over gently undulating beds and sandbanks of this wadi (**Figs. 14, 15**). Driving southwards on the Desert Highway, one can notice it on one's left hand side at the point ca. 7km this side of al-Ḥusayniyya. A land bridge over the al-Ḥijāz railway will provide a good landmark for the site.

WB-KS1 is a vast, stone-built enclosure with an inside area of ca. 13ha. It consists of a circular perimeter wall ca. 1.3km in total length and a number of small features attached to it. It should be noted, however, that the latter contain not only a series of installations proper to this enclosure complex but also many features either anterior or posterior to it, including a cist enclosure (WBs-CE8) at the southwestern corner and a line of small cairns at the southeastern corner. In addition, a variety of structural remains are dotted inside this perimeter wall, on the central and southern sandbank in particular. Because of the site location at wadi beds, a variety of stones are used for the construction, including limestone, flint, and basalt cobbles. Interestingly, while limestone and flint are predominant in the southeastern half of the perimeter wall, basalt is prevalent in the northwestern half, a reflection of the site location between a limestone hilly country (i.e. Tallāt 'Ubyda) to the southeast and a volcanic plain (i.e. Ḥarrat al-Juhayra) to the northwest.

In order to explore the function and chronology of this unique structure, five excavation sectors were set up, four along the perimeter wall and one on the central sandbank. As a result, unexpectedly enough, this large enclosure turned out to be a drive hunting installation built probably in the Umayyad dynasty and reused in the Ottoman period. The description below will follow the order of the supposed procedure of drive hunting; namely, it begins with drive gates (DG), followed by service entrances (SE), drivers' hides (DH), and ambush walls (AW), and ends with capture gates (CG).

Drive Gates (DG)

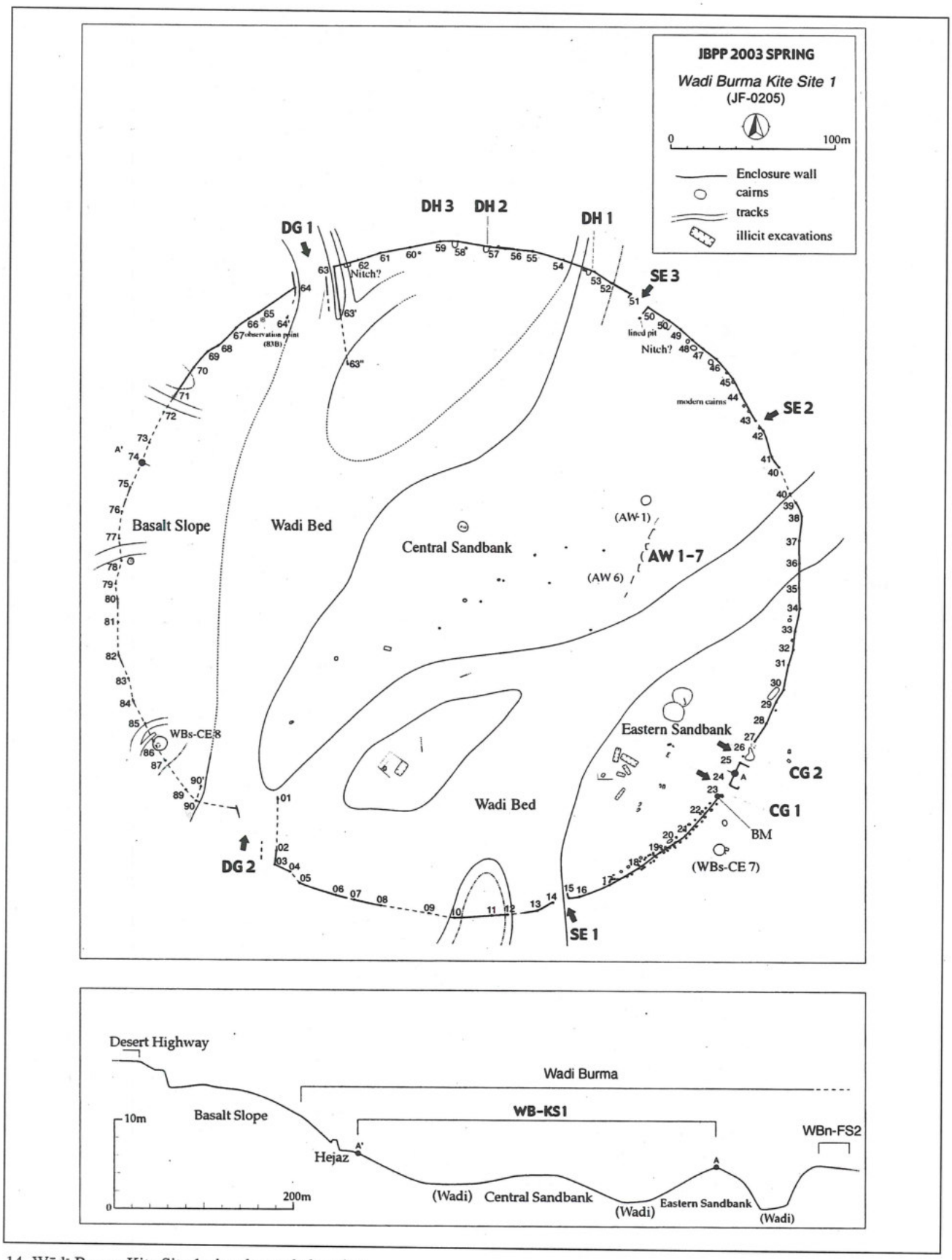
What characterizes this vast enclosure is seven breaks in the perimeter wall. Of particular interest is a pair of wide wall breaks (DG1 and -2) at the western wadi bed. Both of them are ca. 20m wide and accompanied with a pair of long guiding walls, suggesting the function as drive gates. Our excavation was focused on DG1, the northern counterpart.

The excavation confirmed that this feature was built on the upper surface of Layer 2b of the site stratigraphy. (The same is true of the other features with the exception of AW, which, as mentioned below, proved to belong to the upper surface of Layer 2a). This feature consists of the western guiding wall, a short, central partition, and the eastern guiding wall, the former two of which were actually excavated (**Figs. 16, 17**).

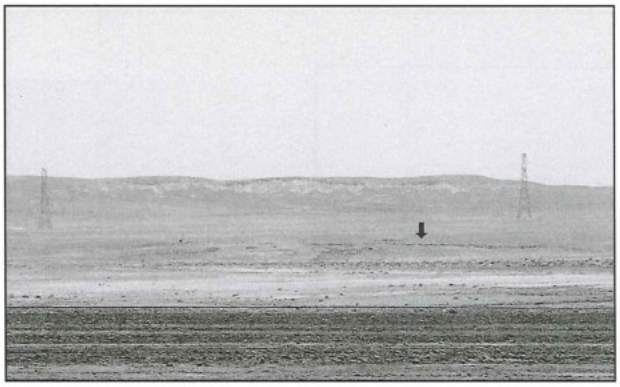
The western guiding wall, ca. 60m in total length and ca. 4.5m wide at its northernmost part, proved to be carefully protected with a rectangular bank at its northern end. The large-scaled, careful construction of this guiding wall highlights that this gate (and its southern counterpart) was a key installation to this enclosure. In comparison with the two guiding walls at both sides, the central partition proved to be much smaller in size, measuring ca. 5m long (or ca. 15m long if the intermittent line of stones is also included) and ca. 1m wide. The less elaborate construction of this wall suggests that it had a subsidiary function to facilitate the control of a driven herd. The western guiding wall, though not excavated, is interesting in that it extends not only inward but also outward by ca. 20m in length. This may have been a device to prevent a driven herd from swerving towards a gentle slope to the west.

Service Entrances (SE)

There are three other wall breaks in the perimeter wall: two at the northeastern part of the



14. Wādī Burma Kite Site 1: the plan and elevation.



15. Wādī Burma Kite Site 1: the general view (from NW).

central sandbank (SE2 and -3) and one at the southern corner of the eastern sandbank (SE1) (**Fig. 14**). What differentiates them from the drive gates is the break width, which is much narrower (ca. 3-10m wide) in these cases. It is also important to note that they are equipped merely with a pair of very short, buttress-like walls, another contrast to the drive gates. The intra-site location is also noteworthy; while the drive gates are located on a wadi bed, these smaller entrances are positioned on sandbanks. The final point to notice is that they occupy intermediate, strategic positions between the drive gates to the west and the capture gates to the southeast. All these suggest that they were used for some supplementary function, service entrances for example.

Our excavation focused on SE2, which proved to be ca. 3.5m wide and protected with a pair of side walls (**Fig. 16**). What most interested us was the stone pavement at the lower part of this entrance, which also argues against the functional identification as a drive gate in favor of that as a service entrance.

Drivers' Hides (DH)

Aside from the five wall breaks mentioned above, three small niches (DH1 to DH3) were found at the northern part of the perimeter wall (**Fig. 14**). The excavation at DH1 showed that it is a rectangular cell ca. 6m wide and ca. 4m deep with a stone pavement at the northwestern corner (**Figs. 16, 18**). The small size of these cells, along with their location adjacent to the northern drive gate (DG1), suggests their function as drivers' (and possibly hunters') hides. Similar features occur at many kite-sites in the Transjordan desert (e.g., Echallier and Braemer 1995; Helms 1981: 38-50, 1982: Fig. 4; Helms and Betts 1987: Fig. 9-14). It is noteworthy, however, that, unlike most hides thus far identified, these cells are attached to the perimeter wall from the inside.

Ambush Walls (AW)

A long, intermittent, freestanding wall ca. 60m in total length was found at the southeastern slope of the central sandbank (**Fig. 14**). It consists of seven wall segments ca. 5 to 10m long with six small gaps in between. The existence of these narrow breaks, combined with their strategic location in front of capture gates and their orientation facing game driven toward the capture gates, argues for their function as ambush walls.

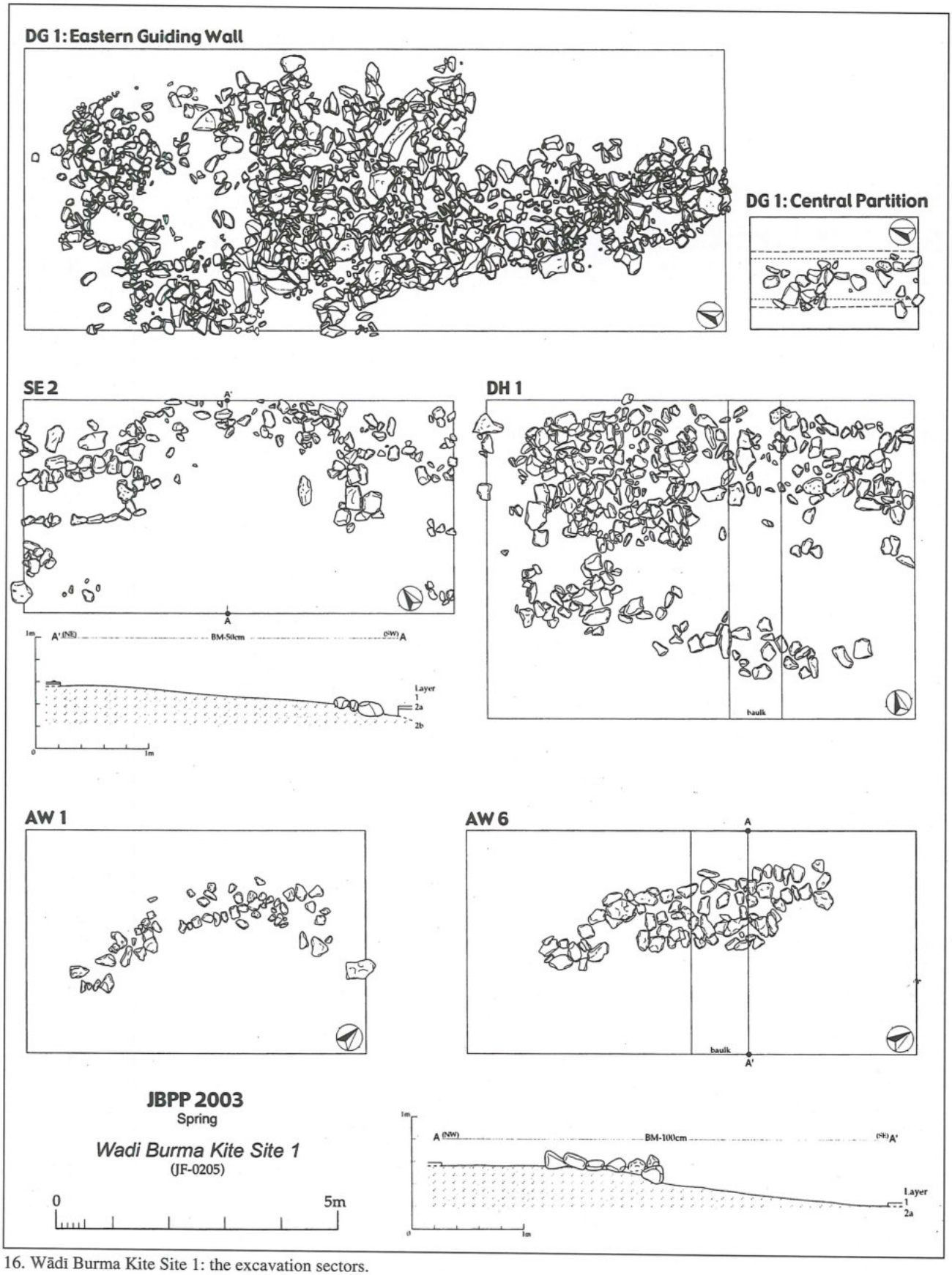
AW1 and AW6 were excavated (**Figs. 16, 19**). Unexpectedly, unlike the other excavated features, both of them proved to have been constructed on the upper surface of Layer 2a. It is therefore evident that this enclosure was subsequently reused with minor modification. Fallen stones around these ambush walls are very small in number, suggesting that their original height was not more than a few courses high. It is possible that ambush men used firearms lying down on the ground surface. This seems likely, all the more because the ambush walls represent the later reuse of this drive hunting installation.

Capture Gates (CG)

A pair of narrow wall breaks, CG1 and -2, was found along the ridge of the eastern sandbank, the highest point of this enclosure (**Fig. 14**). In order to clarify the structure of this probable key feature, a total of 300 square meters were excavated focusing on the central wall segment (**Figs. 20, 21**). As a result, it turned out that a large trench up to ca. 0.8m deep was dug behind this wall. The existence of this trench, along with its strategic location in concert with both the drive gates to the west and a steep slope behind, strongly suggests that these two wall breaks were used for final capture gates.

What puzzled us is that no conspicuous installations were found behind these two gates. This means that some of the driven game might have passed through these gates without being captured. It is, however, more likely that most, if not all, of the game were shot inside this large enclosure and a few of them were driven to these two gates to be finally captured, as suggested by an Assyrian relief that depicts the Assurbanipal's horseback drive hunting scene (Barnett 1959/60: Plate 101) and a pair of Sasanian rock-reliefs that portray royal hunting either on horseback or on boat (Erdmann 1969: Tafel 29, 30). Whatever the case, it is now evident that the construction of this drive hunting installation was based on a careful plan including the systematic arrangement of the small features and the effective use of topography.

The Finds



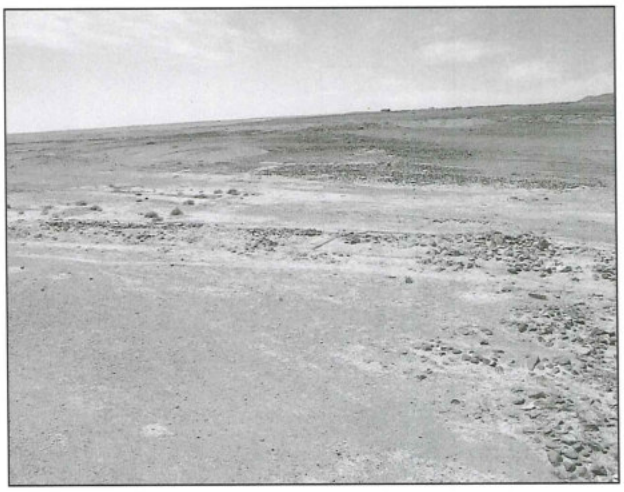
16. Wādi Burma Kite Site 1: the excavation sectors.



17. Wādī Burma Kite Site 1: the general view of Drive Gate 1 (from E).



18. Wādī Burma Kite Site 1: the general view of Drivers' Hide 1 (from SE).



19. Wādī Burma Kite Site 1: the general view of Ambush Wall 6 (from SE).

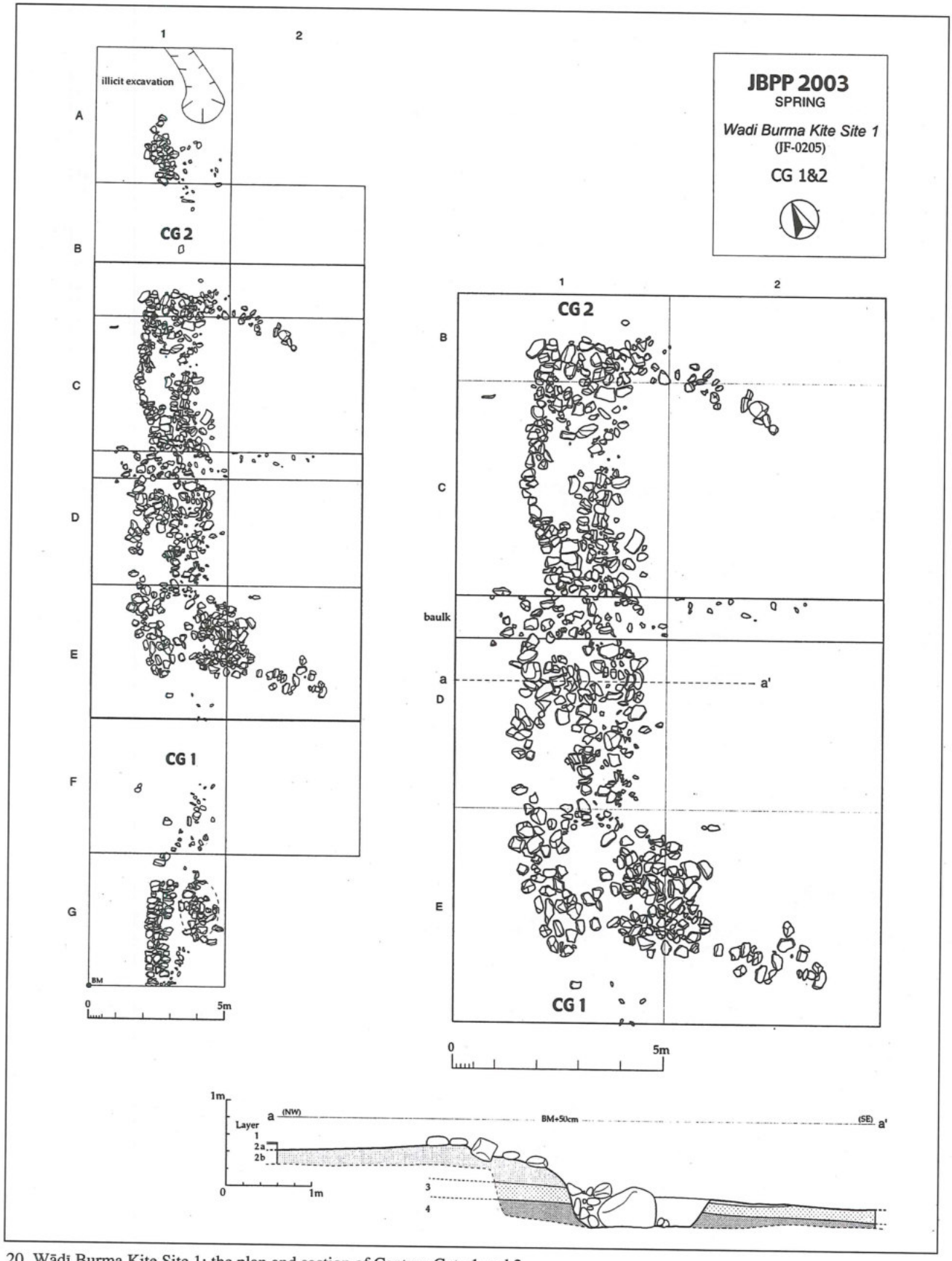
Since no *in situ* finds were recovered from this enclosure complex, the material at hand is limited to the finds from the ground surface and fill layers. They consist of a few bags of flint artifacts and pottery sherds, some iron artifacts, and a few clay objects.

The flint artifacts include Middle Palaeolithic Levallois cores and flakes, Epipalaeolithic microliths, Chalcolithic to EBA tabular scraper components, and a variety of undiagnostic flakes. They are too heterogenous in nature to be reliable chronological markers. The pottery finds also vary in date, containing a variety of samples from EBA coarse ware sherds to modern products. It is important to note, however, that Umayyad sherds are the most predominant among them. Of particular significance is the occurrence of well-levigated, wheel-made, handwriting, red-painted pottery sherds with wavy or linear line motifs (**Fig. 22**), which mark the Umayyad pottery repertoire in Jordan (Abdel-Jalil 1988: Fig. 1, 2; Sauer 1982: Fig. 3, 4; 1986: Fig. 2). Also of interest are gray-faced, well-fired sherds, which are reminiscent of casserole type of wares, another hallmark of the Umayyad pottery repertoire (Hendrix *et al.* 1996; Walmsley 1995: Fig. 8). In addition, the finds includes a boots-heel protection (**Fig. 23: 6**), some horseshoe fragments with or without a iron nail (**Fig. 23: 4-5, 7-8**), and two clay pipe fragments (**Fig. 23: 9**), the latter two of which can be dated to the Ottoman period according to some recent syntheses (Hayes 1992, Simpson 2002, Sparkes 1998; Takeuchi 2005; Hirota 2005).

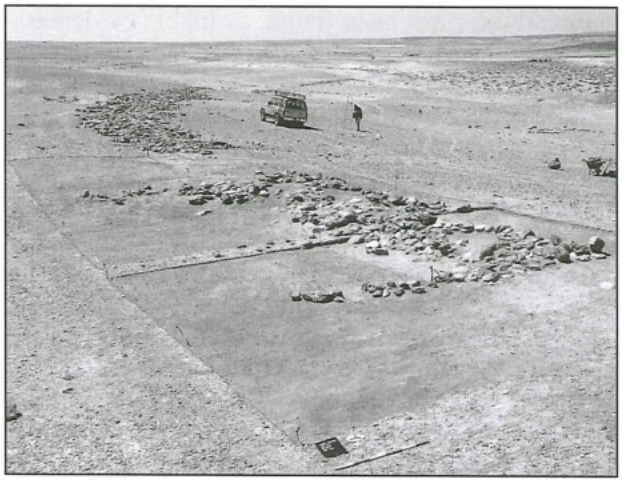
Thus, overall, the finds suggest two distinct dates: the Umayyad dynasty and the Ottoman period. This picture accords well with the twofold history of this drive hunting installation suggested above. It is therefore tentatively concluded that this drive hunting installation was built in the Umayyad dynasty and then reused in the Ottoman period.

Discussion

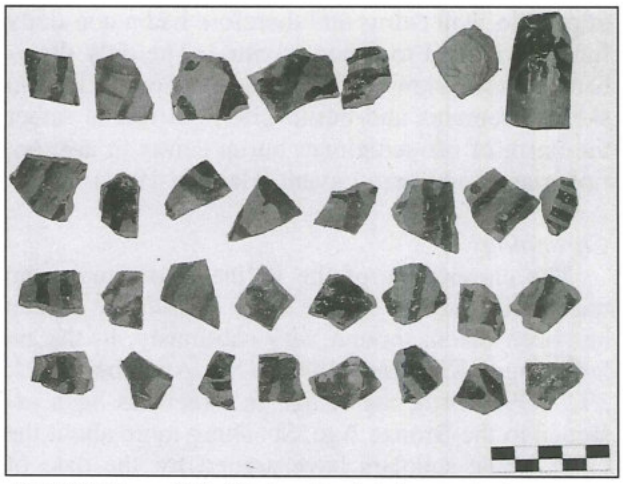
On the basis of the excavated evidence, a brief discussion will be made about the function and chronology of the two sites investigated this season.



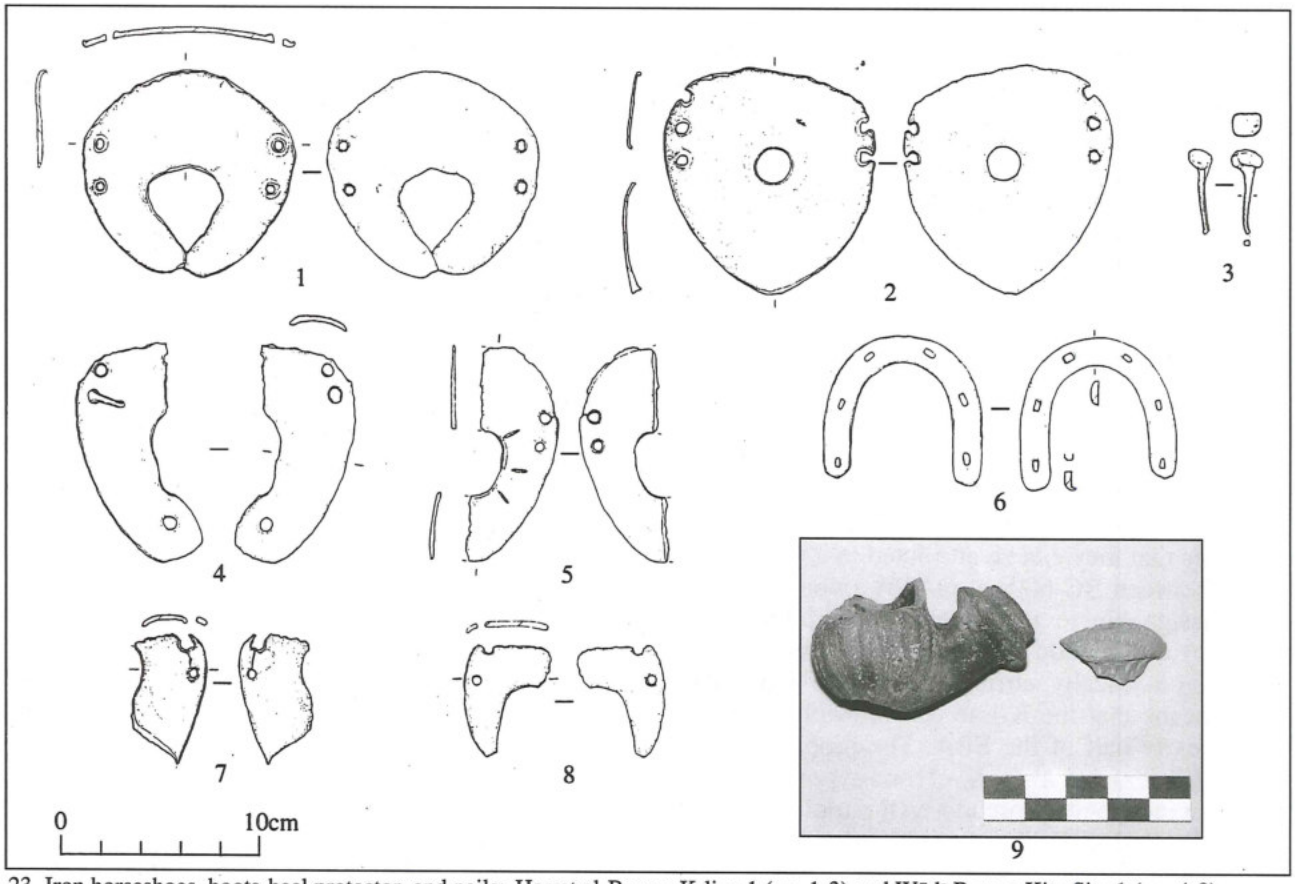
20. Wādī Burma Kite Site 1: the plan and section of Capture Gate 1 and 2.



21. Wādī Burma Kite Site 1: the general view of Capture Gate 1 and 2 (from NE).



22. Wādī Burma Kite Site 1: red-painted ware sherds.



23. Iron horseshoes, boots-heel protector, and nails: Ḥarrat al-Burma K-line 1 (no. 1-3) and Wādī Burma Kite Site 1 (no. 4-9).

Ḥarrat al-Burma K-lines

Function

The function of the K-line, or *Khaṭṭ Shabīb* in Jordanian archaeology, is still controversial. Some scholars have suggested that it was an ancient boundary wall between the sown and the desert (Kirkbride 1948: 154); others have supposed its function as a defensive wall against marauding nomads (Evernari *et al.* 1958: 249-250). In addition, some local inhabitants insist that it was a pilgrim road or a long landmark leading to Mecca.

However, the intra-structure and formation process of Ḥarrat al-Burma K-lines cast doubt on these traditional views in favor of the suggestion that the K-line represents a long chain of cairns and walls (Glueck 1958: 28; 1959: 9-10; Haiman 2000: 22-23, 25). In light of our excavated evidence, it is now evident that the K-line is a linear combination

of pseudo-wall cairns and therefore had a non-daily function related to funerary ritual. The only drawback to this view is the total absence of human skeletal remains and burial gifts, but this is rather the norm of off-settlement burial cairns in arid peripheries of southern Levant (Haiman 1992).

Chronology

The chronology of the K-line also remains an unsettled question. While *Khaṭṭ Shabīb* in Jordan has been dated, though very cautiously, to the Islamic age (Kirkbride 1948: 154; Abujaber 1992: 392; 1995: 740), the K-line in Israel has been assigned to the Bronze Age. Speaking more about the latter, some scholars have argued for the date of the Middle Bronze Age (MBA) (Evenari *et al.* 1958: 249-250), but others cast doubt on this view (Glueck 1959: 10-12). Recently, Haiman has suggested that the K-line may reasonably be attributed to the EBA on the basis of the proximity to EBA settlements (Haiman 2000: 24-25).

Unfortunately, no solid evidence for the date of the K-line has been retrieved from our excavations, but a series of circumstantial evidence allows us to narrow it down to some extent. First, the general occupational history of the al-Jafr basin is in favor of the dating of the K-line to the EBA (Fujii 2002b, 2004b). It is needless to say that Ḥarrat al-Burma K-lines are encompassed with a number of EBA sites, although, unlike the K-line in the Negev Highlands, no settlement sites are included among them.

The second circumstantial evidence derives from the intra-structure of the K-lines itself, which suggests that they can be attributed to a transitional stage between BC-600s at QATW (which is probably assignable to the second half of the Chalcolithic) and pseudo-wall cairn enclosures (which are radiometrically attributable to the EBA III). This means that the K-line can probably be dated to the early half of the EBA. The problem is that there still remains a small, chrono-typological gap between independent pseudo-wall burial cairns (i.e. BC-600s) and their linear combination (i.e. the K-line). However, as will be described elsewhere in this volume (Fujii 2004a), this gap will reasonably be bridged with Ḥarrat al-Burma Cairn-line 1, a linear but intermittent combination of pseudo-wall cairns.

Wādī Burma Kite Site 1

Function

There is little doubt that this large enclosure was used for drive hunting. Although no specific evidence such as hunting weapons and slaughtered animal bones has been found, available evidence – the location on wadi beds, the vast area within the enclosure, and the systematic arrangement of relevant features – casts doubt on daily use such as an animal pen in favor of the non-daily use suggested above. The frequency of kite-sites in the Transjordan plateau also argues for this functional identification.

Thus the question is what kind of drive hunting took place there. A key to this question is the fact that, unlike many kite-sites thus far confirmed in the Transjordan plateau, WB-KS1 consists merely of a vast enclosure and lacks a pair of long guiding walls converging on it. What is incorporated to this enclosure is several pairs of short guiding walls that protrude inward, a marked contrast to the standard form of kite-sites. Thus, taking the vast inside area into account, it seems reasonable to suppose that the large enclosure itself was used for a drive hunting ground. Suggestive in this regard is the hunting scene depicted on the fresco at Quṣayr 'Amra (Almagro *et al.* 1975) and the relief at *Taq-i-Bustan*, both of which illustrate that royal hunting was conducted on the game that was driven into a large enclosure either in parallel to or in advance of that (Fujii 1989). The same probably holds true of WB-KS1, every aspect of which is highly suggestive of ceremonial hunting in historical periods rather than subsistence activities in prehistoric times.

Chronology

As opposed to the functional identification, the dating of WB-KS1 is troublesome because of the total absence of datable *in situ* finds. To make matters worse, the site location on wadi sediments makes stratigraphical comparisons with surrounding sites difficult. Thus, the available clue is limited to the finds from the ground surface and fill layers, which, as noted above, suggest the twofold date: the Umayyad dynasty and the Ottoman period.

A few clues are available to test the reliability of this tentative dating. The first clue concerns the construction order between WB-KS1 and WBs-CE8, a cist enclosure incorporated to the former, which clearly shows that the former postdates the latter and, therefore, can be dated to a period posterior to the EBA III. The second clue comes from techno-typological comparisons with other kite-sites. No close parallels to WB-KS1 have been found among prehistoric kites thus far identified in southern Levant; instead, as noted above, it shares basic characters with royal hunting installations of historic ages. Highly suggestive in this respect is

the fact that, despite the undulated topography, the enclosure of WB-KS1 draws a nearly true circle ca. 400m in diameter, solid evidence for advanced surveying and construction technology. Also of significance is the popularity of drive hunting in the early half of the Islamic age. It is commonly known that Abbasid Caliphs and princes often enjoyed drive hunting in a large circle constructed in a desert fringe (Hitti 1970: 340-341). The Umayyad dynasty is no exception to this; both the fresco at Quṣayr 'Amra and numerous hunting villas dotted in the Jordanian Badia testify that drive hunting was very popular among men of power in those days.

Considered in this light, the twofold date suggested by the surface finds seems to be well founded. It is therefore reasonable to conclude that WB-KS1 was built in the Umayyad dynasty and then reused in the Ottoman period, although further evidence is needed to reach a final conclusion.

Concluding Remarks

The first operation of the JBPP-2 has shed new light on the K-line and the kite-site, two unique features that characterize the dryland archaeology of southern Levant. Ḥarrat al-Burma K-lines turned out to be a form of the EBA pseudo-wall cairn entity in the al-Jafr basin and thus contributed to filling up the chronological gap of the QATW sequence to some extent. Though not directly relevant to the objective of this season, it is another significant result that a probable Umayyad drive hunting installation, Wādī Burma kite site 1, was identified for the first time as an archaeological site. However, much still remains to be explored before the general occupational history of the al-Jafr basin will be fully understood. The second operation, due this summer, will hopefully contribute to this issue.

Acknowledgements

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Sumio Fujii
Faculty of Letters
Kanazawa University
Kakuma-machi, Kanazawa
920-1192, JAPAN

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IRON AGE LOOM WEIGHTS FROM TALL DAYR 'ALLĀ IN JORDAN

Jeannette H. Boertien

Introduction

Loom weights are often found in Iron Age Levantine sites. The warp-weighted loom came to this part of the world during the Early Bronze Age. In the Iron Age it was used on a large scale for textile production. Iron Age loom weights are brittle clay balls mostly made of unbaked clay, making it difficult to recognise and recover these objects. It is difficult to reconstruct textile production because textile rarely survives in this region due to adverse soil and climatic conditions. The study of loom weights found in situ gives us the chance to remedy this situation. Barber (1991) published research on loom weights related to textile production in general. For the Levant, research on loom-weights was done by Browning (1988), Friend (1998), Shamir (1996), Sheffer (1981), Sheffer and Tidhar (1991) and Cecchini (2000). This is a case study dealing with a large number of Iron Age loom weights from Tall Dayr 'Allā in Jordan. The great amount of loom weights recovered and some textile remains from the same period provide an opportunity to classify loom weights from Jordan and to reconstruct textile production in Iron Age Dayr 'Allā. Tall Dayr 'Allā (تل ديرعـلاّ) is located on the eastern part of the Jordan Valley, near the entrance of the Wādī az-Zarqā' into the Jordan Valley. The tall rises 25 meters above the surrounding valley and measures 250-200m at its base. From 1960 onwards several excavations have been carried out on the tall, first directed by Dr. H. J. Franken (1969, 1992) and succeeded by Dr. G. van der Kooij, both from the University of Leiden in the Netherlands, and Dr. M. Ibrahim succeeded by Professor Dr. Z. Kafafi from Yarmouk University, Irbid in Jordan. One of the main goals of the excavation is to provide a detailed stratigraphic sequence of the tall, and thus correlating social behaviour of the inhabitants. Such a detailed investigation makes it possible to deal with spatial analysis and the connection with production diffusion and use of artefacts (Kooij and Ibrahim 1989; Petit 1999: 145).

Iron Age Dayr 'Allā

Phase IX, carbon-14 dated to ca. 800 BC, Iron Age II B, was a period of intensive use, showing a tightly built village and signs of irrigation of the agricultural fields. The phase is only partly excavated. Phase IX started as an architectural complex, without initial small scale buildings. In its final stage of existence the settlement underwent a sudden destruction by an earthquake, accompanied by fires that broke out in many places (Kooij 2002: 64). Two earthquakes followed by a fire destroyed Iron Age Dayr 'Allā, people had time to leave this place safely, but they left most of their possessions behind. The debris from the fire has been relatively untouched by either erosion or later inhabitants. As a result, the objects belonging to this phase can be securely provenanced and dated (Kooij and Ibrahim 1989: 80-82).

The fire that destroyed Iron Age Dayr 'Allā left many looms in the place were they were used. The unbaked clay weights were fired and the loom weights were found preserved in situ in the debris. (Kooij and Ibrahim 1989: 80-82). Although the wooden frames of the looms have not survived, 675 clay loom weights do exist indicating that the warp-weighted loom was in general use at Dayr 'Allā.

In addition to loom weights different tools for textile production were found including spinning-whorls, bone pin beaters, needles, and textile fibres. Thanks to the detailed method of digging used on the Dayr 'Allā Project, a small piece of textile and some thread were found relating to the loom weights. This unique find makes it possible to say more about the sort of textile produced on the warp-weighted loom in this village in the Levant during the late Iron Age.

Phase IX is of particular interest for textiles and textile production in the Levant region because of the quantity of relevant material recovered from the occupied layer. As suggested by G. van der Kooij (Kooij and Ibrahim 1989: 86-87) Dayr 'Allā

phase IX was inhabited by about 14-15 households during Iron Age II. These 15 households of peasants lived in an unfortified village built of mudbrick. The settlement had a special room (EE 335) in which a text devoted to Balaam Bar Beor was painted on the wall. The language appears to be an early form of Aramaic. The fragments have been published by Hoftijzer and van der Kooij (1976, 1991). The name and figure of Balaam is known from the Old Testament (Numbers: 22-24).The benched room had a religious function. Wenning and Zenger suggest this room to be a local school for prophets devoted to Balaam (1991: 189). Van der Kooij writes: "the room and surroundings show no specific religious activities, no cultic use. ...Ethnoarchaeology adds hardly any information. Historical texts of this kind may have a religious use in a teaching context ("Class room")" (Kooij 2002: 68-69). The excavator, Prof. Dr. H. J. Franken (1999 and 2005), calls this room a cella and suggests a sanctuary in the Iron Age village as the Late Bronze Age village had a sanctuary.

"The combination of the artificial hill (tall) with the building on top, the Balaam text and a number of associated objects justify the present attempt to interpret the ruins as the remains of a Baal hight" (Franken 1999: 193). Franken sees a relation between the textile production and the religious function of the site. The relation between the production of textile and the function of Dayr 'Allā in the Iron Age is a point to be studied separately (Boertien 2005).

Textile Remains from Dayr 'Allā Phase IX

It is known both from written sources and organic remains that four textile fibres were in common usage in this region for thousands of years. Two of these fibres are of animal origin, the others are from plants (Vogelzang-Eastwood 1989: 57).

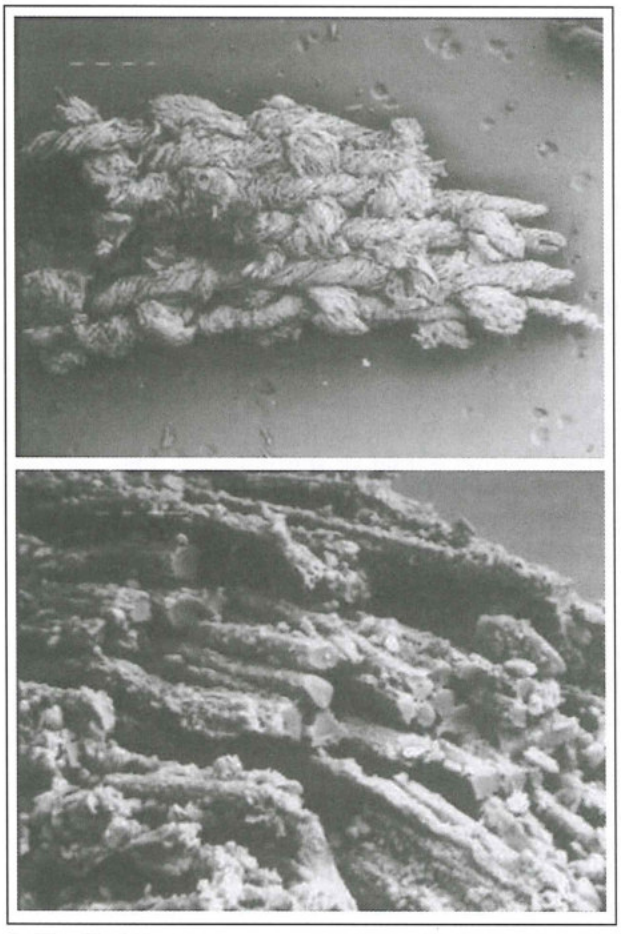
Animal fibres: used to produce textiles in Iron Age Dayr 'Allā were sheep's wool and goat hair. Both are of common use in this region in different periods. Sheep's wool is the most important of these fibres, references are found in Akkadian documents and in the Old Testament to flocks of sheep and to the use of wool for different sorts of male and female garments as well as objects like blankets and spreads. Skeletal remains of sheep (ovis) have been found in Dayr 'Allā phase IX. Goat hair is coarser than sheep's wool and therefore is used for thick outer garments and tents. Up till now the Bedouins of the Levant use goat hair to make their black tents. The coarse hair of the goat is strong and hard making it extremely useful for this purpose. The use of this sort of hair during the 19th century is documented in this region by the work of Dalman (Dalman 1964). In the 20th century P.V.Glob (1911-1985) describes the use of hair for the Arabian Gulf (Glob 1999).

Plant fibres: are in use world wide as material to produce a fine textile. In the Levant flax (Linum Usitatissimum), or the wild form of flax (Linum Bienne L), is the most common plant fibre.

Assyrian texts and Old Testament sources mention linen used for fine garments for both men and women. Browning (1988: 159-162) states that linen was one of the textiles the region had to pay as a tribute to the Assyrians. The Jordan Valley was climatically a good place to grow flax. The region of Bayt Shean is famous for the production of flax in post-Biblical Hebrew literature (Midrash Genesis Rabbah 20, Mishnah Kelim 9: 42). Recent archaeological discoveries have yielded further evidence of linen production in the region. A spindle with linen threads still wrapped around it was found in the 10th century BC stratum at Tall al-Ḥimma (Cahill *et al.* 1989: 36 as cited by Shamir (1996: 142).

Hemp (*Cannabis Sativa*) is known as a fibre to make ropes. "The identification of textiles made out of hemp is one of the unexpected discoveries of Dayr 'Allā" (Vogelzang-Eastwood 1989: 58). The analysis of this textile examined under a Scanning Electron Microscope shows that hemp was used here to make very fine cloth. This opens up many questions because Dayr 'Allā seems to be the only known place in this period in the Levant where fibre-hemp was used to make such a fine cloth. There are no literary and documentary sources for the use of hemp in the Iron Age in the Levant. We do not know where the hemp came from, how it was processed nor how hemp cloth was used (Boertien 2005b). From other periods it is known that hemp is used to make ropes and sacks. In the Middle Ages hemp was used in Europe to make strong water-resistant sails (Bender Jurgensen 1996). The word Canvas (a strong water-resistant cloth) may derive from the word Cannabis. Nowadays it is very fancy to use fine hemp cloth for clothes and lampshades.

The Cloth: in Iron Age Dayr 'Allā a small fragment of fabric, 52x32mm, was found amongst the loom weights (**Fig. 1**), and some weights had threads in the perforation. The finds from square B/A6 and B/A7 were analysed by Dr. W.D. Cook, the Manchester department of textiles. The fragment of cloth in tabby weave was found between the loom weights in a room in the north-east corner of square B/A6 and the north-west corner of B/A7. Here 41 loomweights were found, one weight with



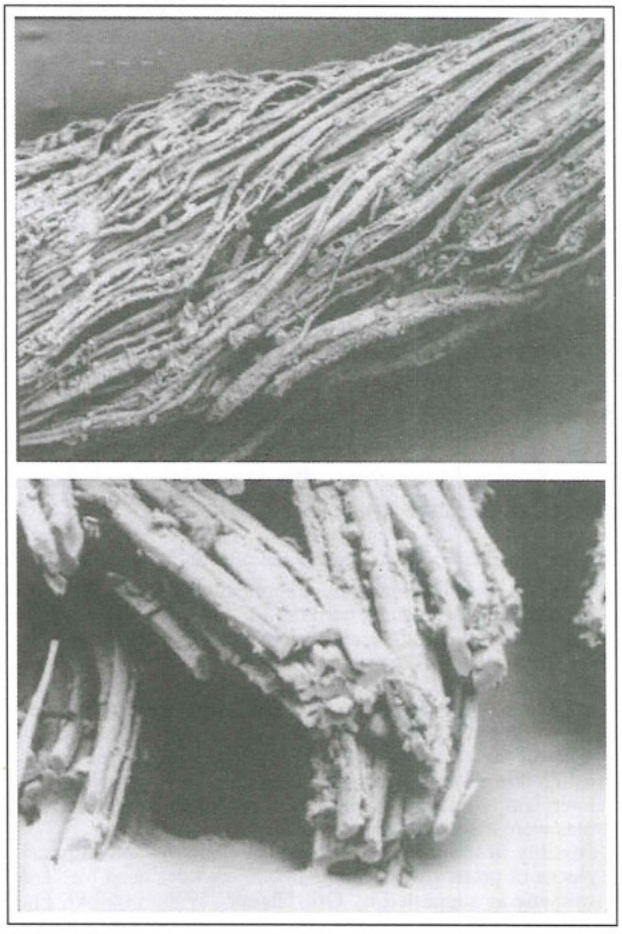
1. The Cloth.

the threads still inside the perforation. In the same room in B/A 6 more loom weights were found: in locus 200 three weights, in locus 204 two more loom weights and one weight was located in locus 250 [1].

The hemp cloth found between the loom weights was very fine, the textile is made of Z-spun hemp thread. The thread count per cm is 24 tpcm (thread per cm) for the warp and 20 tpcm for the weft. The warps being basic for the fabric were harder spun than the wefts and became thinner during the weaving process. Stronger spun, thinner and more crowded threads were therefore treated as the warp (Sheffer and Tidhar 1991: 3). The thread count (24/20) shows that hemp is used here in a very fine thread and the warps are set up close to each other on the loom. This is comparable to the textiles of Kuntillat 'Ajrud (Sheffer and Tidhar 1991).

The fact that there is no sign of wear, or that it has never been washed, indicates that the textile is a fragment of the cloth that had just been woven when the loom was destroyed by fire (Vogelzang-Eastwood 1989: 61).

The Thread: the analysed thread is part of a separate cord used for tying the weights to the warp threads. This cord is made of *Cannabis Sativa* as well and has a diameter of 1.5 x the maximum diameter in the fabric (**Fig. 2**). The same type of fibre is used in both the cord and the fabric, but the twist level in the cord is less than the yarn systems in the fabric fragment. "I would conclude that the thread is part of the separate cord used for tying the weights to the warp threads, and the fabric on the loom burnt and fell on top of the weights." (Dr W.D. Cooke, Dep. of Textiles UMIST Manchester, report June 26th 1989). It is known from written sources that hemp was used for rope and textile, but this is the first time that it has been identified so early in an archaeological context. The scrap of fine hemp textile found between the loom weights shows that this material was made at the site. As a result of the find of fibre hemp in the Jordan Valley during the Iron Age, it seems necessary to re-



2. The Cord.

1. The relation between the different finds in B/A6 and B/A7 is not yet clear, when the stratigraphy of this period is published, more detailed interpretations will be possible.

examine Levantine textile finds in order to confirm the identification of the vegetal fibre types (Boertien forthcoming).

The Warp Weighted Loom

The warp-weighted loom is an invention that did not originate in the Levant. This method of weaving came from Central Europe and went through Anatolia to the southern Levant, where this tradition was introduced in the Early Bronze Age. The basic types of the loom, the horizontal ground loom and the warp-weighted vertical loom, originate in the same region and period - the Neolithic in Anatolia ca. 8500-4300 BC. The horizontal loom spread southward through the Levant into Egypt, and the vertical loom spread westward into Central Europe where the warp-weighted loom was skillfully used during a long period (Barber 1991: 113)[2]. Its use spread to the north where we find this type of loom up to the 1950s in Scandinavia (Hoffmann 1974).

The horizontal ground loom and a variation of this type, the vertical loom, remained the looms of choice in the Levant until the introduction of the warp-weighted loom in the Early Bronze Age (Friend 1998: 2). The warp-weighted loom of this type stayed in use in the Levant up to the Byzantine period (Barber 1994: 84).

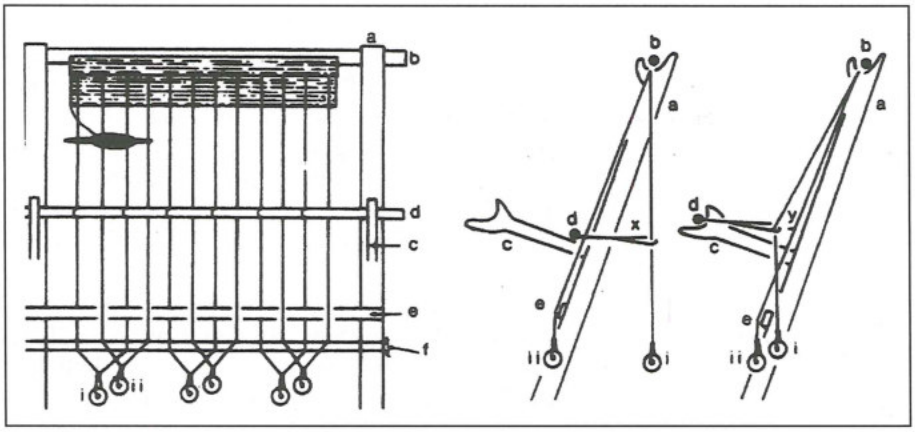
Different ways of weaving were used in the same period, but it is difficult to trace these forms of weaving in the archaeological record. Less known methods of weaving were definitely used to make narrow pieces of cloth or to produce belts. For such small work it is not practical to erect a loom, people mostly use their own body to stretch the warp threads that are attached to a tree or a piece of wood in the house. One of these weaving methods is card weaving, this is a simple technique often used to make long narrow belts[3].

The loom

A warp-weighted loom is made up of two vertical side beams which are about two metres high, and which are placed at an angle normally against a wall. The uprights are supported by a vertical beam. From each upright, usually about chest height, a bracket was forked to support one end of the heddle-rod. Lower down the frame is a shed-rod, which spans the gap between the uprights. All the odd numbered warp threads are hung down perpendicularly behind, but free of, the fixed shed-rod. Groups of thread are then fastened to each loom weight. Each thread is also fastened with a leash to a pre-woven textile band or cord, the so-called starting border or starting cord. This cord or band is attached to the heddle-rod. The even numbered warp threads are tied to a corresponding, but separate row of loom weights. The threads hang over the front of the shed-rod (**Fig. 3**). In order to change the shed the heddle-rod is placed in the fork of the support and the back row (odd numbered) warp threads are thus drawn in front of the even numbered (Vogelzang-Eastwood 1989: 59). The strands could be lengthened, enabling pieces of cloth to be woven which were far longer than the height of the loom. The work progressed from top to bottom, the cloth being gradually rolled around the upper beam (Cecchini 2000: 211). Tapestry weaving which involves the creation of patterns or pictures requires a loom in which only portions of the shed can be opened easily. This is possible on a warp-weighted loom in which the weights also keep the constant tension on groups of warp threads (Browning 1988: 165).

The use and technology of the warp-weighted loom has been described by Hoffmann (1974), Brittnell (1977), Broudy (1979), Sheffer (1981), Browning (1988), Vogelzang-Eastwood (1989), Shamir (1994), Friend (1998), and Cecchini (2000).

2. Weaving techniques are more sophisticated in Central Europe during these early periods. In the Early Bronze Age very fine and coloured cloth was made in Switzerland on the warp-weighted loom.
In about 1000 BC very fine textiles made of coloured wool and linen were woven in Hallstadt and Hallein (Barber 1991). The warp-weighted loom was in use in Central Europe till the Middle Ages, and very fine textiles were made using this loom. In Northern Europe the warp-weighted loom was in use until about 1950, but here more coarse textiles were made with this technique.
3. Possibly in the Iron Age the pottery "buttons" or elliptical pieces of pottery with one or two holes were used for card weaving as suggested by Orit Shamir (1996: 148-149, Fig 221-10, Pl. 11: 11,12,13). These "buttons" would give us an interesting sign of one of these simple ways of weaving. In an experiment Shamir produced a woven strip in the plain weave technique using tablets with two perforations.
Many fabrics with the starting border preserved were found to come from regions where the warp-weighted loom was used (Hoffmann 1964: 15).
The starting border served to keep the warp threads evenly spaced on the loom (Crowfoot 1955: 22), they are divided into two main groups: woven starting borders and corded starting borders (Hoffmann 1964: 154).
It is interesting to note that the starting border in the textiles found in the Iron Age desert site of Kuntillat 'Ajrud, is a variant on the corded starting border, the twined starting cord (Sheffer and Tidhar 1991: 4) used in a very fine linen textile (Sheffer and Tidhar 1991: 5, fig. 9 and 10).
An experiment by a professional weaver has to be done to prove this interesting suggestion. And a detailed study of these pottery "buttons" is needed to research the relation of these artefacts to loom weights and other weaving implements.
This unknown technique is mentioned here to give an impression of how much more textiles could have been produced than we can obviously find.



3. The warp-weighted loom.

The loom weights

The function of the loom weight is to stretch the warp threads on the hanging vertical loom. The weights are attached to bundles of warp threads suspended from a pre-woven band attached to the top beam. This separately woven heading band, or starting border, is a typical distinguishing phenomenon for cloth woven on the warp-weighted loom (Crowfoot 1951: 18, fig. 3 and plate VII: 21; Hoffmann 1964: 151-152, 154 and 178; Hald 1980: 203, 205-208; Browning 1988: 29; Sheffer and Tidhar 1991: 4-5; Raeder Knudsen 1998: 79-84; Cecchini 2000: 211). The weights supply tension and keep the warp threads parallel. The tension is easily adjusted by adding more weights or by retying the warp threads and therefore the warp-weighted loom depends less on precise warping than either the ground or vertical loom (Friend 1998: 4).

"It was sometimes necessary to tie two loom weights to one group of warp threads in order to balance one heavy weight on the other half of the shed" (Hoffmann 1974: 42).

Loom weights differ in shape and piercing. Loom weights without a perforation are known as cigar-shaped loom weights and reels or so called spool shaped loom weights (**Fig. 4**). A problem is that they are often not recognised as loom weights (Cecchini 2000: 214-217).

The unperforated weights are known from Bulgarian Neolithic sites and are comparable to the Macedonian 'waisted weights' (Barber 1991: 98). In Anatolia this type of loom weight is used during the Late Bronze Age at Alishar Hüyük, Tarsus, and Tille Hüyük (Cecchini 200: 217). Weights made of unbaked clay were found in Iron Age I levels at Tall Afish in Syria, and in levels of Iron Age II made of baked clay. This is comparable to the situation in Tall Matsuma and Tall A'mar (Cecchini 2000).

Spool weights are found in the Philistine sites Ashdod, Askelon and Tall Mikne (Ekron) (Stager 1995: 34). In Dayr 'Allā phase IX one spool loom weight was found within a group of perforated weights (For a description of this weight see the chapter Large groups, group XII, and the photograph Fig. 23).

Pierced Loom Weights

The perforated loom weights are divided into two main groups related to the place of the perforation, as introduced by Beck for the description of beads (1928: 51):

1. The horizontally perforated loom weights or pendant form weights. These weights are perforated above the middle of the weight and makes the weight hang as a pendant.
2. The vertically perforated loom weights are pierced in the middle of the weight (**Fig. 4**).

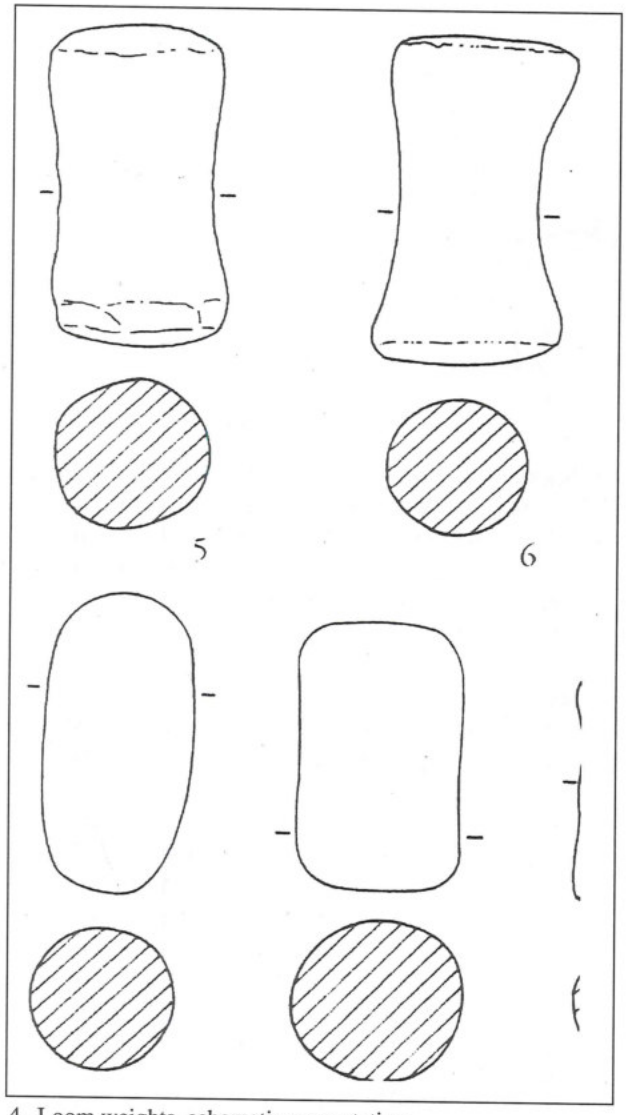
These groups are usually divided by their form into the following types.

The horizontally perforated loom weights: conical loom weight, pyramidal weights, the dome-shaped or beehive-shaped loom weight, the ovoid type, which is an egg-shaped weight, and the oblong loom weight which is a high cylindrical weight.

The vertically perforated weights: The donut-shaped loom weight, (and the bi-conical weight), the spherical or ball-shaped loom weight, the cylindrical or drum-shaped loom weight and the wheel-shaped loom weight (**Fig. 5**).

Collections of loom weights are found from the Early Bronze Age onwards. In the Iron Age the number of loom weights increase (Barber 1991). Examination of loom weights from a number of sites has revealed regional, typological and chronological variation (Vogelzang-Eastwood 1989: 60; Shamir 1996: 139-140; Friend 1998: 8).

Middle and Late Bronze Age weights are made of fired ceramic. The form is conical, dome or cigar shaped (Friend 1998: 8). The weight varies be-



4. Loom weights, schematic presentation.

tween 172-393 grams (Friend 1998: 9). In the Iron Age we find many more loom weights than in earlier periods and their form and weight are clearly different. The Iron Age loom weights are made of unfired local clay. This makes correct registration and a stratigraphic context very important.

Prior to the Iron Age loom weights were usually intentionally fired clay of conical dome or cigar shaped. However in the Iron Age the form and method of manufacture changed and weights were made of poorly fired or unfired clay, in the form of a donut or a ball. The change in shape may have been implemented because the earlier forms, when not well fired, tended to break more frequently at the narrow end near the perforation, the new shape did not have a weak narrow end (Friend 1998: 9). The donut-shaped unbaked loom weights form the largest group at most Levantine sites in Iron Age.

The weight of the Iron Age loom weights is higher than in the periods prior to the Iron Age.

In Dayr 'Allā an Iron Age loom weight has an average weight of 465.9 grams (ranging between 125-2400 grams). In the City of David Jerusalem the range is 22,8-805 grams (Shamir 1996: 143). In Kuntillat 'Ajrud the range is 240-310 grams. (Sheffer and Tidhar 1991: 1-26). The weights of Tall 'Amal range between 90-420 grams (Gal 1988: 283).

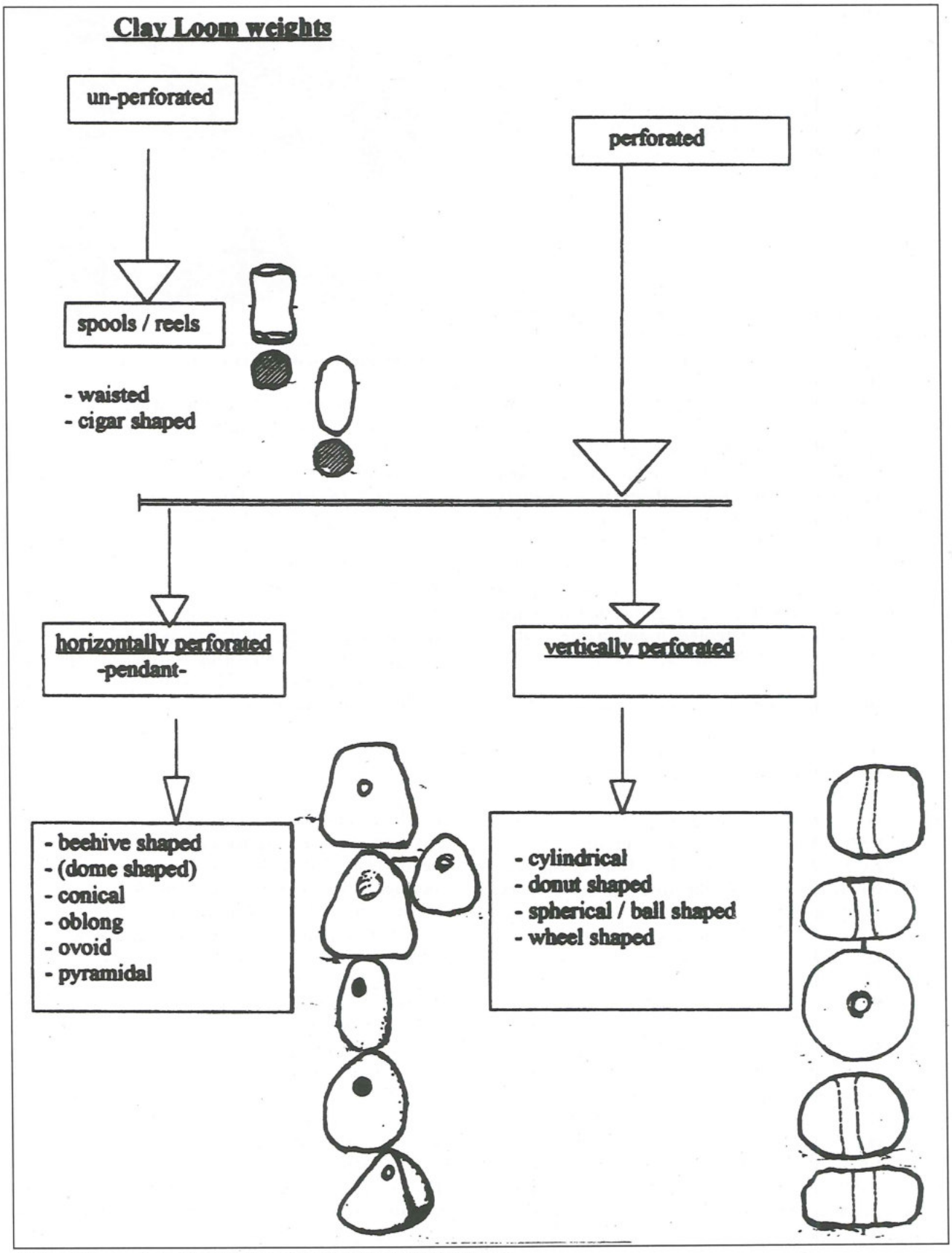
In Syria pierced baked or partially baked loom weights are characteristic for the Iron Age II period. At Tall Afish hundreds of loom weights are found. They are spherical, donut shaped or flattened cylinders. The weights range between 50/60 and 460/470 grams. Very few are conical or nearly conical, pyramidal or ovoid with a horizontal perforation. A small number of unbaked clay loom weights were also found (Cecchini 2000: 222).

Later in the Persian period loom weights are smaller and lighter (less than 100 gram) biconical (Shamir1996: 151) or donut shaped, ovoid, pyramidal or dome shaped and baked (Shamir 1997: 2) or pyramidal and baked (Friend 1998: 10) or ovoid and made of unbaked clay as in Dayr 'Allā. The loom weights from Hurvat Nimra mark a transition between the originally Iron Age donut shaped loom weights and the pyramidal loom weights of the Greek and Roman period (Shamir 1992: 6). In the Hellenistic period the dominant type is pyramidal with a weight of around 100-200 grams.

The publication of the loom weights from Syria is very interesting because there was a gap of information about the weaving tradition in Syria. Barber and Shamir suggested that the warp weighted loom was absent in this region (Barber 1991: 91-101, 300-302; Shamir 1996: 140, 145)! It is only recently in the Aegean area that Late Bronze Age terracotta objects in the form of reels have begun to be recognised as loom weights (Discussion in Cecchini 2000: 214 notes 21).

In Iron Age the unperforated reels are fewer in number than the spheroid perforated loom weights but their existence or coexistence is certain (Cecchini 2000: 222). The finds from Tall in Northern Syria are very interesting in relation to the finds from Tall Dayr 'Allā because in the collection of Iron Age Dayr 'Allā 14.6% of the loom weights is spheroid. This is a large number compared to other Iron Age II sites, such as at Jerusalem 3% (Shamir 1996: 136), none in Kuntillat 'Ajrud (Sheffer and Tidhar 1991: 11), and at Tall Taanek 2 of the 92 Iron Age loom weights are spheroid (Friend 1998: 36-58).

In Iron Age Dayr 'Allā one spool shaped loom weight was found within a group of loom weights



5. Spool loom weights from Northern Syria (after Cecchini 2000: 212).

in group XII (B/E9 locus 24).

If the form of the loom weights is dependent on tradition then a northern influence could be suggested and relating them to the language used in the Balaam (Bal'am) inscription and the imported grinding stones in Tall Dayr 'Allā from the north or north-east (Petit 1999: 157). It is interesting that the types used in Iron Age Dayr 'Allā show a relation to the type of loom weights used in the Iron Age in Northern Syria, as described by Cecchini in her publication on the textile industry in Tall (Cecchini 2000).

These facts would plea for connections with Damascus. But it is too early to point in this direction, we will have to wait for more published material from Syria, and hope for textile remains to be found and analysed.

Weight variation among loom weights from the same assemblage is a common phenomenon. Possibly the number of threads tied to each weight was not always the same and it was thus not necessary to make each loom weight identical in weight. More numerous warp threads could have been tied through a heavier loom weight while a lighter one would bear fewer threads (Shamir 1996: 143; Broudy 1979: 26; Hoffmann 1974: 314). Weight variations of more than 200 grams between the weights on a warp-weighted loom create a distortion in the textile (Shamir 1996: 143).

The Iron Age Loom Weights from Tall Dayr 'Allā

In Dayr 'Allā phase IX 675 loom weights were registered, 589 of these weights could be studied by the author (86 recorded loom weights were not traceable because they were taken out of the collection for exhibition and were lost) (**Fig. 6**).

The material: From a technical analysis of the pottery from Dayr 'Allā by the Institute for Pottery Technology in Leiden, it is known that in this region the local banded Lisan clay was used for pottery making. The local clay has been analysed by Kalsbeek (1969: 73-80) and Franken (1969, 1985 and 1992: 105-114).

The clay on which the tall stands is built up from thin clay deposits (banded clay) which vary in structure and composition. The colours of these layers vary from light grey to yellow, blue and greenish to pink or brown-red. In between these layers one may find thin layers of very fine sand. The amount of iron oxide (in the form of visible grains) is high as seen in the pottery of the village (Franken 1992: 106-107). This gives the clay a red to pinkish colour.

In the banded lisan clay two groups of non-plastic materials can be differentiated:

1. A combination of quartz-sand and organic material.
2. A combination of quartz-sand, lime and organic material (Kalsbeek 1969: 73-80).



6. Loom weights from Tall Dayr 'Allā, Iron Age.

Quartz-sand washed down by the az-Zarqā' river occurs in abundance in the vicinity of Dayr 'Allā. 'Temper indicates the non-plastic elements in a clay, which are considered to have been added by the potter……. fillers are used inter alia to open the clay for texture and/or workability, to control drying shrinkage and firing shrinkage' (Franken and Steiner 1990: 79). The amount of iron oxide (in the form of visible grains) is high as seen in the pottery of the village (Franken 1992: 106-107).

Apparently the potters dug this clay close to the tall and soaked it for some time but often not long enough to let the clay break up or 'dissolve' completely (Franken 1992: 106). The use of impure clay does not necessarily point to lack of skill of the thrower, but may be due, at least in part, to shortage of water (Kalsbeek 1969: 74).

The clay in Dayr 'Allā is a bit salty. The loom weights had a light scum visible after drying, as described for pottery by Orton (1994: 116).

The Find Spot: The weights from Dayr 'Allā phase IX show that different types of loom weights were used on one loom. To determine a group of loom weights belonging to one loom, square and locus are taken as selection criteria. This narrow definition of a loom was necessary because the stratigraphy of the Iron Age is not yet published and making the interpretation of the different locus numbers impossible. Using the criteria of the find-spot defined as square and locus gave the opportunity to recognise the looms without a detailed stratigraphy.

This method limited the numbers in the groups

and the number of groups because often locus numbers are changed while digging. Without a detailed stratigraphy it is impossible to reconstruct the related locus numbers correctly.

A 'large group' is a collection of loom weights containing more than 10 weights from one square and locus number. The choice of 10 weights in a large group is based on the fact that this number makes weaving on the warp-weighted loom still possible[4]. When using less than 10 weights the cloth will be to narrow (less than 20cm). This would not be worth all the work of warping the loom and having it occupy space. If such a narrow piece of fabric were wanted other weaving methods would be chosen. Because the site has such a large collection of weights it was possible to define different large groups representing a loom.

Typology of Iron Age Clay Loom Weights from Tall Dayr 'Allā

The classical classifications are shape descriptions based on the work of Beck (1928) made for the description of beads and pendants [5]. Most authors (Hoffmann 1974; Barber 1991; Browning 1988: 193-194; Shamir 1996: 136; Friend 1998: 8) follow the shape description as mentioned above.

This study presents a typology based on technical, rather than on morphological variables. A classification based on technical criteria is fundamentally different from a typology based on shape descriptions. Similar shapes may have been made in different ways and that results in a slightly different typology than usually presented. In a techno-analytical typology one type may have different shape variants, and similar shapes may have been made in completely different ways. The production technique for making loom weights is the starting point for the typology. When the production process demands separate and conscious actions to make a special form in the piece of clay this is counted as a proceeding to make a new or different type. If different gestures are used to make a weight these proceedings give a separate type. For instance a conical loom weight with a flat base and a conical weight with a rounded base (the sack form) are different types in a shape descriptive classification but in a typology based on technical criteria both belong to the same type.

When the weight is formed in the palm of the hand this gives a rounded base, the so-called sack form. Here both are called a conical loom weight.

Because the flat base was the result of working on a flat surface, the hard surface gives a flat side to the loom weight. The difference in shape resulted from the place where the loom weight was made and not from different production techniques.

This also applies for donut shaped loom weights with a flat side. These are often large weights made of wet clay that could not be held in the hand while making the weight. They need the support of a surface and this gives the flat side to a weight.

In a technical typology a difference has to be made between a conical loom weight and a beehive shaped loom weight because the beehive shaped weights have a flattened top. To flatten the top is a separate series of gestures and this gives a new type.

The mixed forms in the collection of Phase IX show a special relation between three types of loom weights related to the production process. The wheel form and the cylindrical loom weight are made out of a donut form. In the collection of Dayr 'Allā this is visible in different artefacts that show both, or even the three forms, in one weight. In the category of smaller weights this leads to a mixed type that does not occur when the loom weight is larger. This is because the forming techniques of larger weights are principally different. 4.3 % of the loom weights from phase IX show a mixed form (For a detailed description see the experiment in the Appendix to this article).

The method of production leaves more traces in the loom weights than previously expected. Because the Iron Age loom weights are made of clay and thus formed in a different way than beads a new approach was chosen. The basic division related to perforation was followed and the well-known descriptive names of the different types are

4. From experiments with loom weights from various sites it is known that about 20 warp threads are tied to a cord in the loom weight. (Shamir 1996: 144; Sheffer 1980; Kelm and Mazar 1995: 163; Shamir 1994: 282; Broudy 1979: 26; Hoffmann 1974: 314) These numbers make weaving still possible without disordering the warp in such a way that holes would appear in the textile.
   Using 10 loom weights gives 10x20 threads in the fabric, compared to the thread count of the textiles from Kuntillat 'Ajrud (Sheffer and Tidhar 1991: 5-19) this is an average count (20 tpc), it gives a piece of cloth with a width of about 20cm.
5. In the literature concerning this subject most authors base their typology on Beck (1928): a classification and nomenclature of beads and pendants. Glenda Friend does not mention Beck but she based her typology on the work of Shamir (Friend 1998: 1). These typologies are based on the form of an artefact and not on the manufacturing techniques that the different materials demand from the maker. "A classification based on technical criteria... is fundamentally different from a classification based merely on shape description. ...Technical analysis attempt to explain phenomena, instead of only describing them, this simplifies the typological work and increases its significance" B. van As. (1984: 144).

used as far as possible. In the Appendix to this article Experiment Making Loom Weights is presented. The differences in shape are discussed based on production factors.

There is always a variation in the repeat 'item' as described for pottery production by B. van As (1984: 136). Small variations in form are due to this phenomenon and are to be neglected in a typology.

The Loom Weights

The 589 studied loom weights are separated into 7 main groups, a group of mixed types and the rest.

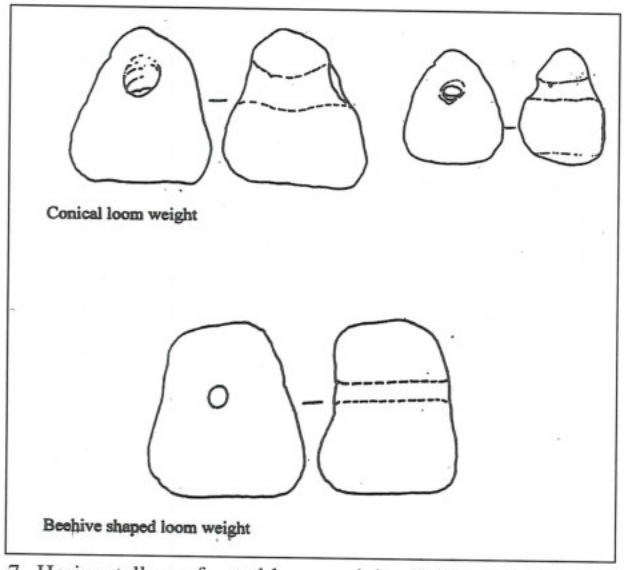
*Horizontally Perforated Loom Weights, pendant form (***Fig. 7***)*

1.Conical loom weight (average of 62 weights)

height	8.4cm
diameter	7.5cm
perforation	2.0cm
weight	433.5g

The clay is mostly impure and often not well mixed. This shows that no special attention was given to the composition of the clay used for these weights. 62 conical loom weights are found. This is 10.5% of the total amount of loom weights in Iron Age Dayr 'Allā. 23 weights came from square B/E9, group XII and XIII.

Conical loom weights often appear in small groups within larger groups of other types of loom weights. Within these large groups the conical loom weights have an average of 20.16% of the weights, ranging between 52.8 % in group XII and 5.8% in group X.



7. Horizontally perforated loom weights Tall Dayr 'Allā, Iron Age.

2. Beehive shaped loom weight (average of 8 weights)

height	7.8cm
diameter	7.4cm
perforation	1.4cm
weight	424.3g

The clay is impure and contains much iron ore and small organic material. The beehive shaped loom weight is seldom found in collections dated to the Iron Age in the Levant. In Dayr 'Allā phase IX only 8 (1.4%) loom weights of this type were found. It is a pendant form with a narrow perforation in the middle of the weight. The differences with the conical weight is the flat top, and the position and the size of the very small perforation. Group XII has 4 beehive shaped weights and group XIII has one weight of this type (B/E9) In group II are two beehive shaped loom weights (B/A8). And in group IX one more beehive shaped loom-weight was found (B/C8).

The beehive shaped loom weight looks like weights used to produce fine linen found in Europe (Switzerland) (Barber 1991: 96, fig. 3.18). This type of weight is perforated with a stick, and possibly a stick or a rod were used to attach the weight to the warp-threads.

The idea of the stick in this form of weight is provided by the loom-weight-stamp published by McLaughlin (**Fig. 8**). The weights from Dayr 'Allā do show traces of a stick used in the beehive shaped loom weight (**Fig. 9**) [6]. (See also **Fig. 23**).

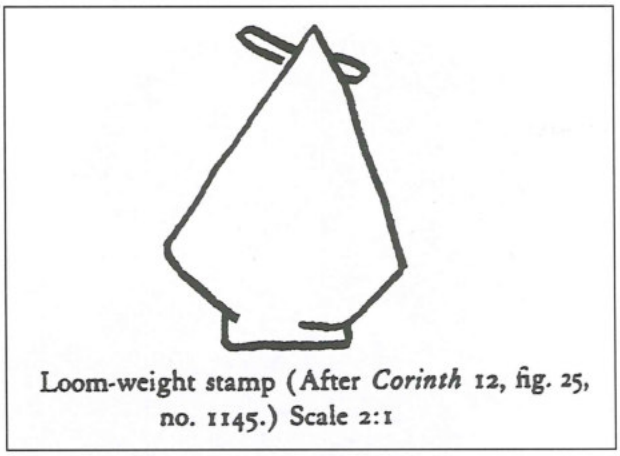
Vertically Perforated Loom Weights (**Fig. 10**)

1. Donut-shaped loom weight (average of 322 weights)

height	5.1cm
diameter	8.0cm
perforation	2.1cm
weight	335gram

The width varies more than 1cm from the height. The clay used for the small models (diameter under 9cm) is impure and medium mixed (**Fig. 11**). The clay contains the natural amount of organic material and grit, so no special attention is given to the clay. The amount of iron oxide in the visible grains is high. The donut is the most popular loom weight in Iron Age Palestine. In Iron Age Dayr 'Allā 325 donut shaped loom weights were registered.

6. The suggestion was done by McLaughlin (1981) based on the work of Davidson and Thompson (1943) regarding the loom weights from Athens now in the British Museum. Some of these loom weights have a metal ring in the narrow perforation, but such rings are not found in the Levant.



Loom-weight stamp (After *Corinth* 12, fig. 25, no. 1145.) Scale 2:1

8. Loom weight stamp.

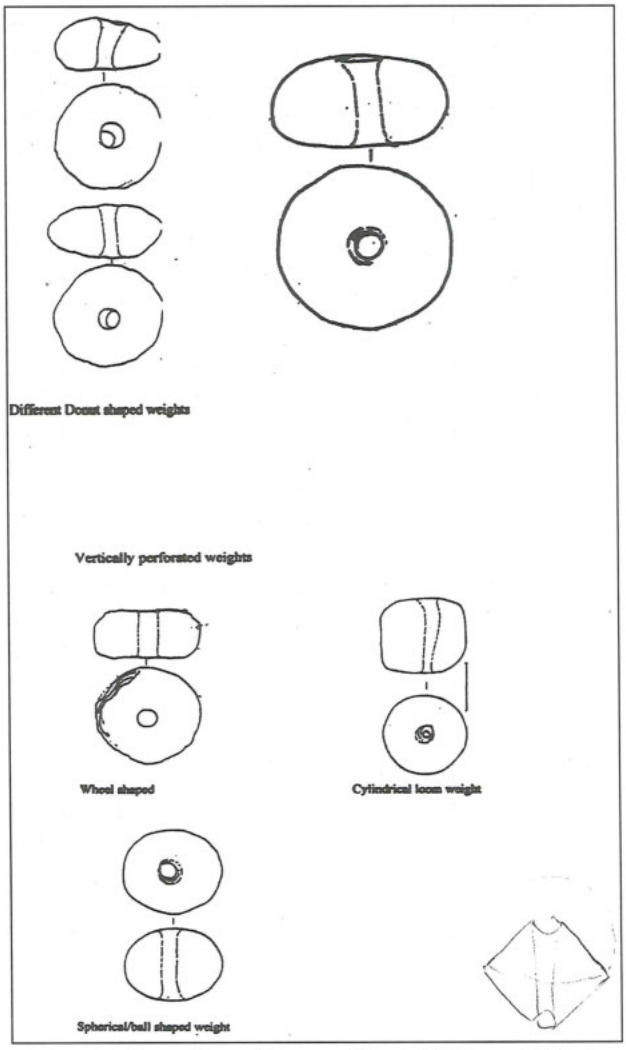


9. Beehive shaped loom weight and 2 conical weights.

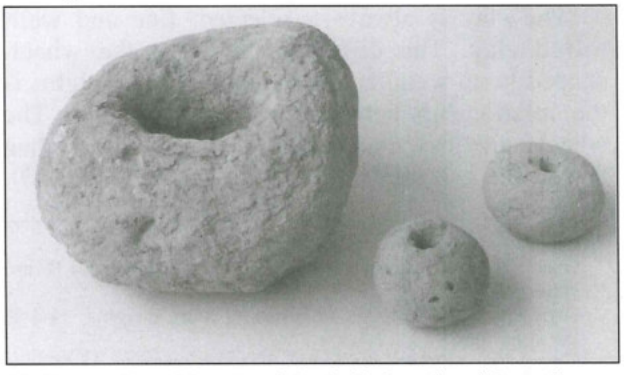
If a donut is large, over 9cm, it is often made of fine selected yellow clay, well-mixed and used wet.

The general idea is that this kind of loom weight was made around the finger. This may be true for weights with a diameter between 6 and 9cm, because a coil of about 3cm thick and 15-18cm long can be worked around the finger of a hand. When a weight is smaller, the perforation cannot be made with a finger, because the perforation would be too wide (about 1.8-2cm). But when the diameter of a weight is larger than 9cm, it is impossible to work this long coil (longer than 15-18cm) around a finger, as experiments have shown. The partly flat donut is made of fine (selected) wet clay. Using the wet clay the perforation is always from one side.

Big loom weights of this type are perforated whilst on a hard surface. Sometimes a stick is used which left visible traces in the hole of the weight. It is possible to pierce the weight with a finger. If the weight is kept in the hand whilst piercing then both sides will be rounded, the so-called "bi-conical" form. When using a hard working surface part of the weight will be flat (Detailed description in the Appendix to this article).



10. Vertically perforated loom weights Tall Dayr 'Allā, Iron Age.



11. Donut shaped loom weight, ball shaped weight and extra large donut loom weight of 2400 grams (group II).

2. Spherical/ ball shaped loom weight (averages 86 weights)

height	6.0cm
diameter	7.8cm
perforation	2.1cm
weight	441.5gram

In this kind of loom weight the width and height never varies more than 0.75 % from each other. The clay used for this model is mostly a fine and well-mixed selected clay. It is surprising that rather large stones are often found in this weight, causing problems while drying. 20% of the 86 spherical loom weights have a flat side caused by the use of very wet clay. It is difficult to form a good ball from rather dry clay, and using wet clay gives a nice and smooth ball, but it is difficult to dry this model while keeping the shape. Spherical loom weights often occur in large groups and within these group they form a high percentage (**Fig. 11**).[7]

3. Cylindrical loom weight (averages 23 weights)

height	6.0cm
diameter	7.5cm
perforation	1.5cm
weight	452.6gram

The difference between height and width is not more than 0.8%. Cylinders are more than 5.5cm high and about 7.5cm wide (**Fig. 12**). The clay is a fine yellowish or banded clay. A cylindrical or drum-shaped weight is always made on a stick, it has a narrow perforation made by a thin stick or a reed cane. The cylindrical or drum-shaped loom weight is easy to make, by rolling a spherical or donut-shaped weight over a flat surface while the weight is still attached to the stick. This type occurs in a small amount within large groups.[8]

4. Wheel-shaped loom weight (averages 41 weights)

height	5.1cm
diameter	8.3cm
perforation	2.0cm
weight	439.2gram

The clay is always a selected, fine and well-mixed clay. The difference between the wheel-shaped loom weights and the cylindrical weights is the relationship between width and height. The wheels are less than 5.5cm high and more than 8cm wide, and they do look like a wheel (**Fig. 13**).



12. The cylindrical loom weight.

The wheel-shaped loom weight is often found in different parts of the site. It is easy to make this loom weight repeatedly uniform. They are formed around a stick. If there is a dome around the perforation this means that the clay has been worked out in the direction of the stick. When the wheel was turned to smooth the surface it has a slight groove in the surface of the wheel. They are mostly used in combination with other models. For this type of loom weight the amount of weights associated with one loom is striking [9].

This kind of weight is not commonly known in Iron Age Palestine. The only place where this shape has been reported is Tall Qasilah, on the coastal plain. Orit Shamir (1994) describes these loom weights and calls them "cylindrical". 66% of the weights are "cylindrical", wheel-shaped, and the rest of the weights have the donut form.

7. Percentages of spherical/ ball shaped loom weights.
   Group II (B/A8 locus 55) has 33 loom weights, 5.4 % are spherical.
   Group VIII (B/C6 locus 117) has 29 loom weights, 34.4 % are spherical.
   Group IX (B/C8 locus 75) has 52 loom weights, 15.6% are spherical.
   Group XI (B/D7 locus 54) has 14 loom weights, 25% are spherical.
   B/C6 locus 114 has 9 loom weights, 11.1 % are spherical.
8. Percentages of cylindrical loom weights
   Group II (B/A8 locus 55) has 33 weights and 9% are cylindrical weights.
   Group IX (B/C8 locus 75) has 52 loom weights and 13.7% are cylindrical weights
   Group X (B/D7 locus 52) has 18 weights and 22.2% are cylindrical shaped loom weights
   Group XI (B/D7 locus 54) has 14 weights and 6.2% cylindrical shaped loom weights.
9. Percentages of wheel-shaped loom weights
   Group II (B/A8 locus 55) has 33 weight and only 7.6 % are wheel-shaped loom weights.
   Group IV (B/A10 locus 26) has 10 weights and 60% are wheel-shaped loom weights.
   Group VIII (B/C 6 locus 117) has 29 weights and 17.5% are wheel-shaped loom weights.
   Group IX (B/C8 locus 75) has 52 loom weights and 16% are wheel-shaped loom weights
   Group X (B/D7 locus 52) has 18 weights and only 5.5% are wheel-shaped loom weights
   Group XI (B/D7 locus 54) has 14 weights and 43.7 % are wheel-shaped loom weights.
   B/C 6 locus114 has 9 weights and 11.5% are wheel-shaped loom weights.



13. The wheel-shaped loom weights.

The average weight of the wheel-shaped loom weights in Tall Qasilah is 340.8 grams, which is comparable to Dayr 'Allā. The average diameter in Tall Qasilah is 8.35cm which is about the same as the wheel-shaped weights from Dayr 'Allā. The average height in Tall Qasilah is 5.35cm. This height is slightly higher than the ones from Tall Dayr 'Allā (5.1cm), but are not as high as the cylindrical weights (6cm).

The clay used in Tall Qasilah is not selected and thus contains stones and organic material. The clay used in Dayr 'Allā for this type of weight is fine and a selected well-mixed banded clay.

5. Mixed forms (averages of 26 weights)

height	5.1cm
diameter	7.6cm
perforation	1.7cm
weight	350.1g

There is a special relationhip between the three types of loom weights: the wheel form, the cylindrical and the donut form. Their relationship is the result of the production process. When a weight of a medium size and a stick or a finger is used to form the weight, only the final steps make the difference in type. This gives in the category of smaller weights a mixed type that does not occur when the loom weight is larger, because in the case of a larger weight the forming techniques are principally different. As in the above description for the donut shaped weight.

Mixed forms are seen in the collection of Iron Age Dayr 'Allā within different groups of loom weights (**Figs. 14, 15**). For a description of the forming process of the weights see the chapter on experiments. (Appendix to this article).

Rest Groups

In this category loom weights are mentioned that do not belong to one of the major types of this period. The group contains 21 loom weights. The spool/reel shaped imperforated loom weight from B/E9 locus 24. The 3 oblong loom weights: a high cylindrical weight with a horizontal perforation.



14. Mixed forms.



15. Mixed forms.

Two were found in B/D9: one specimen was found in locus 18 and the other one in locus 9. And 1 oblong weight was recovered in B/D8 locus 6. Three loom weights belong to the ovoid type, which is an egg-shaped weight with a horizontal perforation, comparable to the ovoid weights described by Shamir (1996: 136). All these ovoid shaped weights were found in square B/D9 (loci 18, 25 and 43). Amorph are 14 weights that were damaged and not identifiable as a type (**Fig. 16**).

Large Groups Arranged by Square and Locus

Here, 15 large groups of weights representing a loom will be discussed. The numbers used are the square and locus numbers as mentioned on the topplan published by G.v.d. Kooij (1989, 2002) (**Fig. 17**).

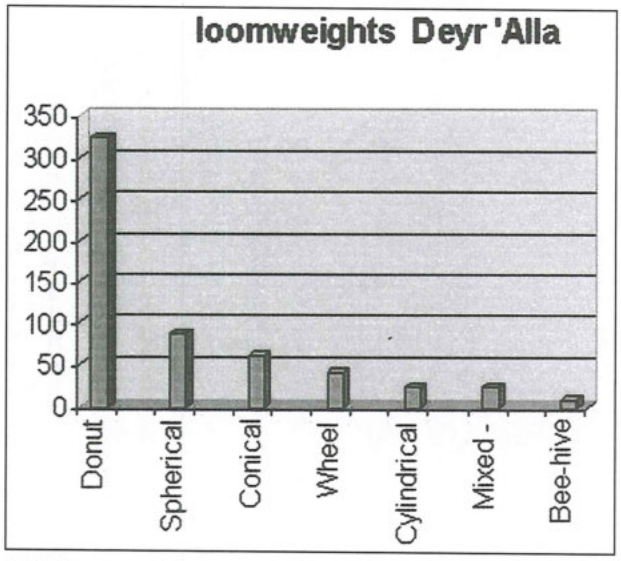
Group I

B/A7 locus 60 and B/A6 locus 122, this is a small room with an entrance to a courtyard at the

Type	Number	Weight range in gram
Donut	27	240-665
Spherical/ball	7	290-600
Conical	3	185-610
Wheel	1	270
Mixed type	3	330-440
Total	41	Total average weight 357

Iron Age Loom weights Dayr 'Allā phase IX

Iron Age Loomweights Deyr 'Alla phase IX		
Type	Number	Percentage
Donut	322	54.8 %
Spherical/ ball shaped	86	14.6 %
Conical	62	10.5 %
Wheel	41	6.9 %
Cylindrical	23	3.9 %
Mixed -type	26	4.3 %
Beehive	8	1.4 %
Spool shaped un-perforated (rest group)	1	0.2%
Oblong (rest groups)	3	0.5 %
Ovoid (rest groups)	3	0.5 %
Amorph (rest groups)	14	2.4 %
Total	589	100 %



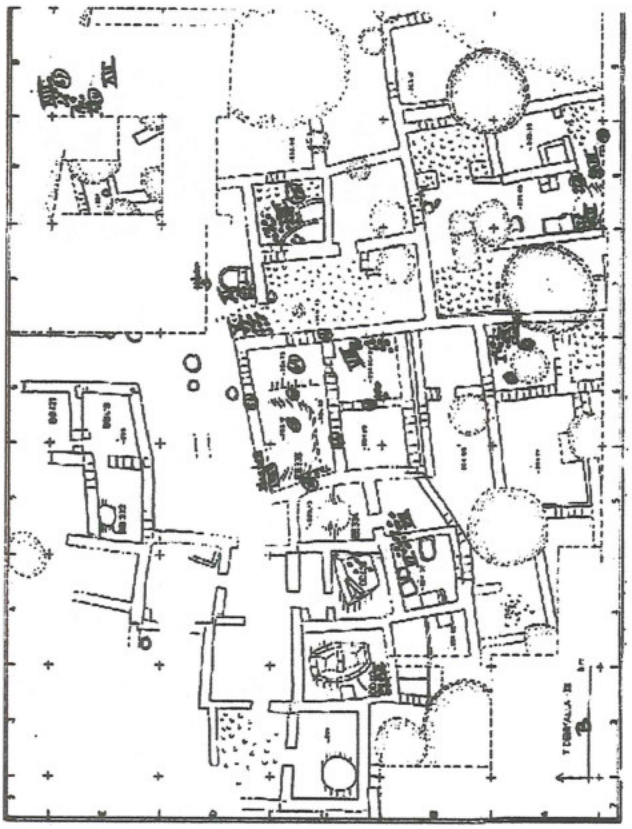
16. Diagram of the loom weights from Tall Dayr 'Allā phase IX (Iron Age II) n=589.

south. The loom stood in the North-East corner (**Fig 18**). The cloth fragment and the thread inside a loom weight were found in this locus.

Group II

Type	Number	Weight range in gr.
Donut	19	160-2400
Spherical/ball	3	140-180
Conical	3	335-400
Wheel	3	330-350
Cylindrical	3	260-380
Beehive shaped	2	360-460
Total	33	Total average weight 379

B/A8 locus 55, the loom stood next to a bin made of clay plaster with potsherds in a storeroom that also contained jars, a dish and a jug-stand. The room has been reconstructed and is described in Kooij and Ibrahim (1989: 82-85). In the publication these loom weights are referred to as "Some forty wheel-shaped loom weights lay against the west wall, one of which was extremely large". The loom weights are of different types and not only wheel-shaped as recorded by Kooij and Ibrahim 1989: 85. (The extra large weight **Fig. 12**).
B/A8 locus 55



17. Top plan of Iron Age Dayr 'Allā.



18. The 41 loom weights in rows of group I (BA6 and BA7).

Group III

B/A8 locus 63 this collection may have belonged to locus 55 "The weights found further to the east probably belong here" (Kooij and Ibrahim 1989: 85). But they seem to be amongst a small collection stored between the broken pots for the production

Type	Number	Weight range in gram
Donut	6	335-405
Spherical/ball	3	320-335
Conical	2	130-390
Total	11	Total average weight 311

of yoghurt, dung for burning as well as a number of storage jars with burnt contents (Kooij and Ibrahim 1989: 84).

If these weights belonged to locus 55 then more loom weights should have been scattered around all over the place. But the top plan of this section shows that these weights lay together in a circle, between the pots where they might have been kept in a basket (**Fig. 19**).
B/A8 locus 63

Group IV
B/A 10 locus 26, this square is not yet published, and no top plan is available. Unknown interpretation.
B/A 10 locus 26

Type	Number	Weight range in gram
Donut	2	320
Spherical/ball	2	275-295
Wheel	6	335-475
Total	10	Total average weight 327

Group V
B/B3 locus 38, is the southern part of room number DD417 where there is a mudbrick-lined pit.

Type	Number	Weight range in gram
Donut	9	225-435
Spherical/ball	1	285
Conical	2	360
Total	12	Total average weight 232

Group VI

Type	Number	Weight range in gram
Donut	11	220-520
Spherical/ball	3	515-575
Total	14	Total average weight 382

B/B4 locus 83, is a small room, south of room DD409, with mudbrick constructions and basins.

Group VII

Type	Number	Weight range in gram
Donut	10	200-390
Spherical/ball	2	490-530
Conical	1	1550
Total	13	Total average weight 320

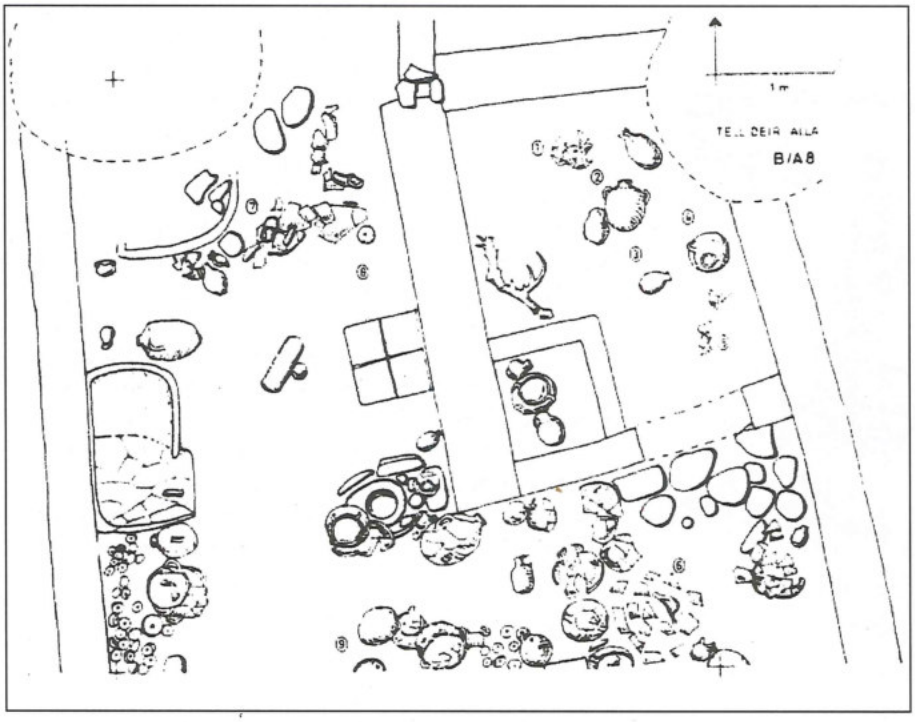
B/B5 locus 129, is a small open courtyard next to the above room. It seems that the loom weights of these two looms were scattered around the room and the courtyard. The looms probably stood on the roof and fell down with the roof-material.

Group VIII

Type	Number	Weight range in gram
Donut	15	205-465
Spherical/ball	6	265-525
Wheel	4	270-430
Mixed type	4	415-275
Total	29	Total average weight 353

B/C6 locus 117, is a small room belonging to the complex with the benched room and associated with Bal'am text and drawings on the plastered wall (**Fig. 20**) (Room EE335 in Fig. 17/Top plan).

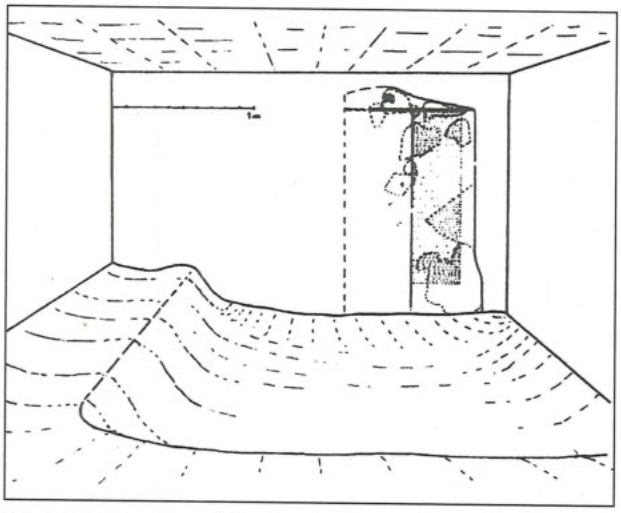
Group IX
B/C8 locus 75, is a room with a pavement of cob-



19. Reconstruction of the rooms in BA8 (Group II and III) (Kooij and Ibrahim 1989: 82).

Type	Number	Weight range in gr.
Donut	15	190-550
Spherical/ball	6	125-500
Conical	1	460
Wheel	16	405-595
Cylindrical	8	425-640
Beehive shaped	1	250
Mixed type	5	335-490
Total	52	Total average weight 370

bles, next to the cobble-paved courtyard with a large amount of plant matter. This plant matter was only macroscopically analysed and is defined as layers of reed laid down on a muddy pavement (Kooij 2002: 68). The plant matter has to be analysed. It could be hemp left in the open air on the cobbled pavement of the yard for ratting (Boertien 2005b). The loom weights scattered around suggest that the loom stood on the roof of this building and fell inside with the roof material (**Fig. 21**).



20. Reconstruction of the benched room (room EE335) with the Bal'am plaster text (Kooij and Ibrahim 1989: 64).



21. The loom weights of group IX (B/C8 75) — the loom probably stood on the roof of the building.

Group X

Type	Number	Weight range in gr.
Donut	10	220-465
Wheel	1	430
Cylindrical	3	420-480
Mixed type	2	405-570
Total	16	Total average weight 378

B/D7 locus 52, the entrance (North side) to the cobble stone paved courtyard. The loom stood in the entrance next to bread ovens, at the Northeast corner of the benched room where the Bal'am text was found.

Group XI

Type	Number	Weight range in gr.
Donut	4	305-460
Spherical/ball	4	355-520
Wheel	7	450-500
Mixed type	2	500-520
Total	17	Total average weight 393

B/D7 locus 54, is the courtyard as described above. This loom stood on the unpaved part of the yard next to a mudbrick construction.

Group XII

Type	Number	Weight range in gr.
Donut	12	255-480
Conical	17	320-500
Beehive shaped	4	460-500
Spool (un-perforated weight)	1	430
Total	34	Total average weight 347

B/E9 locus 24, roofed room partly paved with cobblestones. There were three rows of weights. The loom stood next to a large cooking pot. This group contains a special weight: An imperforated spool/ reel shaped weight found together with the perforated weights. The spool: Height 8.5; Diameter 7-6cm; Weight 430 gram. It was made of the same banded clay, though not so well mixed and contained grit. The form is comparable to the spools found in Northern Syria (Cecchini 2000: 212) (**Fig. 5**). In group XII three fragments are found made from the same sort of clay but these fragments could not be clearly identified. They may have been three more spool shaped weights. The donut shaped weights in this group are of the common type but the conical and beehive shaped loom weights used in this group look very much the same as the loom weights from Northern Syria (Cecchini 2000: 224) compared to **Fig. 23**

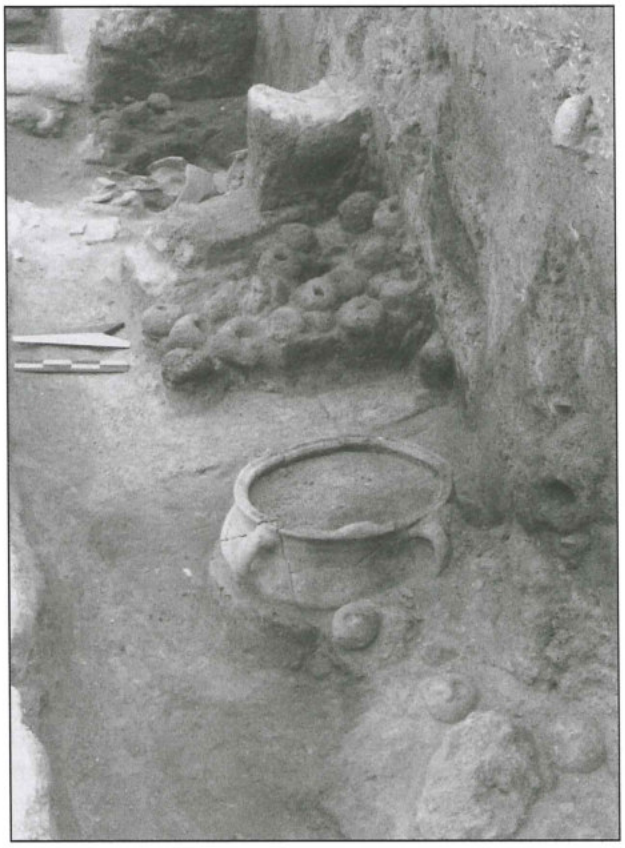
The upper row shows some of the conical weights together with a beehive shaped weight. The row in the middle shows some donut shaped weights. The last row shows the spool shaped imperforated weight in the middle and a conical weight on both sides (**Fig. 22**).

Group XIII

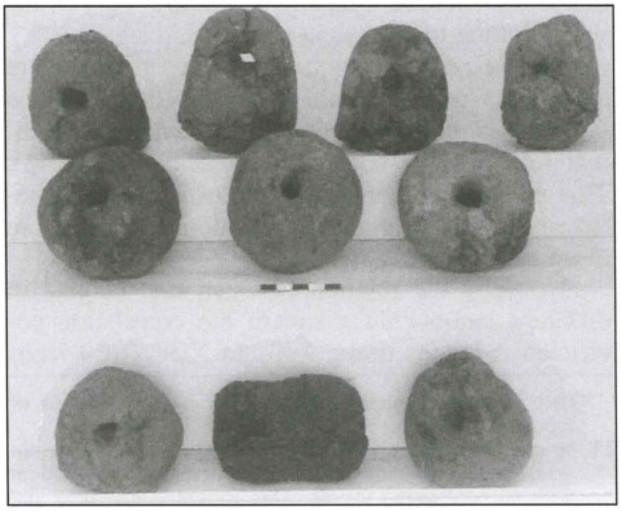
B/E9 locus 67, is a roofed room partly covered

Type	Number	Weight range in gr.
Donut	7	400-540
Conical	6	355-520
Beehive shaped	1	445
Total	14	Total average weight 379

with cobble stones. The loom stood next to a lined shallow mudbrick pit (Comparable to room DD417), and near a small mudbrick table/ construction filled with line seed.



22. The loom weights of group XII. (B/E9 24).



23. Some of the loom weights from group XII (B/E9 locus 24).

Group XIV

Type	Number	Weight range in gr.
Donut	68	190-460
Spherical/ball	12	225-1050
Conical	2	445-575
Cylindrical	8	260-575
Mixed	8	240-305
Total	98	Total average weight 267

D/D7 locus 123=D/C7 locus 100, not on the plan of Iron Age Dayr 'Allā. This very large group of weights is found together with carbonised organic material (**Fig. 24**) (not yet analysed). The connection between the different loci is not clear.

Group XV

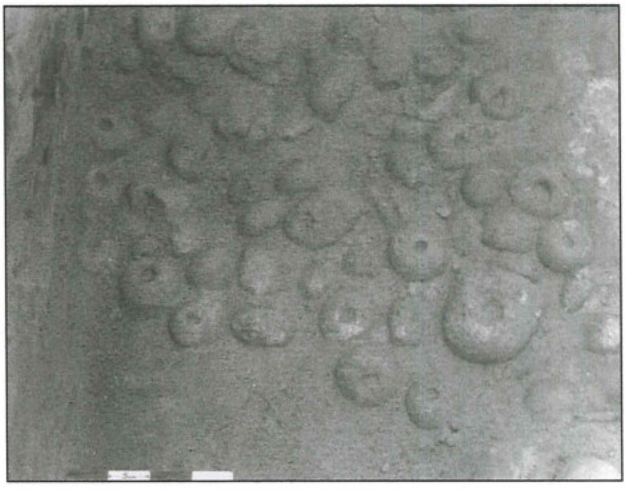
B*8 locus 9 Not on the plan of Dayr 'Allā phase IX. This group was found with carbonised organic material that has not yet been analysed. The group is very interesting because of the strange forms and mixed types used.

Type	Number	Weight range in gr.
Donut	13	300-400
Spherical/ball	4	129-310
Conical	5	330-450
Mixed type	1	470
Amorph	1	270
Total	24	Total average weight 338

The Relationship between Different Types of Loom Weights Within a Group

The calculations are based on the 15 large groups of loom weights from phase IX. Browning (1988) states that there is a relationship between the donut and the conical loom weight. He states that when they are used in a household the relationship is 1:5. In Dayr 'Allā this relationship is 1:6 but more differences in form are seen than at in Tall Battash.

Working in an analogue way the pendant-like loom weights (with a horizontal perforation) and the centrally perforated (vertical perforation) weights that are to be compared within a group of



24. The loom weight of group XIV during the excavation.

weights.

The result for Dayr 'Allā phase IX is horizontal perforation: vertical perforation 1:7. The interrelation can be shown by the correlation coefficient for the shape of the loom weights from Iron Age Dayr 'Allā. A correlation coefficient of 0.70 indicates an interesting relation that has to be studied (Velde 1996: 50-51). The general conclusion is that none of these relations in shape is very important.

These statistics give some extra information:

1. The correlation coefficient for the donut and the conical loom weight is 0.59.
   Conclusion: There is a slight relation between these types.
2. The correlation coefficient between conical loom weight and the beehive shaped loom weight is 0.22.
   Conclusion: There is no relation between these horizontal perforated types.
3. The correlation coefficient between the wheel form and the spherical loom weights is 0.40.
   Conclusion: There is a slight relation.
4. The correlation coefficient between the cylindrical and the wheel form loom weight is 0.54.
   Conclusion: This points to a slight relation.

The general conclusion must be that there is no special relation within different types of loom weight used on the warp-weighted loom.

The Weight of Loom Weights

The average weight of loom weights used on a loom in Dayr 'Allā is 8kg. The average weight of a loom weight in phase IX is 465.9g.

Often the weights used within one loom are supposed to be similar, but differences are recorded. Barber mentions the possibility that heavier weights were used at each end of a loom to strengthen the side selvedges (Barber 1991: 96). Hoffmann records that sometimes two weights were tied to one bunch of threads to balance the shed, and that there are weavers using much heavier weights tied to each end to strengthen the side selvedges, which get a lot of wear. She records differences of about 450g between the weights on the loom and the last two for the selvedges (Hoffmann 1974: 42, 65). In Iron Age Dayr 'Allā this phenomenon was not visible.

Because some of the studied large groups contained extra large weights the influence of weight was studied[10]. A donut type loom weight of 2400 grams was found in group II (B/A8 locus 55). The height is 10cm, the diameter is 18cm and the perforation has a diameter of 6.5cm.The influence in the figures of this extra large weight is limited because all donuts (the huge weight included) have an average weight of 335 gram without this extra big weight this would be an average weight of 325 gram. Within group II the average weight of all loom weights is 379.3 (the huge weight included), without the large weight it would be 307 gram. An extra large conical weight was found in group VII (B/B5 129) the weight is 1550 grams. The height is 11.5cm, the diameter is 13cm, and the perforation diameter is 3cm. This conical weight shows signs of use in the perforation.

The weights in this locus have an average weight of 320 grams when the huge weight is counted. Without this extra large weight the average weight would be 201 grams, which is very low considering the average weight of Iron Age loom weights is normally is 300-400 gram (Shamir 1996: 140). This shows that the huge weights are to be counted within the loom weights till we know what their function was and if this function is related to the loom weights. In group XIV (D/D7 locus 123) a huge spherical weight was found. The diameter is 16cm, the height is 7.5cm and the weight is 1050 grams. The heaviest weight was found in square B*8 locus 11: a conical weight, the diameter of which is 14cm, the height is 17cm, the perforation diameter is 5cm, and the weight is 2740 gram[11]. The relation between the large loom weights and the normal sized weights in the same locus was studied but no special relationship could be found in the weight or in the type. This clarifies that it is difficult to find significant influence of the weight of the loom weight used within a loom.

The weight of a loom weight and the measure of the perforation could have a relation to the thread used, but these parameters do not have a direct relation (the correlation coefficient is 0.48). This means that there is no interesting relation between the weight of a loom weight and the measure of the perforation.

To study the relation between the weights in different loci within a square the correlation coefficient between group XII and XIII (B/E9 locus

10. Within the collection of Dayr 'Alla 4 very large and heavy weights are found. Dr. G. van der Kooij (personal communication) suggested that these weights are not loom weights, this indeed is not sure.
    But because these huge weights are found within the collections of loom weights (in the same square and locus) and are registered as part of the same find (find-number), they will be counted as part of the different groups of loom weights.
11. In the same square B*8 in locus 14 an undefined weight was found, the diameter 14cm and the height is 10.4cm with no perforation visible. This weight is damaged and thus not represented in this group.

24 and B/E9 locus 67) was calculated. The result is a correlation of 0.08, which makes clear that there is no statistical relation between these two large groups of loom weights. This means that different types of weights were used within one household.

Conclusions

The 589 studied loom weights from Iron Age Dayr 'Allā make clear that research on loom weights has to be based on loom weights from sites with large numbers of weights. Then conclusions can be made out of the average numbers and weights belonging to the same loom and household can be studied.

From the study of the large Dayr 'Allā collection it is clear that there is no correlation between form and function of the loom weights on the warp-weighted loom. Crowfoot (1951: 29) and Browning (1988) suggested that there was a correlation between form and function but this can not be proved in the Iron Age collection of Dayr 'Allā. This means that the type of used loom weights does not give us the opportunity to find out what sort of textiles were made.

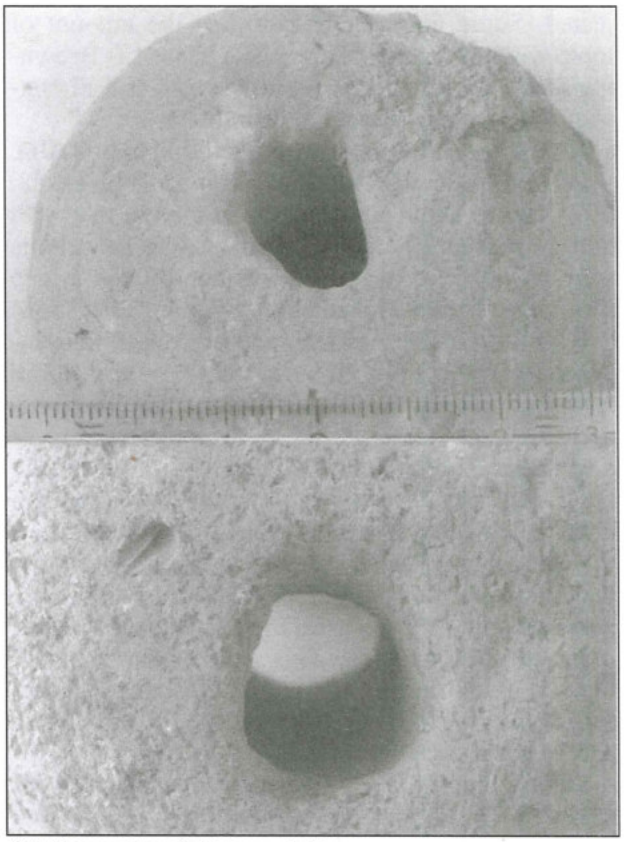
There is no statistical correlation between the form and the number of loom weights used on this type of loom. In Dayr 'Allā the average set of loom weights is 22.2 weights. The weights have been used for a long period, this is visible from the use traces of threads occasionally left on the unbaked weights (Appendix to this article) (**Figs. 25, 26**).

In one household different types of loom weights were used. There is no special inter-relationship between the used weights on a loom, neither in weight nor in type. It is interesting that the types used in Iron Age Dayr 'Allā show a relation to the type of loom weights used in the Iron Age in Northern Syria, as described by Cecchini in her publication on the textile industry in Tall (2000).

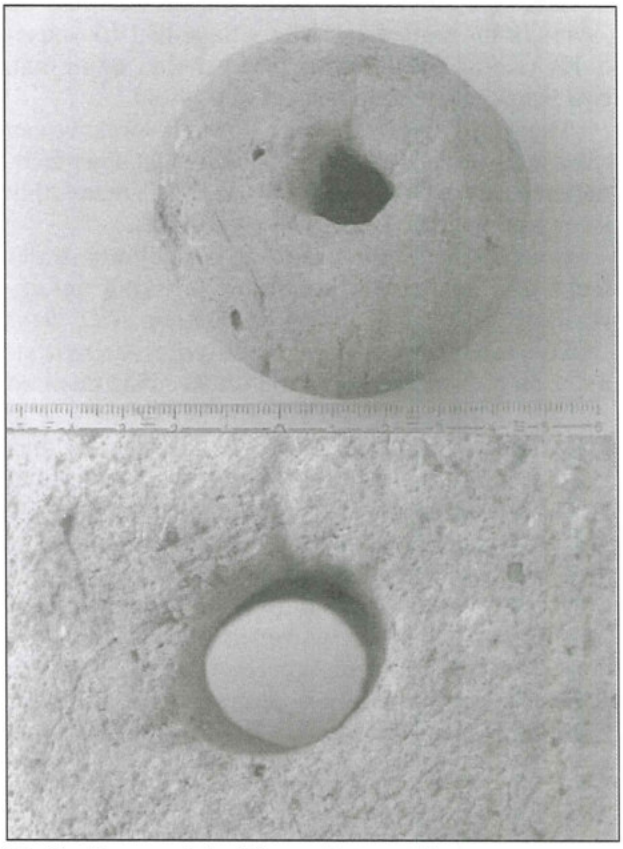
The type of a loom weight does not indicate the sort of textile produced but it might indicate a regional tradition for manufacturing the loom weights.

Household Production Only?

Another important point is whether weaving was done only for household use or that it also had commercial value. G. van der Kooij states that: "The fact that at the moment of the earthquake, only a few looms were in use, makes it possible that textiles were only made for home use when needed" (Kooij and Ibrahim 1989: 88). However, because of the amount of loom weights found in the village of phase IX, till now 675 loom weights are registered, (and even more are expected) this idea has to be re-



25. Traces of use in loom weights.



26. Used loom weights (Macro-photograph).

jected. Some numbers to compare the amount of loom weights found in Dayr 'Allā phase IX: Browning (1988) counted 288 loom weights at Tall Battash and he writes about textile industry.

In Tall as-Sa'īdiya, not far from Tall Dayr 'Allā, Pritchard (1985: 16-18 and 35-38) and Tubb (1988, 1998) write about a production for own use with 215 loom weights. In Jerusalem 186 loom weights were found, 97 of these weights were found in one room, the 'Bullae House'. Orit Shamir (1996: 153) calls this domestic weaving activity rather than industrial production. Kenyon found 128 loom weights in Jerusalem in and around one building, and Margreet Steiner (1994: 122) interpreted this as a commercial production. This means that Iron Age Dayr 'Allā has three times more loom weights than other Iron Age sites in the Levant.

The interpretation of the amount of loom weights related to the rate of production is often a problem but in Dayr 'Allā each household had more than two looms. This means that the production of textile was an important economical factor for the community. The fact that a special fibre was made stresses this point.

When the village was destroyed there were about 675 loom weights in the different houses or on the roofs and in the courtyards. That means that in Iron Age Dayr 'Allā there were more than 30 looms in the settlement. The village had 15 households (Kooij and Ibrahim 1989) that is more than two warp-weighted looms per household.[12]

The warp-weighted loom is the only loom we can trace in the excavation, but it is likely that other techniques to make cloth were also used. This means that the amount of textile could be even higher.

Concluding: In this Iron Age agricultural settlement the inhabitants combined working in agriculture, trade and textile production. Tall Dayr 'Allā is located in an agriculturally fertile environment on a cross road of trade routes. This position and the amount of loom weights per household in this village makes it reasonable to suggest that during the Iron Age external contacts seem normal and almost essential. Because the inhabitants of the village were dependent on usual tools and their own craft more than on luxury goods and treasures (Petit 1999: 162). There must have been a form of distribution of textiles woven in the village. It is reasonable to see Iron Age Dayr 'Allā as an important textile production centre, where different kinds of textile were produced and sold. Iron Age Dayr 'Allā situated on an important commercial crossroad was part of a trading and exchange network in which the textiles probably played an important role. The production of the special fine hemp cloth possibly strengthened the position of the small village within this network. It is clear that the production of textile in this village was on a household production level for a (local) market.

Reanalysing textile material from the Levant is necessary to distinguish between linen and hemp in the textile finds. The use of a scanning electron microscope and knowledge of textile plant fibres is indispensable. When more detailed information is available then the special hemp-textile made in Iron Age Dayr 'Allā could lead to distribution patterns of textile production in the Levant.

Where was Weaving Done Within the Village?

Weaving could be done at different places in or near the house. The warp-weighted loom needs some space to stand next to a wall, a beam or a construction made to stand against.

To weave fine textile or patterned cloth much light is needed, that is the reason why the description of Kooij is not very logical. In his view the rooms are dark and dusty, and this was the place were weaving was done (Picking up the threads 1989: 88). But for weaving much light is needed. The finds show that other places were used for setting up the loom, such as on the roof (Browning 1988: 133; Steiner 2001: 100) or in the courtyard of the house. Inside the house is a possible place to weave if there were windows and/or a door opening and/or enough light shining through the thin mats on the roof (Kooij 2002: 70-71). If the house is roofed than it is possible to use the roof, as a place to make textile and the courtyard seems a suitable place.

The plan of phase IX shows that some looms stood inside a room, such as the looms of group I, II, V, XII and XIII. Sometimes loom weights were in storage, such as group III. Looms stood on the roof as suggested by group VI, VII and IX. And the looms stood in the courtyard, such as the two looms near the bread ovens group X and XI. In conclusion, in Iron Age Dayr 'Allā the looms stood inside the house, in the courtyard and on the roof.

In this publication I focused on loom weights. But besides loom weights the rest of the artefacts used to produce textile will have to be studied. Especially the spinning whorls, bone spatulae, (sword

12. 675 loom weights were found in Iron Age Dayr 'Allā. The average number for a loom is 22.2 loom weights. 675: 22.2 = 30.40 looms. There are 14-15 households 30.40: 15 = 2.02. This suggests that there were two looms in each household in Iron Age Dayr 'Allā.

beaters) and pin beaters used for beating up and /or pattern weaving. These are of interest in relation to the loom weights (Crowfoot 1941, 1944, 1945; Tufnell 1953: 397; Hoffmann 1974: 320). To make a comprehensive reconstruction of the textile production of this village in the late Iron Age the connection between the different tools used in textile production have to be studied in relation to the use of space. This will be possible when the detailed stratigraphic information of Tall Dayr 'Allā phase IX is published.

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APPENDIX

Experiment Making Loom Weights

Introduction

Iron Age loom weights show a great variety in form, and thus to make a typology based on technological information technical information about manufacturing loom weights was needed. While studying the collection from Dayr 'Allā it became clear that it was sometimes difficult to distinguish between marks of manufacture and traces of use. An experiment was needed to gather information on the marks manufacturing leaves on different types of raw loom weights. The perforation often showed signs that could not have been understood. The author therefore decided to perform a small experiment.

The Experiment

From technical analysis on the pottery from Dayr 'Allā done by the Institute for Pottery Technology in Leiden it is known that in this region the local banded Lisan clay was used for pottery-making.

In this clay two groups of non-plastic materials can be differentiated:

1. A combination of quartz-sand and organic material.
2. A combination of quartz-sand, lime and organic material (Kalsbeek 1969: 73-80).

Quartz-sand washed down by the az-Zarqā' river occurs in abundance in the vicinity of Dayr 'Allā.

Temper indicates non-plastic elements in a clay, which are considered to have been added by the potter (Franken and Steiner 1990: 79)

The temper used in loom weights is often organic, together with the small and large stones, it is probable that the clay was not specifically cleaned or selected before it was used for the loom weights.

For the experiment local clay was used without a special temper. The clay was collected from a clay-bed 20 minutes walk southeast of the tall. No extra temper was added because the clay collected contained the above mentioned components and it was a good plastic clay as described by Kalsbeek (1969: 74) [13]. The experiment was carried out in 1999 when the temperature was 18-25° C. 22 loom weights were made, based on shapes of the loom weights found in Tall Dayr 'Allā phase IX.

The 'problem' in the collection from the Iron Age showed us that some models had typical drying cracks. The drying process of thick parts takes a long time and the escaping air between the clay-particles damages the surface of the clay. To study these phenomena two different groups were made.

The kneading and drying process of clays was studied to distinguish between damage related to the way of making the loom weights and damage caused by use. Two different groups of weights were made. (See step 4 of the working scheme).

In Group I the clay was kneaded, while the new loom weights dried the thick loom weights showed the expected cracks. In Group II, more kneading was done to work out the air from the clay. Kneading the clay thoroughly is really necessary to produce workable clay.

Working Scheme

1. Collecting the clay.
2. Crushing the lumps of hard clay.
3. Adding water and mixing the clay.
4. Kneading (thoroughly) into a lump of plastic clay, two different groups were distinguished.
5. Preparing clay balls.
6. Shaping the balls into different types of loom weights.

13. The following test showed that the clay was good plastic clay. 'A simple test can be done on natural clay found near an excavated site, to find out about the plasticity of the material. After mixing some clay with water until it is kneadable, a roll is made 15cm long and 1cm in diameter. One lifts the roll holding one end between the fingers, while the other end can swing freely. If the clay roll breaks of, the clay is not plastic. If the roll does not break, and if it is possible to wind the free end like a snail's shell, without causing the clay to crack, it is a very good plastic or unctuous clay'.

7. Perforating the loom weights.
8. Smoothing the surface.
9. Drying the object.
10. Traces of use.
11. Firing the weights.
12. Disintegrating of raw clay loom weights.

Collecting the clay

The clay used is the local banded lisan marl from a source 20 minutes walk south-east of Tall Dayr 'Allā. The clay was not specially selected. Some stones, sand and organic materials were left in the clay as known from the loom weights of this period. (See the chapter The loom weights from Iron Age Dayr 'Allā 'The material').

Crushing the lumps of hard clay

Crushing was needed to make a workable mixture. The clay showed different colours from grey to brown, and from red to pink and yellow. Small pieces of iron ore were visible as small red spots.

Adding water and mixing the clay

The original loom weights showed signs of being made of a dry clay mixture. Therefore we decided to keep the clay rather dry. But for some models more water had to be added while working.

Kneading the clay

In the Iron Age collection a difference could be observed in the way the clay was treated. A small number of loom weights were made of nicely selected and thoroughly kneaded fine clay that resulted in a smooth structured loom weight. But most loom weights are made of clay that suggested nonchalance in selecting and working before use. These weights contained big stones and sand or organic material in different amounts.

Here a difference was made for two series of loom weights. Group I was made of a medium mixed and kneaded clay, to make 9 loom weights of different type. And group II made of well-mixed and kneaded clay for 13 loom weights of different type. For both groups this was done in a different way, for the first group the clay was slightly mixed and kneaded and the clay for the second group was mixed very well and kneaded thoroughly.

I. Kneading and mixing the clay medium for the first group of loom weights in the experiment.
II. Kneading and mixing the clay thoroughly for the second amount of loom weights to make a difference with group I.

Preparing the clay balls

Each piece of clay weighed about 350 grams (this is the average weight of Iron Age loom weights (Shamir 1996: 140). At the time of the experiment the numbers of the loom weights from Tall Dayr 'Allā phase IX were not yet available).

Shaping the loom weights

While making the loom weights it became clear that some shapes are very logical to make. A piece of clay is easily formed in the hand to a coil, while forming the fore finger, middle finger and thumb of the right hand automatically press the clay together while placing the piece of clay on the left hand, then a conical form stands between both hands! (**Fig. 27**).

It was very surprising to see that the most 'illogical' form of loom weight came into being in such a simple way. The conical loom weight with a rounded bottom stood on the palm of the hand, while the same pressed coil placed on a flat underground gave the shape of the conical loom weight with a flat bottom. The distinction between the two conical loom weight-forms appeared to be of less interest, it actually is the same form, made on different surfaces.

The beehive form is related to the conical form. It is basically made from the same pressed coil, but now the bottom and the upper part of the weight are flattened. This type always has a very small perforation half way through the loom weight. An intermediary has to be attached to this weight such as a loop or a stick or a rod to fasten the warp threads to this loom weight.

The donut form loom weight is easily made, forming a coil and winding it around a finger, this gives



27. Forming the conical loom weight.

a donut form with a diameter of max. 6-9cm. A coil of about 15-18cm and 3cm high can still be worked around the finger, but longer or thicker roles are impossible to be used in this way.

Big loom weights of this type, (with a diameter over 9cm) are made in a different way, a spherical piece of clay is perforated with a stick, traces of such sticks are found in the loom weights of Dayr 'Allā. The donut is smoothed with wet hands to make a regular form and often these larger donuts have a flat side even after smoothing. The big loom weights show signs of this way of making and regularly some clay is pressed out the hole at one side and it is smoothed and pressed away on the donut. It is clear that larger donuts are worked out in a different way than the smaller ones.

To make a real spherical form appeared to be difficult, a clay ball of 350 grams is not very easily formed into a smooth ball. Perforating these balls with a stick had the difficulty of misforming the ball. Friend (1998: 9) suggests that "the ball shape was easier to make" but it is difficult to make a good ball-shaped weight. The ball-shaped weights have an additional problem in that whilst drying deep cracks occurred. These cracks could be repaired in the leather-hard clay.

The cylindrical form develops from the ball shaped form. Working on a hard surface a spherical form quickly develops into a cylinder, it is even more practical to make a cylinder, a clay-ball placed on a hard surface and then rolled on this surface while forming, will turn into a cylinder. Perforating the cylindrical weight is not easy, as is the perforation of the spherical weight because both forms have a long way to pierce through.

The wheel form develops from working around a stick. A clay ball with a stick in the centre is transformed into a wheel-form when working on a hard surface and when the clay is smoothed in the direction of the stick. The typical form of the wheel-formed loom weight 'grows' out of the clay lump while pressing the clay in the direction of the stick and making it flat around the stick. This gives the wheel its typical form, a slight depression in the wheel occurs when smoothing and then a truncation often is the result. When the weight is turned and the wheel rolls over the surface of this weight is nicely smoothed while the perforation widens in a conical form. This is typical for these weights.

Pulling out the stick leaves traces in the loom weights (the so-called truncated top, thus it is not a typological difference) the pulling often changes the form of the wheel in an asymmetric wheel. The wheel form appeared to be a quick way of making a loom weight, it can be large and heavy without the problems the spherical and cylindrical weights have, because this form is thinner, the hole is not so long and the problems while drying are less.

The mixed forms in the collection of Phase IX show a special relation between three types of loom weights related to the production process. When a weight is of a medium size (less than 9cm in diameter) and it is formed holding the clay in the hand forming the weight around a stick or the finger, only the final steps make the difference in type. This leads in the category of medium weights to a mixed type, because in the case of a larger weight the forming techniques are principally different.

The wheel form and the cylindrical loom weight are made out of a donut form, in the collection of Deyr 'Allā this is visible in different species that show both or even the three forms in one weight.

4.3 % of the 589 loom weights from phase IX show a mixed form:

- 5 loom weights are partly a donut and partly a wheel formed weight.
- 6 loom weights are donuts worked out as a cylinder.
- 9 loom weights are spherical and worked out as a cylinder.
- 2 loom weights are spherical and donut in one
- 2 weight is a combination of a conical and a donut form
- 1 donut/triangle formed huge weight
- 1 weight shows 3 forms in one, a donut/cylinder that is partly spherical.

From the above experiment this is logical, because when working on a flat surface the weights with a diameter between 5 and 7.5cm are very much related by their measurement and the forming techniques used. All these weights have a hole with a diameter of 2cm, they are partially made in the same way, only the last steps in the forming process differ and that causes the difference in form. The 'mixed type' shows this fact clearly.

Perforating the Loom Weights

The hole in the middle of the loom weight can be made in two ways. While making the object a coil of clay is wrapped around a stick or a finger, or the hole is made afterwards by perforating the weight with a stick. This leaves different traces on the clay. We can distinguish between a horizontal perforation above the middle of the weight. This gives the pendant form, as seen in the conical and beehive shaped weights and a vertical perforation in the middle of the weight seen in most donut, ball, cylindrical and wheel-shaped weights.

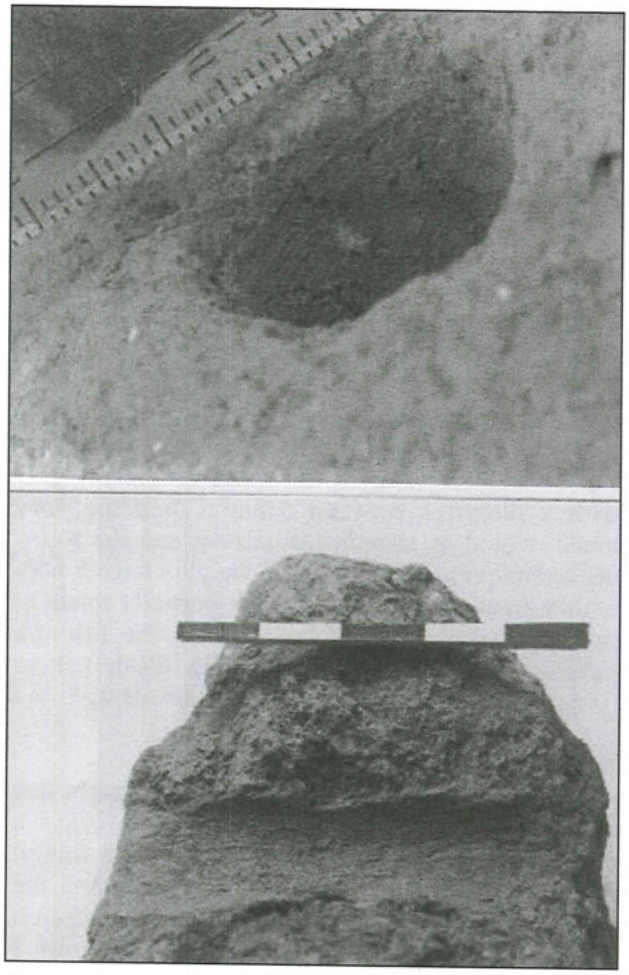
With a stick a weight can be perforated from

one side, this often gives characteristic traces in the wet clay that are still visible in the dry material and on the weight (**Fig. 28**). Sometimes the clay is worked from one side and comes out of the hole, often signs of smoothing are visible.

A perforation can be made from two sides and leaves typical traces inside the loom weight. Before the stick is taken out of the weight it can be turned around, this often results in a hole with a conical form at one side. The size of the perforation depends on the way the hole is made. Perforations wider than 2.5cm in diameter are always made from two sides.

Smoothing the surface

When leather hard the weights could be smoothed easily with wet hands. Small cracks can thus be mended.



28. Traces of manufacture in loom weights from Tall Dayr 'Allā.

Drying the loom weights

Loom weights are thick clay artefacts and to prevent cracks they have to dry slowly. Drying in the sun as described by Shamir (1994: 37, 1996: 136) and suggested by Bienkowski (Bienkowski 1995: 89) is impossible. Drying has to be done in the shade as potters do with their pots. When drying to quick deep cracks as reported by Rye (1981: 21-24, fig. 46) for the rim of pots will develop [14]. The loom weights in the experiment were dried in the shade. After two days they were turned over. At a temperature of 18-25 °C it took 8 days for the weights to dry thoroughly.

Even during the slow drying process in the shade, the thick loom weights of group I cracked, because the drying process of thick parts takes a long time and the escaping air between the clay-particles damages the surface of the clay. Often very deep cracks appeared during the drying process, especially in or around the perforation in the spherical and cylindrical weights. When this happened it was clear that kneading the clay thoroughly is really necessary to produce a good loom weight.

In group II, more kneading was done to work the air out of the clay. It is important to distinguish between cracks that occurred whilst drying and cracks related to firing. Firing cracks develop related to the temper used in clay. As reported for the re-baked loom weights by Albright (1943: 118) they make the weight brittle. Because Iron Age loom weights were not meant to be baked, a lot of this sort of damage is visible in the collection of Dayr 'Allā. Here the destruction fire baked the loom weights by accident.

The experiment showed that deep cracks are difficult to avoid for the relatively thick weights. The form of the cracks is comparable to the description for pottery in Rye (1981: 66 and figure 46). The edges of cracks that form during drying tend to be irregular, frayed, and rough as a consequence of slow development. If a crack results from drying the edges will tend to remain in alignment on the surface. Drying problems give long and deep sharp cracks extending vertically.

This sort of damage can be seen in the thick loom weights within the collection of Dayr 'Allā. Here the spherical, donut and wheel-shaped weights sometimes show surface cracks, due to the drying process and thus not related to use.

In conical loom weights sometimes cracks occur around the perforation, especially when the hole is

14. The drying rate is related to the nature of the packing of clay minerals, which govern the size and distribution of capillaries through which water reaches the surface where it can evaporate. Because clays and bodies shrink during drying, stresses are created when one part dries more quickly than another and cracks develop (Rye 1988: 21-24).

more than 2cm in diameter.

Traces of use

The loom weights are very hard after drying. Threads of wool and linen were pulled through different types of loom weights for several hours. The loom weights were then examined under a magnifying glass and no signs of usage were visible. Trying to make traces of use in the weights did not succeed in this experiment. This corresponds to the experiment done by Orith Shamir. Her conclusion was that grooves do not always form (Shamir 1996: 143). Because loom weights do not move that much on a loom it will take a very long time to produce grooves of usage, even in unbaked weights. The fact that these traces have been found in the collection from Dayr 'Allā shows that the weights have been used very intensively and for a very long period. Grooves in loom weights that originate from usage can be distinguished from other damage by the place and the form.

Usage gives a smooth broad curve at one side of the weight. That is the place where the weight pulls the bunch of threads due to gravitational pull (**Figs. 25** and **26**).

Firing the loom weights

Albright (1943: 118) did a firing experiment: Re-baking loom weights in a controlled fire with a temperature of 970° C resulted in cracks around the perforation and after a day this caused disintegration of the weight.

The loom weights of Dayr 'Allā phase IX are made of unfired clay, but many loom weights of this layer are "fired" in the fire that destroyed the village after the earthquake. The question was what happens to raw loom weights when occasionally fired in an uncontrolled fire.

Eight loom weights from the experiment were fired in an open fire. The fire was kept burning during 1.5 hour, and the loom weights were kept in the hot ashes for half an hour longer. The temperature in such a fire is max 1000° C, organic material burns out and the colour of the clay turns to red/brown and sometimes black due to the fluctuating temperature and different oxygen rates. If the temperature is low and it rises slowly the colour hardly changes. Most of the weights did not collapse in this fire, even the ones from the first group made of medium mixed and kneaded clay. The high temperatures reached during the accidental firing can make the weights brittle.

The result of firing the weights from the experiment showed the same sort of changes, in colour and structure and eventually damages comparable to the weight from the Iron Age. The destruction fire of Iron Age Dayr 'Allā caused the same sort of firing traces as seen on the loom weights in the experiment.

Disintegrating

From literature by Shamir (1996: 136) and Hoffmann (1974: 314) and from experience at different archaeological digs it is known that unfired clay loom weights disintegrate when getting wet. When left lying in the rain they turn to clay. In this experiment this fact was proved. Some unbaked, but dry loom weights were wetted and fell to pieces when wetted again they turned to clay [15].

Conclusions

The experiment made clear that the loom weights of Dayr 'Allā were used unbaked and were not intended to be fired. Often the clay was used just as it was found containing organic material and stones. As known from ceramic production, drying the weights has to be done slowly and not in the full sun. Describing weights as sundried is not correct.

The production of loom weights shows that the form is not so diverse as most authors report. The experiment showed that the development of the form could be explained by the production method. This means that a different typology is needed in which the form is related to the way of production.

Bi-conical weights are not a special type of loom weight but belong to the donut form weights. Perforation is often done with a stick, the so called truncated top is the result of taking the stick out of the hole and does not point to a different type. The conical loom weight is very easy to make.

The spherical/ ball shaped weight is problematic while drying and it is not as easy and fast to make this type of loom weight as often suggested.

Weights with a diameter between 5-7.5cm are very much related in the way they were produced and this results in a group of loom weights with a mixed type. Traces of use are visible in loom weights only when they are used for a very long time.

Jeannette H. Boertien
Ixiadal 4
2317 HL Leiden
The Netherlands
Tel *31-715211318
e-mail: jeannette@levant.cc

15. This experiment was based on personal communication (1996) with Loes Dumas, object registrar on the Tall Dayr 'Allā project. She said that when a bucket with unfired loom weights was accidentally left in the rain, this bucket after a day turned to a bucket filled with clay. In this way tens of loom weights were lost.

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THE INTERNATIONAL WĀDĪ FARASA PROJECT (IWFP) PRELIMINARY REPORT ON THE 2003 SEASON

Stephan G. Schmid and André Barmasse

I. Introduction and acknowledgments

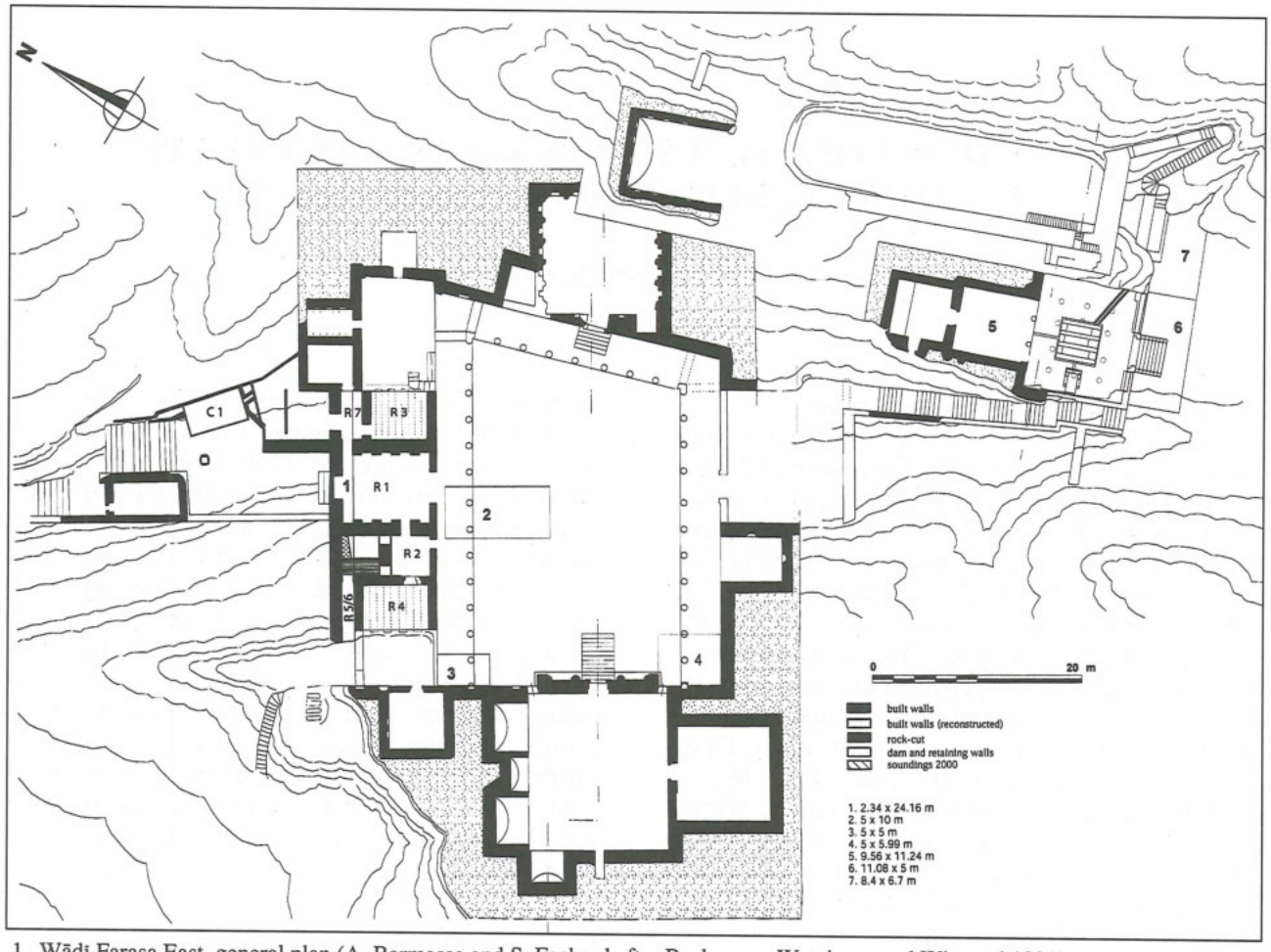
The field season 2003 of the International Wādī Farasa Project (IWFP) lasted from August 24th to September 18th. The IWFP 2003 was carried out by the Association for the Understanding of Ancient Cultures (AUAC: www.home.tiscalinet.ch/iwfp), based in Basel (Switzerland) and the Palestine Exploration Fund (PEF, London: www.pef.org.uk). We would like to thank the director general of the Department of Antiquities, Dr. Fawwaz Al-Khraysheh, for his support and for granting the working permit as well as Dr. Fawzi Zayadine ('Amman) and Prof. David Graf (Miami) for their continuous interest in the project. We are very glad to announce that since 2003 Nestlé Pure Life, the bottled water division of Nestlé International S.A., represented in Jordan by Ghadeer Mineral Waters, is sponsoring our project.

The following persons participated in the 2003 season of the IWFP: Stephan G. Schmid, director (Montpellier), André Barmasse, MA (Basel), Caroline Huguenot, MA (Lausanne), Dr. Konstantinos Politis (PEF, London) and Ahmad Jum'a al-Shami, MA (representative of the Department of Antiquities) whose help and advice were much appreciated. Seventeen workmen and one teawoman from the Bdūl tribe were employed. Further, the IWFP 2003 season would not have been possible without the friendly cohabitation in the John Lewis Burckhardt Centre (Nazzal's Camp) with the team from Basel University carrying out the Swiss-Liechtenstein excavations at az-Zanṭūr (الزنطور) ; the practical advice of Dr. Bernhard Kolb (Basel) considerably advanced our campaign. We would also like to thank IFAPO Amman for lodging the team during its stay at Amman.

Following the results of the previous seasons (cf. Schmid 2000b; 2001a; 2001b; Schmid and Studer 2002) work on the upper and lower terraces of the Wādī Farasa (وادي فرسة) East continued with the following soundings and trenches (**Fig. 1**): On the upper terrace work in trenches 5 and 6, containing the so-called Garden Triclinium and the space in front of it, continued in order to completely clean the entire structure. The second rock cut room of the "triclinium" itself was cleared of remains of its previous use as a stable for sheep and goats (trench 5 on **Fig. 1**). On the lower terrace, sounding 1 was extended towards the east, west and north, exposing further rooms belonging to the entrance complex (**Figs. 1, 2**). In addition trench 2 from the 2000 and 2001 seasons was partially reopened and extended towards the east, so that the entire transition from the entrance hall to the N-portico and into the courtyard has been exposed. Further activities included cleaning in front of the complex of the Soldier's Tomb and during these activities a cistern was discovered and partly exposed (C 1 on **Fig. 1**).

II. Lower Terrace

While cleaning an area just to the north of the Soldier Tomb complex to prepare it for storing the stone blocks exposed during excavation, a rather big cistern was discovered (C 1 on **Fig. 1; Figs. 3, 4**), measuring 5.2m x 3.4m and 2.20m in depth. Following this discovery, the storing of the stone blocks was moved elsewhere and investigation of the cistern started. The cistern initially was covered with four arches and slabs, some of the slabs still being *in situ* on the southern corner (**Fig. 3** bottom left). Contrary to the cistern in front of the "Garden Triclinium" where the arches were entirely constructed on one side and inset on the other (cf. Schmid 2001b; Schmid and Studer 2002), in the newly discovered cistern the arches were inset on both sides into spaces cut into the rock (**Fig. 4**). In order to clarify the stratigraphy in the cistern, only one third of it was excavated this year while the remaining part shall be exposed in a forthcoming season. On the upper levels of the cistern fill huge blocks of stone clearly indicated a violent destruction of the covering and the arches (**Fig. 3**). Until about 30cm above the ground of the cistern the pottery from all strata showed a mixed composition, containing a wide range from Nabataean

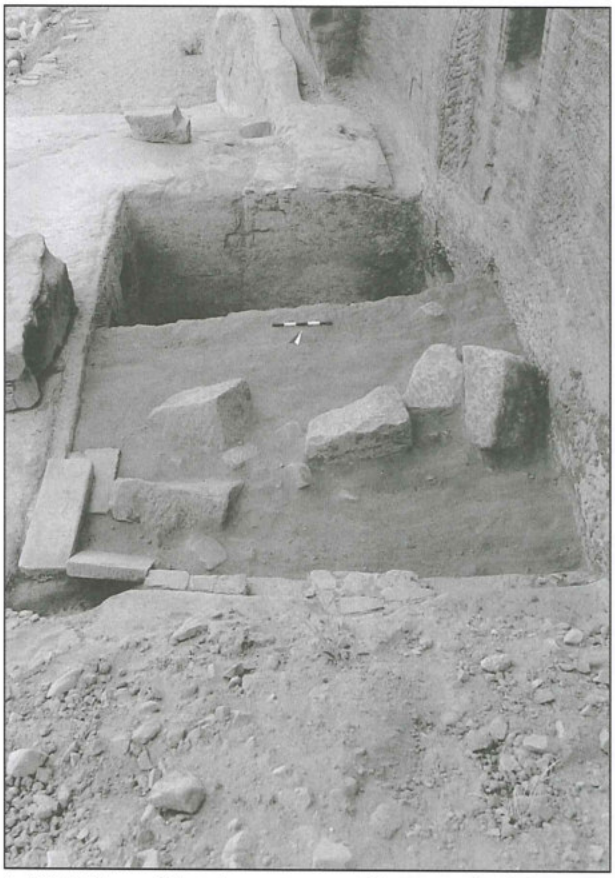


1. Wādī Farasa East, general plan (A. Barmasse and S. Fachard after Bachmann, Watzinger and Wiegand 1921).



2. Wādī Farasa East, lower terrace. General view from S (Schmid).

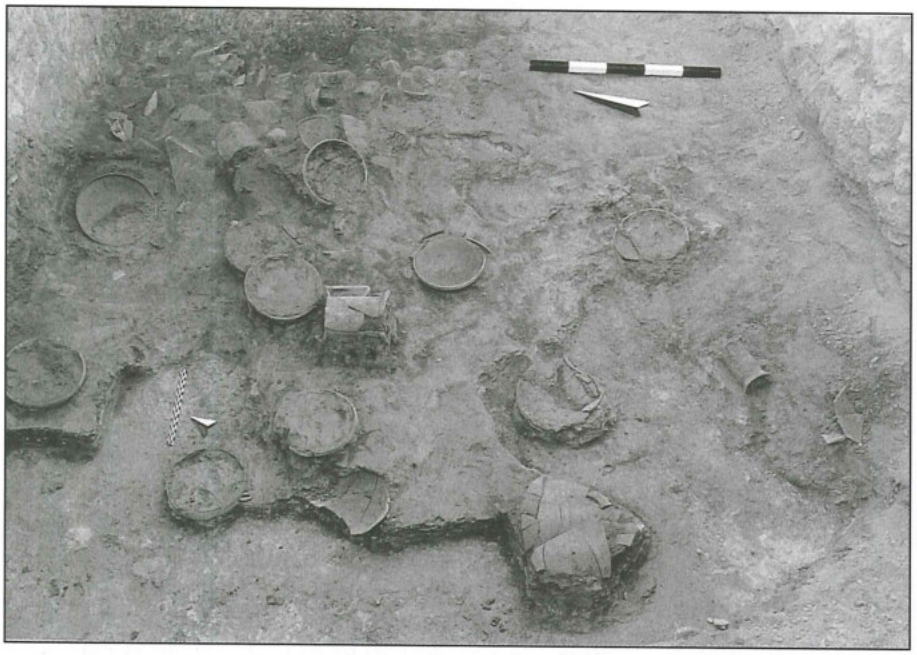
to Medieval pottery. On the other hand, the pottery from the last layer, measuring about 30cm in thickness, contained exclusively Nabataean pottery from the first century AD. Interestingly, the bottom of the cistern was literally covered with fractured but complete pottery (**Fig. 5**), indicating that all this pottery must have been intact when it was thrown into the cistern. The collected ensemble strongly suggests one of pottery belonging to a household: cooking pots, jugs, jars, flasks and a vast majority of fine ware bowls and plates (**Fig. 6**). Interestingly, on more than one dozen plain plates of Nabataean fine ware collected so far comes only one complete painted specimen (beneath the small arrow on (**Fig. 5**, top left on **Fig. 6**). This bowl belongs to type E 18a 187 and to phase 3a according to the typology and chronology established for az-Zanṭūr (Schmid 2000a: chap. V. 2. 26). Phase 3a running from ca. 25 to 75 AD, this bowl is also the earliest specimen from that layer while some other painted sherds belong to phase 3b, ranging from ca. 75 to 100 AD. The unpainted pottery belongs to phases 3a and 3b without further specification possible and, therefore, to a span of time from ca. AD 20 to AD 100. The complete pottery from the ground of the cistern was found stuck in a very compact layer of clay containing earth, surely being the result of a silting process and, therefore, indicating that the pottery was thrown in the cistern when the latter still was working as such. This raises of course the question why several dozen complete vessels may have been thrown in a still working cistern. As far as the provenience of the pottery is concerned, the cleaning of the area surrounding the cistern showed that similar but broken pottery is found in a layer coming from higher up the S of the cistern. Together with the pottery important amounts of bones were found in-



3. Wādī Farasa East, lower terrace. Cistern north of the complex from S (Schmid).



4. Wādī Farasa East, lower terrace. Cistern north of the complex from NE (Schmid).



5. Wādī Farasa East, lower terrace. Cistern north of the complex with pottery *in situ* (Schmid).



6. Nabataean pottery from cistern on Figs. 2 and 3 (Schmid).

side the cistern, some of them belonging to a rather big animal, probably a camel. Most interestingly, the detailed statistic analysis of different bone material from all over the Petra area by Dr. Jacqueline Studer (Geneva) showed that the camel was exclusively consumed during the Nabataean and Roman periods, while in later periods it disappeared from the local menu (J. Studer in Frösén *et al.* 2001: 385). It would seem, then, that our cistern deposit represents the remains of a feast that took part on the lower terrace of the Wādī Farasa East, once again stressing the multifunctionality of that complex. One can only guess as to whether that pottery was used in the triclinium opposite the Soldier's Tomb. A further speculation is related to the rounded stones found together with the pottery (**Fig. 6** bottom left). These could indeed be sling stones for small catapults and, therefore, indicating a violent destruction of the complex or some parts of it (on the functioning and equipment of catapults in a wider context see Baatz 1994). Since the pottery from the ground of the cistern includes the last quarter of the first century AD as is specified by the painted sherds, one could be tempted to evoke the Roman annexation of the Nabataean kingdom in AD 106, especially since other contexts could be related to that event by previous research (Schmid 2000a: 139-146; 1997). However, in other contexts

probably related to the Roman annexation, pottery from phase 3c, being produced from the early second century AD onwards, was already present. Since the cistern under investigation has not yet been fully excavated we should remain cautious about final interpretations. In any case, as will become clear with results obtained from the western sector of the entrance complex, the structure of the Soldier's Tomb was not only in use in the second century AD but even saw an enlargement (cf. infra).

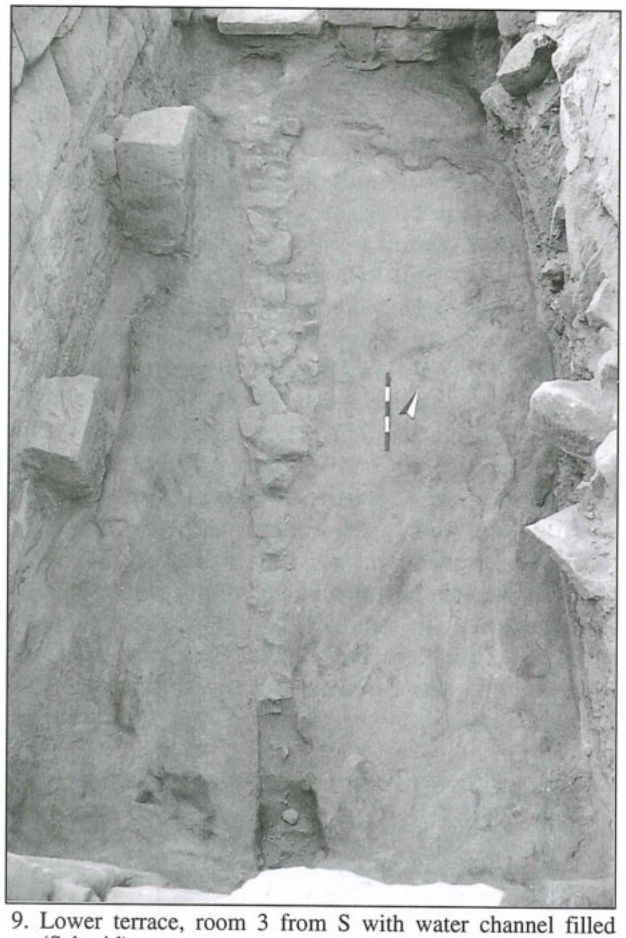
In 2001 and 2002 we exposed the main entrance to the complex of the "Soldier Tomb", consisting of a huge entrance hall (room 1; cf. **Figs. 1, 2**) immediately upon the huge terrace wall as well as the adjacent room 2 (cf. **Figs. 1, 2**). The complete clearing of the huge entrance hall (room 1) revealed also a small door in its NE corner, clearly leading to a very small corridor or staircase. This room, temporarily numbered as room 7, apparently had the function of giving access from the main entrance hall to several lateral units as it shows four doors in total (**Fig. 7**; cf. **Figs. 1, 2**). The room itself measures 4.30m x 2.15m and once was covered with high quality floor slabs, some of them still being *in situ* on the eastern part of the room (**Fig. 7**). In the eastern wall of room 7 a door still standing upright for more than two meters opens to a next room completely filled with debris (**Fig. 7** background). Interestingly, a small door in the northern wall of room 7 gives access to a next room that, therefore, projects from the northern limit of the complex indicated by the huge main wall (on this wall cf. Schmid 2001b). These two rooms to the north and to the east of room 7 shall be exposed in a subsequent season. In the southern wall of room 7 another door opens towards room 3, partially cut into the rock (**Figs. 8, 9**). Room 3 measures 4m x 6.5m and once was covered by four vaulted arches as is indicated by the respective rock cuttings in its eastern wall and the two pillars positioned towards the western wall (left on **Figs. 8, 9**). In the western part of the room, that was exposed this year, a rock cut channel runs in a S-N direction but was never completely finished as shown in Fig. 8. During the later reuse of the room the channel was filled in and covered in a somewhat hastey manner (**Fig. 9**). Other than not yet



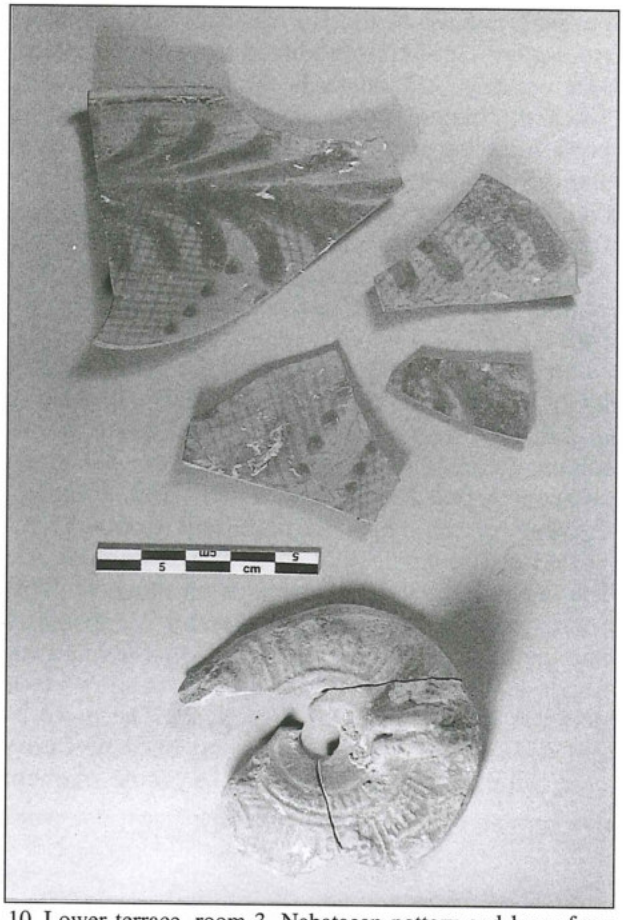
7. Lower terrace, room 7 from W (Schmid).



8. Lower terrace, room 3 from S with water channel cleaned (Schmid).



9. Lower terrace, room 3 from S with water channel filled (Schmid).



10. Lower terrace, room 3, Nabataean pottery and lamp from channel fill (Schmid).

cleaned and identified coins, Nabataean pottery and a fragment of a lamp were found in the channel fill (**Fig. 10**). The pottery belongs to phase 3b of Nabataean fine ware, that is the last quarter of the first century AD (Schmid 2000a: 28f. 38), whilst the lamp is from the so-called Negev 1a type, produced during most of the first century AD (I. Zanoni in Bignasca, A. *et al.* 1996: 314-316; new research by M. Grawehr shows that Negev 1a lamps do continue well into the second half of the first century AD, pers. comm.). The latest phase of use of room 3 can be dated to the Medieval period as Medieval pottery was found directly on the rock that apparently served as the floor level during that period. Also the stone built walls of the room were partially rebuilt in the Medieval period as is indicated by their low quality technique. However, in the Nabataean period the room must have been covered with floor slabs about 30cm higher than the actual rock level as is indicated by the original threshold of the door leading to room 7 (top on **Figs. 8, 9**). The Medieval reuse of that area corresponds well to the observations already made for room 1 during our 2002 season (cf. Schmid and Studer 2002) and on other occasions during this year's excavation (cf. below).

The rooms to the east of the structures so far exposed (cf. **Fig. 1** and background on **Fig. 7**), as well as rock cuttings for stairs visible in the rock higher up, clearly indicate that the entrance pavilion to the Soldier's Tomb complex had two storeys and, therefore, must have been a massive and truly impressive construction.

On the other side of the entrance complex room 4 was exposed (**Fig. 11**, cf. **Figs. 1, 2**). Room 4 measures 4.0m x 6.40m and is built in a very similar technique as room 3, i.e. one wall (here the western one) is cut into the rock and the room was once covered with four vaulted arches. In contrast to room 3, in room 4 about three quarters of the original floor slabs are still *in situ* (**Fig. 11**). However, as became clear at several points including the missing parts where the bedding of the floor slabs was visible, the actual state of the floor corresponds to a later phase of our complex. As a matter of fact, beneath the western part of room 4 runs an important rock cut water canalisation, the same that is clearly visible on the outside of the main re-



11. Lower terrace, room 4 from S (Schmid).

taining wall of our complex (Schmid 2001b). A small sounding at a location towards the western limit of room 4, where the floor slabs were missing, showed that this canalisation was filled in with massive stones and smaller elements in order to establish the actual floor level of room 4 (**Fig. 12**). The fill also contained architectural elements, some of them even showing plaster of wall paintings. The slabs were bedded into a layer containing lime mortar, a very unusual technique in Nabataean times, as we already observed last year in room 2 (cf. Schmid and Studer 2002). The pottery of that fill beneath the floor slabs belonged to the early second century AD, showing the characteristic late Nabataean painting styles (phases 3c and 4 according to Schmid 2000a: chap. IV. 1.; IV. 5.; XII.). Within the finds from that fill is an almost complete lamp with a barely visible *ovulus* decoration on its shoulder (**Fig. 13**). Similar lamps were found in the Petra theatre, more specifically in a context dated by the excavator to the first years after the Roman annexation (Hammond 1965: 65



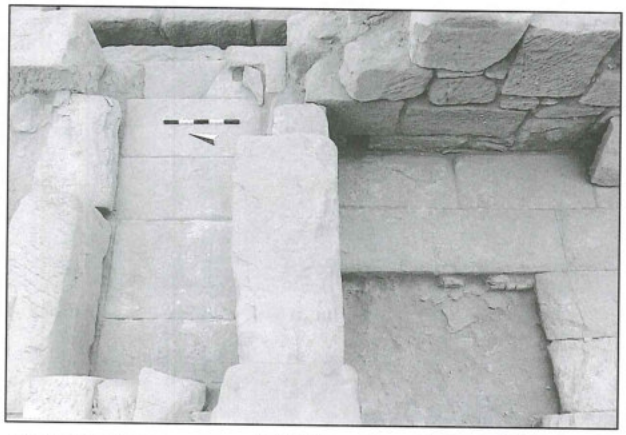
13. Lower terrace, room 4, lamp with ovulus decoration from fill (Schmid).



12. Lower terrace, room 4, fill beneath floor slabs (Schmid).

[period Ic]. 80) and in tomb 64b opposite the Khazna, apparently belonging to the second century AD (Zayadine 1982: 371f. nos. 3. 8 pl. 122). A precision of the chronology of this type will be possible with the publication of the finds from az-Zanṭūr, where more than 40 examples were found, clearly indicating the main production of these lamps in the late first and second century AD[1]. The filling in of the water canalisation and the bedding of the floor slabs of room 4 can, therefore, be dated to a period after the Roman annexation of Nabataea in AD 106. As the main parts of the Soldier's Tomb complex were constructed around the middle of the first century AD, the question raises whether room 4 had a Nabataean predecessor or not. An answer to that question would be all the more important as it would help to clarify the picture of the outer façade of the entire complex (cf. on this Schmid 2001b; Schmid and Studer 2002). Probably to the same period, i.e. the early second century AD, belongs the construction a small room 5/6 to the S of room 4 (**Figs. 14, 15**). Related to the area E of it by a small door, this new room (a staircase?) was covered with well-cut floor slabs being on a slightly higher level than the slabs of room 4. The re-use of the rooms and the partial reconstruction of the walls in the Medieval period considerably increase the difficulties in interpreting the relation and the function of the rooms in the western part of the complex. After the construction of room 4 in the early second century AD, it was used for quite a while as is underlined by the thick layer containing ashes and "fat" earth, typical for remains of household activities (**Fig. 16**). To our knowledge it seems that at least two major rooms – room 2 and room 4 – as well as smaller structures such as room 5/6 were added to the complex in the early second century AD. Although for the time being, it is not clear whether any of these rooms had earlier predecessors, this constellation shows that the complex continued to be in use after the Roman annexation in AD 106 and probably was even enlarged. This can be taken as another element as well as for the importance of the Soldier's Tomb complex as well as for its multipurpose function. There would have been no good reason to take care in that manner about a simple tomb two or more generations after its construction. This as well as the results obtained about the installations on the lower terrace (see below) show that the owner of the entire complex has to be located at the very top of Nabataean society.

Like most of the other rooms room 4 also saw a Medieval reuse which, however, took place on a level about 40cm higher than the floor slabs so that the last layers inside the room remain untouched. From the Medieval layer higher up comes a tombstone with a carved cross, reusing a Nabataean floor slab. With the new tombstone we already have five Medieval funerary stones from the lower



14. Lower terrace, room 4 (right) and small room 5/6 to the S of it (left) (Schmid).

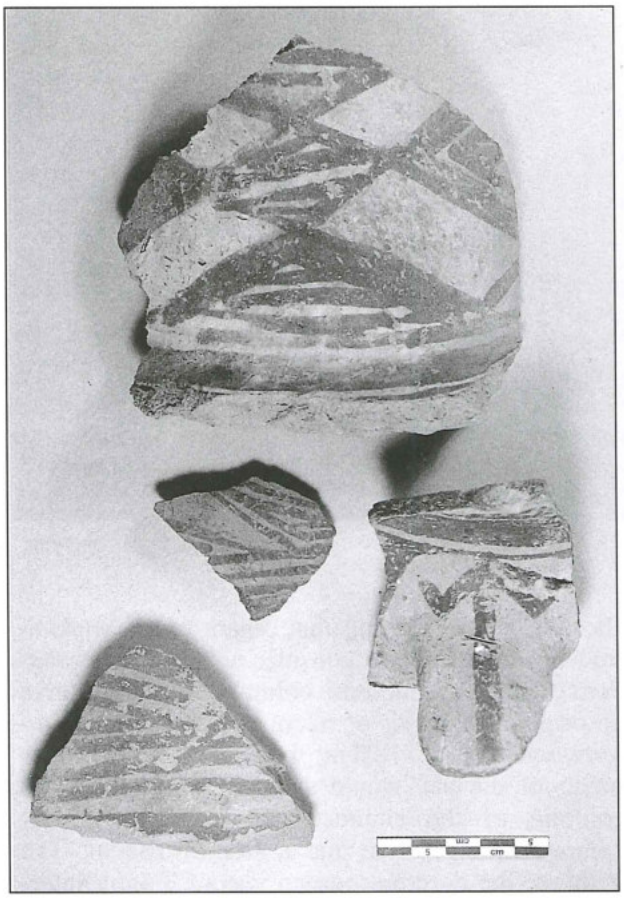


15. Lower terrace, SE corner of room 4 and small room 5/6 to the S of it (Schmid).



16. Lower terrace, room 4, floor slabs and dark layer of household activities on top (Schmid).

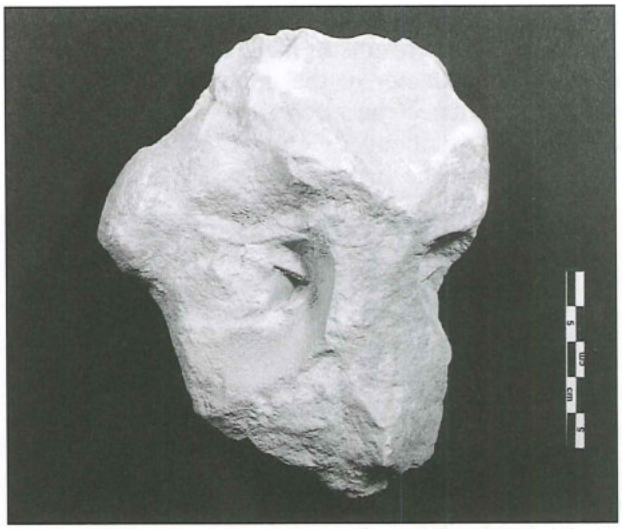
1 We would like to thank M. Grawehr (Basel) for his comments on the lamp fig. 12 and information about the finds from az-Zanṭūr. His results will be published in volume III of the Petra az-Zanṭūr series (forthcoming).



17. Lower terrace, room 4, Medieval painted pottery (Schmid).



18. Lower terrace, room 4, left arm of statue from Soldier's Tomb (Schmid).



19. Part of the face from a statue from the Soldier's Tomb (Schmid).

and upper terrace in the Wādī Farasa East (on the others see Schmid 2001b), underlining once more the importance of the Medieval occupation of that part of the city of Petra. The pottery from these Medieval strata does contain the characteristic handmade painted ware (**Fig. 17**) belonging to the 11th to 13th century AD that has been mentioned on previous occasions (Schmid 2000b, 2001b, Schmid and Studer 2002).

From the same Medieval layers comes a fragment of one of the statues on the attica zone of the Soldier's Tomb (**Fig. 18**), identical in technique and material to the ones we found in 2002 just in front of the tomb (Schmid and Studer 2002). The fragment illustrated on Fig. 18 shows a bended left arm and could belong to the statue on the right side of the tomb. The analysis of the fragments found during the past season further revealed part of a human face from one of the statues (**Fig. 19**). As the block with the head of the central figure, i.e. the so-called soldier, is completely missing, the fragment on Fig. 19 most probably belongs to one of the lateral statues.

We take this opportunity to announce a series of other sculptural finds by the kind permission of Suleiman Farajat from the Petra office of the Department of Antiquities. During the cleaning activities realized by the Department of Antiquities in the frame of a World Bank sponsored project (on this project see also the contribution on the "Renaissance Tomb" in this volume) the cavities in the Wādī Farasa West were cleaned. Inside the triclinium BD 256 (Brünnow – Domaszewski 1904:

279 no. 256) not only the huge installations for the banqueters were found and, therefore, eliminating any doubt as for the use of the room, but also several fragments of limestone sculptures belonging to at least life size statues (**Fig. 20**). Most of them are fragments of drapery difficult to identify more precisely. However, there are some fragments of cuirasses (**Fig. 20** bottom right) as well as a huge fragment of a shoulder wearing a cloak (**Fig. 21**). Inside the triclinium where the fragments were found there is no space to place life size statues nor is there in the other rock cut installations nearby. It would seem possible then that these fragments belong to the statues in high relief from the Soldier's Tomb in the Wādī Farasa East. However, other sculptural decoration within the installations of the Wādī Farasa East and West should be ruled out a *priori*.

In order to proceed with the cleaning of the central area of the complex, that is the courtyard and the surrounding porticoes, trench 2 was reopened and extended towards East (**Fig. 22;** cf. **Figs. 1, 2**). Beside the two columns already exposed in 2000 (cf. Schmid 2000b), a third one was found this year belonging to the main access from the N-portico to the courtyard. As it could be supposed already from the reconstructed plan of the area (cf. **Fig. 1**), the distance between the two columns forming the entrance is slightly bigger than in the other cases. According to the results of the 2000 and 2003 campaigns, the diameter of the columns is 60cm, the standard distance between the columns (*intercolumnium*) is about 187cm with the bay measuring 247cm. The better preserved column drums



21. Statue fragment from the Wādī Farasa West showing shoulder wearing cloak (Schmid).

showed careful carving that points to the application of stucco. If we consider a layer of approx. 1cm of stucco around the columns this would give an original diameter of 62cm and therefore an *intercolumnium* of 185cm; however the measurements of the bay would still be 247cm. The two columns of the entrance zone show an *intercolumnium* of 224cm and a bay of 284cm. The width of the northern portico was of 3.65m. Interestingly, the water channel exposed last year in room 1 continues straight into the portico (**Fig. 22** bottom) but not further into the courtyard. This means that it served to collect and drain the rain water from the roof of the portico, showing once again the technical skill of the Nabataeans.



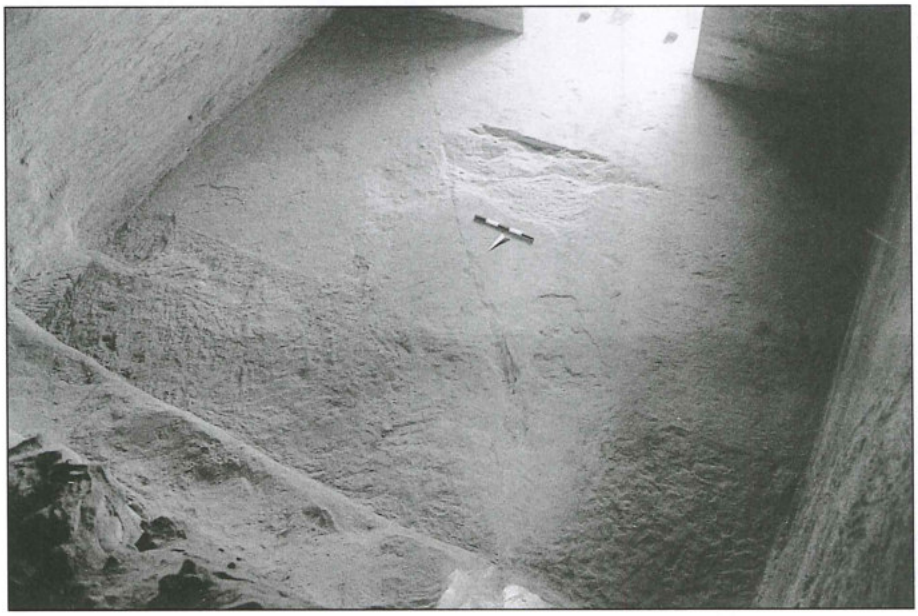
20. Statue fragments from the Wādī Farasa West (Schmid).



22. Lower terrace, trench 2 from E (Schmid).

III. Upper Terrace

On the upper terrace we cleaned the second rock-cut room of the so-called Garden Triclinium from the remains of its modern occupation so that the entire monument is now completely cleaned. As with the first room of that structure, the second one did not contain any additional hint as to its original use (**Fig. 23**). As already indicated in previous years, the absence of *loculi* or other devices for the deposit of sarcophagi or corpses clearly speaks against the use of the structure as a tomb. Further, the sliding traces beyond the threshold of the door that separated the two rooms (**Fig. 24**) shows that this door was regularly used, another argument for the profane use of the structure. About three quarters of the second room are executed in the best Nabataean carving technique indicating that the room once must have been covered by painted stucco. Some small fragments of painted stucco maybe belonging to the Garden Triclinium were found in the cistern and in debris in front of it (**Fig. 25**). The last part of the room, however, is done in a much less careful technique (**Fig. 26**) sharply contrasting with the good carving of the other part. Most probably the enlargement of the room is due to a later reuse of it, as this is another area of massive Medieval occupation (cf. Schmid 2001b; Schmid and Studer 2002). Another explanation, already proposed by Bachmann, Watzinger and Wiegand, would be the assumption of a built wall at the rear of the carefully carved part in order to close the room at that point (Bachmann, Watzinger and Wiegand 1921: 87). Despite the "finish" of most of the walls of the second room and despite the clear traces of use as indicated by the door slides (**Fig. 24**), the room was not completed in Nabataean times. The window placed high on the western wall of the room was not completely finished as is clearly visible on **Fig. 27**, al-



23. Wādī Farasa East, upper terrace. Garden House, second rock-cut room from NW (Schmid).



24. Wādī Farasa East, upper terrace. Garden House, door between rooms (Schmid).

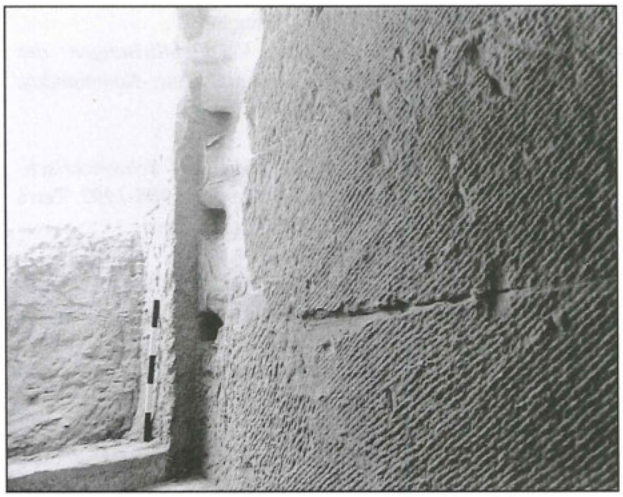


25. Wādī Farasa East, upper terrace. Fragments of painted wall plaster found in front of the Garden House (Schmid).



26. Wādī Farasa East, upper terrace. Garden House, second rock-cut room with careless carving in the rear part of the room (Schmid).

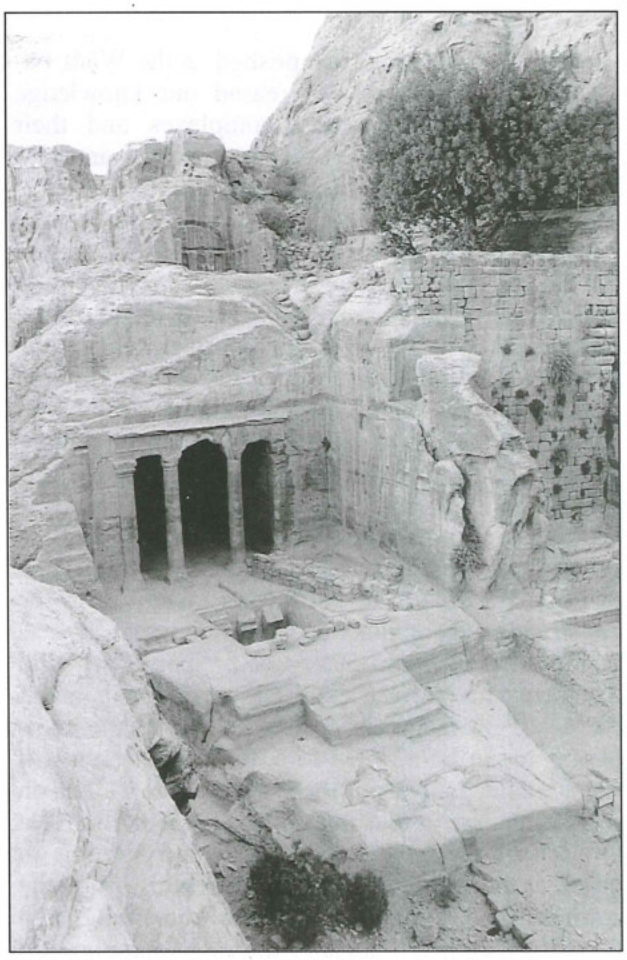
though the side walls as well as the holes for bars were accomplished. The complete cleaning of the structure did not reveal any additional element as for its traditional designation as "temple" or "triclinium", we are all the more inclined to stick with the interpretation proposed by Bachmann, Watzinger and Wiegand that we developed further since the start of the International Wādī Farasa Project in 1999 and to call that structure the "Garden House" rather than anything else (Bachmann, Watzinger and Wiegand 1921: 85-87; Schmid 2001a; 2001b, Schmid and Studer 2002). With the reconstruction as proposed, that is as a peristyle house with porticoes surrounding the rock-cut cistern in front of the façade, the entire area would become a stringent and well planned installation. The upper storey would allow a smooth circulation from the level of the huge cistern, using the rock-cut staircases in order to join the different areas. As



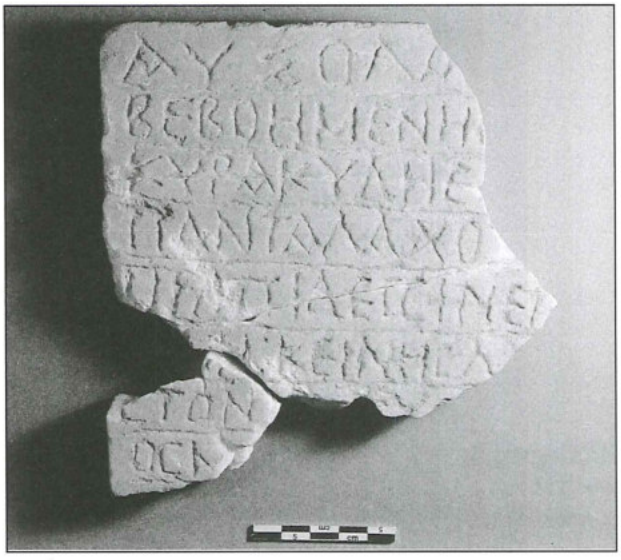
27. Wādī Farasa East, upper terrace. Garden House, window in the second rock-cut room (Schmid).

already pointed out in last years report and on other occasions (Schmid and Studer 2002; Schmid 2001a), the installation of the "Garden House" all the more turns out to follow in a surprisingly exact way the recommendations for constructing a Greek type peristyle house by the Roman engineer and architect Vitruvius, writing in the time of Augustus (Vitr., de archit. VII 149, 3f.). By the time of Vitruvius and even more by the time of constructing the "Garden House" (mid first century AD), these features had become integral part of luxurious Roman houses as well (see for a case study Dickmann 1997). With the interpretation of a good part of the upper terrace of the Wādī Farasa East as living area, we have of course to ask questions about functional aspects related to the other structures as well as about the relation between the different installations. Since the "Garden House" can be interpreted as a living area requiring regular access by its occupants, this means that they had to cross on a regular base the lower terrace with the Soldier's Tomb, the triclinium and the courtyard. This is a strong indication that the two terraces belonged to the same overall installation and also to the same owner, no matter whether this was a private, a family or a corporation.

In front of the Garden Triclinium the space of what could be called the podium of the structure was cleaned down to the natural rock (**Fig. 28**). The rock surface shows traces of stone extracting and quarrying and we can, therefore, presume that the needed building material for the monuments under study was extracted in the immediate neighbourhood. In this area (trench 6 on **Fig. 1**) a fragmented Greek inscription was found (**Fig. 29**). According to the shape of the letters the inscription dates to the Byzantine period and may be a funerary inscription mentioning the name of the deceased in the first line (Auxola[os]?).



28. Wādī Farasa East, upper terrace. Garden House (left) and huge cistern (right) from SW (Schmid).



29. Greek inscription from space in front of Garden House (Schmid).

IV. Perspectives

The work so far accomplished in the Wādī Farasa East considerably increased our knowledge about Nabataean funerary complexes and their function. As with every year new rooms and elements are discovered, the continuation of the activities of the International Wādī Farasa Project will contribute to some still outstanding answers as to the exact layout of that structure. In forthcoming seasons it would seem reasonable to focus on the eastern parts of the entrance complex and to the courtyard. With the discovery of several additional building phases, involving the main retaining wall as well as the rooms built behind it, special attention shall be devoted to the chronology of the different building phases. The possibility to excavate rooms preserved for almost the entire height of the ground floor such as indicated on the background of Figure 7, should reveal further insight as to the construction techniques and the functional aspects of the different main phases of the complex. With the increasing surface exposed, more details about the water management system related to the complex come to light. Therefore, further research will focus on the analysis of these systems as well as on the evaluation of the possibility for a partial restoration of the basic water evacuation systems in order to protect the rock-cut structures from the springs. The excavation of the remaining two thirds of the cistern north of the main complex (cf. above and C 1 on **Fig. 1**) shall be completed in a forthcoming season.

Stephan G. Schmid
Dépt. Histoire de l'art et Archéologie
– UMR 5140
Université de Montpellier III
Route de Mende
F-34199 Montpellier
stschmid@aol.com

André Barmasse (MA)
Erikasstrasse 7
CH-4057 Basel
andre.barmasse@hispeed.ch

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PRELIMINARY REPORT OF THE 2004 WĀDĪ AL-ḤASĀ CHERT SURVEY[1]

Deborah I. Olszewski, Maire P. Crowley and Maysoon al-Nahar

The Wādī al-Ḥasā (وادي الحسا) region has been the focus of archaeological survey and Paleolithic research since 1979. Early surveys of the south bank (Wadi Hasa Survey or WHS) of the al-Ḥasā drainage system by MacDonald *et al.* (1980, 1982, 1983) located hundreds of sites attributed to the Lower, Middle, and Upper Paleolithic, as well as the Epipaleolithic. Additional survey of the north bank (Wadi Hasa North Bank Survey or WHNBS) of the al-Ḥasā system by Clark *et al.* (1992, 1994) further augmented the number of Paleolithic and Epipaleolithic sites.

Based on the results of these surveys, several sites were chosen for more extensive research and test excavations. Initial work was conducted under the auspices of the Wadi Hasa Paleolithic Project (WHPP), under the direction of Geoffrey A. Clark, and involved work at the Middle Paleolithic sites of 'Ayn Difla (WHS 634) and WHS 623, the Upper Paleolithic sites of 'Ayn al-Buḥayra (عين البحيرة) (WHS 618) and Yutil al-Ḥasā (يتل الحسا) Areas A and B (WHS 784), the Early Epipaleolithic sites of Ṭūr aṭ-Ṭarīq طور الطريق (WHS 1065) and Yutil al-Ḥasā Areas C and E, and the Late Epipaleolithic in Area D at Yutil al-Ḥasā (Clark *et al.* 1987, 1988; Lindly and Clark 1987; Neeley *et al.* 1998; Olszewski *et al.* 1990, 1994).

Subsequent to the WHPP, the Eastern Hasa Late Pleistocene Project (EHLPP), under the direction of Deborah I. Olszewski and Nancy R. Coinman, continued test excavations at some of these sites, as well as including new sites. The EHLPP researched the Upper Paleolithic sites of Multaqa al-Widyān ملتقى الوديان (WHNBS 192-195), Ṭūr Ṣadaf طور صدف (WHNBS 8), Tha'lab al-Buḥayra ثعلب البحيرة (EHLPP 2), 'Ayn al-Buḥayra, and Yutil al-Ḥasā Area A. This project also tested Early Epipaleolithic occupations at Yutil al-Ḥasā Area C, Ṭūr ṣaghīr طور صغير (WHNBS 242), and Ṭūr aṭ-Ṭarīq, as well as Late Epipaleolithic (Early Natufian) at aṭ-Ṭabaqa (WHS 895) and Yutil al-Ḥasā Area D (Coinman *et al.* 1999; Olszewski *et al.* 1998, 2001).

The overarching goal of the WHPP and the EHLPP was to investigate long-term adaptations of Paleolithic and Epipaleolithic groups to the lake/marsh context that existed in the Wādī al-Ḥasā (Schuldenrein and Clark 1994). During the Pleistocene, the eastern basin of the al-Ḥasā (in the vicinity of the Desert Highway) was characterized by Lake Hasa, and remnant lake bottom sediments (marls) can still be seen to the west of the Desert Highway, particularly near the Ottoman period castle and the Ḥajj road. Farther down-wadi, there are similar marl deposits, especially near the confluences of various major tributary wadis with the Wādī al-Ḥasā. These locales are likely to have been a series of large ponds, fed primarily by fresh-water springs (Olszewski *et al.* 2001: 39). Analyses geared toward reconstructing the environmental parameters of the al-Ḥasā area, such as palynology, and specifying the types of animals favored by Paleolithic hunters at the sites investigated are on-going.

Adaptations, however, are not strictly environmentally determined, and they include aspects of daily life in addition to procuring food and water. One of these primary considerations is the need for flint/chert[2] for the manufacture of stone tools. Chipped stone artifacts, of course, often constitute the main line of evidence for prehistoric behaviors due to their durability over long periods of time. In

1. The Wādī al-Ḥasā Chert Survey was funded by grants from the National Science Foundation (#0309247) and the University of Pennsylvania Museum of Archaeology and Anthropology (Penn Museum). We thank Dr. Jeremy A. Sabloff, former Director of the Penn Museum, Dr. Fawwaz al-Khraysheh, Director of the Department of Antiquities and his staff, Mr. Ashraf Rawashdeh, our representative from the Department of Antiquities, Pierre and Patricia Bikai, Directors of ACOR and all the ACOR staff, and, finally, but not least, the people of Jordan. This is EHLPP Contribution No. 29.

2. We use the terms chert and flint interchangeably, while recognizing that most Levantine researchers prefer the term "flint" due to the generally high quality lithic raw materials used throughout the region and throughout much of the Paleolithic and Epipaleolithic periods.

this regard, understanding their typology and technology is one key to interpreting Paleolithic behavior. An equally important variable is to examine where the sources of flint/chert are located with respect to the archaeological sites, and to determine if the prehistoric flintknappers preferentially used only certain types or sources of flint/chert. Obviously, flint/chert sources and preferential use can also be monitored over time, with the expectation that prehistoric groups may have varied their use of sources. Identifying these prehistoric choices thus has implications for assessing the mobility of groups over the landscape, as well as whether or not they used methods of conserving flint/chert if this raw material was perceived to be scarce or difficult to obtain.

Previous Chert Survey in the Wādī al-Ḥasā Region

During the 2000 field season of the EHLPP, the question of the location of chert sources in the al-Ḥasā region was addressed through pedestrian survey transects in areas on both the south and north banks of the Wādī al-Ḥasā drainage system (Olszewski *et al.* 2001: 53-57). The 2000 chert survey began with six nonsystematic surveys (A-F), which were designed to allow the survey participants to gain an appreciation of the types of cherts and other knappable rocks that might be encountered in the al-Ḥasā region (**Fig. 1**). Following this introduction to the hard rock geology of the area, the EHLPP team walked 16 systematic transects (#1-16). In these systematic transects, team members were spaced from 50 to 150m apart, depending on the local topographic situation. Each person collected relevant chert samples along their line, and, in some cases, also collected examples of various marker beds within the geological formations that would aid in later placing the chert samples into the correct geological formation.

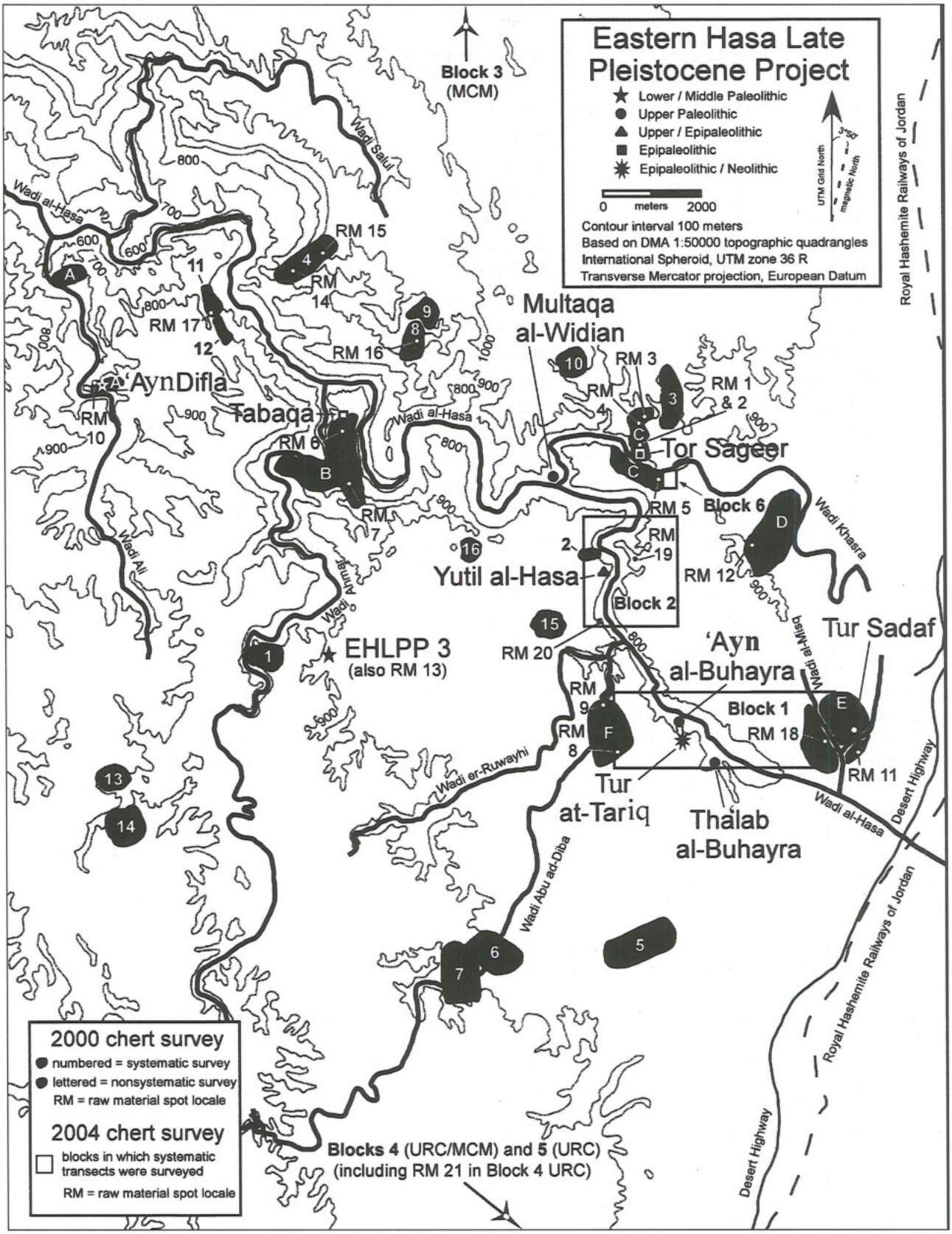
There are three major geological formations with wide exposure in the Wādī al-Ḥasā system. All contain varying amounts of chert, are pre-Quaternary in age (Cretaceous), and belong to the "Belqa Group" (descriptions are taken from Moumani 1997). The lowest formation examined by the 2000 survey is the Wadi Umm Ghudran Formation (WG). This formation is not exposed in the vicinity of Pleistocene Lake Hasa, but can be found downstream of the confluence with the Wādī ar-Ruwayḥī (وادي الرويحي), and coincides with where the Wādī al-Ḥasā narrows considerably. The WG consists of various limestone, sandstone, and quartzite occurrences. There are also brecciated cherts, chert lenses, and nodular cherts.

Overlying the WG is the Amman Silicified Limestone Formation (ASL). The ASL has numerous chert beds, often brecciated, and generally forms a relatively steep topography throughout the al-Ḥasā region. Other beds within the ASL include phosphatic cherts, dolomite cherts, coquinas, phosphates, and coquinal limestone. Some nodular chert is also present. The ASL is found mainly downstream of the confluence with the Wādī ar-Ruwayḥī, as well as in the plateau areas on the north and south banks of the al-Ḥasā system. There is also a small exposure of ASL near Pleistocene Lake Hasa. This begins near the mouth of the Wādī al-Misq (وادي المسك) and continues down steam along the Wādī al-Ḥasā proper.

The uppermost formation surveyed in 2000 is the Al-Hisa Phosphorite Formation (AHP). One prominent member of this formation is the Bahiya Coquina (BC), often easily recognizable due to the presence of numerous fossilized oyster shells. The AHP is characterized by phosphate, phosphatic chert, phosphatic limestone, chert, microcrystalline limestone, and, of course, coquinal limestone. This formation is widespread in the al-Ḥasā region, characterizing the majority of the landscape in the vicinity of Pleistocene Lake Hasa, as well as the plateau tops throughout the immediate region.

Examples of chert were encountered in virtually all transects in 2000, with nodular chert in the AHP occurring only as non-*in situ* examples. While this type of information was helpful in the general assessment of chert availability with the al-Ḥasā region, the goal of the 2000 chert survey was to find *in situ* nodular sources, as analysis of the stone artifacts from the archaeological sites indicated that nodular cherts were the preferred source type. To this end, the systematic transects during 2000 recorded a series of spot locales of *in situ* chert raw materials, including both bedded and nodular cherts (RM 1-17; see Figure 1). A handheld GPS unit was used to record each UTM location. These RM locations are not intended to indicate unique or exclusive chert sources, but rather serve as a method of spot-identifying promising chert sources that can eventually be compared to the archaeological materials. **Table 1** describes these RM spot locales.

In general, the 2000 chert survey accomplished its goals of identifying cherts and potential chert sources within the Wādī al-Ḥasā system. The picture that emerged after this research indicated that while cherts are nearly ubiquitous with the Wādī al-Ḥasā, many of the available cherts likely were not extensively used by Paleolithic and Epipaleolithic groups. This is because the majority of the cherts are bedded, brecciated, or otherwise



1. Map showing 2000 and 2004 chert survey areas.

Table 1: Spot Locales for Chert Raw Materials Identified during the 2000 Field Season.

#	Formation	Raw Material	Description
RM 1	WG/ASL	matte chert banded with silicified limestone	bedded; brecciated
RM 2	ASL	matte chert	bedded; generally flawed
RM 3	ASL/AHP	matte chert	surface nodules
RM 4	ASL/AHP	chert	surface nodules
RM 5	WG	silicified limestone	bedded; near top of WG
RM 6	WG	silicified limestone	bedded
RM 7	ASL	grey to grey-brown chert	*in situ* nodules in limestone
RM 8	AHP	grey chert	nodules in sediment
RM 9	AHP	siliceous coquina	bedded in BC coquinal limestone
RM 10	ASL	grey chert	bedded and *in situ* nodules
RM 11	AHP	chert	*in situ* nodules
RM 12	ASL	matte to grey chert	*in situ* nodules within chert bed
RM 13	AHP	cream-colored chert (EHLPP 3)	rubble surface
RM 14	WG/WSL	matte to grey chert	*in situ* nodules in limestone
RM 15	ASL	translucent and grey chert	bedded
RM 16	ASL	matte to grey chert	*in situ* nodules in limestone
RM 17	ASL	chert	bedded and *in situ* nodules

flawed, and while usable flakes can be struck from them, it would be difficult to prepare adequate cores from such sources. Additionally, there is a much wider range of knappable raw material in the al-Ḥasā region than was selected for use by most of its prehistoric inhabitants. These include, for example, highly siliceous phosphatic cherts, which have not been documented in any of the Wādī al-Ḥasā archaeological collections, and siliceous coquina, the use of which appears to be confined to Ṭūr aṭ-Ṭarīq[3], where this raw material can be found in abundance as rubble on the hilltop immediately above the site.

Several questions remained after the 2000 chert survey. The first of these concerns the characterization of *in situ* nodular chert sources. Time constraints during 2000 allowed the team to identify spot locales, but not to follow these laterally to measure the distance over which they are exposed or to document the variability in quality and color of chert that might be present within each *in situ* nodular source. The second question relates to whether prehistoric groups in the al-Ḥasā region used the al-Ḥasā chert sources exclusively, or transported cherts from other areas into the al-Ḥasā region. There are two geological formations that bear upon this research theme, neither of which was investigated by the 2000 chert survey. These formations are the Muwaqqar Chalk-Marl Formation (MCM) and the Umm Rijam Chert Formation (URC); they are within 7 to 15km of the al-Ḥasā. The MCM is present to the north, south, and southeast, while the URC is found to the south, in the vicinity of Jurf ad-Darāwīsh (جـــرف الدراويش). Finally, several of the nonsystematic chert surveys of the 2000 season were conducted near the archaeological sites. This meant that systematic collection of cherts and documentation was lacking for the immediate vicinity of the sites, particularly those in the vicinity of Pleistocene Lake Hasa.

The 2004 Wādī al-Ḥasā Chert Survey

The 2004 Wādī al-Ḥasā Chert Survey took place between June 27 and July 12, 2004. Its main goal was to build upon and expand, both in detail and areas covered, the work undertaken by the EHLPP in 2000. The 2004 project surveyed a total of 17 systematic transects, ten of which are within the Wādī al-Ḥasā in the areas designated as Blocks 1, 2 and 6 (see Figure 1). These were designed to

3. The use of siliceous coquina at Ṭūr aṭ-Ṭarīq appears to be most prevalent during its later occupation. This later phase was originally described as Middle Epipaleolithic (Clark *et al.* 1987, 1988; Neeley *et al.* 1998), but is now known to be Neolithic in age based on radiocarbon dates obtained during the 2000 season of the EHLPP.

provide systematic recording of cherts available in the immediate vicinity of several of the archaeological sites. Seven transects were placed in Blocks 3, 4, and 5, outside the Wādī al-Ḥasā drainage system, to examine the MCM and URC formations for chert sources. Finally, lateral explorations of five RM locales (#s 7, 11, 12, 14, and 16) found during the 2000 survey were undertaken.

Methodology

All the 2004 transects within blocks were surveyed systematically to determine the range of variability of good quality, knappable chert available to prehistoric flintknappers. Each team member collected samples of each type of chert found on their transect line, thus providing an indication of how chert varied in color, texture, and knapping quality.

Three to four people participated on each survey day, with each member collecting an average of 15 to 30 chert samples per transect line. Participants' transect lines within the blocks were spaced variously from about 20 to 50 meters apart, depending on the terrain. For the lateral exploration of RM locales, the original GPS coordinates were used as an origin point, with an A-line and a B-line tracing the *in situ* cherts laterally in both directions from the 2000 season GPS origin point. Both A- and B-line transects collected chert samples from *in situ* nodules to gather information on chert quality and color.

GPS readings (UTM) were taken at the beginning and end of each transect line, using a GPS unit accurate to within several meters. GPS readings were also recorded at various significant points on the landscape, such as the tops of ridges, or where the chert outcrop seemed particularly noteworthy. Chert outcrops were documented using both digital and 35mm film photography.

Transects within blocks (see Figure 1)

Six blocks were designated for chert survey transect research. Three are within the Wādī al-Ḥasā (Blocks 1, 2, and 6), one (Block 3) examined the MCM on the Karak Plateau to the north, and two (Blocks 4 and 5) studied the MCM and URC in the vicinity of Jurf ad-Darāwīsh to the south.

The position of Block 1 was chosen because this area contains Ṭū Ṣadaf, Ṭūr aṭ-Ṭarīq, 'Ayn al-Buḥayra, and Tha'lab al-Buḥayra, which span an extensive period of time, from approximately 45,000 to 8,400 bp. The sequence of industries found at these sites includes the "transitional" Early Upper Paleolithic, Early and Late Upper Paleolithic, Early Epipaleolithic, and the Neolithic (Pre-Pottery Neolithic B: see Footnote 3). It is possible that site occupants intensively exploited the local cherts, so a detailed systematic survey of the raw material resources in the vicinity of these four sites was deemed important.

A total of 6 transects were surveyed within Block 1. Transect lines 1 and 2 were walked near Ṭūr Ṣadaf, through the AHP. Lines 3 and 4 were near the sites of Ṭūr aṭ-Ṭarīq and 'Ayn al-Buḥayra and also sampled the AHP. A final two transects are located west of Transects 1 and 2. These (Transects 5 and 6) were walked generally south and north; they document sections of the AHP and the ASL.

Rubble rock characterizes the AHP terrain of Block 1, and contains some knappable chert. In addition, bedded chert was found both in the BC and above it. High quality knappable chert could occasionally be obtained from the bedded sources, although this source is generally unpredictable in quality. The BC also contains nodules of good quality silicified oyster shells that knap and look like cherts. One of these locales in Transect 2 was designated RM 18 (**Table 2**). In other areas, nodules were found partially buried in sediment in Transects 3 and 4, with a smaller number of such occurrences in Transects 5 and 6. These nodules are usually good quality chert of the type used at Paleolithic and Epipaleolithic sites in the Wādī al-Ḥasā. It is likely that they are approximately *in situ*, although it is not possible to be certain. The ASL in Block 1 mainly yields brecciated cherts with many flaws, likely removing it from consideration as a principle prehistoric chert source.

Block 2 focused on the immediate vicinity of

Table 2: Spot Locales for Chert Raw Materials Identified during the 2004 Field Season.

#	Formation	Raw Material	Description
RM 18	BC	oyster shell chert	*in situ* nodules
RM 19	ASL	matte to whitish chert	*in situ* nodules
RM 20	ASL	chert	*in situ* nodules
RM 21	URC	medium to dark grey chert	*in situ* nodules

Yutil al-Ḥasā, which has three major periods of occupation during the Late Upper Paleolithic, the Early Epipaleolithic, and the Late Epipaleolithic (Early Natufian). Three transects were walked in this block; two (Transects 12 and 13) are across the al-Ḥasā channel from the site, and the third (Transect 14) is along the same side of the channel as the site, but upstream, closer to the confluence with the Wādī ar-Ruwayḥī. All of these transects sampled a small section of the WG and a more extensive section of the ASL.

No cherts could be assigned to the WG in the transects walked in Block 2. The ASL sequence, however, was well documented. Aside from the bedded cherts, a couple of *in situ* nodule locales were noted. The first was designated RM 19 (Transect 12) and occurs relatively high in the ASL sequence (see **Table 2**). These chert nodules are small, irregular in shape, and have a smooth veneer; they outcrop in a limestone/dolomite bed. Given their position in the ASL sequence, they may correspond to the same source as RM 16. The second nodular occurrence was labeled RM 20 and is located in Transect 14 (see **Table 2**). RM 20 contains high quality chert nodules with a cortical rind, occurring relatively high in the ASL sequence. These appear to outcrop in a chert bed, and may be similar to the source noted for RM 12. The RM 20 source, however, appears to be exposed only for a short distance, perhaps some 20 to 30m.

Because it is possible that raw materials from chert-yielding formations outside the immediate Wādī al-Ḥasā drainage system were used by prehistoric groups, Blocks 3, 4, and 5 were placed to sample these outlying geological formations. Two transects (Transects 10 and 11) in Block 3 on the Karak Plateau attempted to sample the MCM, which is described as pale red to yellow marl that contains concretions including cherts (Moumani 1997; Shawabkeh 1990). The MCM on the Karak Plateau, however, is overlain either by fluviatile and lacustrine gravels or by other colluvial deposits. No exposed MCM in Block 3 yielded *in situ* chert.

Blocks 4 and 5 sampled both MCM and URC formations in the areas south and southeast of Jurf ad-Darāwīsh. Transects 16 and 17 were walked in Block 4, and Transects 7, 8, and 9 in Block 5. The most accessible MCM was found in Block 5, where large exposures of the chalk-marl can be easily accessed and examined. The MCM here, however, did not yield chert. In Block 5, the MCM was mainly overlain by colluvial deposits of URC cherts.

The URC formation is characterized by thick exposures of chalky calcareous marl, chalk beds with *in situ* cherts (both nodular and thinly bedded), limestone, chert concretions, and thickly bedded chert (Moumani 1997). The transects in Block 4 yielded *in situ* nodular chert of exceptionally high quality; there are also thin bedded cherts, often highly fractured, that possess the same cortical rind as the nodular cherts. Two separate beds of nodular chert, ranging in color from medium to dark grey and brownish-grey were observed in Transects 16 and 17. A spot locale designation of RM 21 (Transect 16) was assigned to the URC nodules (**Fig. 2**; see **Table 2**). In contrast, the URC cherts found in Block 5 occur as a rubble surface on top of the MCM formation. While these cherts are essentially in place, they are not *in situ* in their original chalk bed context.

The final block, Block 6, had one survey transect (Transect 15). This block is on the opposite side of the wadi from Ṭūr Ṣaghīr, and to the southeast of the site. It was placed to systematically examine more of the ASL formation near this Early Epipaleolithic site. A nodular *in situ* chert embedded in a chert bed (similar to RMs 12 and 20) was noted on this transect. This particular source type often yields a relatively glossy, almost translucent chert, which bears some resemblance to the raw material used to manufacture artifacts at Ṭūr Ṣaghīr.

Lateral exploration of RMs 7, 11, 12, 14, and 16

The final task of the 2004 Chert Survey was to conduct detailed lateral explorations of five RMs identified during the 2000 field season. These transects are indicated on Figure 1 by their RM numbers. The goals were to examine the lateral extent of these *in situ* outcrops and to comprehensively sample the chert occurring in each RM.

The geologically oldest occurring *in situ* nodular source in the al-Ḥasā is RM 14 (**Fig. 3**). This source is either within the top of the Wādī as-Sīr Limestone (WSL) or the basal portion of the WG. This nodular outcrop is particularly rich and laterally extensive. It owes its exposure, which would have also been visible during the Pleistocene, to the fact that it is present on the north side of the al-Ḥasā drainage, which has been uplifted some 100 to 150m above the south bank of the al-Ḥasā drainage. Nodular chert of a light grey or somewhat whitish appearance is typical, although some tested nodules have translucent chert immediately under the cortex, or yield a brownish-grey chert. A few examples contain hints of pink coloration. Some parts of the outcrop are sections of limestone with readily visible nodules, which occur in at least



2. RM 21: *in situ* Nodular Chert in the URC Formation.



3. RM 14: *in situ* Nodular Chert in the WSL/WG Formation.

three different levels or lines within the limestone over approximately a 30m thick section. Other portions of the outcrop are less thick, and can become essentially "hidden" by colluvial deposits. The raw material yielded by this source is reminiscent of some of the artifacts from Yutil al-Ḥasā.

RMs 7, 12, and 16 represent *in situ* nodular sources relatively high in the ASL sequence. RM 16 is a nodular source outcropping in a limestone or dolomite (**Fig. 4**). In this regard, it is quite similar in surface appearance to RM 14. The nodules have a smooth veneer and yield a fairly consistent medium grey chert, although some nodules have a thin translucent chert immediately under the cortex. A few nodules yield a whitish chert. The visibility of this outcrop is quite variable. Some sec-



4. RM 16: *in situ* Nodular Chert in the ASL Formation.

tions quite easily seen, while in others, the limestone/dolomite outcropping is quite low to the modern ground surface and thus subjected to colluvial deposits that hide the nodules unless one is looking quite closely at the ground surface. The medium grey color of the majority of the nodules sampled is similar to that seen in the artifacts found at Multaqa al-Widyān and perhaps at aṭ-Ṭabaqa as well.

The RM 7 and 12 spot locales are likely the same source in the ASL (**Fig. 5**). This source occurs just above the RM 16 type of chert nodule. RMs 7 and 12 are chert nodules that have formed in a chert bed. In some cases, these nodules are not distinct from the chert bed, except for their "tops," which have a limestone cortical rind. In other cases, they form separate material which erodes out of the chert bed and is primarily deposited in the sediments immediately downslope from the source bed. In the RM 12 locale, the chert tends to have a glossy luster, and thus is quite similar to the artifacts from Ṭūr Ṣaghīr. In the RM 7 area, however,



5. RM 7: *in situ* Nodular Chert in the ASL Formation.

there are at least three "lines" of these nodules. Two produce a medium grey, almost glossy, chert comparable to the artifacts at aṭ-Ṭabaqa (which is located nearby), while the remaining line of chert nodules (which have a smooth veneer) yields white chert. This white chert has been documented only rarely at Paleolithic and Epipaleolithic sites in the Wādī al-Ḥasā.

The geologically youngest *in situ* source locale explored is RM 11, which occurs in the BC member of the AHP. RM 11 is primarily a bedded chert, although there are some portions that appear more nodular in form. Generally speaking, this source type is not as high quality as the other RM locales investigated. It is likely that it did not serve as a principle raw material resource for the prehistoric inhabitants of the Wādī al-Ḥasā.

Although transects were walked laterally to document the extent of the exposed RM sources, in no case did the survey "run out of" visible nodules. Most lines were ended simply when the nodular sources became more sparsely visible or patchy across the landscape. This likely indicates that such sources were widely available throughout the al-Ḥasā region during the Paleolithic and Epipaleolithic.

Concluding Remarks

The results of the 2004 chert survey in the Wādī al-Ḥasā and the surrounding region add considerable new knowledge and insight into available chert source types and locations. It is now apparent that the best *in situ* nodular occurrences comprise one source in the WSL/WG, two sources in the ASL, and one source in the URC. While some aspects of these are superficially similar, there are differences as well, particularly in type of cortex and a general consistency in color or texture within the separate sources explored. Additionally, some sources, such as the WSL/WG nodules, are not widely available (either today or during the Pleistocene). Others, such as the URC, require transport over medium-to long-range distances (7 to 10km). These sometimes subtle differences can be used as a first approximation in assessing the likely principle chert source for each of the al-Ḥasā Paleolithic and Epipaleolithic sites.

As during the 2000 season, the chert survey of 2004 did not locate a nodular source of translucent chert, which is seen principally at Late Epipaleolithic (Early Natufian) sites. The lack of pinpointing a source for this material, despite fairly extensive pedestrian coverage of many parts of the al-Ḥasā south and north banks, suggests that nodular translucent chert may have been transported into the al-Ḥasā from a considerable distance away.

The combination of the 2004 and 2000 survey results is thus beginning to yield a detailed map of the Wādī al-Ḥasā chert sources. This field work provides the baseline data for Ph.D. thesis research (by M.P.C.) that will compare the geological chert source samples to the chert used to make stone artifacts at the Wādī al-Ḥasā Paleolithic and Epipaleolithic sites of Ṭūr aṭ-Ṭarīq, Yutil al-Ḥasā, aṭ-Ṭabaqa, Ṭūr Ṣaghīr, Ṭūr Ṣadaf, ʻAyn al-Buḥayra, and Thaʻlab al-Buḥayra. The ultimate goals of this research are to examine the proximity of in situ chert sources to the archaeological sites and to test a chert raw material procurement and utilization model for Late Pleistocene adaptations in the Wādī al-Ḥasā lake/marsh ecological system.

Deborah I. Olszewski
University of Pennsylvania

Maire P. Crowley
University of Pennsylvania

Maysoon al-Nahar
University of Jordan

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PRELIMINARY REPORT OF THE SIXTH ARCHAEOLOGICAL AND EPIGRAPHICAL SURVEY AT WĀDĪ RAMM/IRAM

Saba Farès-Drappeau and Fawzi Zayadine

The sixth archaeological and epigraphical survey at Wādī Ramm (Iram) was held from the November 7 to 24, 2001, under the direction of Saba Farès-Drappeau and Fawzi Zayadine. Khaled al-Jbour was the representative of the Department of Antiquities. From the Directorate of Antiquities and Museums in Saudi Arabia, Hussein Abu al-Hassan and Abdallah al-Saoud took part in the survey. The French team consisted of Sabine Sorin (archaeologist and draughtsman), Bertrand Moulin (geographer of CNRS), Hervé Tronchère (student in geography) and Eric Frénée (archaeologist from INRAP), The National Institute for Research and Preventive Archaeology. The fieldwork, as it was the case in the previous campaign, was facilitated, thanks to the assistance from the al-Zalabiyah and al-Zawaydah families. The Committee of Excavations (French Ministry for Foreign Affairs) financed the mission, as in the previous years. We are grateful to the Royal Society for the Conservation of Nature in Jordan who provided part of the financial support and the accommodations in the village. The program of this campaign, which was presented to the Department of Antiquities and approved by the Director General, Dr. Fawwaz al-Khraysheh included the continuation of the recording of the inscriptions in Wadis Ramān رمـــان, Ṣābiṭ (صـــابط), Ruways Salīm (رويس سليم),Umm Saḥm (أم سـحم), Ḥafīr (حفـيـر) and Rābigh (رابغ) . It was planned to undertake a sounding at the cairn of Abu Nukhayla (أبو نخـيلة) , at the caravan-station of al-Kharaza (الخـــرزة) ,at Wādī Ṣābiṭ and at Ruways Salīm in order to determine the periods of occupation of these sites.

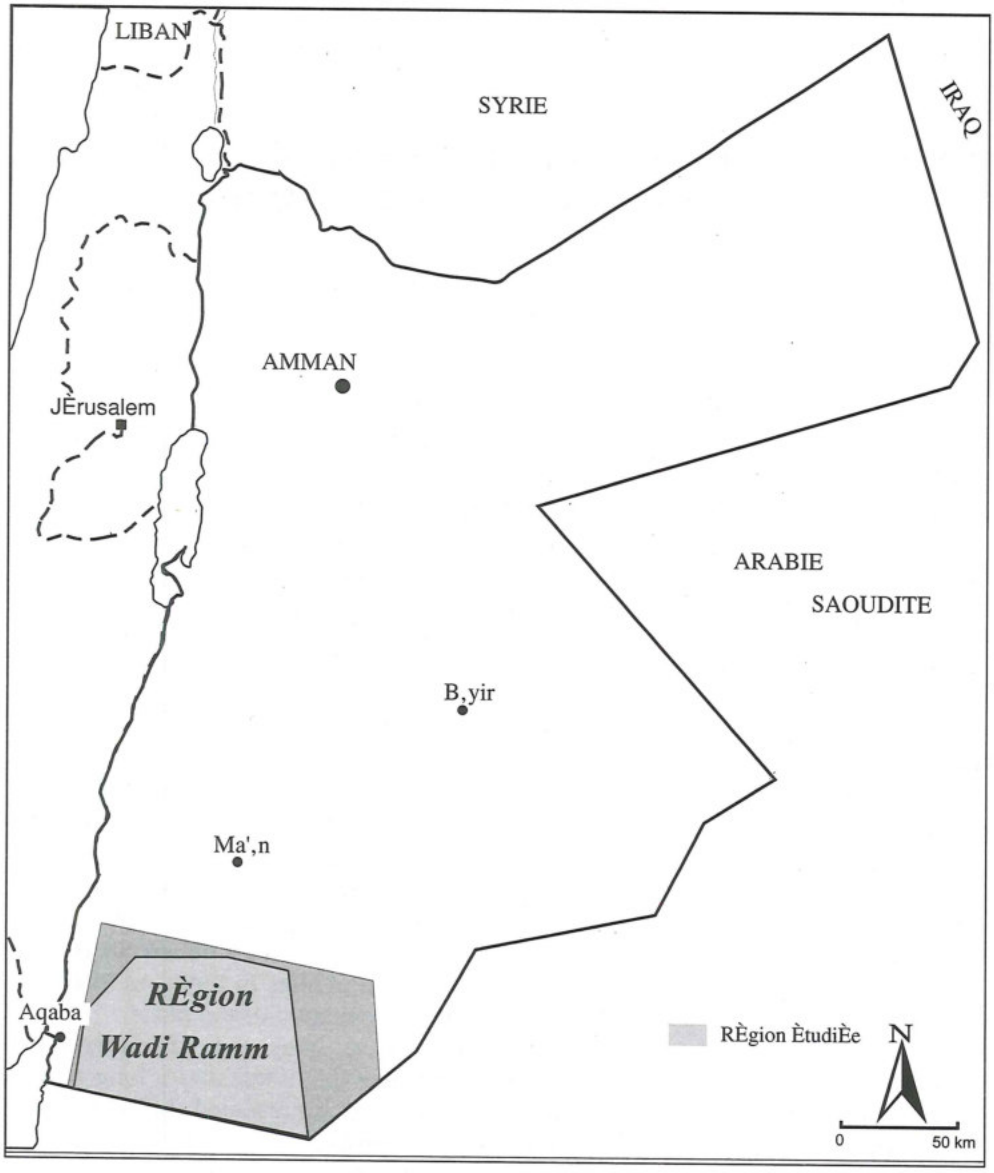
Objectives and Methods

The main objective of this project is to study the history of the Arabs in the first millennium before the rise of Islam, focusing on epigraphy. in order to understand the process of the occupation of the space, our work was enlarged to include the study of human occupation. In this case, the aim of our project is to investigate "the Archaeology of the Nomads", in chronological and spatial continuity. Thus, without forgetting that our first objective is the epigraphy, we tried to study the different natures of the sites: domestic occupation, cultic, funeral remains and hydraulic-systems. In order to obtain a general view of the organization of the sites, and a better understanding of this complex study, we undertook an elaborate geographical-archaeological database System (GIS) to integrate all sites.

Our method was double fold: "horizontal" and "vertical". The first consisted of registering the sites after a quick examination of surface material: ceramics, flints, structures (domestic-structure, tombs and enclosures), rock-arts and rock-inscriptions. This enabled us to obtain an overall vision of the function of sites in time and to record the chronological occupation of the place.

The second phase consisted of undertaking soundings at the sites that witnessed a long period of occupation and which presented different types of archaeological remains. The materials found in the excavation determined the chronology of the area by comparison with other excavated sites. Before presenting the results of the 2001 campaign, a summary of our previous work is provided:

In 1996, an epigraphical survey was conducted in Wādī Ramm, with private funds, following the suggestion of Fawzi Zayadine, at that time Deputy-Director of the Department of Antiquities of Jordan. Our target was to study North Arabian graffiti (known as Thamudic), in order to supply the *Corpus* of North Arabian inscriptions in Jordan. When we realized the epigraphic importance of the area, a new campaign was organized under the scientific support of IFPO (Institut Français du Proche-Orient). The objective was always to study North Arabian graffiti, in Wādī Ramm and Wādī Umm Saḥm. This preliminary epigraphical survey was carried-out during two years, 1997 and 1998. It was immediately noticed that the epigraphical



1. The research area.

work is not enough to understand the human occupation of the site. We then started a study of the different traces of occupation on the ground: flint, ceramics, structures and rock-art.

In 1999-2000 a cartographical program was initiated: a "horizontal" study, by fixing all of the sites on a geographical map. This work of locating sites was carried out at the same time as the epigraphical survey. Furthermore, a first hydraulic study of the water resources was carried out by Olivier Barge and a sociological study was carried out by Geraldine Chatelard.

In 2001, the first sounding campaign was undertaken at six sites, at the same time as conducting the land survey. The topographical work on the enclosure at the south exit of Wādī Ramm, provided evidence of a cultic function. This was confirmed by the central standing stone that was found oriented to the east. The sounding in this same unit also confirmed this function, by the absence of daily-life material in the stratigraphical layers. The sounding at the other sites (Ruways Salīm, Wādī Ṣābiṭ) confirmed that the remains were not those of modern Nomads, but as a result of successive occupation, from the Neolithic period until the Iron Age[1].

THE EPIGRAPHICAL SURVEY 2001

Thamudic Inscriptions

The epigraphical survey of 2001 was con-

1. This conclusion was reached after the initial analysis of the ceramic material by Dr. Zeidan Kafafi (Yarmouk University).

centrated in Wādī Ḥafīr[2]. However, we partially surveyed two new Wadis: Wādī Rābigh and Wādī Ramān[3]. The total sites recorded this season were 84 and they yielded many inscriptions: prayers, epitaphs or simple genealogical lists. Rock drawing representing persons in an adoration position, hunters, feet, ibexes and camels. These texts suffered from weathering, a fact that makes their reading difficult. The onomasticon is essentially Arabian, such as Ḥamza حمزه, ʿAli علي and Sārī ساري . Below are some inscriptions found at two sites, al-Qaṭṭār القطّار of Wādī Ḥafīr and al-Kharaza.

Site n° 02/01, al-Qaṭṭār (Wādī Ḥafīr)

Al-Qaṭṭār lies to the north of Wādī Ḥafīr (**Fig. 2**), on the slope which borders the western bank of



2. Map of the survey area.

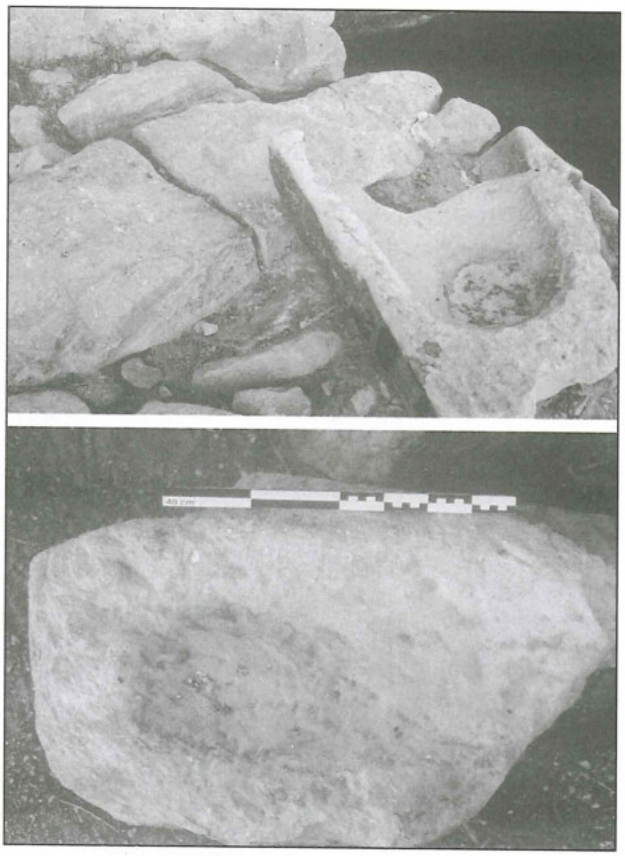
2. Wādī Ḥafīr and Wādī Rābigh were intensively surveyed during 10 years by the late W. Jobling. Preliminary reports were published in *ADAJ* between 1982-1992.
3. Wādī Ramān was visited by Musil (1908: 228, 248).

the wadi, in the middle of the ascent. Here, there is a spring and water collects in a deep basin (**Fig. 3**). This place was used since a remote period, because of a number of carved basins along the foot of the rock (**Fig. 4**).

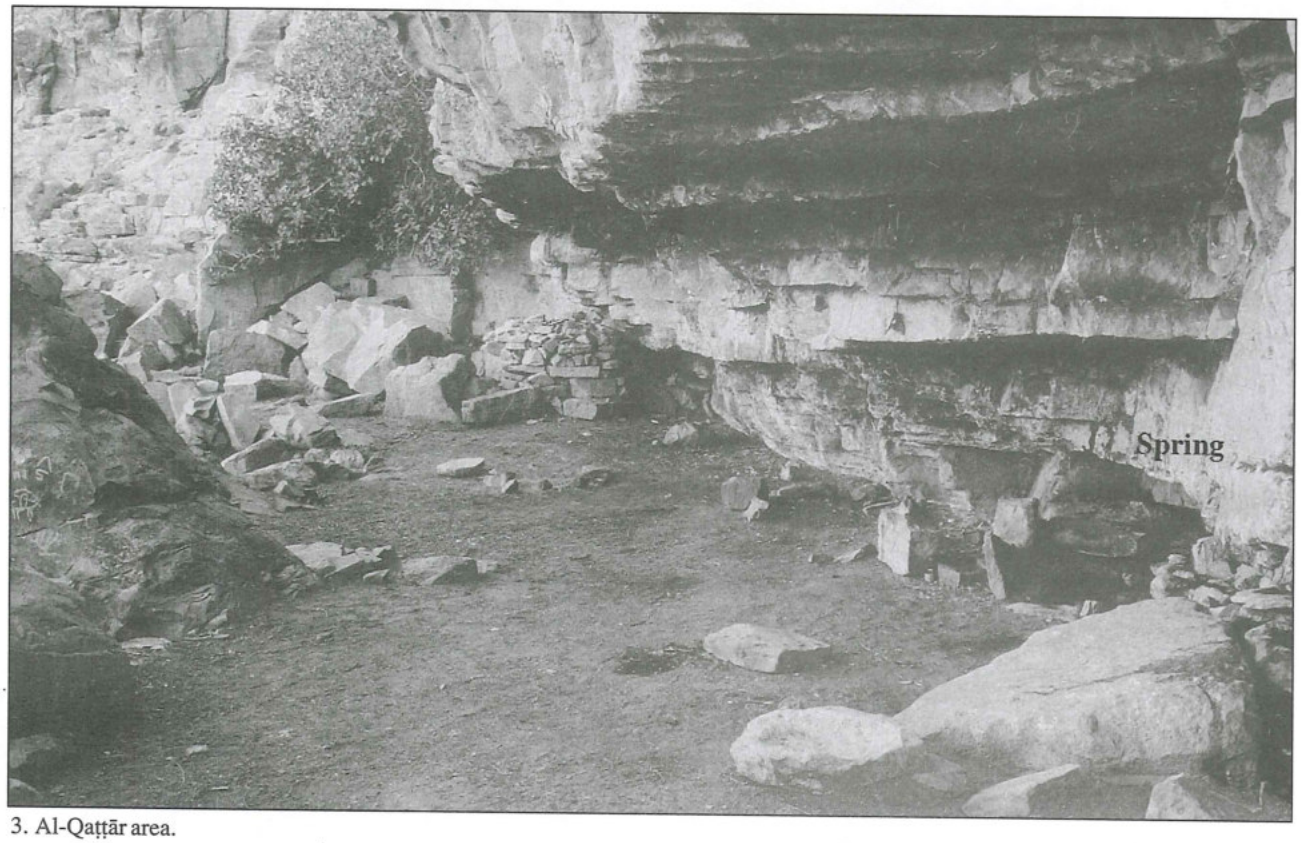
Huge rocks, which are incised with North Arabian inscriptions and rock art of persons in orant position with feet and hands (**Fig. 5**), protect this shelter. Near the North Arabian inscriptions, there is a rock drawing representing persons holding a rifle and in a combat position. This representation indicates that the place was occupied in modern period and was probably the field of an unspecified conflict (**Fig. 6**).

The first category of inscriptions is registered on the southwestern face of the rock. Representation of feet and camels accompanied these graffiti. The letters are slightly damaged (**Fig. 7**).

1. L- ŠKM'N, *Personal name.* Maybe this is a substantive as the paradigm of فعـلان. ŠKM شكم means "(to) remunerate, to offer a present", and provides the composite personal name (ŠKMLH, ŠKM'LHY, etc). This personal name is common in Safaitic inscriptions (Caskel, Index), in Thamudic (King, II: 563) and in Nabataean ŠKM', ŠKM' (Cantineau 1930: 150).
2. L-NṢRLH BN ĠḌR For NṢRLH son of



4. Carved basins at al-Qaṭṭār.



3. Al-Qaṭṭār area.



5. Persons in orant position with feet and hands.

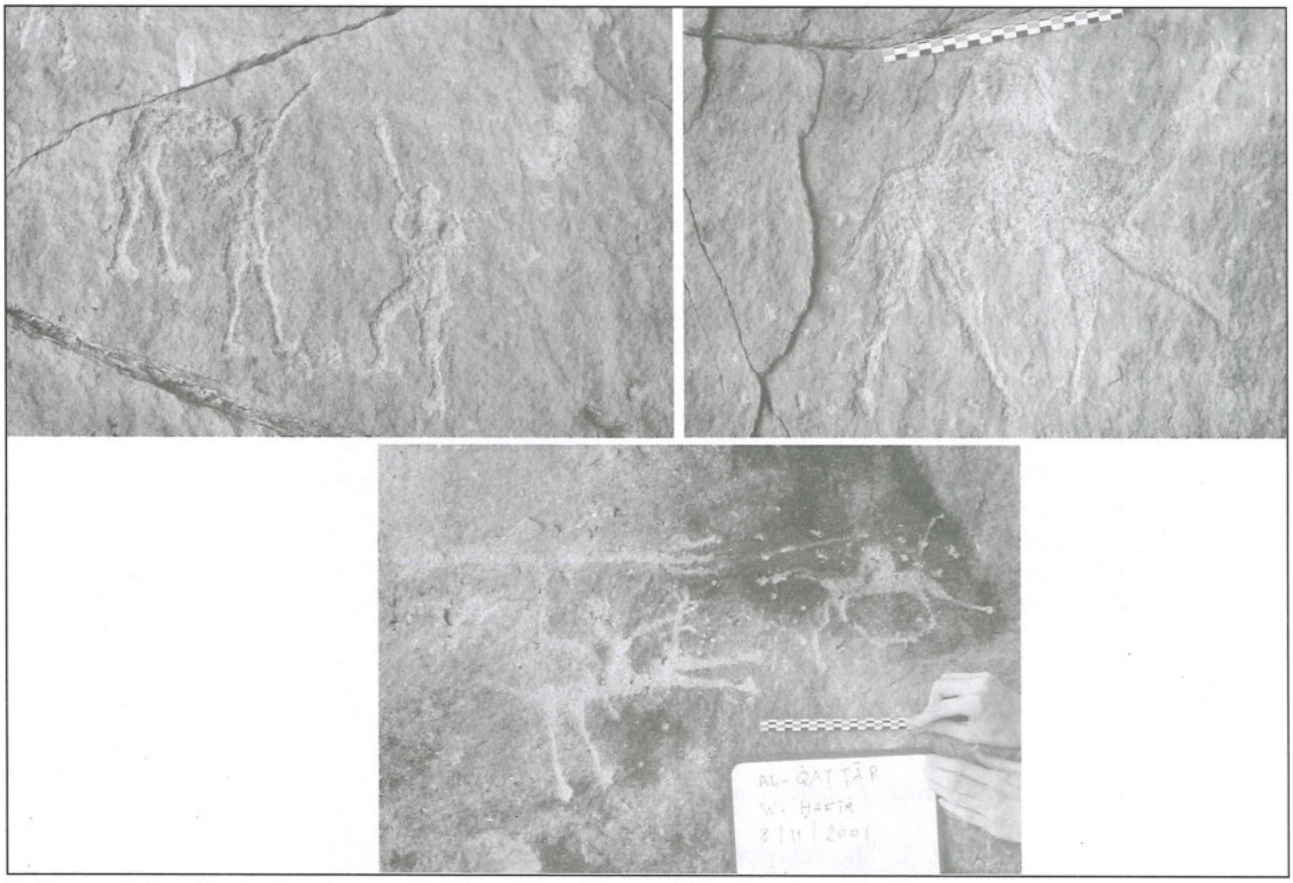
ĠḌR لنصر الله بن غضر
NṢRLH, *Genitive compound* "Help of Lāh". Arabic *Naṣir-Allāh*. The first element NṢR, Arabic نصـر "to aid; to supply support", provides the personal names. For parallels see: Nabataean NṢR'LH (Cantineau 1930: 122).
ĠḌR, *Personal name*. in Arabic, the root ĠḌR غضر, means "to be prosperous, to flourish".

3. L-S'D'L For S'D'L لسـعـدإل *Genitive Compound* "Luck from God". For parallels in Nabataean, see Cantineau (1930, II: 153); in Palmyraean inscriptions see J. K. Starck (1971: 115); in South arabian inscriptions see Ryckmans (1934, I: 239-240). The element S'D provides several composite names, see: S'DLT, S'DLH.

4. L-ḤDD BN Z'... For ḤDD son of Z'... لحدد بن زع ...
ḤDD, *Personal name*, known in Aramaic inscriptions. It is related to the god ḤDD, the god of storm, rain and thunder. The South Arabian ḤDD's means "to sacralize". For parallels see Ryckmans (1934, I: 88) and Branden (1966: 59).

5. L-RML, *Personal name*. In Arabic رمل "fast walking" and it is known as a personal name.

6. L-ḤRS BN QDM
ḤRS, *Personal name*. Arabic حَـرِّس "eternity" or حَـرَس "to guard". This name is attested in Arabic as a personal name and as a tribal name (see al-Sam'ānī 1988:



6. Representation of a camel, and persons holding a rifle and in a position of combat or hunting.



7. Northarabian inscriptions at al-Qaṭṭār.

(وحـرس بطن من طيء قـال ابن حـبـيب: في طيء حـرس بن جندب بن خارجة بن سعد بن فطرة بن طيء. قـال: وفي لخم حرس بن أريش بن اراش بن جزيلة بن لخم).

It is common in Thamudic inscriptions (al-Dheeb, 1999: n° 77; King 1990, II: 517), and is also known in Nabataean (Cantineau 1930: 100) and in Liḥyanite (Jaussen and Savignac 1914, II, n° 377: 531). In South Arabian, this word occurs as a verb "to perform a military service" (Sabaic Dictionary 1982).

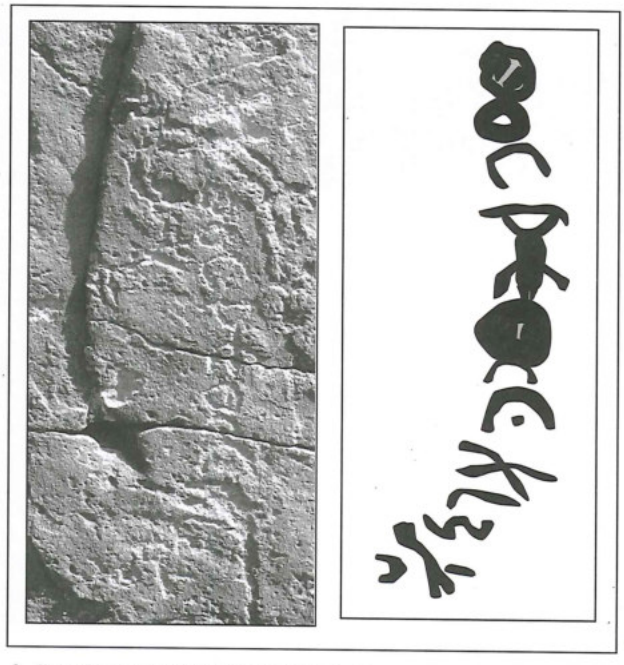
- QDM, *Patronymic,* in Arabic قَـدَم، قـادم "to advance". "Banī Qedem: men of the East" (Job I: 3). It occurs in our bilingual Nabataean-Southarabian inscriptions found in 1998 at Sahl aṣ-Ṣuwwān (Farès-Drappeau and Zayadine 2001: 212). This personal name is known in Thamudic inscriptions (see Jaussen and Savignac 1914, t. II: 598; al-Dheeb 1999, n° 30) and in Safaitic inscriptions (Caskel, *Index*). In Nabataean it is a preposition meaning "in front of" (Cantineau 1930: 141), and as a personal name *Qdmu* (Cantineau, 1930: 114). In Arabic historiography the names قُدَم and بنو القُدام are known (Ibn Durayd 1979: 419-420). It is well known in Southarabian as a verb "to be in charge of a job, confront, send" and as a substantive meaning "leader, commander". Qudm قُدْم is known in Yemen as a place name that provided a clan name.

Site n° 24/01, Wādī Ramān (Sharāyif Ramān) شرايف رمان

To locate the site, see **Fig. 2**. The inscriptions are engraved on a huge rock, opposite the mountain, on the same rock, a very big ibex was also carved.

7. W-'BDḤWR BN ḤLFNṢR و عبد حور بن خلف نصر (**Fig. 8**)

'BDḤWR, *Genitive compound* "servant of ḤWR". This theophoric name was attested in three spots in the Ḥismā of southern Jordan. King (1988: 307-317) recorded the first evidence in Wādī Judayyid. This wadi is below Ras an-Naqab escarpment, about 13km east/southeast of al-Ḥumayma (Graf 1992: 70). The Thamudic graffiti reads "L 'BD ḤWR" in favour of 'BD ḤWR. King men-



8. Inscriptions from Sharāyif Ramān

tions the names: 'ḤWR, ḤWR, WHB'ḤWR, 'BDḤWR, TM 'ḤWR, in various graffiti of Jordan (1988: 312-313, and note 10).

In his survey of epigraphical material of Jabal Kalkha, west of al-Ḥumayma, Graf (1992: 67-76), registered the Nabataean graffito 'ŠLM BR-TLM 'BD 'LḤWR: Peace BRTLM servant of 'BD 'LḤWR.

The theophoric names prefixed with 'BD are very common in the Northarabian onomasticon, and ḤWR called for several interpretations. The most common is that ḤWR, 'LḤWR represents the first star that is next to the body of three stars in the tail of "Ursa Major". This tail is called بنات نَعْش in Arabic astronomoy (Mujāhid 1979: 65). 'LḤWR designates Jupiter or al-Mushtarī in Arabic astrology.

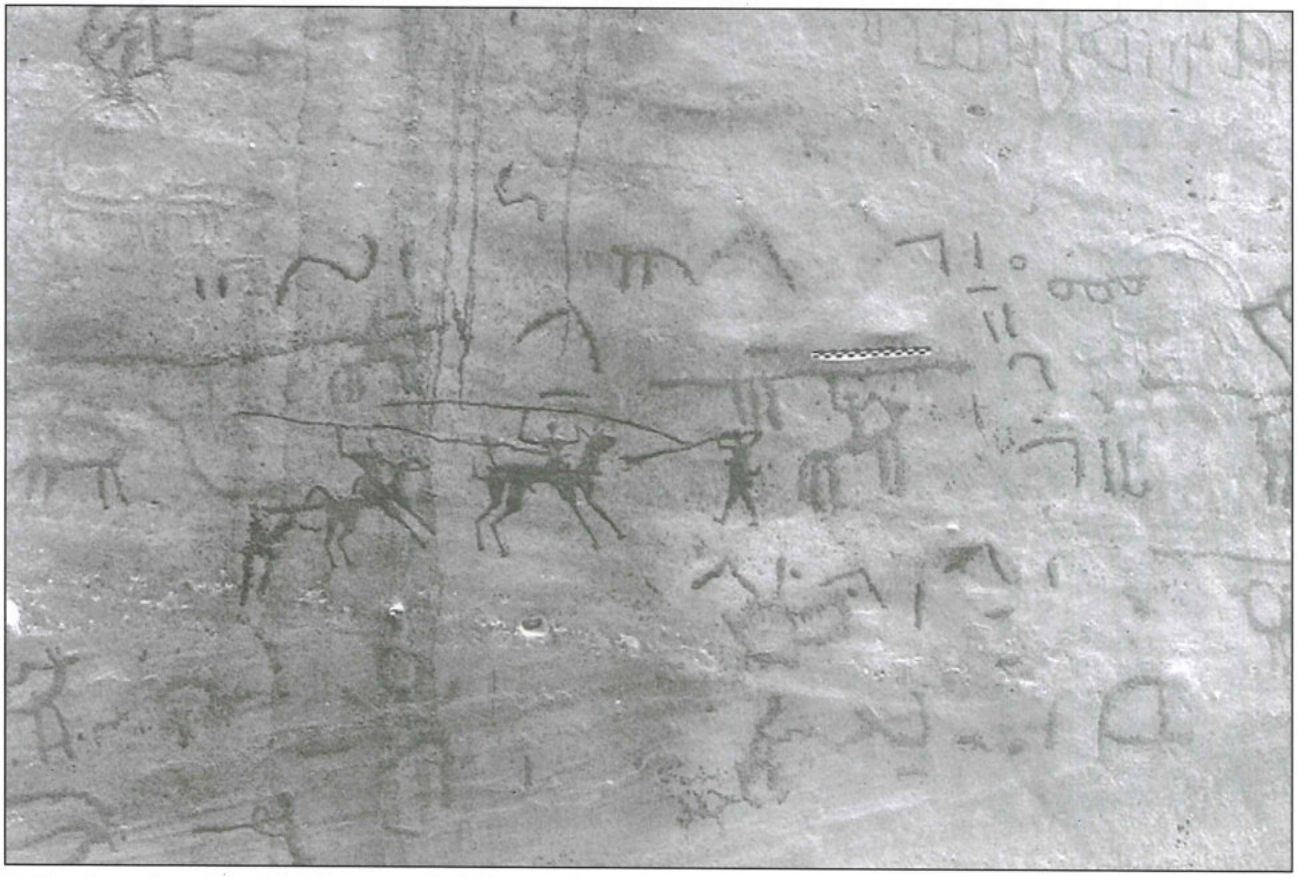
ḤWR occurs in the Thamudic inscription as a personal name (al-Dheeb 1999: n° 161): and occurs in Nabataean as ḤWRW (Cantineau 1930: 94-95). See Harding (1971) for the Safaitic and further Thamudic occurrence. For Milik (1958: 237-238) ḤWR must be connected with the toponym *ḤWRW'*, which occurs with *Qaws* at Khirbat at-Tannūr (Central Jordan): QWS 'LH ḤWRW' (for more parallels see King 1990, I: 129 and note 14, 15).

ḤLF, *Patronymic*, is well known in Nabataean inscriptions (Cantineau 1930; Farès-Drappeau and Zayadine 2001: 213).

Site n° 67/01, al-Kharaza-'Umayyid

A few hundred meters to the north of al-Kharaza post (see **Fig. 2**), at al-'Umayyid, we discovered a rock panel (about 140m wide and over than 150m high). It consisted of whitish sandstone, and is covered with drawings of huge camels, fighting scenes (**Fig. 9**) and Nabataean and Northarabian graffiti (Thamudic). At the foot of this rock-wall, flint tools of the Neolithic or Chalcolithic period were found scattered, together with basalt mortars. They are witness of prehistoric occupation. In the same place, sherds of the Nabataean and Roman periods were found. The attraction of the wall lies in the Nabataean and Northarabian inscriptions.

Three huge camels are engraved on this rock face (**Fig. 10**). Some of them have inscriptions engraved inside the body of the animal. The inscriptions are of an archaic epigraphical script and are written according to the same model: to *X (belongs) the camels* (**Fig. 11**).



9. Drawings of camels and fighting scenes at al-Kharaza-'Umayyid.

1- L-ḪṬM H-GML *to* ḪṬM belong this camel لخثم هذا الجمل

ḪṬM, *personal name,* Arabic خـثم "to have a flat nose". It is known in the Arabic onomasticon (al-Sam'ānī, 1988):

"الخثمي: بضم الخاء المعجمة وفتح الثاء المثلثة في آخرها الميم هذه النسبة إلى خثعم وهو اسم لجد حمد بن مالك بن خثم الخثمي".

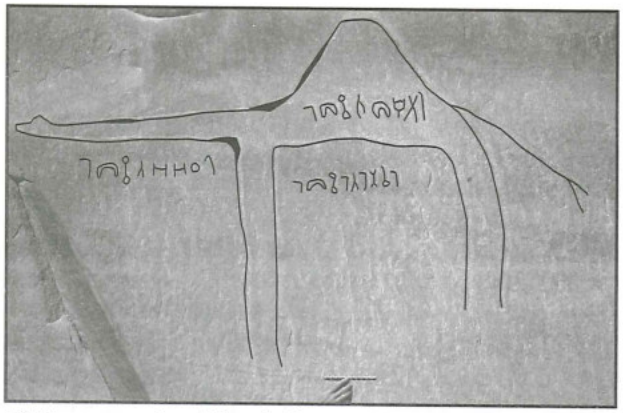
H-GML, the first element *h-* is the definite article in Thamudic and Safaitic inscriptions. As in all Semitic languages, the definite article is also used as a demonstrative[4].

2- L- 'ZZ H-GML to 'ZZ belong this camel لعز هذا الجمل

'ZZ, *personal name*, Arabic عـزّ "to be strong, powerful". Well known in Nabataean inscriptions (Cantineau 1930: 129). In old Aramaic, it is used as a substantive (Jean-Hoftijzer 1965). In Arabic, *'Izz Allāh* عز الله, it occurs in composite names.

3- L-Y'L HL-GML

Y'L, *personal name*, unknown in the *Index* of Caskel.



11. Large camels and inscriptions at al-Kharaza-'Umayyid.

The interest in this text is the definite article. It is composed of the demonstrative *h-* and the Arabic definite article (*al-*). Here *h-* is demonstrative, equivalent to Arabic *ha-dha* هذا, while the definite article is (*al-*) as in Arabic. The demonstrative and the article are contracted HL, like in the colloquial Arabic HL BL for هذه الإبل.

4- L-'QRB BN MRḪMT لعقرب بن مرخمة **(Fig. 12)**

'QRB, *personal name*, Arabic عقـرب "scorpion",



10. Large engraved camels at al-Kharaza-'Umayyid.

4. This is also the case in all of the Semitic dialects.

known in Nabataean personal names (Cantineau 1930, II: 134) and is known in Arabic personal names (Ibn Durayd 1932, s.v.). It is also common in Safaitic (20 times WH 106, 175, 243, 662, etc. and see Cairn of Hanī) (Harding 1951 and *Index*). It is attested in Liḥyanite inscriptions (JSlih 75/1: 342) and in Thamudic inscriptions (al-Dheeb 1999, n° 78: 152, 181).

MRḤMT, *personal name*, unknown in Arabic personal names. The word marḥimat مُرْخِمَة means in Arabic "The marble cutter". Raḥīm in Arabic means "a gentle voice".

5- L-ḤFD for ḤFD لحفد (**Fig. 13**)

ḤFD, *personal name* unknown in Arabic but is attested in Minaean inscriptions from al-'Ulā (JSmin n° 186, 1914, II, p. 354 ; JSmin n° 194, 1914: 356) and in Southarabian inscriptions (Arbach 2001). also See Hartmann 1909: 252. In Southarabian ḤFD means "Tower, a projecting element of a wall, bastion" (Sabaic Dictionary).



13. Thamudic inscription of ḤFD.

Nabataean Inscriptions

The Nabataean inscriptions were mainly registered this year at al-Kharaza, at the site called al-'Umayyid العميّد, they were engraved among Thamudic inscriptions.

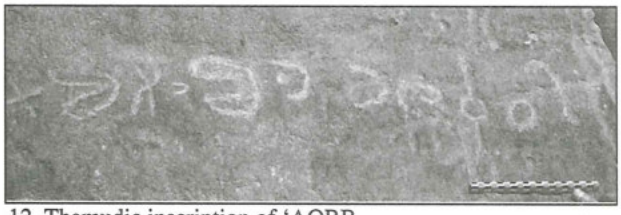
1. BLY ŠLM RB'L BR NKR' Yes, hello RB'L son of NKR' (**Fig. 14**)

BLY, to compare with Arabic bala بلى, meaning "undoubtedly, certainly". The interpretation of Savignac B 'LHY, by "god" is not impossible, but difficult to demonstrate.

ŠLM, "hello" is often in the beginning of Nabataean graffiti.

RB'L, is a royal name, but it is used here as a personal name.

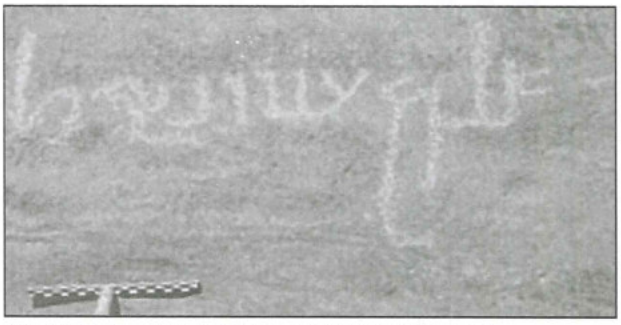
NKR', of Arabic *nkr* adjective "nakira", means "intelligent, astute". The verb NKR means "to be unaware of, to deny" (see Lane). As a proper name, "astute" is more appropriate.



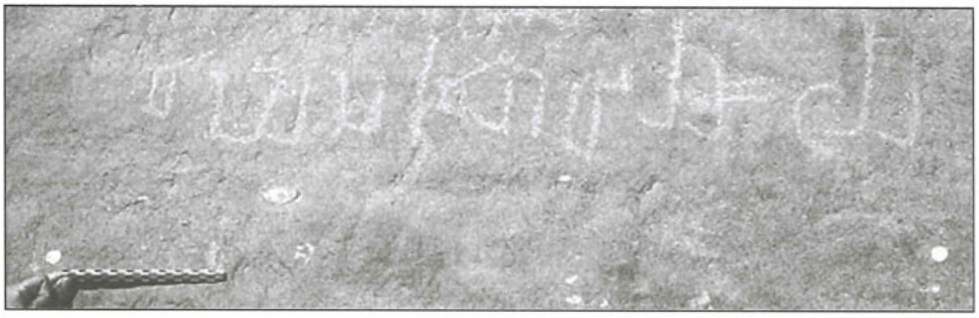
12. Thamudic inscription of 'AQRB.

2. ŠLM 'BD RB'L Hello, 'BD RB'L (**Fig. 15**)

The interest of this graffito is to provide a basileophore name: Rab'el. This royal name probably refers to Rabel I, who is believed to have reigned between 167 and 100 BC (Graf 1997, s.v., *Nab-*



15. Nabataean inscriptions at al-Kharaza-'Umayyid.



14. Nabataean inscriptions at al-Kharaza-'Umayyid.

ataeans). The type of *alif* with three branches is archaic and is found in the dedication of the Rabel I statue (*CIS* 349). It also appears on the inscription of the triclinium of *Aṣlaḥ*, year 1 of 'Obodat, wire of Aretas (II) (96/95 BC). The present *graffito* would probably date from the second half of the first century BC.

3. 'BD 'MNW *(***Fig. 16***)*

'BD 'MNW, This name is frequent in the Ḥawrān (southern Syria) (Cantineau 1930, II: 132).

4. ŠLM BNYRW BR 'TMW BR ḤLFW Hello BNYRW, son of 'TMW, son of ḤLFW *(***Fig. 17***)*

BNYRW is not frequent, and is probably of Greek origin Πανιερος meaning "fully sacred".

'TMW, appears in Nabataean inscriptions from Umm al-Quṣayr (Savignac 1932). It is also well known in Thamudic (Harding *Index*).

ḤLFW, occurs in Hegra/Madā'in Ṣāliḥ and in Wādī Ṣābiṭ (Farès-Drappeau and Zayadine 2001: 213).

The Survey of Enclosures in Wādī Ramm

Many square structures are visible in Wādī Ramm. We undertook a topographic plotting of the area. The first step of the research enabled us to better understand the architecture, the orientation and the space distribution of this type of structures in Wādī Ramm. We found this type of agglutinated structures, common in Wādī Ramm, to the north and the south of the village, at the foot of Jabal Ramm (area 38.00) and Jabal Umm 'Ishrīn (area 44.00). The absolute regularity of the structures was observed in the beginning (**Fig. 18**).

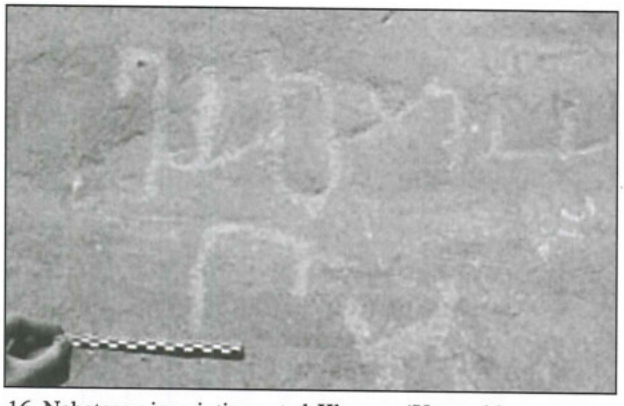
Accurate documentation of each stone was done by Sabine Sorin, helping us to understand the technique of construction. The walls have a shallow foundation trench. They are built with dry stones of regular shape without mortar. The structures constituted units of five to six aligned squares. In several examples, the floor is paved and contains a monolith block in the middle. A general plotting of the standing stones was undertaken in order to demonstrate their common characteristics. The stone blocks have a flat face, smoothed at the top and generally turned to the east.

A denser area of occupation can be found at the foot of Jabal Ramm (area 38.00). It includes a number of square structures, more regular than in the other sectors. Taking into consideration these characteristics and the time available, we focused our attention on area 38.00. Two soundings were dug and a detailed stone drawing was made.

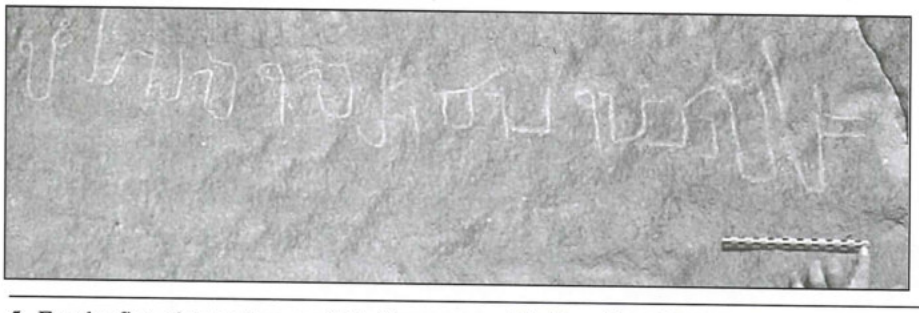
Soundings

Six soundings were excavated at sites observed in previous surveys. The excavations were carried out by Eric Frenée and conducted in three wadis:

- Wādī Ramm, at approximately two kilometres from the village, there is about thirty quadrangular enclosures distributed on both sides of the wadi at the foot of the sandstone mountains of Ramm and Umm 'Ishrīn. Two of them were the subjects of a sounding. We also placed a sounding on a tumulus close to the quadrangular enclosures (see below).
- Al-Kharaza, in the north of ad-Dīsa plain. The site consists of a stone building. It was the subject of a stratigraphic excavation.
- Wādī Ṣābiṭ, the site consists of rectangular and circular structures, at the foot of the mountain.
- Ruways Salīm, the site consists of honeycombed cells[5].

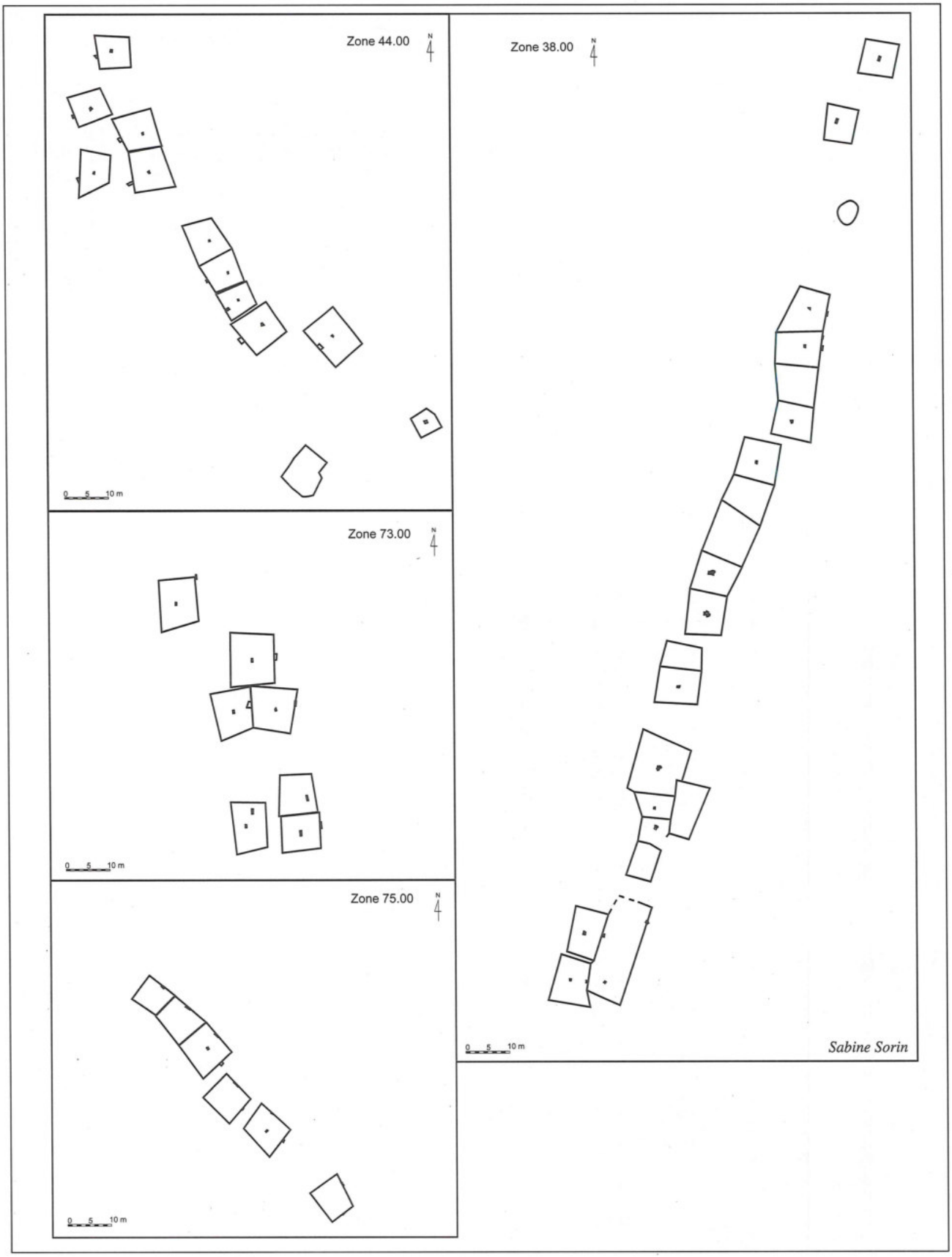


16. Nabataean inscriptions at al-Kharaza-'Umayyid.



17. Nabataean inscriptions at al-Kharaza-'Umayyid.

5. For the first observation, see S.F. Drappeau and F. Zayadine (2001:214).



18. Square structures visible in Wādī Ramm.

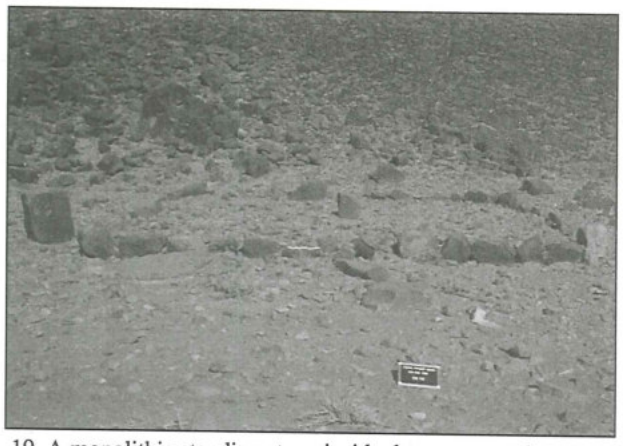
The Quadrangular Enclosures of Wādī Ramm

This site is characterized by the presence of thirty square enclosures consisting of aligned stones. These enclosures are composed of three or more (up to 9) units orisolated. Each unit presents in its centre a monolithic standing stone (**Figs. 19 and 20**), three stones form a niche-like structure, oriented to the east, apparently the stones seem to be laid on the ground. However, the sounding revealed that the stones were deeply founded without foundation trenches. This means that the trenches were dug and then they were filled with earth. There was no material evidence of occupation in the trenches.

The Kharaza Station

The Kharaza station (**Fig. 21**) is located at the junction of tracks connecting al-Quwayra, ad-Dīsa and Ramm village. The sounding was carried out in the northeastern angle of the building, and it was observed that treasure hunters had already disturbed part of the stratigraphy. Thus, our sounding was undertaken in the still undisturbed part.

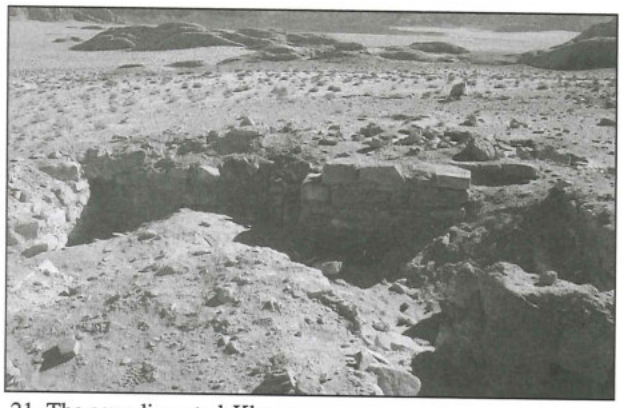
This building is square, consisting of a central structure with an inner staircase at the northern side. A great number of sherds of Nabataean and Roman period ceramics cover the ground in a perimeter of approximately 50m around the building.



19. A monolithic standing stone inside the square enclosure.



20. The sounding at the base of the monolithic standing stone.



21. The sounding at al-Kharaza.

The sounding revealed a stratigraphy of 9 layers: layer 1 is formed from the tumble of building. Layers 2 to 5 correspond to the deposit after the abandonment of the building, while layer 6 is made of beaten earth of yellowish colour. Between layers 6 and 7 there is a charcoal layer corresponding to a burnt layer. Layer 9 composed of greyish sand containing chink of lime mortar representing the phase of construction.

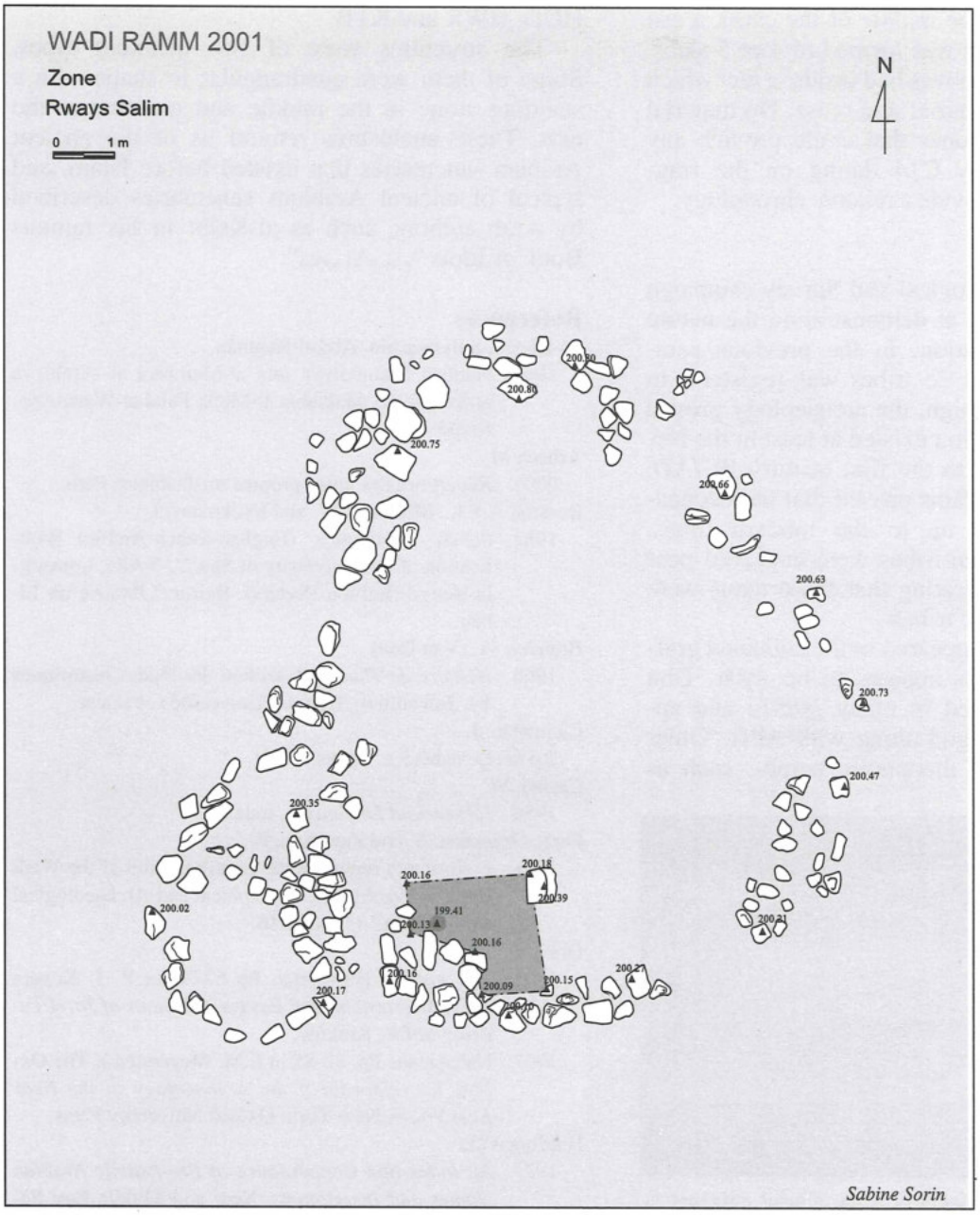
Layers of occupation 6 to 9 produced only three ceramics sherds, all of them dating to the Nabataean period. If it is difficult to determine the exact function of this building, but its location at the junction of three tracks suggests that it was a caravan station or watchtower.

Ruways Salīm

At Ruways Salīm, next to a cave containing Thamudic inscriptions, there were several rock caves. On the ground, there were irregular enclosures forming units of honeycombed cells (**Fig. 22**). We undertook a sounding (1m square approximately) in one of these enclosures. This revealed the occupation level, characterized by a gritty layer (about 20cm thick), and abundant ceramic material. Fragments of hard soil were found, probably the remainders of a floor. Fragmented animal bones and pottery sherds were discovered in this level. This discovery suggests that it was probably a domestic dwelling.

Huḍayb ar-Rīḥ (Wādī Ṣābiṭ)

At Huḍayb ar-Rīḥ (Wādī Ṣābiṭ), a sounding was carried out at the corner of a rectangular structure. The aim was primarily to determine the state of conservation of this unit, to date it and, of course, to try to establish its function. This site consisted



22. The honeycombed cells at Ruways Salim.

of several stone enclosures in addition to some tumuli.

The sounding revealed a well-preserved construction (**Fig. 23**). The stones forming the wall of the structure were consolidated from the inside by other larger stones, which formed a bench. It is difficult to confirm by this sounding whether the floor was paved or not because many stones were exposed but their irregular position made their interpretation difficult.

Some elements of ceramic furniture came from this area. However, a fragment of a grinding stone and two ceramic sherds were brought to light directly in the core of the wall. The ceramic sherds are of fine light red clay with a lime inclusion. These were body fragments, one of them with a knob and the other with nail-pressed incisions.

The Cairns

In the different wadis prospected, we observed a large number of cairns, characterized by a heap of stones about 2m in height. Usually they are placed on visible spots, on a hill or along the wadi. In the Wādī Ramm, 11 such cairns were built on the slope of the mountain.

At ʿAyn Abū ʿUwayna, a cairn was excavated (**Fig. 24**). It consisted of a circular heap, about 4m in diameter. A circular wall enclosed the western

side of this cairn. In the middle of the cairn, a cist was constructed which was formed of 4 or 5 slabs. A fragmentary skeleton was laid inside, a fact which suggests a secondary burial and reuse. No material was found with the bones that could provide any dating evidence. Only C14 dating on the fragmentary bones will provide a relative chronology.

Conclusion

Our sixth Archaeological and Survey campaign at Wādī Ramm aimed at demonstrating the nature of the human occupation. In the previous campaigns, a list of about 25 tribes was registerd. In the more recent campaign, the archaeology proved that sedentary occupation existed at least in the Neolithic period and up to the first century BC/AD. The large number of dams proved that the occupation was continuous up to the modern times. Names of Northarabian tribes were engraved near the ancient dams, indicating that those dams were the property of specific tribes.

Several gods also appeared in the collected graffiti. The main goddess appears to be Allāt. Dhū ash-Sharā was recorded in many graffiti and appears to be the main god along with Allāt. Other gods appeared in the theophoric names, such as ḤDD, ḤWR and KTB.

The structures were of two different types. Some of them were quadrangular in shape with a standing stone in the middle and oriented to the east. These enclosures remind us of the ancient Arabian sanctuaries that existed before Islam, and typical of ancient Arabians sanctuaries described by Arab authors, such as al-Kalbī in his famous Book of Idols "كتاب الأصنام".



23. The sounding in the angle of a rectangular structure at Huḍayb ar-Riḥ (Wādī Ṣābiṭ).



24. The cairn at ʻAyn Abū ʻUwayna.

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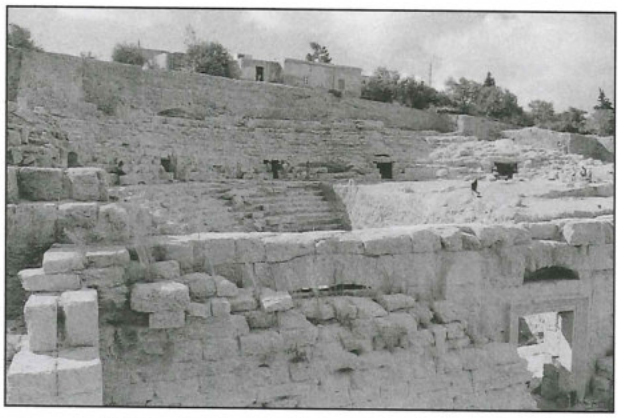
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١٩. منظر عام يوضح الأجزاء التي تم الكشف عنها في منطقة المسرح حتى هذه اللحظة.

اعتبار الجدار الذي تم إضافته على الجدار الشمالي للمسرح جزءاً من سور المدينة مما يعزز الفكرة بأن هذا الجدار قد بني لأهداف دفاعية بحتة وليس لأي هدف آخر.

أما في الجهة الشرقية وكما ذكر سابقا أن سور المدينة قد استمر بمحاذاة الجدار الخارجي الشمالي للمسرح وحتى البرج الشرقي، فقد اعتمد الجدار الشرقي للمسرح كجزء من سور المدينة وذلك بعد إغلاق مداخل الأقبية ببناء جدران سميكة من الداخل فاغلق مدخل القبو رقم (١) بواسطة جدار بعرض (١,٣٠م) وبناء جدار خلف الباب الحجري للقبو رقم (٢) وبذلك يكون قد تم اعتماد هذا الجزء من المسرح كجزء من سور المدينة وحتى بداية انحناء هذا الجدار ليتخذ الشكل نصف الدائري في الزاوية الجنوبية الشرقية للمسرح حيث تم متابعة بناء سور المدينة عند تلك النقطة واستمر باتجاه الشرق، وكما حصل في الجهة الغربية ومن خلال طريقة البناء فإن سور المدينة قد بني على جدار المسرح وليس مشركاً به، مما يعزز الفكرة بأن بناء المسرح كان سابقاً لبناء سور المدينة.

يبدو بأن الجدار الشرقي من المسرح والذي استغل كجزء من سور المدينة وذلك عن طريق إغلاقه من الداخل لم يكن كافياً ليقوم بوظيفته الدفاعية في الفترة البيزنطية مما ادى إلى بناء جدار عريض ارتبط مع البرج الشرقي للمسرح وامتد باتجاه جنوب شرق ليلتقي على بعد ٥٠م تقريباً مع زاوية سور المدينة.

أما بالنسبة إلى تاريخ بناء هذا المسرح فيعتقد ومن خلال تقنية البناء بأنه يعود إلى النصف الثاني من القرن الثاني الميلادي، حيث جاء هذا المسرح سابقاً لبناء سور المدينة الذي أورخ من قبل شيري لنزن إلى النصف الثاني من القرن الثالث الميلادي.

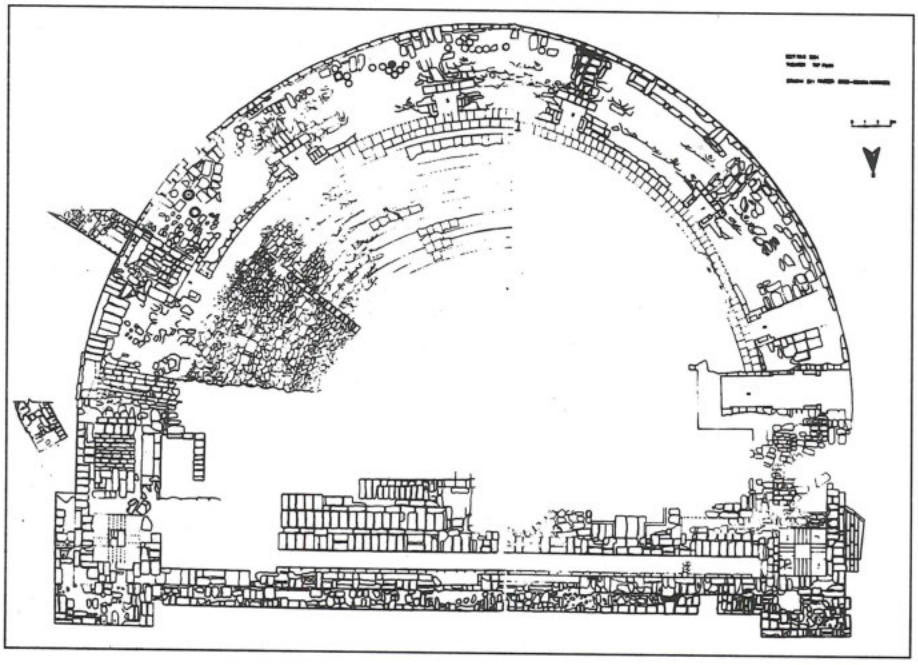
سلامه فياض
وجيه كراسنة
دائرة الآثار العامة

المراجع

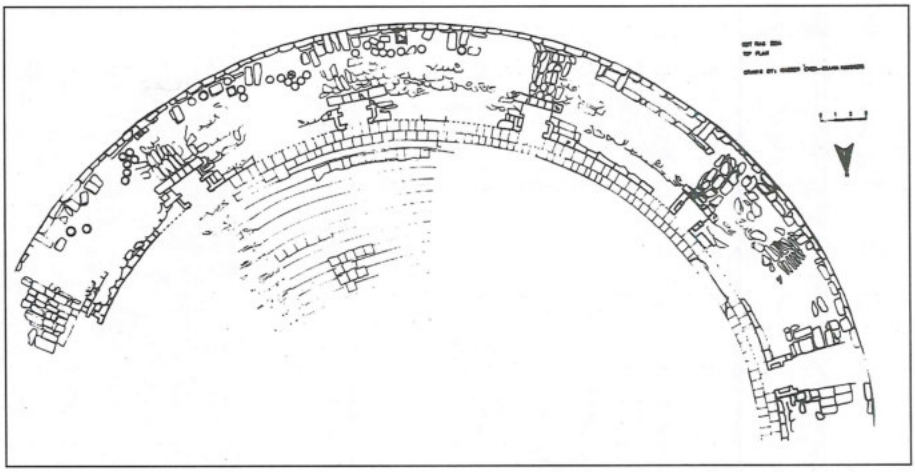
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١٩٩٣ **طرق بناء المسارح الرومانية في عمان وأم قيس،** دراسة مقارنة. رسالة ماجستير، جامعة اليرموك.

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٢٠٠٣ بيت راس (كبيتولياس). **حولية دائرة الآثار العامة** ٤٧، عمان.

Lenzen,C.J. and McQuitty, M.
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٢٠. مخطط يوضح الشكل النهائي لمدرج المسرح.



١٧. مخطط أفقي لنتائج التنقيبات الأثرية لموسم ٢٠٠٤.

كانت مخصصة لشرفة الجزء العلوي من المسرح بشكل كامل، ويلاحظ احتواء التاجيات التي وجدت متناثرة على الأرض على فتحات ربما كانت مخصصة لوضع جسور من الخشب لتغطية الشرفة سابقة الذكر (**الشكل ١٨**).

القبو رقم (٩): يقع في الجزء الغربي من المسرح ويتناظر مع القبو رقم (٢) وهو مستطيل الشكل أبعاده (١١,١٥ × ٣,٠٦م) بني باستخدام العقد نصف الدائري المائل إلى الداخل بزاوية ٤٥° وباستخدام الحجر الكلسي الصلب، عثر على الجزء الخلفي منه متهدماً أما الجزء الأمامي فلا يزال قائماً، يحتوي هذا القبو على مدخلين الأول باتجاه الغرب والثاني باتجاه الشرق يطل على منطقة الأوركسترا، وقد تم إيقاف التنقيب فيه لحين تقوية جدرانه الآيلة للسقوط.

الخاتمة

بالرغم من أعمال التنقيبات الأثرية في المسرح والتي لا زالت جارية وللموسم الخامس على التوالي، إلاّ أن الموقع لا يزال بحاجة إلى الكثير من العمل لأنه لا يزال يحتوي على كميات كبيرة من الطمم والأترية تشكلت غالبيتها بفعل السكان المحليين عبر الفترات التاريخية المختلفة وحتى العصر الحديث، واعتماداً على وجود الطبقات الترابية التي جاءت



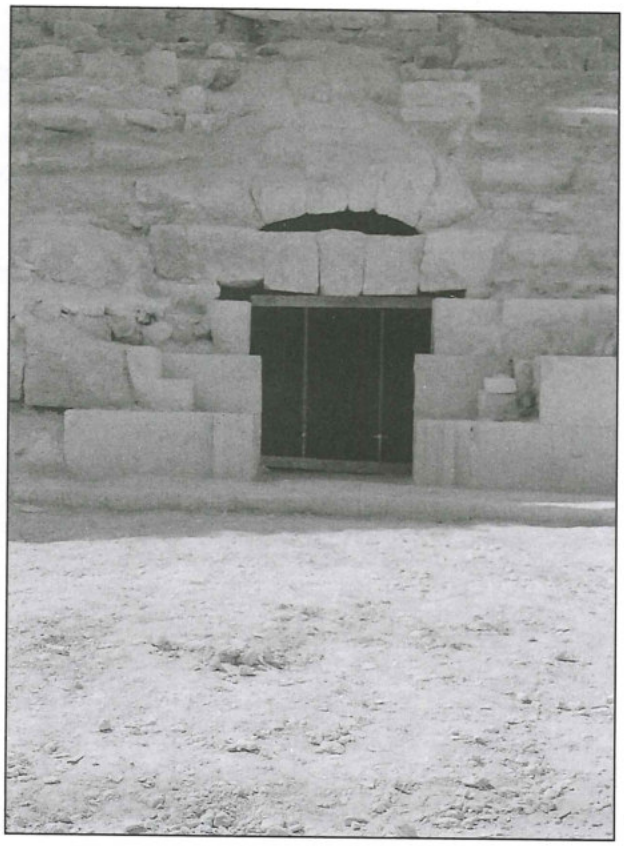
١٨. بعض أجزاء أبدان الأعمدة والتاجيات المتناثرة في الجزء العلوي من المسرح.

منحدرة بشكل حاد يعتقد بأن الموقع كان يستعمل كمكان لرمي الإنقاض والأترية وحتى فترة قريبة لا تتجاوز عدة سنوات.

لا يمكن الاعتماد كثيراً على التسلسل الطبقي في عملية التاريخ لهذا المعلم أو فترات الأشغال السكني التي جرت عليه كون هذه الطبقات قد تشكلت بفعل الظروف الطبيعية والمجتمع المحلي، ورغم ذلك يمكن الاستنتاج ومن خلال بعض الموجودات الأثرية التي عثر عليها بالإضافة إلى الكسر الفخارية والتي جاءت مخلوطة مع بعضها البعض وبشكل كبير بأن هناك عدة مراحل تاريخية جرت على الموقع تمثلت بالمرحلة الرومانية المتأخرة، البيزنطية والإسلامية المبكرة وبعض الكسر الفخارية القليلة التي تعود إلى الفترة الأيوبية المملوكية وبعض الموجودات حديثة العصر.

كشف من خلال المواسم الخمسة المتتابعة من أعمال التنقيبات الأثرية عن عدة عناصر معمارية لهذا المسرح تمثلت بالكشف عن الجدار الخارجي الشمالي للمسرح، معظم أجزاء منطقة تغيير الملابس، أساسات جدار خلفية المنصة، الجزء العلوي من مقاعد المسرح، مداخل الأقبية المطلة على منطقة المنصة، منطقة الأوركسترا بالإضافة إلى أجزاء من سور المدينة الذي جاء لاحقاً لبناء المسرح وخاصة في الجهة الغربية والجهة الشرقية منه. وبهذا يكون قد كشف عن غالبية العناصر المعمارية للمسرح باستثناء منطقة الأوركسترا والجهة الغربية من الجزء السفلي من مقاعد مدرج المسرح بالإضافة إلى الجدار الداخلي للمنصة (**الشكلين ١٩ و٢٠**).

لقد جاء بناء المسرح سابقاً لبناء سور المدينة ويبدو ذلك واضحاً من خلال التقاء جدار هذا السور مع جدار المسرح من الجهة الشرقية والغربية حيث يلاحظ وخاصة في الجهة الغربية بأن جدار السور قد بني على جدار البرج الغربي للمسرح وليس مشركاً به في حين يلاحظ بأن هناك استمرارية لبناء السور مع الجدار الذي تم إضافته على الجدار الخارجي الشمالي للمسرح، وبهذا يتضح بأنه عندما بني سور المدينة التقى هذا السور مع جدار البرج الغربي للمسرح ثم استمر بمحاذاة الجدار الشمالي وحتى البرج الشرقي الذي التف حوله وتوقف عند تلك النقطة وبذلك تم إغلاق جميع المداخل الواقعة على ذلك الجدار، ولهذا يمكن



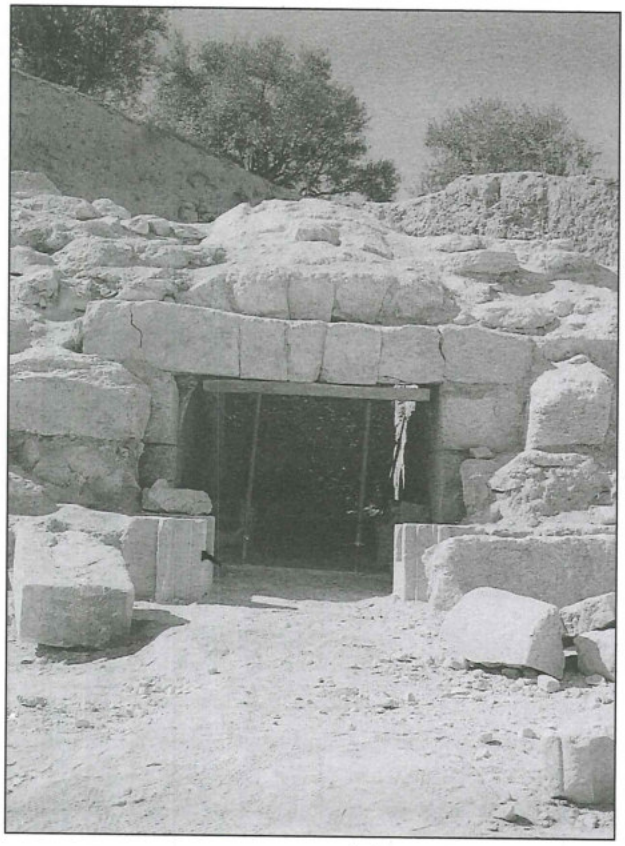
١٤. منظر خارجي للقبو رقم (٦).

هذان القبوان مع بعضهما البعض.

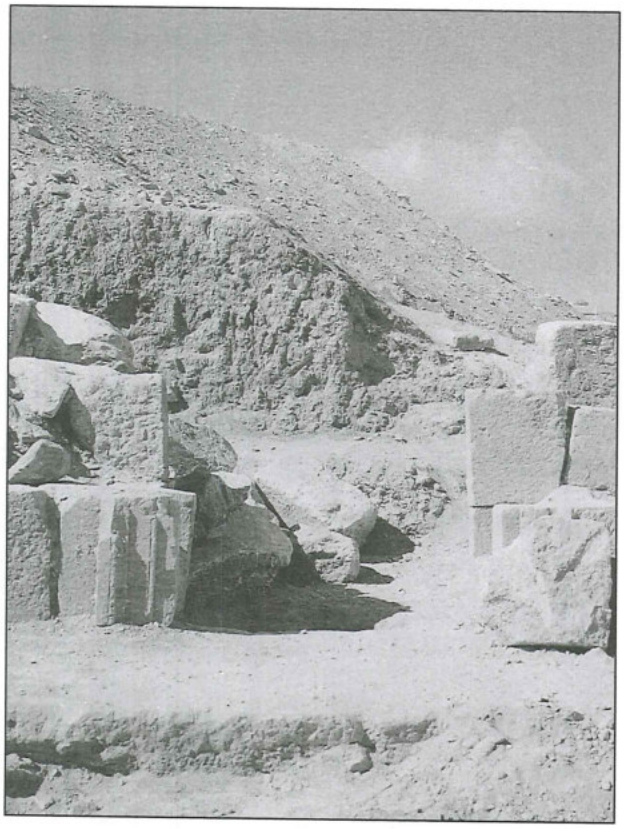
القبو رقم (٧): يوجد في الجهة الجنوبية الغربية من المسرح ويتناظر مع القبو رقم (٤) حسب مخطط المسرح، وهو عبارة عن قبو مستطيل الشكل أبعاده (٥,٤٣ × ٢,٤٤م) بني باستخدام العقد نصف الدائري المائل إلى الداخل بزاوية ٤٥° وبالحجر الكلسي الطباشيري، يختلف هذا القبو عن باقي الاقبية المشكلة للجزء العلوي من المسرح بعدم إغلاق مدخله الخارجي المطل باتجاه جنوب غرب في حين وجدت باقي مداخل الأقبية الأخرى المطلة إلى خارج المسرح مغلقة (**الشكل ١٥**).

القبو رقم (٨): يوجد هذا القبو في الجهة الغربية من المسرح وهو متناظر مع القبو رقم (٣) حسب مخطط المسرح وقد عثر على هذا القبو متهدم السقف والأجزاء العلوية من جدرانه فلم يبق منه إلاّ المدخل وأجزاء من الأدراج الصاعدة التي تتقدمه، ويلاحظ عدم إغلاق مدخله الخارجي كما حصل للقبو السابق (**الشكل ١٦**).

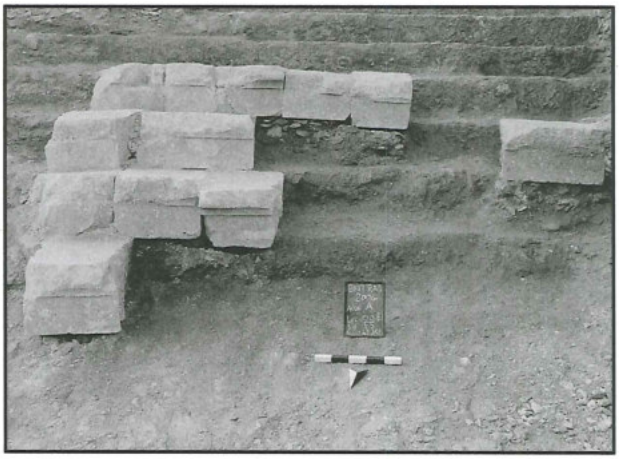
بعد الكشف عن الاقبية الستة المشكلة للجزء العلوي يكون بذلك قد تم الكشف وبشكل كامل عن الجزء العلوي من مقاعد مدرج المسرح بالإضافة إلى الجدار الخارجي له (**الشكل ١٧**)، وقد عثر على هذا الجزء متهدماً ومعاد استعماله في مراحل لاحقه ولم يعثر إلاّ على عدد قليل من المقاعد المخصصة للمشاهدين في مكانها الأصلي. ومما يلفت الانتباه في هذا الجزء العثور على كميات كبيرة من أبدان الأعمدة التي ربما



١٥. منظر خارجي للقبو رقم (٧).



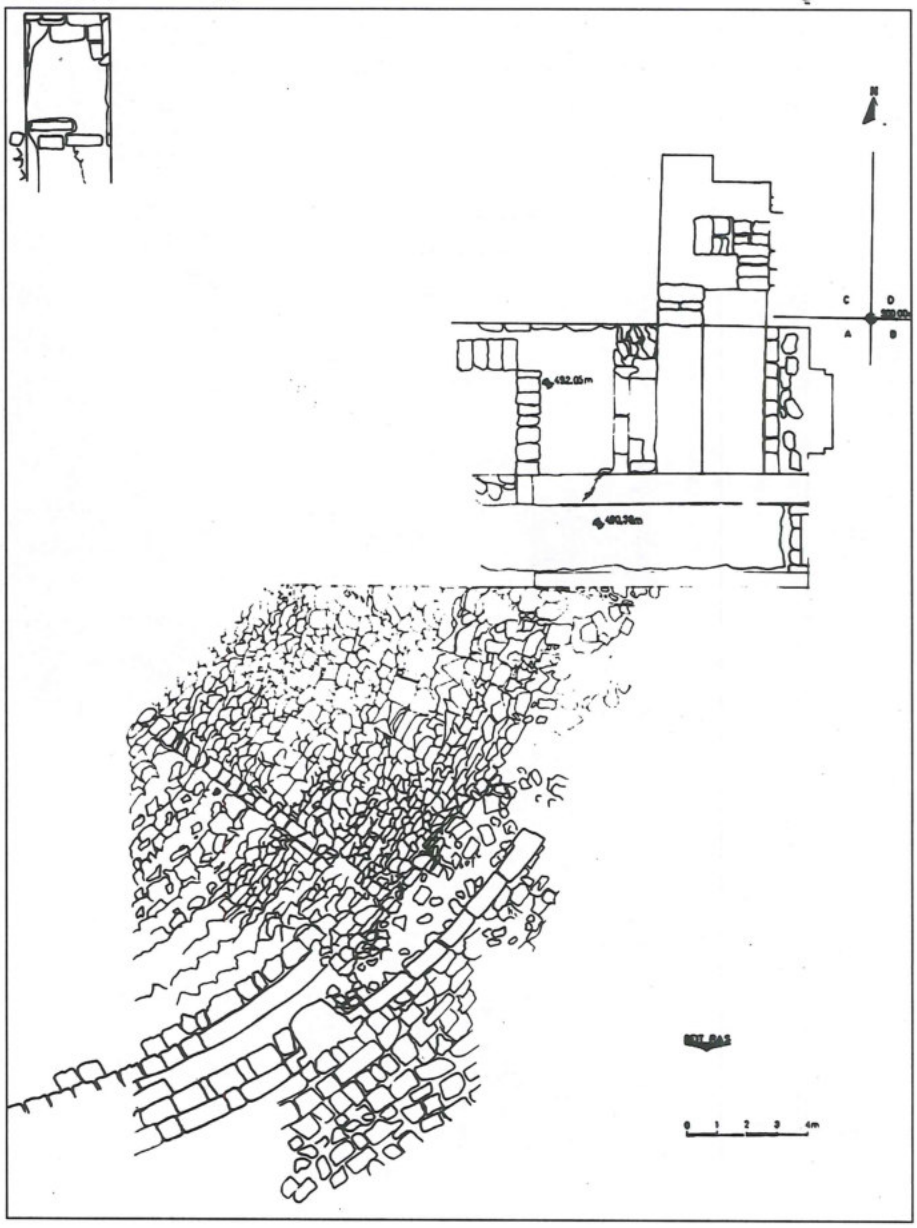
١٦. منظر خارجي للقبو رقم (٨).



١٢. صورة توضح بعض مقاعد المسرح التي ما زالت قائمة في مكانها الأصلي.

واستعمل الحجر الكلسي الطباشيري لبنائه. يحتوي القبو على مدخلين الأول باتجاه الجنوب أغلق في فترة لاحقة لاستخدامه لأغراض السكن، أما المدخل الثاني فيطل على الممر الفاصل بين الجزء الأول من مقاعد مدرج المسرح والجزء العلوي، ويتقدم هذا القبو أجزاء من درجين صاعدين إلى الجزء العلوي يوجد الأول على يمين المدخل والأخر على شماله.

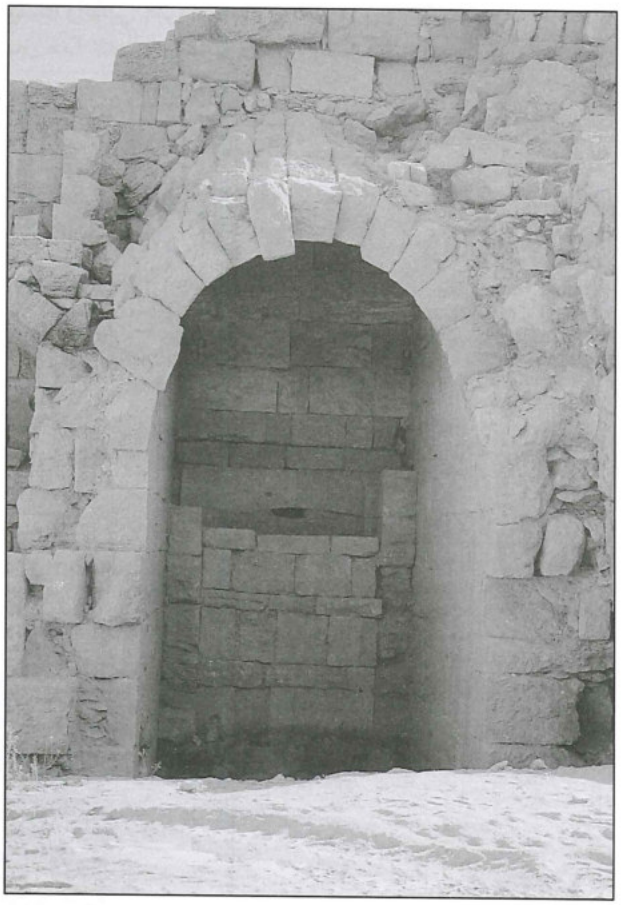
القبو رقم (٦): إلى الغرب من القبو رقم (٥) في الجزء العلوي من المسرح، وهو عبارة عن قبو مستطيل الشكل أبعاده (٥,٧٤ × ٢,٢٨م) بني باستخدام نظام العقد نصف الدائري المائل إلى الداخل بزاوية ٤٥° وبالحجر الكلسي الطباشيري، ويقع باتجاه الشمال من الممر الفاصل بين الجزء السفلي من مقاعد مدرج المسرح والجزء العلوي يتقدمه درجين صاعدين الأول على يمينه والثاني على شماله (**الشكل ١٤**)، وتشكل المنطقة الفاصلة بين هذا القبو والقبو رقم (٥) منتصف المدرج حيث يتناظر



١٣. مخطط أفقي لنتائج التنقيبات الأثرية لموسم ٢٠٠٣.



٩. صورة توضح عملية اغلاق القبو رقم (٢) باستخدام الباب الحجري.



١٠. صورة توضح عملية اغلاق القبو رقم (٢) من الداخل.

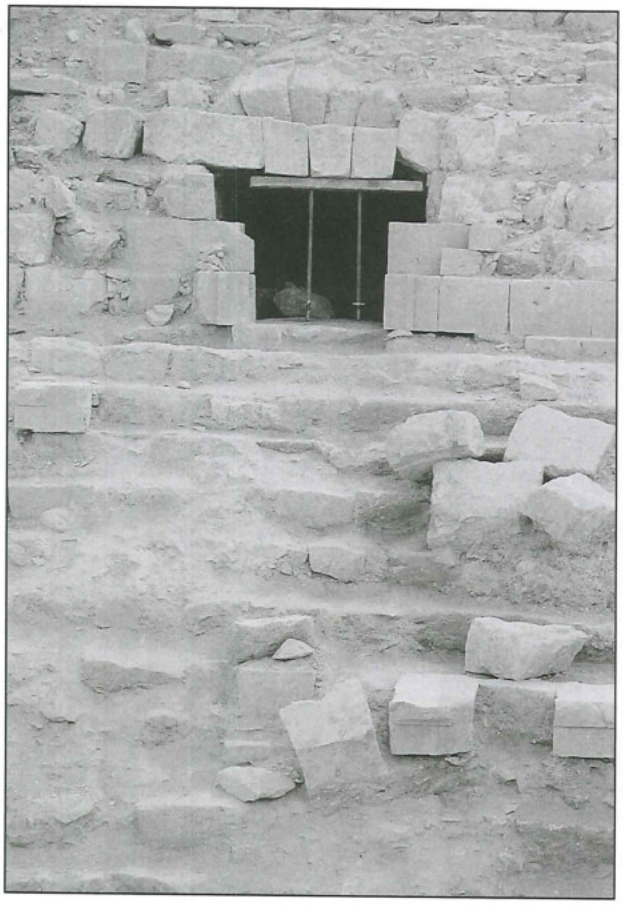
وفي الجهة الجنوبية من القبو رقم (٣)، كشف عنه في الموسم ٢٠٠١ وهو عبارة عن قبو مستطيل الشكل أبعاده (٥,٢٠ × ٢,٤٨م)، بني باستخدام أسلوب العقد نصف الدائري المائل بزاوية ٤٥° إلى الداخل وبالحجر الكلسي الطباشيري. يحتوي هذا القبو على مدخلين الأول باتجاه الجنوب الشرقي أغلق في فترة لاحقة أثناء العصر البيزنطي لاستخدامه لأغراض السكن، أما المدخل الثاني فيطل على داخل المسرح والممر الفاصل بين الجزء العلوي والجزء السفلي من مقاعد مدرج المسرح، يتقدم هذا المدخل أجزاء من درجين صاعدين إلى الأعلى يوجد الأول على يمين المدخل والثاني على يساره (**الشكل ١١**).

أجزاء من المنطقة المخصصة لمقاعد المشاهدين: كشف في هذا الموسم عن الجزء الشرقي من المنطقة المخصصة لمقاعد المشاهدين ويلاحظ اعادة استعمالها في فترة لاحقة باستثناء عدد قليل من المقاعد التي لا زالت في مكانها الأصلي (**الشكل ١٢**)، اما باقي المقاعد فقد اختفت وربما تكون قد أعيد استعمالها أثناء العصر البيزنطي في بناء بعض المباني، ويلاحظ استعمال أجزاء من بعض المقاعد في بناء سور المدينة المرحلة الثانية الذي يعتقد بأنه أضيف في الفترة البيزنطية (**الشكل ١٣**).

الموسم الخامس ٢٠٠٤

تركز العمل في هذا الموسم في الجهة الجنوبية والغربية من المسرح للكشف عن الجدار الخارجي له ومنطقة تجويف الجزء العلوي المخصصة لمقاعد المشاهدين وذلك في المنطقة (A)، فكشف عن مجموعة من العناصر المعمارية الخاصة بالمسرح وهي

القبو رقم (٥): يقع هذا القبو في الجزء العلوي من المسرح وهو عبارة عن قبو مستطيل الشكل أبعاده (٥,٧٤ × ٢,٤٨م) بني باستخدام العقد نصف الدائري المائل بزاوية ٤٥° إلى الداخل،



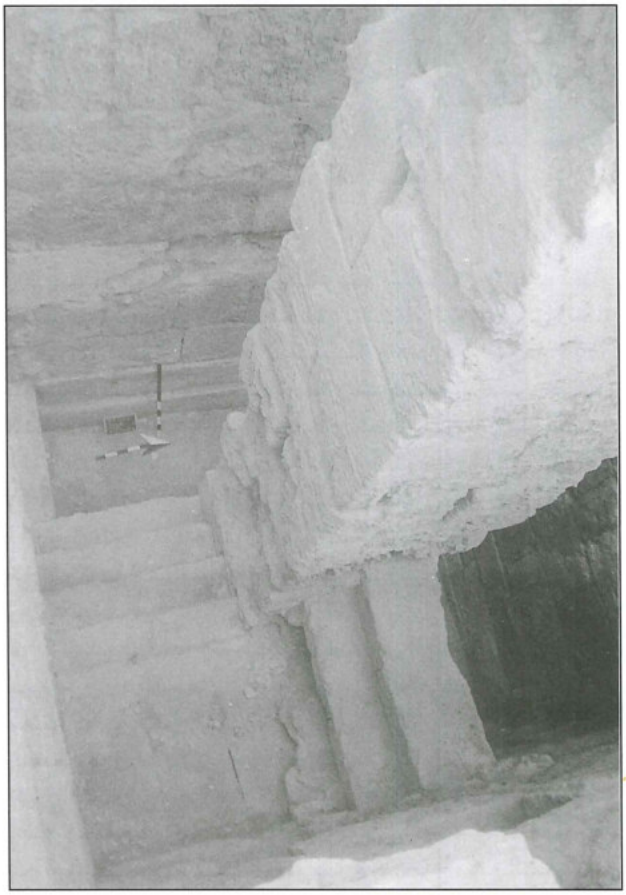
١١. منظر خارجي للقبو رقم (٤).

الشكل يلتف حولها مجموعة من الأدراج الحجرية (**الشكل ٦**) وعثر على مجموعة من الدرجات التي لا زالت في مكانها الأصلي، وقد استعمل الحجر الكلسي في بناء هذه الأدراج، كما ويحتوي هذا البرج على مدخلين الأول يطل باتجاه الشمال إلى خارج المسرح تم إغلاقه لاحقاً بامتداد سور المدينة، أما الثاني يطل باتجاه الجنوب إلى داخل القبو رقم (١) الذي يحاذيه من الجهة الجنوبية، ويلاحظ اختفاء بعض الدرجات الحجرية بالإضافة إلى البلاط الحجري لهذا البرج التي قد يكون أعيد استعمالها في فترات لاحقة.

القبو رقم (١): يقع هذا القبو بمحاذاة البرج الشرقي مباشرة من الجهة الجنوبية ويرتبطان ببعضهما بواسطة مدخل، وقد كشف عن سطح هذا القبو لأول مرة في الموسم ٢٠٠١، وكشف عنه كاملاً من الداخل في الموسم ٢٠٠٣م (**الشكل ٧**)، وهو عبارة عن قبو مربع الشكل، أبعاده (٧,١٠ × ٦,١٥م) بني باستخدام أسلوب العقد الهابط وبالحجارة الكلسية الطباشيرية ويحتوي هذا البرج على مدخلين الأول باتجاه الشرق أغلق في فترة لاحقة بواسطة جدار من الداخل ومعاصر لبناء سور المدينة، أما المدخل الثاني فهو باتجاه الغرب على منطقة المنصة ويتقدمه شرفة حجرية أبعادها (٣,٢٠ × ٣,٦٠م) وتعتبر الشرفة جزءاً من منطقة المنصة، تدل بعض المؤشرات الأولية بأن هذا المدخل كان مزين بالزخارف الحجرية والكورنيش (**الشكل ٨**).

القبو رقم (٢): يقع هذا القبو بمحاذاة القبو (رقم ١) من الجهة الجنوبية، كشف عن سطحه الخارجي في الموسمين ٢٠٠٠ و٢٠٠١، أما من الداخل فقد كشف عنه في الموسم ٢٠٠٣م، وهو عبارة عن قبو مستطيل الشكل أبعاده (١١,١٠م × ٣,٠٢م) بني باستخدام العقد نصف الدائري المائل بزاوية ٤٥° إلى الداخل وبالحجر الكلسي الصلب، يتميز هذا القبو بارتفاعه الذي وصل من الداخل إلى ٨,٢٠م تقريباً، ويحتوي هذا القبو على مدخلين الأول باتجاه الشرق تم إغلاقه على عدة مراحل، حيث كان هذا القبو مفتوحاً بشكل كامل من الخارج تم إغلاقه في الفترة المعاصرة لبناء سور المدينة مع ترك مدخل صغير اغلق باستخدام الباب الحجري (**الشكل ٩**)، ثم أضيف مدخل أخر في فترة لاحقة من الداخل كان يغلق باستخدام الباب الخشبي، وفي فترة ثالثة تم إغلاق المدخل الأخير باستخدام الحجارة (**الشكل ١٠**)، أما المدخل الثاني لهذا القبو فهو باتجاه الغرب يطل على منطقة الأوركسترا، ويلاحظ تهدم الجزء الأمامي لهذا القبو وكذلك امتداد الجدار الشمالي له إلى داخل الأوركسترا ويعتقد بأن هذا الجدار يقطع منطقة الأوركسترا باتجاه الغرب ليلتقي مع جدار القبو الغربي المتناظر معه مشكلاً بالتالي الجدار الداخلي للمنصة.

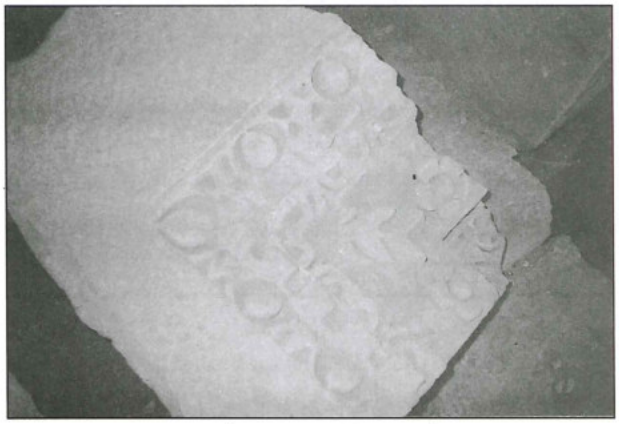
القبو رقم (٤): يقع هذا القبو في الطابق الثاني من المسرح



٦. منظر علوي للبرج الشرقي.



٧. صورة توضح عملية اغلاق المدخل في القبو رقم (١).



٨. الكورنيش الذي كان يعلو مدخل القبو رقم (١).

الجدار الشمالي، يبلغ عرض الأول حوالي ٢,٨٠م يسير بشكل مستقيم باتجاه الشرق ثم ينعكس باتجاه الجنوب لتشكل عملية التقائه بالجدار الشرقي للمسرح الزاوية الشمالية الشرقية لسور المدينة الأثرية، أما المرحلة الثانية من السور فيقع إلى الشمال من المرحلة الأولى وهو يسير بشكل مائل جنوب شرق زاوية السور باتجاه شمال غرب ليلتقي مع البرج المربع القائم على زاوية المسرح، يعتقد بأنه يعود إلى الفترة البيزنطية من خلال ملاحظة إعادة استعمال بعض الحجارة الخاصة بالمسرح في بناء هذا الجزء من السور.

بالإضافة إلى أعمال التنقيبات الأثرية التي جرت في الجهة الشرقية للمسرح فقد تم أيضاً التنقيب في الجدار الشمالي وذلك في عدد من المربعات كشف من خلالها عن البرج المناظر للبرج الشرقي للمسرح وهو عبارة عن برج مربع الشكل يتم الصعود اليه من خلال عدة درجات حجرية تلتف حول ركبة حجرية وله مدخل يطل باتجاه الجنوب إلى داخل المسرح، وكذلك كشف عن جزء من سور المدينة عند التقائه بالبرج الغربي، وبهذا تتوضح لنا أجزاء كبيرة من الجدار الشمالي والجدار الشرقي خلال هذين الموسمين ٢٠٠٠ و٢٠٠١.

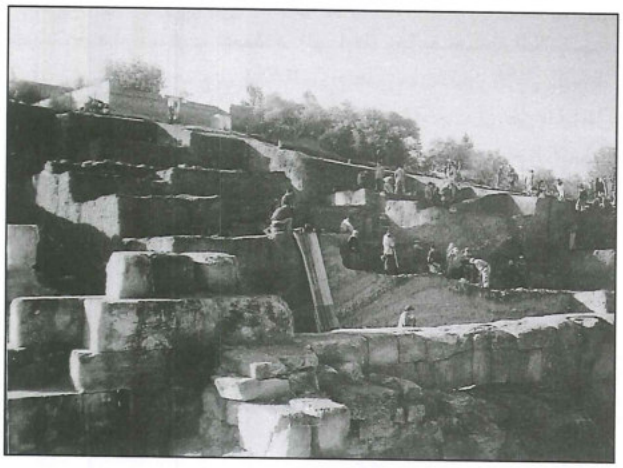
الموسم الثالث ٢٠٠٢

تركز العمل في المرحلة الأولى في الجزء الشمالي من المسرح حيث كشف عن بعض الأجزاء الخلفية للمنصة أما الجدار الأمامي فلم يكشف عنه، كما عثر في منتصف منطقة المنصة على نفق محفور بالصخر بعرض ٩٠سم وارتفاع ١,٨٥م ويمتد باتجاه الشمال إلى خارج المسرح مسافة ١٩,٨٠م، ويعتقد بأن هذا النفق كان يستعمل من قبل الممثلين لتحقيق عنصر المفاجأة خاصة وأنه يوصل الممثل إلى منتصف المنصة، كذلك كشف عن أساسات جدار خلفية المنصة وهو الجدار الذي يفصل المنصة عن منطقة تغيير الملابس، ولم يبق من هذا الجدار إلاّ بعض الأجزاء البسيطة في الجهة الغربية وبعض أساسات المداخل المطلة على منطقة المنصة، كما وكشف أيضا عن معظم أجزاء منطقة تغيير الملابس وعن الجدار الشمالي الخارجي للمسرح، ويلاحظ بأن هذا الجدار يحتوي على مرحلتين تاريخيتين تمثلت الأولى بالجزء الداخلي له ويعتبر الجدار الأصلي الخاص بالمسرح ويشكل الجدار الخارجي له. أما المرحلة الثانية والمتمثلة بالجدار الخارجي فهي عبارة عن امتداد لسور المدينة الذي بني في فترة لاحقة للمسرح حيث يلاحظ امتداد سور المدينة من الجهة الغربية وبذلك تم إغلاق جميع المداخل الخاصة بالمسرح المطلة باتجاه الشمال، وقد استمر هذا الجدار حتى البرج الشرقي حيث التف حوله وتوقف في تلك المنطقة (**الشكل ٤**).

وفي المرحلة الثانية من أعمال التنقيبات الأثرية في الموسم ٢٠٠٢ توقف العمل في المنطقة الأمامية واستكمل في المنطقة العلوية وذلك باتباع أسلوب المصاطب نظراً لارتفاع منسوب الطمم والمقاطع الترابية الناتجة عن أعمال التنقيب السابقة (**الشكل ٥**).



٤. منظر عام للجدار الشمالي الخارجي للمسرح.



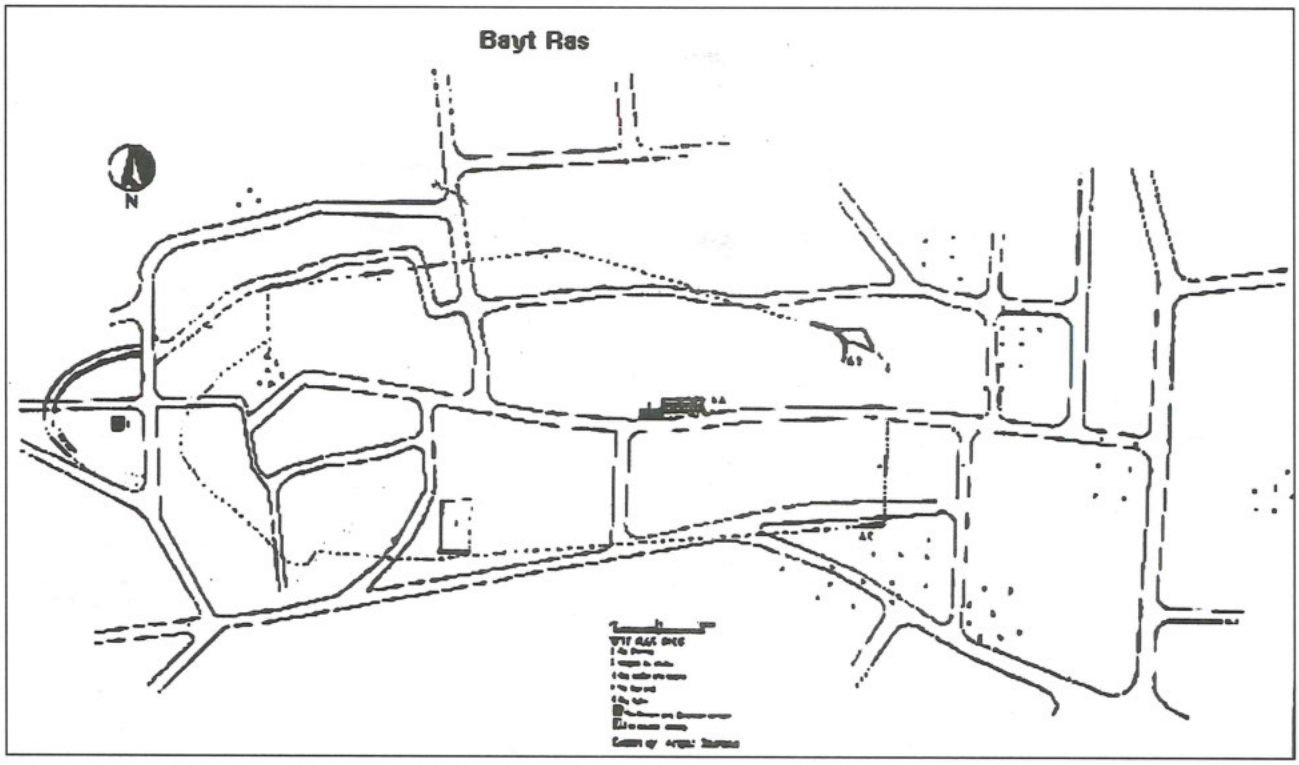
٥. منظر عام يوضح أسلوب التنقيب بواسطة المساطب.

الموسم الرابع ٢٠٠٣

بعد الاعتماد في نهاية الموسم الثالث ٢٠٠٢ على نظام المصاطب وتخفيف الارتفاعات في المقاطع الترابية إلى الحد الأدنى من الخطورة، فقد تم متابعة العمل في الموسم ٢٠٠٣ بالأسلوب نفسه وذلك في الجهة الشرقية من المسرح ضمن المنطقة (A) والتي تقدر بحوالي ٤٠٠م في المربعات A1 و A2 و B1 و B2 و B3 و C1 و C2 و C3 و C4 و C5 و C6 و D3 و D4 و D5 و D6 و E5 و E6 بالإضافة إلى عدد من المربعات الأخرى التي لم يتم الانتهاء منها، حيث تم إيقافها مبدئياً لضمان عدم خلق مقاطع ترابية عالية قد تشكل في المستقبل خطرا على الموقع وعلى العاملين.

كشف في هذا الموسم عن عدد من العناصر المعمارية للمسرح واصبح من المؤكد بأن هذا المعلم هو أحد مسارح مدينة كبيتولياس الرومانية، والذي لم يكن ظاهراً في المواسم السابقة ومن أهم العناصر المعمارية

البرج الشرقي: يقع هذا البرج في الزاوية الشمالية الشرقية وقد كشف عن الجزء العلوي منه في الموسم ٢٠٠٠، وإكمل العمل به في الموسم ٢٠٠٣ وهو عبارة عن برج مربع الشكل تبلغ أبعاده (٣,٥٥ × ٣,٦٨م) يحتوي على ركبة حجرية مربعة



٢. مخطط تنظيمي لبيت راس موضحا عليه المعالم الأثرية.

المدينة (Lenzen and McQuitty1989: 193-195) حيث تم فتح مربعين بامتداد السور وقد دلت النتائج على امتداد الجدار باتجاه الشرق. ثم استأنف العمل في عام ١٩٩٩ وكشف عن امتداد الجدار شرقاً وكذلك عن برج مربع الشكل[1].

الموسم الأول ٢٠٠٠

كان الهدف من التنقيبات الأثرية في هذا الموسم هو الكشف عن العناصر المعمارية ومعرفة ماهيتها، فكشف عن البرج المربع الشكل الذي يقع في الزاوية الشمالية الشرقية من المسرح وايضاً عن الأجزاء العلوية من الجدار الشمالي والجدار الشرقي والأجزاء العلوية لبعض مداخل الأقبية الواقعة على الجدار الشرقي يعلو إحداها نقش لاتيني متآكل على حجر كلسي (**الشكل ٣**)، ويعتقد وجود كلمة كبيتولياس الاسم الروماني لمدينة بيت راس عليه.

الموسم الثاني ٢٠٠١

جاءت أعمال التنقيبات الأثرية في هذا الموسم استمراراً للمواسم السابقة تركز من خلالها العمل في المنطقة الشرقية حيث كشف عن أسطح ثلاثة من الأقبية الواقعة على الجدار الشرقي متدرجة الارتفاعات من الأسفل إلى الأعلى تدل وبشكل واضح على وجود المسرح، ويلاحظ بأن القبو السفلي



٣. النقش اللاتيني الذي يعلو القبر رقم (٢) من الخارج.

بني بشكل مسطح أو ما يسمى بالقبو الهابط، بينما بني القبوان الآخران باستخدام نظام العقد نصف الدائري وبشكل مائل إلى الداخل وبزاوية ٤٥° وذلك لاستخدام أسطحها كأرضيات لمقاعد المسرح.

كما كشف في هذا الموسم عن أجزاء من سور المدينة القائمة على الجدار الشرقي للمسرح، ويلاحظ بأن هذا السور بني على مرحلتين تاريخيتين ويعتبر الجدار الجنوبي أقدم من

١. جرت التنقيبات في موقع بيت راس في مواسم ١٩٩٨ و ١٩٩٩ و ٢٠٠٠ و ٢٠٠١ بإشراف مفتش آثار إربد وجيه كراسنة وفي موسم عام ٢٠٠٢ المرحلة الاولى بإشراف أحمد الشامي والمرحلة الثانية بإشراف سلامة فياض وفي عام ٢٠٠٣ بإشراف سلامة فياض وفي موسم عام ٢٠٠٤ بإشراف وجيه كراسنة وسلامة فياض.

التنقيبات الأثرية في مسرح بيت راس
مراحل العمل من الموسم الأول وحتى الموسم الخامس

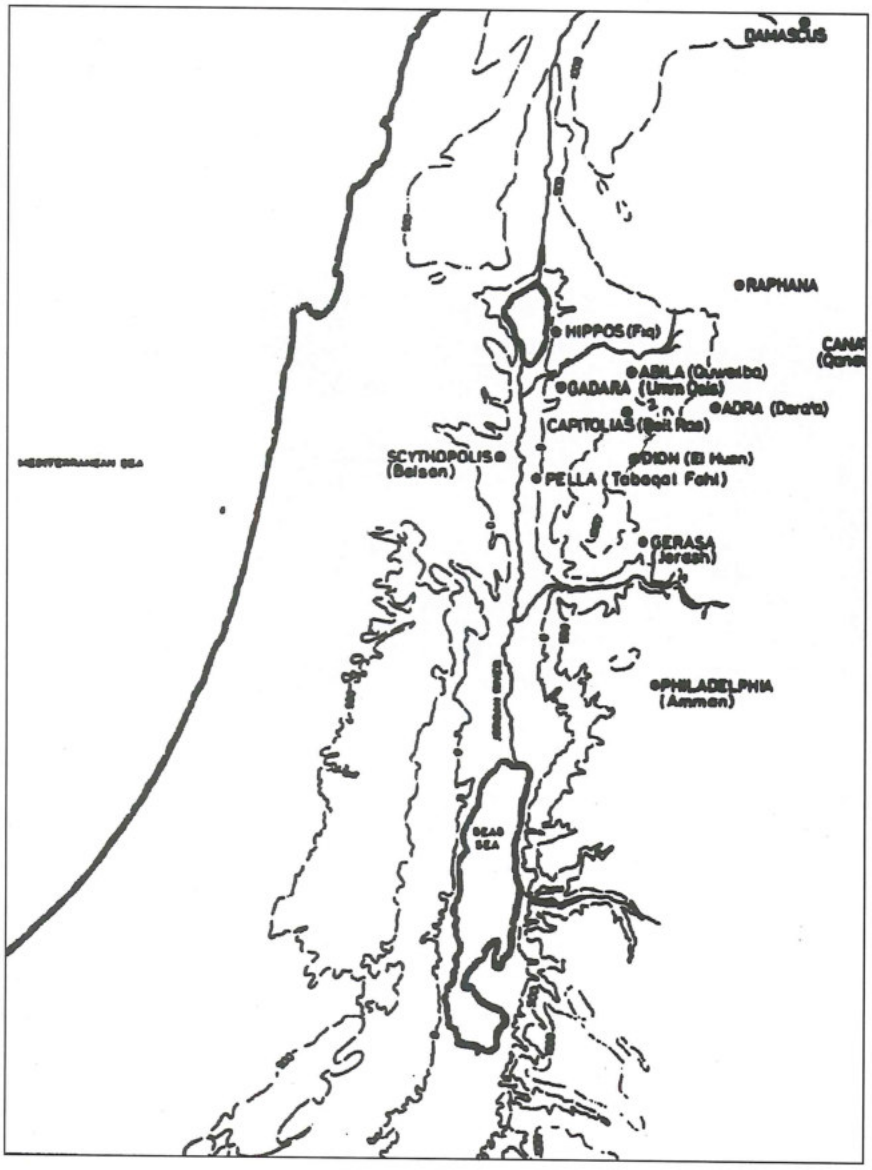
سلامه فياض ووجيه كراسنة

الموقع

تقع بلدة بيت راس على بعد ٥كم إلى الشمال من مدينة اربد، وتعتبر واحدة من أهم مدن الديكابولس الرومانية والتي حملت الاسم اللاتيني كبيتولياس (**الشكل ١**)،

أما منطقة التنقيبات الأثرية كانت في الجزء الشمالي من بلدة بيت راس، وفي الزاوية الشمالية الشرقية لمدينة كبيتولياس الرومانية حسب المخطط الذي تم رسمه من قبل الرحالة الألماني شوماخر سنة ١٨٩٠م (**الشكل ٢**).

كانت بداية العمل الاثري بالموقع في نهاية عام ١٩٩٨ في المنطقة التي حفرت بها لنزن، ويعتقد بأنها جزء من سور



١. خريطة مدن الديكابولس حسب رؤية بليني وبطليموس.

كرمة العنب على الأسرجة الفخارية البيزنطية والإسلامية المبكرة، وأكد أن أغصان الكرمة المنبعثة من الجرار هي التفسير العملي النهائي لدورة حصاد النبيذ.

في الاستنتاج، قام الباحث بتلخيص ما ورد في مقالته وأهمية الأرضيات الفسيفسائية في الأردن لفهم الفن والمجتمع والديانة المسيحية خلال الفترتين البيزنطية والإسلامية المبكرة، وتشابه عناصر معاصر النبيذ وحتى لباس دوّاسي العنب الذي يعكس تشابه أو اختلاف التقاليد، وبأن صانعو الفسيفساء قد أخذوا الواقع في حسبانهم بحيث صوروا الحصاد الحقيقي وليس حصاداً مثالياً، كما أكد أنهم صوروا الحقيقة في اللون حيث أن النبيذ الأحمر في كنيسة القديس إسطفان في أم الرصاص هو إشارة أكيدة لدم المسيح حين ضحى بنفسه لخلاص قومه.

وأختتم الجزء الإنجليزي من العدد بعرض زيدان كفافي لكتاب "**الإسرائيليون**" (The Israelites) من تأليف B. S. J. Isserlin.

خيرية عمرو
المتحف الوطني الأردني
عمّان ـ الأردن
البريد الألكتروني: opnm@go.com.jo

شرح الباحثان بعد ذلك منهجية الدراسة، حيث استخدما الأساليب الإحصائية بمقارنة تواتر (أو تكرار) الأدوات مع أبعادها (قياساتها) لتقييم العلاقة المحتملة بين المواقع، إذ ينتج تواتر الأدوات في الغالب عن نشاطات وظيفية في بيئة معينة، كما قد تعتمد أبعاد الأدوات على المواد الخام المتوفرة إضافة إلى التقاليد الثقافية السائدة. واستخدم الباحثان أسلوبين إحصائيين بسبب اختلاف القواعد المعلوماتية المتوفرة من الجزيرة العربية ومضيق أولدوفاي، واختارا تحليل الاختلاف أو التغير (Analysis of Variance - ANOVA) باستخدام أبعاد الأدوات لفحص العلاقة بين موقعي المسح العربيين وموقع كهف الجوزه، بينما قاما بتطبيق أسلوب القياس متعدد الجوانب (Multidimensional Scaling - MDS) باستخدام تواتر الأدوات للمقارنة بين المواقع العربية والإفريقية، وللحصول على تجمعات إحصائية ذات مغزى، أضاف الباحثان للمقارنة الثانية بيانات عن أدوات من مواقع أفريقية وعربية أخرى، من ضمنها عدد من المواقع السعودية وموقع وادي السرحان في الأردن والعبيدية في فلسطين.

في شرحهما لنتائج التحاليل الإحصائية، أظهر الباحثان التشابه بين المواقع العربية الثلاثة من جهة، وتشابهها مع المواقع الأولدوانية من مضيق أولدوفاي (في مجموعة ضمت أيضاً عينات وادي السرحان)، بينما خرجت كافة المواقع الأشولية بما فيها العبيدية إضافة إلى الأولدوانية المتطورة من مضيق أولدوفاي خارج تلك المجموعة.

في النتيجة، نبه الباحثان على أنه ليس بالإمكان الخروج بنتائج مؤكدة في غياب التأريخ بالنظائر المشعة، إلا أن تشابه اللقى السطحية بتلك المستخرجة من التنقيب في كهف الجوزه يرجح احتمال استسقاء معلومات هامة من المواقع السطحية، كما أنه يمكننا ربط المواقع العربية بالأولدوانية من مضيق أولدوفاي والتي أرخت إلى ١,٨ مليون عام. ودعا الباحثان إلى المزيد من المسح والتنقيب على طول الطرق المقترحة للهجرات البشرية القديمة، حيث تشير كافة الدلائل إلى انتشار المواقع الأولدوانية في الجزيرة العربية على طول مسارات هجرات وأماكن سكن المجموعات البشرية القديمة، وقد نجد في هذه المواقع مفتاح الحل لمعرفة زمان ومكان أقدم الهجرات البشرية إلى آسيا.

آخر المقالات في العدد للزميل المرحوم تيسير عطيات الذي غادرنا بعد نشر مقالته ببضعة أشهر، وربما كانت هذه آخر مقالاته التي قدر له أن يراها قبل وفاته رحمه الله. المقالة بعنوان "**صور معاصر النبيذ على الأرصفة الفسيفسائية في الأردن، وفلسطين، ولبنان**" (Wine Presses on Mosaic Pavements of Jordan, Palestine and Lebanon). ابتدأ الباحث مقالته بالحديث عن الأردن خلال الفترة البيزنطية وازدهار شعبها العربي وانتشار الكنائس فيها، واعتبر الأرضيات الفسيفسائية أكثر ما يبهر الإنسان في كنائس حوض المتوسط، كما اعتبرها مصدراً هاماً للمعلومات حول الحياة الريفية والحضرية، والإدارة الدينية في الأردن خلال الفترة البيزنطية. عرّف الباحث هدف مقالته بإلقاء الضوء على الميزات الزراعية في الأردن في الفترة ما بين القرن السادس والسابع للميلاد وذلك عبر تصاوير مختارة لمعاصر النبيذ على الأرضيات الفسيفسائية، وإظهار العلاقة بين بناء معاصر النبيذ وتصاويرها، ومحاولة فهم تقنية عصر النبيذ وأهميته في الطقوس المسيحية.

بعد المقدمة، انتقل الباحث إلى الحديث عن كرمة العنب وشهرة بلاد الشام بجودة النبيذ وكثرته، فذكر المصادر المصرية القديمة والعهدين القديم والجديد، مركزاً على أهميته الدينية، أما الأرضيات الفسيفسائية فعادة ما تصور دورة حصاد العنب بالتسلسل التالي: ١- قاطف الثمار وهو يقطع القطوف بمنجل قصير، وبجانبه سلة؛ ٢- سلة مليئة بالعنب؛ ٣- نقل العنب على ظهر حمار أو ظهر رجل؛ ٤- رجال يدوسون العنب في المعصرة؛ ٥- وفي العادة تكون هذه الدورة مصحوبة بعازف ناي، وبالإمكان مشاهدتها في كنيسة القديسين لوط وبروكوبيوس في المخيط على سبيل المثال. كما يمكن أن تكون هنالك تفاصيل أخرى في صورة المعصرة مثل عمود مكبس العصر بأخاديده اللولبية الحادة كما في كنيسة الأسقف سيرجيوس، وحوض تجميع العصير في كنيسة القديس إسطفان في أم الرصاص. وفي أحيان عدة صورت مظاهر الحياة اليومية ضمن صفوف من أغصان الكرمة الدائرية، حيث انتشرت زخرفة الكرمة في بلاد الشام خلال الفترة ما بين القرن الرابع والسابع الميلاديين ويعتقد الباحث بأن لهذا علاقة بأهمية العنب والنبيذ في الطقوس المسيحية.

بالنسبة لإنتاج النبيذ في الأردن وفلسطين، رجع بنا الباحث للعصر البرونزي ثم المؤرخ الروماني بليني، وأفادنا بمعلومات حول أرض الأردن وشعبها خلال الفترة البيزنطية، حيث اعتبر انتشار معاصر العنب والزيتون الصغيرة على الهضبة الجبلية في الجهة الغربية دليلاً على شح الأرض التي كان بالإمكان استغلالها للزراعة، وذكرت كل من واطسون وأوهي أن أحجام وتوزيع المعاصر تشير إلى أنها كانت للاستعمال المحلي وليست للتجارة. وكانت معاصر النبيذ في فلسطين أكبر من مثيلاتها في الأردن، ربما لأن كميات العنب كانت أكثر وعدد السكان أكبر، إلا أن المراكز السكنية على الهضبة الأردنية كانت تعتمد في اقتصادها على الزراعة وتصنيع المنتجات الزراعية، خاصة النبيذ وزيت الزيتون. وعرض الباحث تصنيف واطسون لمعاصر النبيذ المتشابهة في عناصرها في الأردن وفلسطين، وشدد الباحث على ترجيح كون النبيذ الأحمر رمزاً دينياً مسيحياً مستشهداً بمقطع من إنجيل متّا ورد فيه على لسان السيد المسيح أن الخبز هو جسده والنبيذ دمه.

كانت المعصرة ذات العمود اللولبي الثابت الطراز الرئيس في الأردن والبلدان المحيطة، حيث ظهرت على ست أرضيات فسيفسائية من الأردن وفلسطين ولبنان، أظهر الباحث رسوم بعضها في لوحة واستطرد بالحديث عن اختلاف التفاصيل والعناصر فيها، واستنتج أن عصر العنب كان يتبع دوسه كما ورد في المصادر الكلاسيكية، ورجح مرة أخرى كون زخارف الكرمة رمزاً دينياً مسيحياً يؤكد العلاقة بين الكنيسة والمسيح بسبب التشبيه السابق الذكر. انتقل الباحث فيما بعد لزخارف

الخط العربي الإسلامي والخط النبطي، ويعتبر مكتمل اللفظ والمعنى ومقروء بالكامل وحالته جيدة باستثناء شق حديث تسبب في ضياع حرفين فقط. قام الباحث بتحليل النص كل سطر على حدة بتفصيل كبير، بما في ذلك تفسير صناعة الفخار والجرار التي استأثرت بحوالي ثلاث صفحات، استدل من خلالها على تفشي القراءة والكتابة بين أصحاب المهن اليدوية كنتيجة لنشر بني أمية لمراكز الكُتّاب في الأرياف والتجمعات السكانية النائية خلال تلك المرحلة من حكمهم. وفي نهاية المقالة أثار الباحث فرضية طريفة وهي إذا ما كان النقش عبارة عن لوحة تجارية "بمثابة شارة إعلانية قصد بها صاحبها التنويه عن مدى مهارته وتسويق بضاعته خاصة عند مستخدمي المورد المائي لغيل المنضج..." تساءل بعدها فيما إذا كانت المنطقة تمر آنذاك بمراحل اقتصادية وسياسية عصيبة لم توثق تاريخياً.

بعد المقالات تم تخصيص قسم بعنوان **"مؤتمرات وندوات علمية"** عرضت فيه عميدة محمد شعلان الندوة الدولية بمناسبة الذكرى السبعين لميلاد البروفسور والتر مولر وهي بخصوص "نقوش وآثار جنوب الجزيرة العربية"، نظمها قسم الدراسات السامية بجامعة فيلبس - ماربورج - ألمانيا بتاريخ ٢٦-٢٧ سبتمبر ٢٠٠٣. وعرضت خيرية عبد الله الأصقة "ندوة التراث العمراني الوطني في المملكة العربية السعودية" المنظمة من قبل الهيئة العليا للسياحة في مركز الملك عبد العزيز التاريخي - الرياض بتاريخ ٣٠ سبتمبر ٢٠٠٣. وعرض أحمد يوسف ذياب "الندوة الخامسة لجمعية الآثاريين العرب" التي عقدت في جامعة القاهرة بين ٤-٦ أكتوبر ٢٠٠٣. وفي الأردن عرضت عميدة محمد شعلان مرة أخرى "ملتقى اليرموك الثاني لدراسة النقوش والكتابات القديمة" الذي نظمه قسم النقوش بكلية الآثار والأنثروبولوجيا - جامعة اليرموك في الفترة ٧-٩ أكتوبر ٢٠٠٣، كما عرض زيدان عبد الكافي كفافي "المؤتمر الثاني للعلوم والتكنولوجيا في الآثار والمحافظة عليها" بتنظيم من معهد الملكة رانيا للسياحة والتراث - الجامعة الهاشمية - الزرقاء بتاريخ ٧-١١ ديسمبر ٢٠٠٣.

وفي نهاية القسم العربي من العدد، عرض مولاي محمد جانيف كتاب "من الإسكندر إلى زنوبيا - تاريخ بلاد الشام القديمة من القرن الرابع ق.م. إلى القرن الثالث ب.م." لمؤلفه موريس سارتر، وهو باللغة الفرنسية، كما عرض عبدالله نصيف كتاب "هندسة المياة والري عند الأنباط العرب" من تأليف زيدون المحيسن وهو من ضمن مشروع "بيت الأنباط" للتأليف والنشر.

أما القسم الإنجليزي من العدد، فقد استهل بترجمة لافتتاحية رئيس هيئة التحرير، تلتها مقالتان الأولى بعنوان **"الحضارة الأولدوانية في شبه الجزيرة العربية"** كتبها نورمان والن وغلين فريتز (The Oldowan in Arabia) Norman M. Whalen and Glen A. Fritz من جامعة تكساس ستيت في الولايات المتحدة الأميركية. في المقدمة تحدث الباحثان عن الاكتشافات المتعلقة بالأصناف البشرية القديمة في أفريقيا وآسيا خلال العقد الأخير من القرن العشرين وبداية القرن الحالي مما عزز الاهتمام بالهجرات البشرية القديمة إلى آسيا، وخاصة اكتشاف بقايا عظام بشرية مع أدوات حجرية أرخت إلى ١,٧٧ مليون عام قبل الوقت الحاضر في موقع دمانيزي في جورجيا، والتأريخ العائد إلى ١,٨ مليون عام قبل الوقت الحاضر في كهف لونغوبو في الصين، إضافة إلى إعادة تأريخ بقايا الجماجم المكتشفة في موبوكرتو وسانغيران في جزيرة جاوا إلى ١,٨١ و١,٦٦ مليون عام قبل الوقت الحاضر. إلا أن أقدم المستحثات البشرية ما زالت تلك المكتشفة في أفريقيا مما يؤكد الأصل الإفريقي للجنس البشري. بعد ذلك قدّم الباحثان الصناعة الأولدوانية حسب ملاحظات سيماو Semaw، وهي نسبة إلى مضيق أولدوفاي في تنزانيا وتعود إلى ٢,٦-١,٥ مليون عام قبل الوقت الحاضر، أي أنها تسبق الأشولية مباشرة. وبما أن هنالك بقايا بشرية تعود إلى ما قبل ١,٨ مليون عام في جنوب شرقي آسيا، فلا بد أن البشر هاجروا من أفريقيا قبل ذلك بآلاف السنين آخذين بعين الاعتبار المسافات الشاسعة والبيئات المتنوعة التي استغلوها في طريقهم. وهنالك طريقان محتملتان للخروج من أفريقيا، الأولى من أثيوبيا بمحاذاة نهر النيل وعبر سيناء إلى بلاد الشام، والثانية من مضيق أولدوفاي إلى جبوتي ثم عبر مضيق باب المندب إلى اليمن وتتفرع منها ثلاث طرق: اثنتان عبر غربي ووسط السعودية بمحاذاة سلسلة جبال البحر الأحمر (عبر نجد وتهامه)، والثالثة عبر عُمان ومضيق هرمز إلى إيران، ومن المحتمل أن كلا المضيقين كانا جسوراً برية خلال العصور الجليدية في حقبة البليستوسين والتي تسببت بانخفاض مستويات البحار، وهذه الطريق الأخيرة عبر اليمن وعُمان هي موضوع هذا البحث.

بعد المقدمة شرح الباحثان أعمال المسح والتنقيب، واختاروا ثلاثة مواقع على الطريق الجنوبية، أثنين في اليمن والثالث في عمان، كمحطات محتملة على درب الرحلة البشرية نحو الشرق حيث كان قد سبق التعرف عليهم كمواقع ما قبل الأشولية أو أولدوانية متطورة، وكان أحد المواقع وهو كهف الجوزه في حضرموت جنوبي اليمن قد تم التنقيب فيه سابقاً حيث عثر على الأدوات الأولدوانية في موقعها الأصلي تعلوها الطبقات الأشولية، بينما تم اختيار الموقعين الآخرين - الأول عبارة عن تجمع لـ١٦ موقعاً على وادي شهار في جنوبي غرب اليمن والثاني تجمع لـ٤٣ موقعاً في منطقة حقف بوسط عمان - نتيجة للمسح الأثري حيث وجدت كميات كبيرة من الأدوات على السطح. وطرح الباحثان سؤالين للدراسة، الأول هو مدى العلاقة بين اللقى السطحية وتلك المكتشفة في موقعها الأصلي، والثاني فيما إذا كانت هنالك علاقة كامنة بين الأدوات المتواجدة في هذه المواقع العربية والأدوات الأولدوانية من مضيق أولدوفاي في شرق أفريقيا. واعترف الباحثان بصعوبة الإجابة على هذه الأسئلة حيث أن أدوات العصر الحجري السفلي المعروفة في الجزيرة العربية جميعها لقى سطحية باستثناء تلك التي اكتشفت في كهف الجوزه، ولم يتم بعد العثور على أية مخلفات بشرية، كما أنه لا توجد بعد أية تواريخ بالنظائر المشعة للأدوات العربية.

طول ضلعها ٧م وارتفاعها ٤, ١م حيث كان يرتقى إليها بواسطة درجين جانبيين ضيقين استبدلا فيما بعد بسلم ثابت، وكانت تعلوها مظلة مرفوعة على أعمدة. عثر في سطح المصطبة على ثلاثة تجاويف محفورة يبدو أنها كانت توضع عليها الأنصاب (التي لم يعثر عليها بسبب إعادة استخدام المبنى خلال الفترتين البيزنطية والإسلامية على الأرجح)، إلا أن الباحثين أكدوا على أن تلك الأنصاب كانت ولا بد شبيهة بتلك المعروفة من موقعي البتراء والحِجر، كما أن منصة معبد الذريح شبيهة بتلك الموجودة في عدد من المعابد النبطية مثل معبد اللات في إرم ومعابد البتراء حيث تعكس المنصة بوصفها "مجلساً للآلهة" جانباً أساسياً من الطقوس والاحتفالات الدينية. بعد ذلك قدم الباحثون نصاً للقديس إبيفانوس (٣١٥-٤٠٣م) تحدث فيه عن الطقوس الدينية لأهالي البتراء وأيدوليون وإلوسا (الخالصة)، ملقياً أضواءً هامة على استعمالات أجزاء المنصة من أماكن إيداع الأنصاب في القبوين أسفل الـ"موتاب" (الذي رجح الباحثون كونه المجلس أو العرش حيث كانت توضع أنصاب الآلهة)، إلى توقيت تنظيم الطقوس في الليل وطرق إحيائها من طواف وترانيم وولائم. أما الحفر الثلاث فقد أعاد الباحثون تصورها على أن اثنتين منها كانتا لوضع نصبين اثنين والثالثة لتلقي الدماء المسكوبة عليهما استدراكاً لاعتقادهم السابق بوجود ثلاثة أنصاب. وخلص الباحثون بعد النقاش والمقارنات إلى أن هذا الجزء الداخلي من المعبد كان مخصصاً لطقوس دينية عربية خالصة.

وبالنسبة لواجهة المعبد التي ناهز ارتفاعها ١٥م واحتوت عدة عناصر أهمها المنحوتات التي كانت تشكل الأجزاء العليا لجدار المعبد الجنوبي والتي أعيد تصورها بشكل شبه تام بعد سنوات من العمل الدؤوب، عرض الباحثون وصفاً دقيقاً لها، ثم اعترفوا بأنهم ما زالوا بعيدين عن فهم مدلولها لغرابة السياق العام للمنحوتات التي مزج فيها الفنان النبطي العناصر المحلية بأخرى "دخيلة (شرقية وفارسية بالأساس)"، وفي النهاية حددوا هدفهم بالإجابة على سؤالين، يتعلق الأول بالآلهة التي كرس لها هيكل الذريح، والثاني بتوقيت الاحتفالات السنوي. وللإجابة انتقلوا إلى معبد خربة التنور المجاور للذريح إذ توجد في المعبدين شواهد ثابتة على ارتباطهما بالنجوم والكواكب، وتمثل التماثيل النصفية على واجهة معبد الذريح الأبراج السماوية الإثنا عشر. ورجح الباحثون أن يكون المعبدان قد خصصا للزوج ذو الشرى والعزى، وأنهما كانا متكاملين بحيث تتم زيارتهما في أوقات مختلفة من العام، وبملاحظة توجه هيكل التنور نحو الغرب وهيكل الذريح نحو الشمال، رجح الباحثون أيضاً أن زيارة التنور كانت تتم خلال فترتي اعتدال السنة عند شروق الشمس أو غروبها، وأن زيارة الذريح كانت تتم في شهر شباط عندما يشكل شروق الشمس أو غروبها خطاً متعامداً مع محور المعبد.

واختتم الباحثون مقالهم بأهمية الشواهد الأثرية من هيكلي التنور والذريح، وبأن دراستها ستسهم دون شك في فهم الثنائيات أو الأضداد التي تبدو مميزة لديانة الأنباط.

المقالة العربية الرابعة في العدد هي بعنوان **"نقش غيل المنضج (المبرح) الإسلامي المؤرخ في سنة ٩٨هـ (٧١٦-٧١٧م) (محافظة ظهران الجنوب. المملكة العربية السعودية) لمحمد بن عبد الرحمن الثنيان** من قسم الآثار والمتاحف في جامعة الملك سعود. ابتدأ الباحث مقالته بتحديد موقع محافظة ظهران الجنوب ثم وصف مدينة ظهران الجنوب وأهلها، ومن ثم منطقة المنضج (المبرح) حيث اكتشف النقش موضوع الدراسة خلال دراسة ميدانية شاملة لطريق الحج اليمني الأعلى من صنعاء إلى مكة المكرمة، وأرفق الباحث جدولاً بأهم المواقع الأثرية في محافظة ظهران الجنوب والرسوم والنقوش التي عثر عليها في تلك المواقع. ثم انتقل إلى المنضج (المبرح) وغيله في المصادر العربية المبكرة، حيث ذكر بداية أن غيل البردان وغيل وادي المنضج (المبرح) هما العينان المائيتان الوحيدتان اللتان كشف عنهما في القسم السعودي من مسار طريق الحج اليمني الأعلى (المعروف في المصادر المتقدمة باسم النجدي)، وأن المبرح هو الاسم المعاصر بدلاً من مسمى المنضج كما شرح اشتقاقات هذه التسمية، إضافة إلى تسمية مصلولة التي تطلق حالياً على مسار درب الحج المرصوف بديلاً عن مسمى المنضج التاريخي الذي اختفى تماماً.

يعد أحمد بن عيسى الرداعي أقدم من ذكر غيل المنضج ومنطقة المبرح وأرفقت المقالة جدولاً بأسماء المواقع التي ذكرها الرداعي خلال رحلته لتأدية فريضة الحج في القرن الثالث الهجري/ التاسع الميلادي، كما ذكر المنطقة عدد من الجغرافيين العرب وضمن الباحث جدولاً يوضح أسماء بعض المحطات على مسار درب الحج وفقاً للحربي وابن خرداذبة وقدامة والهمداني والمقدسي والإدريسي، وذكر أن المنطقة شهدت في عام ١٤٢هـ/٧٦٠م صداماً عسكرياً بين الوالي العباسي على اليمن معن بن زائدة الشيباني وعمر بن زيد الغالبي.

انتقالاً إلى النقش موضوع الدراسة، أشار الباحث إلى انتشار الآثار الخطية الإسلامية على امتداد مسار طريق الحج اليمني الأعلى، إلا أن هذا النقش هو أول أثر خطي مؤرخ يكشف عنه على هذا المسار، كما تكمن أهميته أيضاً بتأريخه للقرن الأول الهجري (حيث أكتشف حتى الآن تسعة عشر نقشاً مؤرخاً لذلك القرن في الأراضي السعودية)، ولارتباطه المكاني بمحطة غيل المنضج وهي من المحطات الرئيسة على درب الحج، وتزداد أهميته بسبب تضمين صاحبه لحرفته ودقة تأريخه مما سيساعد في وضع التأطير التاريخي لمراحل استخدامات درب الحج اليمني الأعلى خاصة وأن هنالك غياباً للتدوين التاريخي الموسع لحالة الدرب واستخداماته خلال الفترات الإسلامية المختلفة.

بعد هذه المقدمة، ابتدأ الباحث بالدراسة التحليلية للنقش الذي يبلغ طوله حوالي ٥٥سم وعرضه ٤٥سم، وهو بالخط الكوفي البسيط مكون من ١٠ أسطر نقشت على حجر غرانيتي مائل للاحمرار، وطلب فيه كاتبه ثابت بن أبي تميم، وهو صانع جرار، الرحمة من الله وذلك يوم السبت ١٠ جمادي الآخرة سنة ٩٨ هجرية. وتظهر بعض السمات الكتابية في رسم وصياغة حروف كلمات النقش جانباً من التزاوج الحضاري بين

مواقع أثرية تؤرخ للفترة النبتية خارج حدود الإقليم المتعارف عليه.

بعد التعريف الجغرافي والحضاري، انتقل الباحث إلى كتابات الرحالة حول الحضارة الكوشية بشكل عام، بدءاً بالإغريق الذين عرفوا السودان باسم (أثيوبيا)، ذاكراً أهم الكتاب الكلاسيكيين أمثال هيرودوت وديودوروس الصقلي واسترابو ثم بليني واسبلينكا، ثم الرحالة في القرن التاسع عشر الذين ذكروا وسجلوا معلومات هامة عن أثار السودان. أما بالنسبة للبحوث والدراسات المنظمة فقام الباحث بعرض لأهمها بدءاً بعام ١٨٩٨ والأعوام التالية التي شكلت نقطة تحول كبيرة في تاريخ البحث الآثاري في السودان، وحتى مؤلفات أدامز الشهيرة عام ١٩٧٧ .

بعد العرض، أتى تحليل بعض البحوث والدراسات الآثارية المتعلقة بالسودان، وارتباطها بتطور علم الآثار، حيث جرى الكثير منها بمنهجية دراسة الأعمال الإنقاذية مما أدى إلى الحصول على نتائج غير مؤكدة، وفي القرنين التاسع عشر وبدايات العشرين انشغل الدارسون بالبحث عن امتداد الإمبراطورية المصرية، وسادت النظرية العرقية الدونية لأصحاب الحضارة الكوشية وانشغل الباحثون "باكتشاف الإمبراطورية البيضاء في إفريقيا". وطرح كاتب المقالة مشكلة تباين الإستراتيجيات والأهداف في علم الآثار وعدم وجود اتفاق حول الأولويات والمناهج للبحث الآثاري في السودان، وخص بالذكر فشل جميع المناهج المتبعة في لفت اهتمام المجتمع السوداني لأهمية الآثار (وهي في الحقيقة مشكلة تتجاوز حدود السودان إلى معظم عالمنا العربي). ثم عرض الباحث عدداً من الأفكار والمفاهيم حول التاريخ النوبي القديم، واضعاً الفترة التي أعقبت الحرب العالمية الثانية كفاصل لاتجاهات جديدة نتجت عن توظيف بعض العلوم الأخرى في خدمة علم الآثار بحيث نقلته من المنهج الوصفي إلى نظام دراسي تحليلي، مما نتج عنه ظهور نظريات ومناهج جديدة تتضح سماتها في دراسات اعتمدت الأدلة الآثارية والأنثروبولوجية كبرهان على استمرارية الثقافة السودانية وخصّ حديثة بأمثلة عن الدراسات المتعلقة بنبتة، ونبّه إلى أن هنالك بعض المواقع التي أرخت إلى الفترة النبتية لم تنل بعد ما تستحقه من أعمال التنقيب.

وفي الخلاصة، ذكر الباحث أن البحوث والدراسات الآثارية التي أجريت في مواقع حضارة نبتة تمخضت عنها نظريات وآراء متعددة تناولت الأصل والسياسة والدين، وقام بتلخيص تقويمه لأهم الأعمال التي ذكرها في مقالته بدءاً بأعمال رايزنر الذي يعد أول من أجرى حفريات في مواقع الحضارة النبتية في العشرينات من القرن العشرين، وإن كان قد كرس بحثه على حفر أكبر عدد من المواقع في أقل وقت ممكن وأقتصر عمله على المواقع البارزة واهتمامه بالطبقة الحاكمة دون غيرها. أتى رايزنر إلى السودان حاملاً معه النظرية العرقية البحتة خدمة للسياسة الاستعمارية في إفريقيا، إلا أن الباحث استماح له عذراً كون تلك النظرية متمشية مع "طبيعة علم الآثار في ذلك الوقت"، وأعاد استراتيجيته في العمل إلى النظرة السائدة عندئذ، كما أرجع إليه وضع أسس دراسات الحضارة السودانية. وانتقل الباحث إلى شرح التطور الذي ظهر في أبحاث أنطوني أركل الذي اتبع استراتيجيات رايزنر لكنه تجرد من النظريات العرقية والانتشارية بسبب اضمحلالها عندئذ. ومع عام ١٩٥٠م، توالت أبحاث وكتابات العلماء الذين "يحملون طرق ومناهج بحثية جديدة ... محاولين معالجة التاريخ الثقافي السوداني".

واختتم الباحث مقالته بتلخيص ما سرده من الدراسات التي ظهرت عن الحضارة الكوشية منذ الثمانينات من القرن العشرين، والتي وإن كانت في معظمها قد اعتمدت على مزاجع وتقارير الحفريات الماضية، إلا أنها عالجت موضوعات كانت غائبة عن أذهان الكثيرين مما "انعكس في تطور الفهم وازدياده عن الحضارة النبتية، التي عالجتها النظريات السابقة، التي كانت تنسبها للعنصر الليبي تارة، وللعنصر المصري تارة أخرى؛ ولكن تبقى نبتة سودانية الأصل والمنشأ".

المقالة العربية الثالثة متعلقة بموقع هام في جنوبي الأردن، وهي بعنوان "**خربة الذريح: إضاءات جديدة على ديانة الأنباط ومعتقداتهم**" **لزيدون المحيسن** من كلية الآثار والأنثروبولوجيا في جامعة اليرموك **وفرانسوا فيلنوف** من مدرسة المعلمين العليا والمركز الوطني للبحث العلمي في فرنسا **ومولاي محمد جانيف** من جامعة باريس الأولى. استهل الباحثون مقالتهم بالحديث عن قلة المعلومات التي وصلتنا عن ديانة العرب قبل الإسلام واستفادتهم من المعلومات المستقاة من البحث الميداني في موقع خربة الذريح التي تحوي آثاراً تعود أقدمها إلى العصر الحجري الحديث وأحدثها إلى الفترة العثمانية، غير أن أهم فترات الموقع هي الفترة النبطية-الرومانية ما بين القرنين الأول والرابع للميلاد، حيث اكتشفت البعثة الأردنية-الفرنسية المشتركة العاملة في الموقع منذ عام ١٩٨٤ معبداً نبطياً هاماً ضمن قرية تحوي أبنية سكنية وصناعية أسهمت إلى حد بعيد في تحسين معرفتنا عن الحياة الدينية والاجتماعية والاقتصادية للأنباط خارج البتراء. وقد ركزت هذه الدراسة على الجانب الديني خاصة كما برز في آثار هيكل خربة الذريح الواقع في الجهة الشمالية الغربية من الموقع. انتقل الباحثون بعد المقدمة إلى وصف الهيكل الذي تصل مساحته الكلية إلى ١٥٠م طولاً و٥٠م عرضاً ووصف المرحلتين الرئيستين التي مرّ بها المبنى ما بين القرن الأول وحتى منتصف القرن الرابع للميلاد (والتي تم طمس بعض معالمها خلال الفترتين البيزنطية والإسلامية)، ثم انتقلوا إلى وصف أجزائه وزخارفه معززين وصفهم بالمخططات والصور، وطرحوا سؤالاً حول طبيعة الطقوس التي كانت تجري في المعبد وعلاقتها بالتماثيل النصفية والمواضيع الميثولوجية المجسدة على واجهته. وللإجابة على التساؤل طرح الباحثون معالجة الموضوع وفق مستويين: الأول يتعلق بالجزء الداخلي أي قدس الأقداس، والثاني يرتبط بواجهة المعبد "التي تحيل بمنحوتاتها وتماثيلها الآدمية النصفية إلى فضاء ديني وثقافي مختلف".

للتحدث عن قدس الأقداس وعبادة الأنصاب، عاد الباحثون لتأكيد أهمية المصطبة المربعة التي وصفوها سابقاً والبالغ

النتائج الأولية" لعبدالله بن محمد الشارخ من قسم الآثار والمتاحف في جامعة الملك سعود، عرض فيها الباحث النتائج الأولية للمسح الميداني الذي قام به فريق من الجامعة لمنطقة الثمامة في وسط المملكة العربية السعودية، بدعم من مدينة الملك عبد العزيز للعلوم والتقنية. إبتدأ الباحث مقالته بمقدمة ركزت على أسباب محدودية الدراسات الأثرية في الجزيرة العربية وضرورة معالجة الوضع القائم، ثم أسباب اختيار منطقة الدراسة التي أثبت البحث الأولي غناها بالمواقع الأثرية. ثم انتقل الباحث إلى الدراسات السابقة المتعلقة بالعمل الأثري في المملكة العربية السعودية بصفة عامة، ودراسات ما قبل التاريخ بصفة خاصة، والدراسة التي قام بها فريق وكالة الآثار لموقع الثمامة في عام ١٤٠٣هـ. بعد ذلك قام الباحث بتعريف منطقة البحث جغرافياً وجيولوجياً، حيث أن الظواهر الطبوغرافية من اجتماع وجود سلسلة جبلية وهضبة سفلية ومنطقة سهلية في الثمامة قد أثرت على اختيار مواضع المواقع الأثرية إضافة إلى حكمها على تقسيم العمل الآثاري وانتقاء العينات.

بعد ذلك قدم الباحث المسح الاستكشافي لمنطقة الدراسة الذي بدء بالمواقع المسجلة سابقاً وبالاعتماد على الخرائط الطبوغرافية، حيث تبين للفريق وعورة المنطقة التي تتركز فيها معظم الظواهر الأثرية. تبع ذلك المسح الشامل الذي فرضت طبوغرافية المنطقة الوعرة أن يقسم حسب تضاريسها عوضاً عن استخدام المربعات الشبكية أو المسارات المتوازية المتعارف عليها في عمليات المسح الأثري، وشرح الباحث الاستراتيجية التي اتبعها الفريق في عملية المسح وتعريفه لـ"الموقع الأثري" وتقدير أبعاده، وعمليات التوثيق التي اتبعها الفريق خلال المسح الشامل، إذ قام بتحديد مواقع الظواهر الأثرية التي بلغت المئات باستخدام جهازي GPS أحدهما محمول يدوياً والآخر ثابت، وشرح الباحث أيضاً نظام تسمية المواقع الذي أتبع أثناء المسح وملخص المعلومات المسجلة في استمارات المسح، كما قام الفريق بتوثيق المواقع بالصور وجمع الملتقطات السطحية من مواقع الأدوات الحجرية.

تبع المسح الأثري اختيار المواقع للاختبار، حيث اختار الفريق موقعين للمنشآت الحجرية وثلاثة مواقع للأدوات الحجرية في السلسلة الجبلية، وموقع للمنشآت الحجرية في الهضبة السفلية، وموقع للأدوات الحجرية متضمناً لمواقد النار في المنطقة السهلية وشرح الباحث بشكل مختصر استراتيجية الاختبار في مواقع الأدوات الحجرية ثم المنشآت الحجرية، ومن ثم قدم وصفاً للتنقيب في مواقع المنشآت الحجرية الثلاثة معززاً بالصور وخرائط تبين تلك المواقع. بعد ذلك انتقل للحديث عن مواقع الأدوات الحجرية (التي بلغ عددها نحو ١٥ موقعاً) وتوثيقها وتحدث بالتفصيل عن المواقع الأربعة التي اختيرت للاختبار ومناطق التجميع فيها معززاً تقريره بصور المواقع والأدوات الحجرية وخريطة لانتشار الظواهر الأثرية وعينات الأدوات الحجرية في المنطقة السهلية حيث تم أيضاً التنقيب عن موقد نار جمعت منه عينة للتأريخ الكربوني (كربون ١٤).

اختتم الباحث مقالته بعرض لعدد من النتائج الأولية المتعلقة بالمنشآت الحجرية في موقع الثمامة الأثري، والتي تدل كثافتها على استغلال الجماعات البشرية للظروف البيئية والموارد الطبيعية للمنطقة، كما يشير تنوع أنماطها إلى التنوع الوظيفي في استخدامها وأثبت التنقيب استخدام الظاهرة (ثم-أ-١٢) التي احتلت صورتها الغلاف الإنجليزي للعدد كمكان للدفن. وقام الباحث بتقسيم المنشآت الحجرية إلى ثلاثة أنواع رئيسة هي الدوائر والأكوام والمباني الحجرية ويتبعها عدد من التقسيمات الفرعية، وأرجع وجود غالبية المنشآت الحجرية على الأجزاء المرتفعة من منطقة الدراسة إلى تفضيل الجماعات البشرية للأماكن المرتفعة والظروف البيئية المتمثلة في كثرة هطول الأمطار وجريان مياه الأودية طوال أكثر شهور السنة، وأشار إلى أن الكثير من نتائج الدراسة ستعتمد بشكل رئيس على نتائج العينات العضوية التي أرسلت لأحد معامل الكربون ١٤ خارج المملكة العربية السعودية، كما أن غياب البقايا الفخارية بشكل خاص (فيما عدا بعض الكسر الحديثة على السطح) يشير إلى خلو منطقة الثمامة من دلائل صناعة أو استخدام المواد الفخارية القديمة.

أما بالنسبة للأدوات الحجرية، فيشير التحليل المبدئي إلى وجود نوعين من التصنيع، يتمثل الأول في الأسلوب الذي يعتمد إنتاج النصال، والثاني في إنتاج الشظايا أو الرقائق، ويدل وجود الأسلوبين معاً في نفس الأماكن على أنهما قد استخدمتا معاً، كما عكس أحد المواقع المختبرة في البحث ظاهرة ورش التصنيع. وحيث أنه لا يوجد دليل على صناعة الفخار في المنطقة، فقد رجح الباحث تأريخها إلى فترة العصر الحجري القديم المتأخر - أو نهايته مع عدم استبعاد عودة هذه المجموعات الحجرية إلى العصر الحجري الحديث المبكر السابق للفخار، تاركاً التحديد الزمني القطعي لمختبرات التأريخ العلمي. وأشار الباحث أيضاً إلى عدم العثور على أي مواد تدل على أن الجماعات التي عاشت في المنطقة عرفت الزراعة أو استئناس الحيوان.

المقالة العربية الثانية في هذا العدد من أدوماتو أتت بعنوان **"البحوث والدراسات الآثارية عن حضارة نبتة الكوشية وارتباطها بتطور علم الآثار: دراسة تقويمية" لجمال جعفر عباس** من قسم الآثار في جامعة دنقلا بالسودان، وتناولت تقويماً عاماً للنظريات حول حضارة نبتة الكوشية التي ازدهرت في شمالي السودان بين حوالي ٨٥٠ إلى ٣٠٠ق.م. استهل الباحث مقالته بعرض مقتضب لتاريخ علم الآثار وتطوره في القرنين التاسع عشر والعشرين الميلاديين انتقل بعده إلى الموقع الجغرافي لحضارة نبتة السودانية، مصوراً حديثه بخريطة تبين أهم مواقع هذه الحضارة على ضفاف نهر النيل وهي نوري وجبل البركل وصنم والكرو، ومفسراً اعتماد الدراسات والبحوث الآثارية في المقام الأول على الأوصاف التي كتبها الرحالة القدماء من إغريق ورومان، حيث اختلفت الآراء حول ماهية نبتة وموقعها الجغرافي، فهل هي مدينة أم إقليم وبعد أن عرض الباحث الآراء المختلفة حول الموضوع، رأى أن يتمسك بأن "نبتة هي حضارة وليست مدينة أو إقليماً" حيث أن هنالك

عرض مجلة

أدوماتو، العدد التاسع [ذو الحجة ١٤٢٤هـ - يناير (كانون الثاني) ٢٠٠٤م].

رئيس التحرير: أ. د. عبد الرحمن الطيب الأنصاري؛ عضوا هيئة التحرير: د. خليل بن إبراهيم المعيقل ود. عبدالله بن محمد الشارخ.

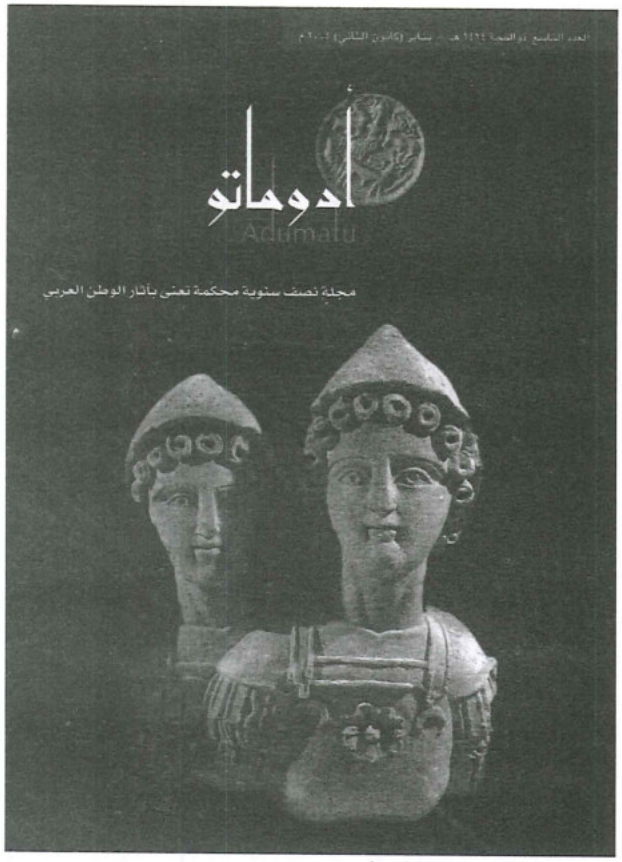
الناشر: مؤسسة عبد الرحمن السديري الخيرية، المملكة العربية السعودية.

عدد الصفحات: القسم العربي - ١٠٩ص والقسم الإنجليزي - ٣٨ص.

صدر مع بداية عام ٢٠٠٤ العدد التاسع (الممتاز) من مجلة **أدوماتو**، وهي مجلة نصف سنوية محكّمة تعني بآثار الوطن العربي. ورغم عمرها القصير نسبياً، حيث دخلت المجلة بهذا العدد سنتها الخامسة، إلا أنها أثبتت وجودها كمرجع هام خاصة في المكتبة العربية التي تفتقر لمثل هذا التوجه نحو عرض الأبحاث الآثارية المعنية بأرجاء مختلفة من الوطن العربي. وبالإمكان استعراض محتويات أعداد أدوماتو منذ بداية صدورها في مطلع عام ٢٠٠٠م على موقع المجلة الإلكتروني www.adumatu.com. ويحوي هذا الموقع معلومات عن المجلة وعن الناشر مؤسسة عبد الرحمن السديري الخيرية، التي أنشأها الأمير عبد الرحمن السديري أمير منطقة الجوف في المملكة العربية السعودية، بهدف حفظ التراث الأدبي والإرث الحضاري ودعم النهضة العلمية في منطقة الجوف. ومن هنا أتت "أدوماتو" وهو الاسم القديم لدومة الجندل إحدى أهم المواقع الأثرية في منطقة الجوف، والتي كانت تمثل معبراً مهماً للحضارات، ويأمل العاملون على المجلة أن تصبح معبراً مهماً للأفكار والآراء في مجال الآثار على مستوى العالم العربي.

أتى هذا العدد من أدوماتو بطباعة أنيقة والعديد من الصور الملونة، وزين غلاف المجلة العربي صورة تمثال نصفي نبطي من خربة الذريح بجنوب الأردن يرمز لبرج الجوزاء، أما الغلاف الإنجليزي فزينته صورة الظاهرة (ثم-أ-١٢) من موقع الثمامة في المملكة العربية السعودية.

تتصدر القسم العربي من العدد افتتاحية رئيس هيئة التحرير التي عودنا عليها أستاذنا الكبير الدكتور عبد الرحمن الأنصاري في أدوماتو، والتي ابتدأها بالعرفان لمن سقط من "النمط المثالي للباحث والأكاديمي، الذي وهب نفسه للعلم ومن أجله سعى واجتهد وبذل"، وخص بالذكر أعلاماً لن ننساهم هم



حمد الجاسر، وإحسان عباس، وصالح العلي. أما الجزء الثاني من الافتتاحية فتحدث فيه أستاذنا الكبير عن موضوعه المفضّل وهو الكتابات والرسوم الصخرية في الجزيرة العربية، وعن زمرة من الباحثين العرب الذين أثروا هذا الموضوع الهام بدراساتهم وأعمالهم الميدانية. وأختتم الأستاذ الدكتور الأنصاري افتتاحيته بدعوة المهتمين بالنقوش الإسلامية في الجزيرة العربية إلى دراسة الحروف وأشكالها لكل عصر، ومحاولة الوصول إلى ثبت بالحروف مقسمة حسب العصور التاريخية تغنينا عن مصطلح "القرون الثلاثة الأولى" المهيمن على الباحثين في الآثار الإسلامية.

احتوى الجزء العربي من عدد أدوماتو التاسع على أربع مقالات علمية استهلت بملخصات باللغتين العربية والإنجليزية حسب قواعد النشر، أولها بعنوان "**دراسة آثارية لموقع الثمامة:**



١٦. النفق الرضي في منطقة المبنى الثماني.

سادسًا: عثر على عدد من قطع العملة التي تعود إلى الفترة العثمانية المتأخرة.

ابراهيم الزعبي
ضياء الدين طوالبه
دائرة الآثار العامة

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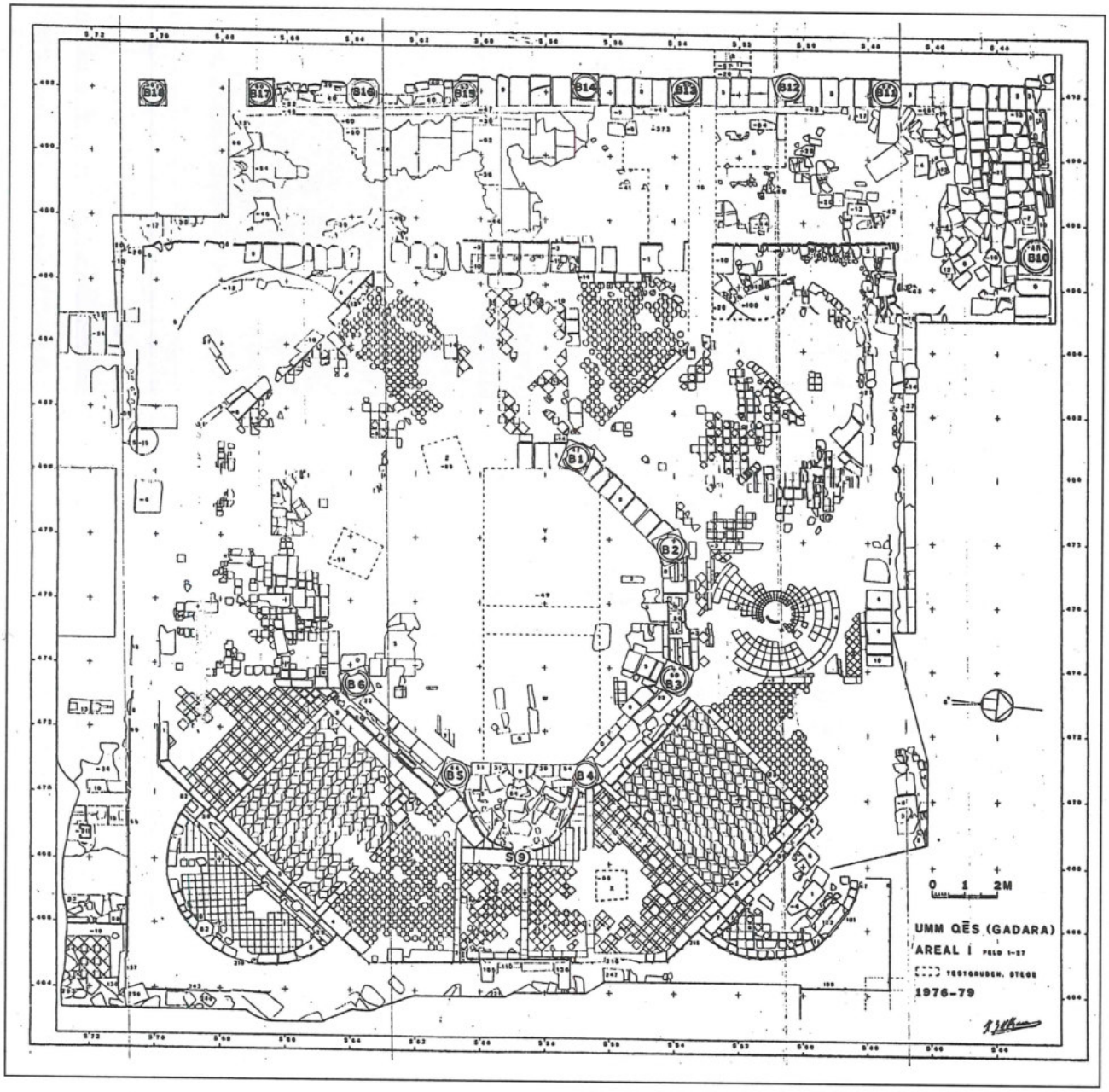
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١٥- مخطط الكنيسة البازيليكي في أم قيس.

بفتحات متباعدة للتهوية والاضاءة يبلغ ارتفاعه حوالي (٢,٥٠م) وعرضه (١,٤٠م) (**الشكل ١٦**).

الأدوار التاريخية

اولاً: الدرج والشارع الفرعي والمبنى الثماني بنيت خلال الفترة الرومانية المبكرة وتقع ضمن سور المدينة المؤرخ إلى النصف الثاني من القرن الاول الميلادي.

ثانياً: اعيد استخدام هذه المعالم في الفترة البيزنطية وإجراء بعض اعمال الصيانة والتعديلات وخاصة في المبنى الثماني والدرج المؤدي إلى الكنيسة البازليكية، وقد عثر على كميات كبيرة من الكسر الفخارية البيزنطية.

ثالثاً: استخدمت هذه المعالم في الفترة الاموية فقد عثر على كميات كبيره من الكسر الفخارية التي تعود إلى الفترة الاموية وكذلك بعض قطع العملة الاموية.

رابعاً: استمر الإشغال السكني الإسلامي خلال الفترة العباسية وقد عثر على كميات كبيرة من الكسر الفخارية التي تعود إلى الفترة نفسها بالإضافه إلى أرضية الحمام.

خامساً: اما خلال الفترة الايوبية المملوكية فالاشغال السكاني كان كثيفا خاصة في المنطقة الغربية من موقع أم قيس الأثري، فقد عثر على كميات كبيره من الكسر الفخارية المدهونة والمزججة وقطع العملة وبقايا الجدران التي تعود إلى هذه الفترة.



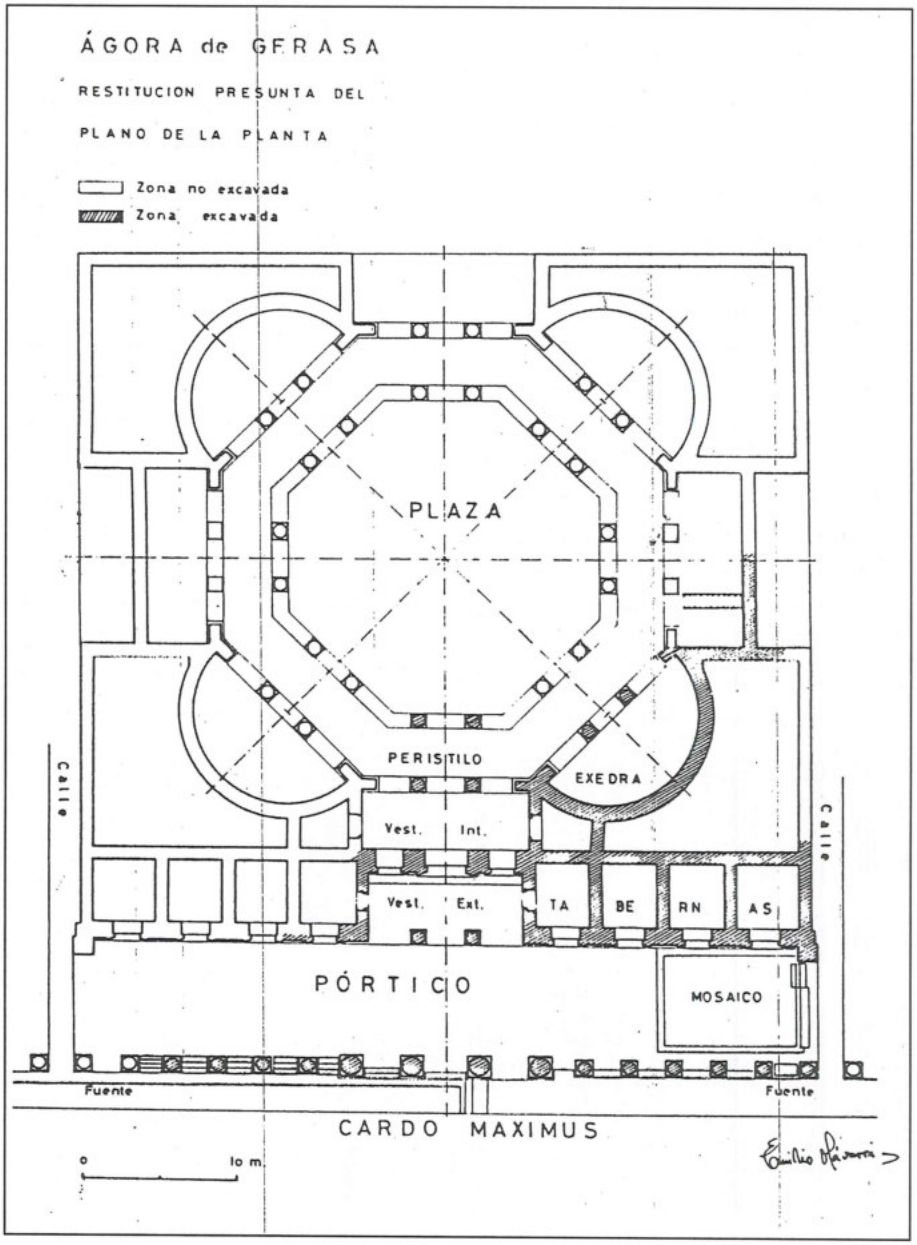
١٣. أعمدة كورنثية.

للبناء ستبقى قائمة لحين توفر دليل مادي يؤكد صحتها او نفيها.

ومن المعروف انه في الفترة البيزنطية شيدت كنيسة ثمانية التخطيط ذات طراز بازيليكي (**الشكل ١٥**) (Lux and Vrie-zen1980: 161) في أم قيس قرب المدرج الغربي تتألف من مثمنين متداخلين يفصل بينهما مجاز مبلط، وربما يكون مخطط الكنيسة الثمانية تقليداً لنفس مخطط المبنى الثماني الذي يعود إلى الفترة الرومانية.

لقد اصبح هذا الطراز المعماري شائعا أيضا خلال الفترات اللاحقة، فخلال الفترة الأموية شيدت قبة الصخرة المشرفة بنفس الأسلوب مع اختلاف الوظيفة والغاية التي شيدت من اجلها.

كشفت التنقيبات عن نفق ارضي تحت مستوى بلاط المبنى محفور في الصخر الطبيعي يسير باتجاه شرق-غرب مزود



١٤. مخطط بلازا في مدينة جرش.

كانت مبلطة بالحجر الجيري تعرضت بعض اجزائها للتدمير، كما عثر على عدد من الانابيب الفخارية والتي تعود للفترة الرومانية تحت الساحة المبلطة ذات علاقة بالنظام المائي المتطور في مدينة جدارا وترتبط هذه القنوات بشبكة القنوات المائية الرئيسة.

أما تقنية واسلوب البناء الذي استخدم في هذا المبنى فهو لا يختلف عن نظام البناء المعماري في الفترة الرومانية، فقد استخدم الحجر البازلتي الصلب كأساسات للبناء ووضع فوقه مداميك من الحجر الجيري الأبيض، ويصل ارتفاع ما عثر عليه من بقايا جدران المثمن الخارجي إلى حوالي (١م) وسماكته (٢٠ , ١م).

للمبنى مدخلان رئيسيان: الأول في الجهة الشمالية يطل على شارع الأعمدة الديكامانوس عرضه (٣م) يتقدمه رواق من الأعمدة الضخمة يبلغ طولها حوالي (٧م) يليه عدة درجات من الحجر الجيري الصلب يمتد بعرض واجهة المبنى وكان يزين مطلعه كورنيش جميل (افاريز)، يؤدي هذا المدخل إلى المنطقة المحصورة بين المثمنين، اما المدخل الثاني فيقع في الجهة الجنوبية المقابلة وعلى المحور نفسه، يؤدي إلى المنطقة الخارجية للمبنى والتي ربما تمثل ساحة عامة مبلطة وقد تعرض للتخريب والتدمير مما يصعب التعرف على طبيعة المنطقة التي يفضي إليها هذا المدخل.

ويقع في كل ضلع من الأضلاع الأخرى للمبنى مداخل ثانوية صغيرة الحجم يبلغ عددها أربعة تفضي إلى ملحقات من الصعب التعرف على طبيعتها وهويتها خلال هذا الموسم، إذ تركزت أعمال الحفريات على المعالم البارزة لمخطط المبنى، إلا أن التوسع بأعمال التنقيب على الجانب الشرقي للمبنى قد أعطت شواهد واضحة حول طبيعة المباني المعمارية المرتبطة بالبوابات من الجهة الشرقية حيث عثر على جدران مبنية من الحجر الكلسي المشذب ترتفع حوالي ٢م مرتبطة ببعض جدران المبنى الرئيسي وهناك جدران اخرى مضافة في فترات لاحقة وقد عثر على مايشبه الاحواض للتخزين واخرى قد تكون للماء (**الشكل ١١**).

أما المساحة الواقعة جنوب المبنى المثمن والتي تفصله عن منطقة (القصر) والبالغ إجمالي مساحتها حوالي ٢٢ × ٩٠م، فقد كانت هناك جملة من الآراء ترجح على أنها ساحة مركزية مكشوفة تتوسط مجموعة من المباني الرسمية في هذه االمنطقة كما هو الحال في اسلوب الأبنية الرومانية الضخمة في الفترة الرومانية.

وقد اكدت التنقيبات الاثريه في الموقع على وجود ما يمكن إعتباره ساحة مركزية حيث كشف عن بعض الاجزاء المبلطة بالحجر الجيري (**الشكل ١٢**)، وتشير الادلة الاولية على أن هذه المساحة المبلطة ربما كانت تغطي كامل الساحة الواقعة بين المبنى الثماني الأضلاع وبين المبنى الجنوبي المسمى (القصر) والذي ربما كان يمثل حماما رومانيا ضخما، فقد كشف عن أساسات من الحجر الجيري الكبير الحجم يمتد باتجاه شرق-غرب ربما كان يمثل رواقا تزينه الأعمدة الكورنثية التي تحيط بهذه الساحة من الجهة الشمالية (**الشكل ١٣**).



١١. الجهة الشرقية للمبنى الثماني/ ملحقات سكنية.

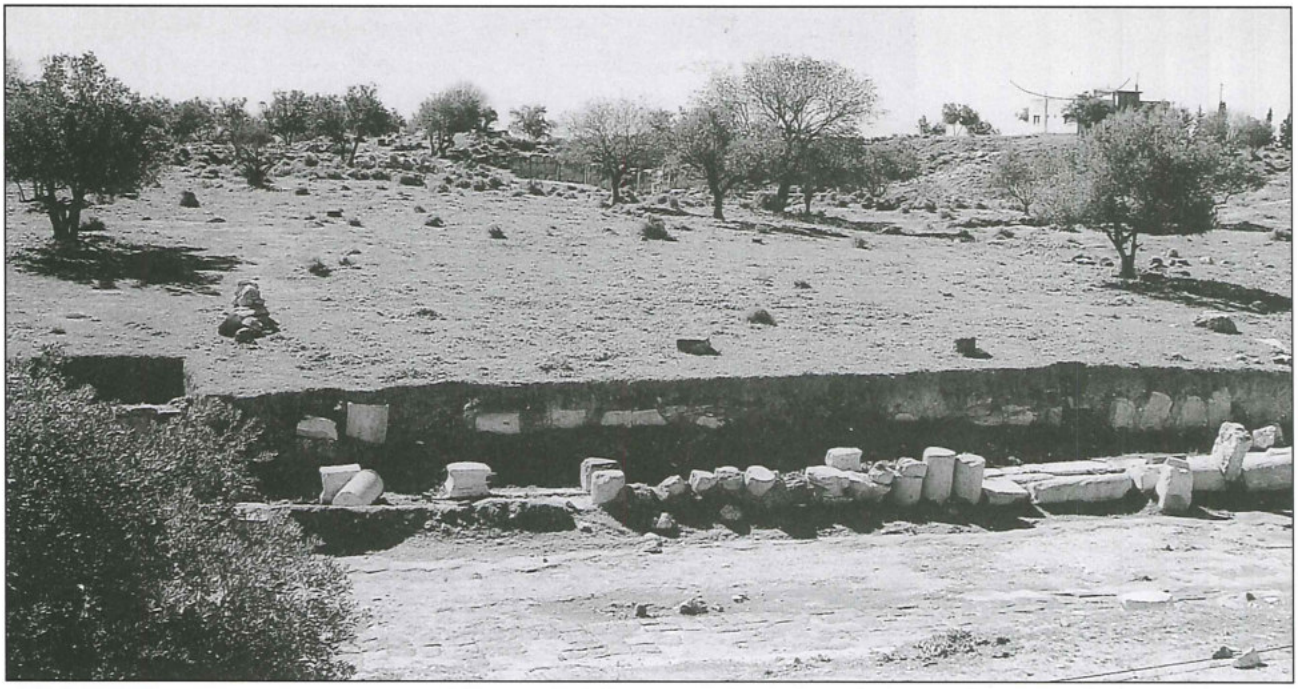
وهذه الاعمدة الكورنثيه كانت كاملة تتألف أبدانها من ثلاثة أجزاء ويصل أطوالها إلى حوالي (٥ , ٥م) وقطرها (٦٠سم) وجدت منهارة في مواقعها الأصلية باتجاه الجنوب وقواعدها ما زالت قائمة في أماكنها والملفت لنظر انهيار هذه ألاعمدة نحو الجنوب باتجاه معاكس للاعمدة التي وجدت منهارة في مناطق أخرى من الموقع ربما لأسباب ناتجة عن ارتدادات الهزة الأرضية التي ضربت المنطقة في منتصف القرن الثامن الميلادي.

تبقى مسألة تحديد طبيعة المبنى وهويته ووظيفته في الوقت الحالي من الأمور غير الممكنه وذلك لعدم اكتمال التنقيبات الأثرية في المبنى وما يحيطه، ولكن التصميم الهندسي العام للمبنى يمكن تصنيفه إما من المباني الرسميه العامة أو المباني ذات الطابع الديني.

ومن خلال الدراسة المقارنة بمعالم مشابهة لهذا المعلم وخاصة النموذج الموجود في مدينة جرش الواقع إلى الغرب من شارع الكاردو والذي ربما يكون سوقا تجاريا (PLAZA) (**الشكل ١٤**)، نستبعد اعتبار هذا المبنى سوقاً تجارياً إذ أن مساحة المبنى في أم قيس أصغر حجماً بالمقارنة مع منطقة (Agora) في جرش والتي تبلغ مساحتها (٥٠ × ٥٥م) مع أن هناك تشابه في التصميم الهندسي. اما فرضية الوظيفة الدينية

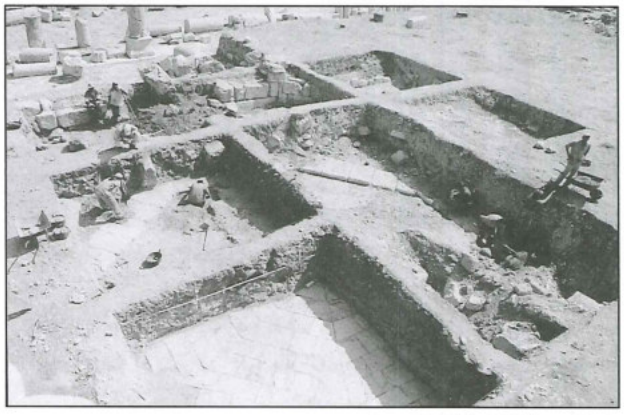


١٢. أرضية مبلطة.



٧ . منطقة المبنى الثماني قبل الحفريات.

بقايا قواعدها محفورة في اساسات البناء اضافة إلى أبدان الأعمدة المتناثرة في المكان وقد أعيد استخدام بعضها في بناء



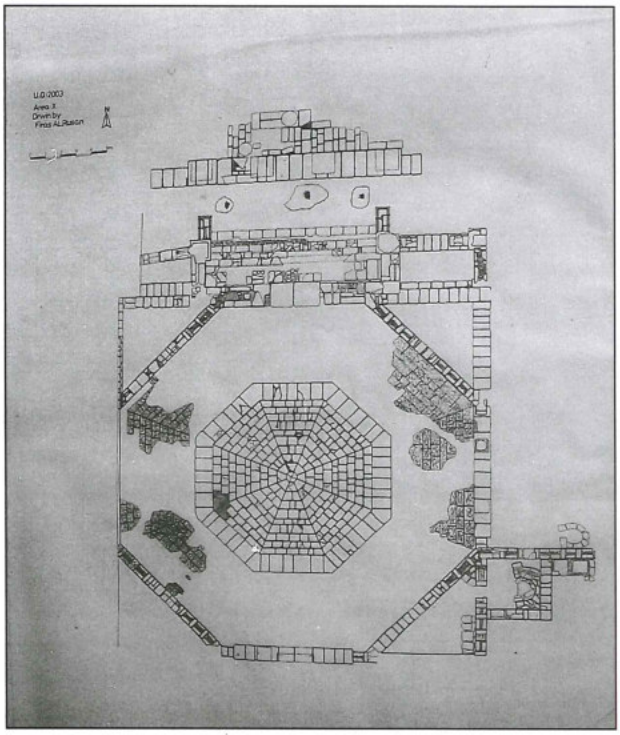
٨ . المبنى الثماني أثناء الحفريات.



٩. المبنى الثماني بعد انتهاء الحفريات.

الجدران في فترات لاحقة (طوالبه ٢٠٠٢: ٦٢٢). ويرجح ان سقفه على شكل قبة تحملها أعمدة مشكّلة قاعدة دائرية مناسبة لبناء القبة، وكما هو معروف في العمارة الرومانية أن القبه كانت تقوم فوق قاعدة دائرية كما هو الحال في قبة حمام بانتيون هادريان في روما (١٢٤م).

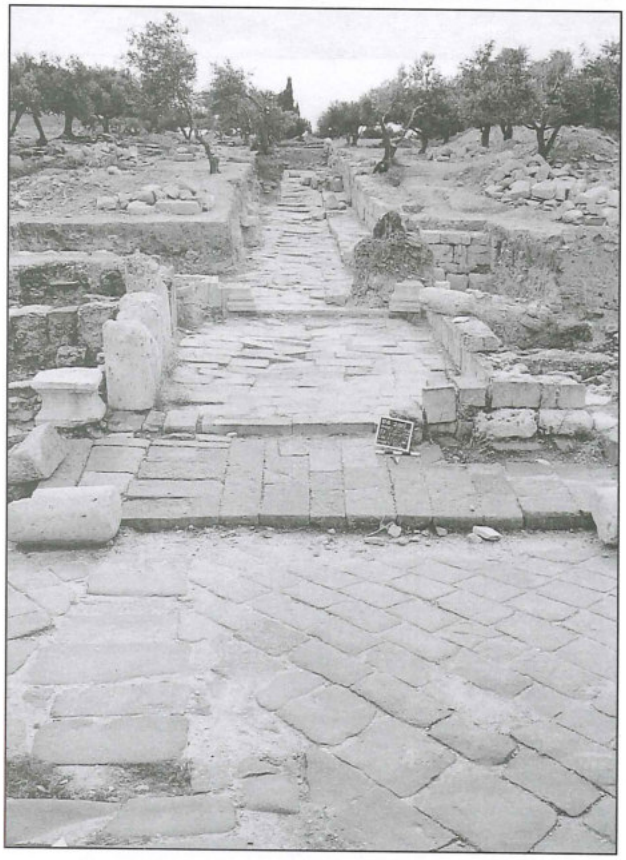
أما المساحة التي تفصل بين المثمن المركزي والخارجي فقد



١٠. مخطط عام للمبنى الثماني.



٤. منطقة الشارع الفرعي أثناء الحفريات.



٥ . الشارع الفرعي بعد انتهاء الحفريات.



٦. أرضية الحمام العباسي.

الإطار (بسم الله ضرب هذا الدينار سنة اثنى عشرة ومئه).

وتعتبر المسكوكات الإسلامية الأموية واحدة من الشواهد المادية الدالة على الاستقرار الإسلامي في مدينة جدارا (ملكاوي ٢٠٠٢: ١٧٦)، وكان وزن الدينار الأموي (٤,٢٦٥ غراما) وهو يعادل وزن الدينار البيزنطي قبل الإسلام كما بلغ قطره حوالي عشرين ملمترا (التل ١٩٨٣: ٧٤).

المبنى الثماني الأضلاع (X)

يقع هذا المبنى في الجهة الغربية من مدينة جدارا ضمن سور المدينة وتحديدا إلى الجنوب من شارع الأعمدة الرئيسي في منطقة ذات سطح مستوي مزروعة بأشجار الزيتون يعود تاريخه للفترة الرومانية المبكرة (**الشكل ٧**).

جاءت اعمال هذا الموسم استكمالاً لأعمال المواسم السابقة التي كشف خلالها عن بعض اجزاء من البوابة الرئيسية للمبنى (**الشكل ٨**).

ويعتبر المبنى الثماني (**الشكل ٩**) أحد أهم المعالم البارزة والمميزة التي كشف عنها في مدينة جدارا لما يتميز به من دقة في التخطيط والتصميم المعماري الهندسي اذ تبلغ مساحته (٢٢ × ٢٢م) (**الشكل ١٠**)، يقع ضمن اطار مربع ينحصر بداخله بنائين على شكل مثمن احداهما خارجي والآخر داخلي أصغر حجماً، أرضيته مبلطة بالحجر الأبيض الصلب بشكل هندسي بديع، أخذت نقطة مركزية تشع منها خطوط باتجاه الزوايا الداخلية للمثمن المركزي، يحيط به وعلى زواياه اعمدة وجدت



٢. منطقة الدرج قبل الحفريات.



٣. الدرج بعد انتهاء الحفريات.

لدواليب العربات عليه كما هو الحال في الشارع الرئيسي، مما يعزز أن هذا الشارع ليس الكاردو، وعلى جانبيه ارصفة ترتفع قليلا عن مستوى الشارع نفسه، مع وجود قناة مغطاة أسفل منتصف الشارع محفورة بالصخر يبلغ عمقها ٧٠سم وعرضها ٦٠سم تعلوها حجارة بازلتية طويلة استخدمت للتسقيف، وربما استخدمت القناة لتصريف المياه (**الشكل ٥**)، وكشف ايضاً عن بقايا جدار من اربعة مداميك بارتفاع ١,٤٠ سم وعرض ٩٠سم، اضيفت اليه مداميك من الحجر الكلسي في فترات لاحقه يتخلله بقايا لمداخل شيدت من الحجر البازلتي بأسلوب (Header and Strecher) تؤدي إلى غرف متشابهة في الشكل قد تكون حوانيت أو مبان رسميه خاصه وأنها مشابه لغرف السوق التجاري للمدينة وربما كانت تمثل منطقة السوق في المرحلة الثانية من توسع المدينة.

وفي المربع رقم (٨) فوق رصيف الشارع مباشرة عثر على أرضية وبقايا جدران لحمام يعود إلى الفترة العباسية، هذا ما اكدته دراسة الكسر الفخارية التي عثر عليها في هذه المنطقة مما يشير إلى استمرارية الإشغال السكني العباسي فيها (طوالبه ٢٠٠٢: ٦٢٤) (**الشكل ٦**).

ومن أهم اللقى الأثرية التي عثر عليها، عدد من قطع العملة البرونزية والدينار الذهبي الأموي الذي وجد في مربع (٨) ضرب عام ١١٢/هجرية خلال فترة حكم الخليفة الأموي هشام بن عبد الملك وعليه كتابات باللغة العربية نصها:-

الوجه

المركز (لا اله إلا الله وحده لا شريك له).

الإطار (محمد رسول الله أرسله بالهدى ودين الحق ليظهره على الدين كله).

الظهر

المركز (الله أحد الله الصمد لم يلد ولم يولد).

تقرير نهائي حول أعمال التنقيبات الأثريه في موقع أم قيس موسم ٢٠٠٣

ابراهيم الزعبي وضياء الدين طوالبه

تركزت أعمال التنقيبات الأثرية في موقع أم قيس لموسم٢٠٠٣م في عدة مناطق وجاءت استكمالا للمواسم السابقة (**الشكل ١**)، وهي منطقة الدرج المقابل لمبنى السبيل (I)، منطقة الشارع الفرعي (Z)، منطقة المبنى الثماني الأضلاع (X)، وأخيرا المنطقة المحصورة بين المبنى الثماني الأضلاع ومنطقة القصر.

شهد موقع أم قيس الأثرى خلال السنوات القليلة الأخيرة إنجازات بارزة، حيث قامت دائرة الآثار العامة ممثلة بمكتب آثار أم قيس بأعمال التنقيبات الأثرية وأعمال الصيانة والترميم في مناطق متعددة (**الشكل ١**)، كشف خلالها عن العديد من المعالم التاريخية والحضارية الهامة لمدينة أم قيس (جدارا) التاريخية.

منطقة الدرج البازلتي (I)

وهي المنطقة المقابلة لمبنى سبيل الحوريات مباشرة، والمؤدية إلى منطقة الكنيسة البازيليكية حيث تم فتح سبعة مربعات كشف خلالها عن عشر درجات مهدمة مبنية من حجر البازلت، وبلغ طول الدرج ٢٢م وعرضه ٢٥سم وسمك الدرجة الواحدة ١٨سم، ويقع على جانبي الدرج عند التقاءه مع شارع الأعمدة برجان كبيران بنيا من حجر البازلت (**الشكل ٢**).

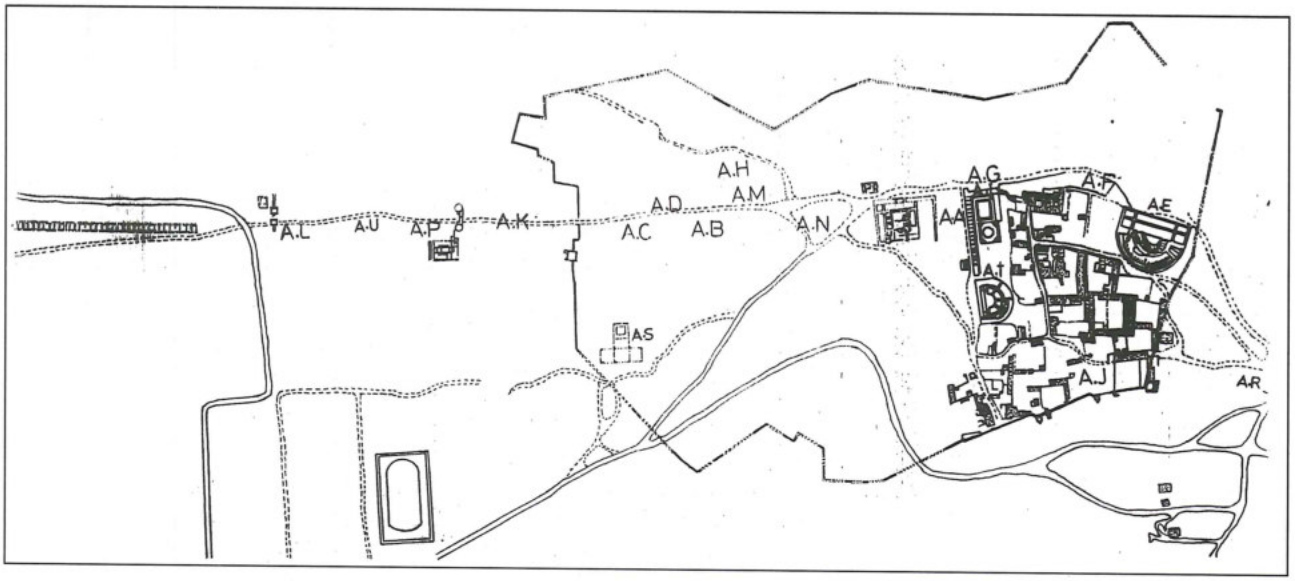
وعثر ايضاً على عدد من قواعد وتيجان وأبدان لأعمدة متساقطة فوق الدرج ربما كانت تزين مطلع الدرج ويبدو واضحا إعادة استخدام الدرج في الفترات اللاحقة وخاصة في العصر البيزنطي.

اما تقنية بناء الدرج فهي مماثلة لاسلوب البناء في الفترة الرومانية حيث بنيت ست درجات ومصطبة (بسطة) طويلة ثم ست درجات ومصطبة وهكذا، وقد وضع بلاط الدرج فوق الصخر الطبيعي بعد تسويته ووضع الحجارة الصغيرة المخلوطة مع المونة تحته (**الشكل ٣**).

وما يلفت النظر في هذه المنطقة وجود نظام مائي دقيق التنفيذ يمتد من أعلى الدرج وعلى جانبيه ويُغذي مبنى السبيل عن طريق النفق الأرضي المار تحت تل الاكروبولس (طوالبه ٢٠٠٢: ١٦).

منطقة الشارع الفرعي (Z)

في موسم ٢٠٠٢ كشف عن بوابة تقع في الجانب الجنوبي من شارع الأعمدة خارج سور المدينة تبين انها تعود للفترة الرومانية المبكرة وقد تم فتح ١٦ مربعاً، كشف خلالها عن شارع يتفرع من شارع الأعمدة (**الشكل ٤**)، وتبين أنه مبلط بحجر بازلتي يبلغ عرضه (٥م) ويلاحظ عدم وجود أي أثر



١. مخطط مدينة أم قيس.

وتبلغ مساحتها ٤,٦٥ × ٤,٤٠م وهي الأكبر مساحة، لها بوابه من الجهة الشمالية يتم من خلالها الدخول إلى الغرفة الثالثة عرضها ١م وإرتفاعها ١,١٠م، تتكون جدرانها من ثلاثة مداميك وارضيتها ذات تربة طينية صلبة، كما تحتوي هذه الغرفة على قواعد لأقواس حجرية وذلك في الجدارين الشرقي والغربي ربما يكون الغرض من بنائها هو لتسقيف الغرفة وهو النظام الذي يتبع في هذه المستوطنة.

الغرفة الثانية: تقع هذه الغرفة إلى الجهة الشمالية الغربية من الغرفة الأولى، مساحتها ٣,٨ × ٣,٦م، تقع بوابتها إلى الجهة الغربية وتطل على الغرفة الثالثة يبلغ عرضها ١م وارتفاعها ١,١٥م، تتكون جدرانها من ثلاثة مداميك مبنية من حجارة متوسطة وصغيرة الحجم، أرضيتها ذات تربة طينية صلبة تعرضت للتدمير والتخريب من قبل المواطنين الباحثين عن الدفائن واللقى الأثرية. وتحتوي هذه الغرفة ايضا على قواعد اقواس حجرية في الجهتين الشرقية والغربية لرفع السقف.

الغرفة الثالثة: تقع إلى الجهة الشمالية من الغرفة الأولى وإلى الغرب من الغرفة الثانية، مساحتها ٤,٣ × ٣,٧م. تعتبر هذه الغرفة الموزع الرئيسي لباقي الغرف وذلك لوجود ثلاث بوابات تابعة لها تطل على كل من الغرفة الأولى والثانية والرابعة.

الغرفة الرابعة: تقع إلى الجهة الشمالية من الغرفة الثالثة، مساحتها ٣ × ٣,٧م جدرانها مكونة من ثلاثة مداميك من الحجارة الصغيرة والمتوسطة الحجم، عثر بداخلها على حجارة قوس متهدم يتجه من الشرق إلى الغرب كما عثر ايضا على عدد من الكسر الفخارية والتي تعود الى فترات تاريخية مختلفة.

الغرفة الخامسة: تقع إلى الشمال من الغرفة الرابعة وإلى الشمال من الغرفة الثانية، مساحتها ٤,٧ × ٢,٥م وهي اصغر حجما من باقي الغرف ربما استعملت كمخزن للحبوب او للعلف. تقع بوابتها إلى الجهة الشمالية يبلغ عرضها ١م وارتفاعها ١,٢ بعمق ٠,٦٥سم، بنيت من الحجارة المشذبة.

الخلاصة

ان قرب هذا الموقع من الطريق التجاري الروماني المجاور لها من الجهة الغربية، ومن ينابيع المياة كان السبب الرئيسي لبناء هذه المستوطنة البشرية الضخمة، ويعتقد انها كانت مأهولة لفترات تاريخية طويلة بدءا من الفترة النبطية والرومانية حتى الفترة البيزنطية فالإسلامية.

كما عثر على كميات قليلة جدا من الكسر الفخارية وذلك بسبب عمليات التخريب ونقل التربة من مكان الحفرية الى أماكن اخرى، ومن خلال الدراسة الأولية للكسر الفخارية ونظام العقود المستعمل في تسقيف الغرف وطبيعة بناء الجدران نستنتج أن هذه الوحدات السكنية بنيت في الفترة البيزنطية.

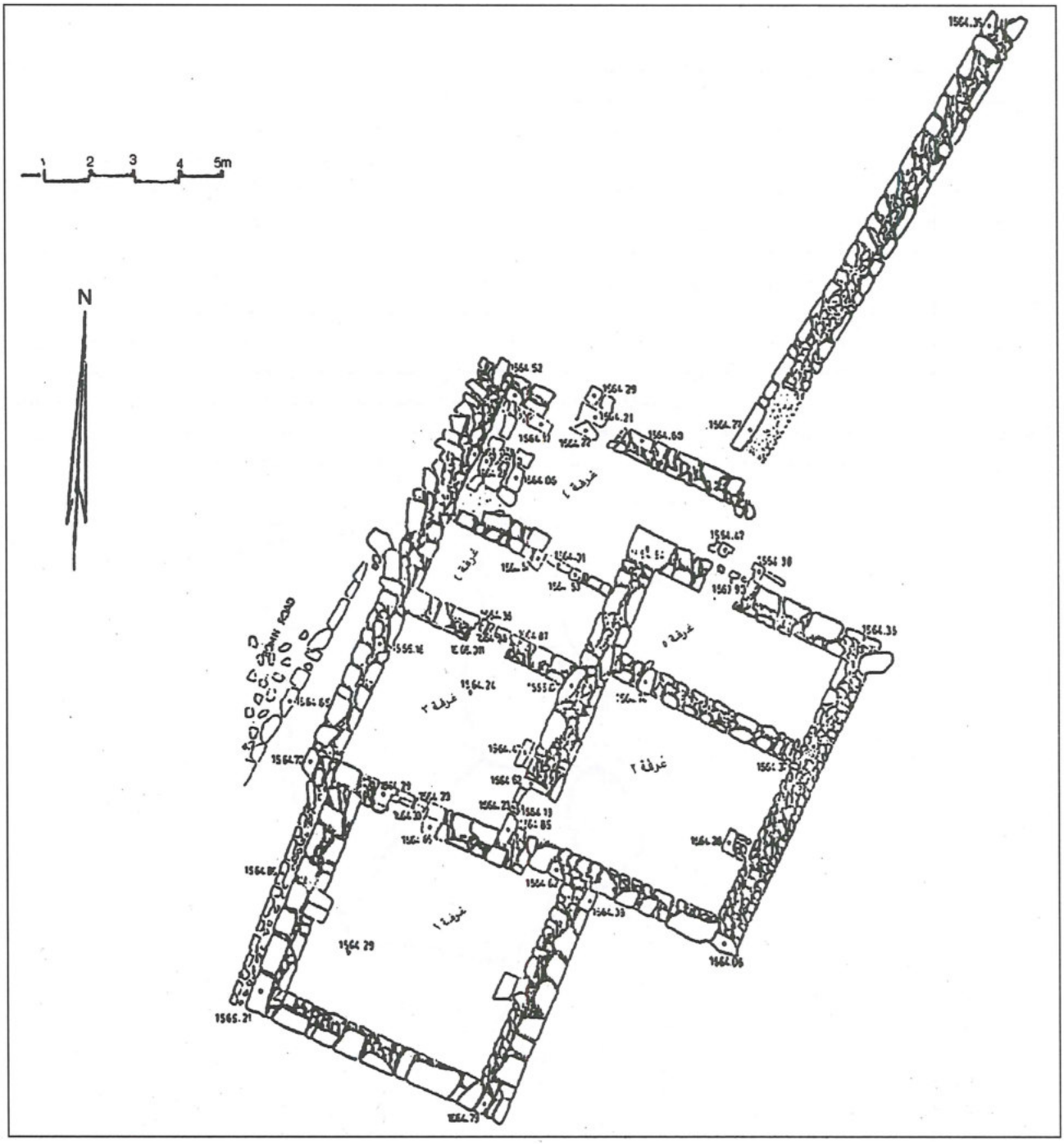
ونظرا لضخامة هذه المستوطنة السكنية ولامتداد جدرانها في عدة اتجاهات بأطوال تزيد عن ٣٠م وهي ظاهرة عن مستوى سطح الأرض ولعدم كفاية الوقت والمخصصات المالية لم نستطع الكشف عن باقي الجدران وابراز معالمها على ان يتم ذلك في المستقبل القريب ان شاء الله.

زهير الزعبي
دائرة الآثار العامة

والإسكان لإجراء تنقيبات اثرية في موقع بئر الدباغات. ومن خلال عملية التنقيبات كشف وبشكل واضح عن تسلسل وتعاقب تاريخي في هذه المستوطنة السكنية ابتداء من الفترة النبطية والرومانية ثم البيزنطية والإسلامية، فقد كشفت اعمال التنقيبات الأثرية عن معالم معمارية تحتوي على غرف سكنية متعددة وجدران تكون هذه الوحدة السكنية ويجدر الإشارة هنا إلى عدم وجود تسلسل طبقي واضح في منطقة العمل وذلك بسبب انهيار حجارة الجدران بالإضافة إلى الأتربة التي جرفت بفعل العوامل الجوية المختلفة لتشكل كمية كبيرة من الطمم، وكذلك عمليات التخريب والنهب فجميع هذه العوامل ساعدت وبشكل واضح على عدم وجود التسلسل الطبقي.

ومن خلال اعمال التنقيبات تبين وجود المظاهر المعمارية التالية التي تشكل بدورها هذه المستوطنة السكنية وهي على النحو التالي (**الشكل ٢**).

الغرفة الأولى: تقع هذه الغرفة إلى الجهة الجنوبية للموقع



٢. مخطط عام لموقع الحفرية.

نتائج التنقيبات الأثرية لموقع بئر الدباغات/الشوبك لعام ٢٠٠٠

زهير الزعبي

الموقع

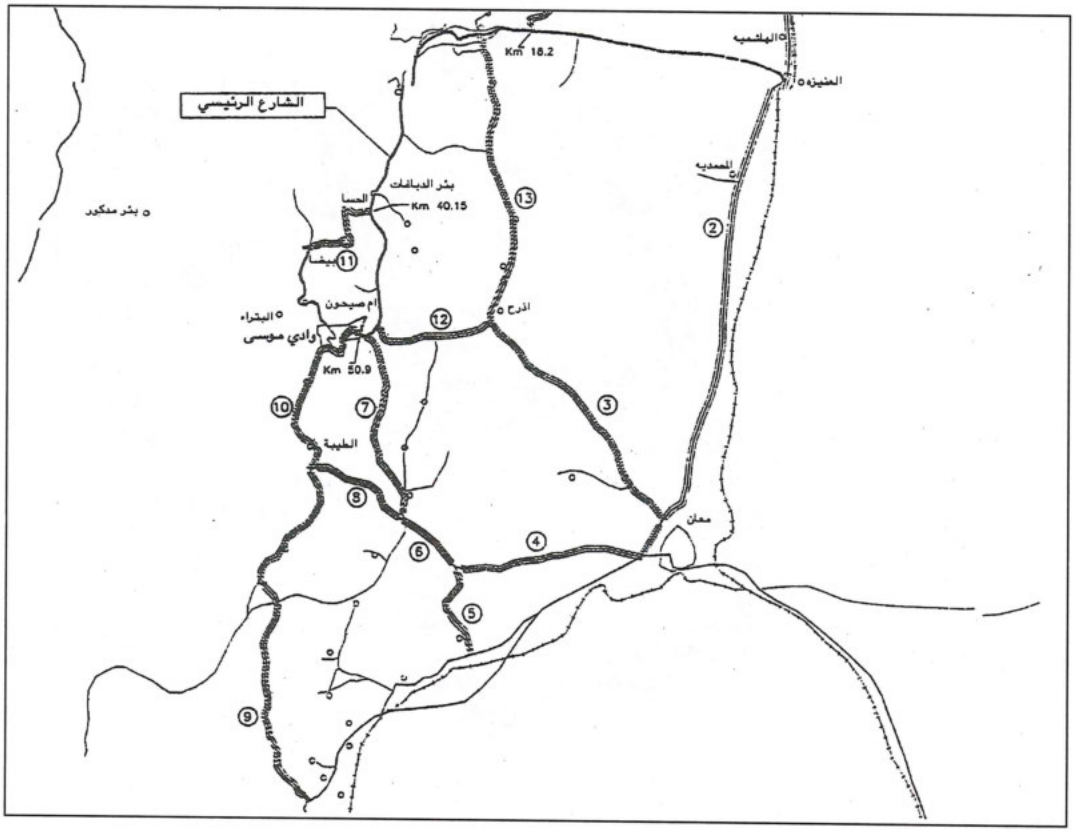
يقع بئر الدباغات في لواء الشوبك ضمن حدود بلدية العبدليه على الجهة الشرقية من الشارع الرئيسي الذي يبعد مسافة ٣٨كم من نقطة الصفر (جسر عنيزة)، ويرتفع عن سطح البحر حوالي ١٥٦٧,٢٨م وهو ضمن الإحداثيات N ٩٨١٤٥٥,٩، E١٩٩٠٥٢,٠٠.

تبلغ مساحة الموقع ٦٣٠م٢ تقريباً، وقد سمي بهذا الأسم نسبة لوجود بئر ماء كان السكان المحليون يدبغون الجلود على مقربة منه، حيث لوحظ انتشار أشجار السنديان في المنطقة التي يستخدم لحائها في دباغة الجلود. والموقع عبارة عن أرض مستوية تميل إلى الإنحدار في بعض اجزائها خاصة في الجهة الشرقية، كما وتظهر بشكل واضح للعيان امتداد بعض الجدران على سطح الأرض إضافة إلى انتشار بعض الكسر الفخارية على السطح. ويعد الموقع من الجهة الشرقية امتداد لوادي بئر الدباغات الذي كانت تغذيه عين ماء على بعد ما يقارب ٢كم باتجاة الجنوب إضافة إلى مياه الأمطار والثلوج الكثيفة مما ساعد على قيام هذه المستوطنة السكنية.

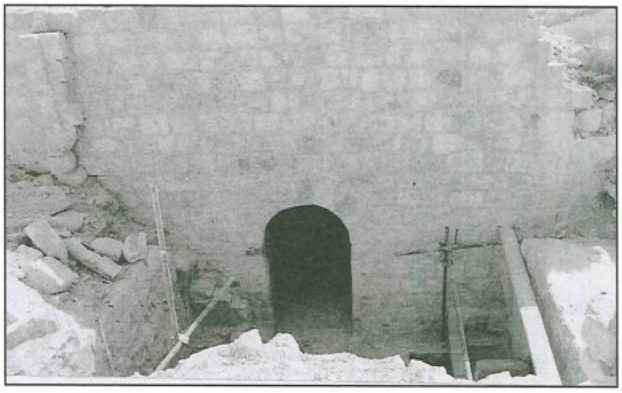
سير العمل

اثناء العمل في مشروع توسعة الشارع الرئيسي الممتد من الطريق الصحراوي / جسر عنيزة مروراً بلواء الشوبك حتى يصل وادي موسى والذي يبلغ طوله ٥١كم، قام فريق من دائرة الآثار العامة بإجراء المسوحات الأثرية الأولية لمسار هذا الطريق عام ١٩٩٩ كشف من خلالها عن وجود حوالي سبعة عشر موقعا على امتداد هذا الشارع وتعود لفترات تاريخية مختلفة (**الشكل ١**).

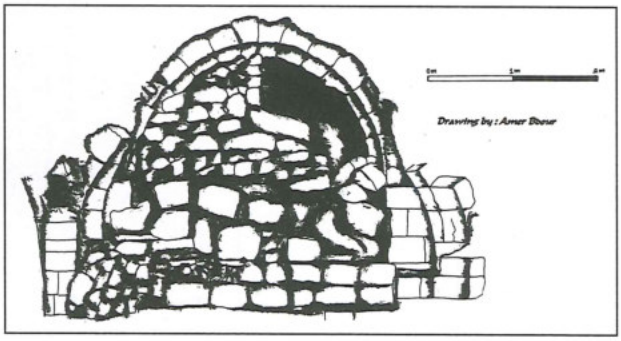
وفي عام ٢٠٠٠ قامت دائرة الآثار العامة بتشكيل فريق أثري انقاذي وذلك بالتعاون والتنسيق مع وزارة الأشغال العامة



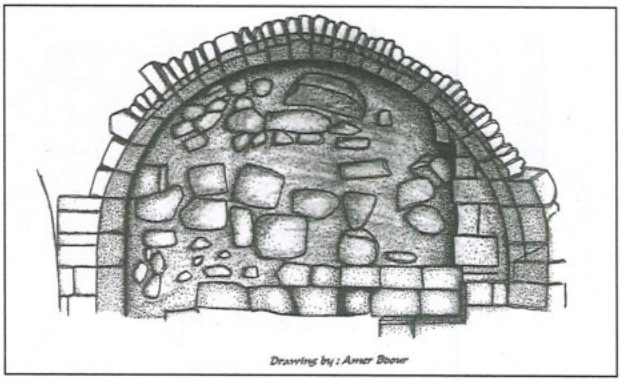
١. خريطة توضح موقع بئر الدباغات بالنسبة للطريق الرئيسي.



١٢ . واجهة البوابة الغربية من الخارج للكنيسة الجنوبية بعد الترميم.



١٣ . البوابة المؤدية إلى احواض التعميد/الكنيسة الجنوبية قبل الترميم.

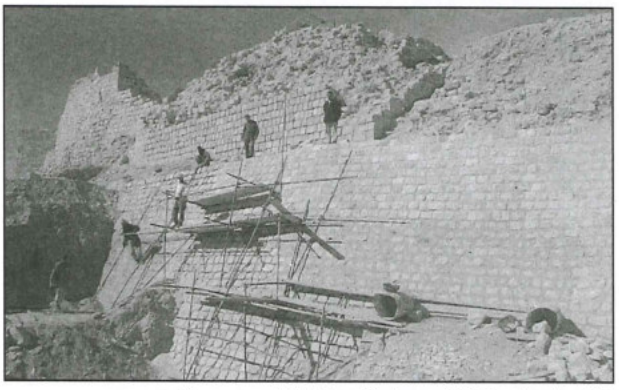


١٤ . البوابة المؤدية إلى احواض التعميد/الكنيسه الجنوبية بعد الترميم.

التاريخية وما لعبته من دور كبير ومميز عبر الحقب والعصور الماضية، حرصت دائرة الآثار العامة على ترميم وصيانة المواقع الأثرية والمحافظة عليها وتهيئتها من أجل وضعها على البرامج السياحية وابراز دورها الحضاري والمساهمه في دعم الإقتصاد الوطني، فقامت بإعداد الدراسات والخطط ورصد المخصصات اللازمة من أجل المحافظة على هذا الموقع المميز من خلال أعمال الصيانة والترميم التي قام بها فريق فني من سلطة المصادر الطبيعية بالتعاون مع دائرة الآثار العامة وما تزال أعمال الصيانة والترميم مستمرة وعلى مدار العام مع العلم بأن فريقا من جامعة فلورنسا / إيطاليا قد باشر بأعمال الحفر والتنقيب للكشف عن معالم القلعة وإجراء العديد من الدراسات والتنسيق مابين دائرة الآثار والفريق الفني للمشروع



١٥ . الجدار (R11) وجدار الكنيسة الخارجي قبل الترميم.

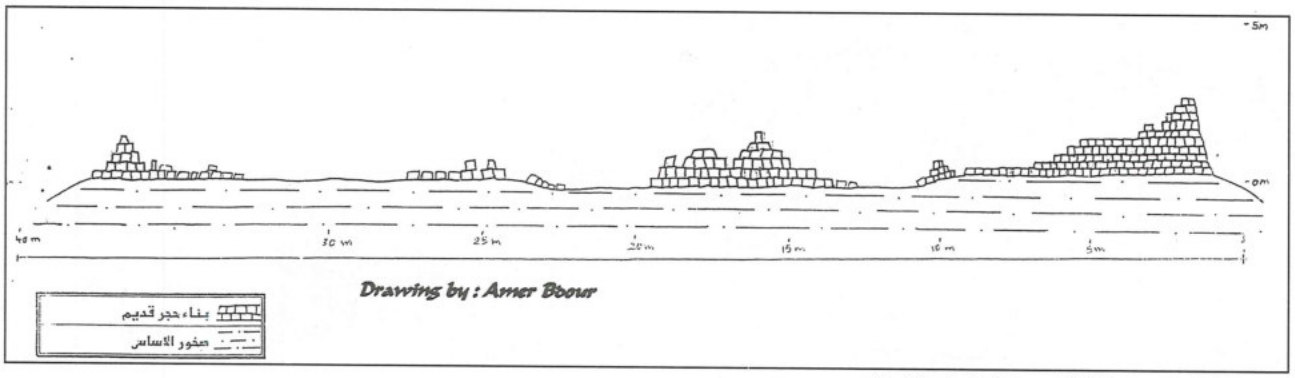


١٦ . الجدار (R11) وجدار الكنيسة الخارجي بعد الترميم.

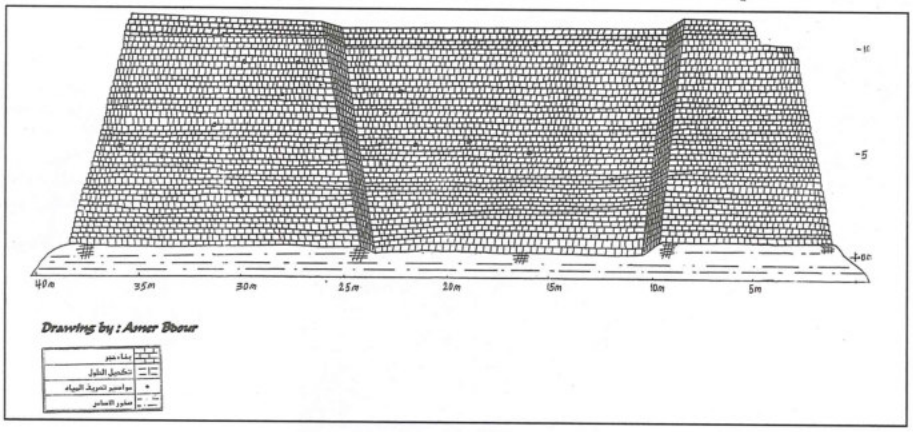
والبعثة الإيطالية لترميم المواقع والمعالم التي يتم الكشف عنها من خلال الحفريات الأثرية.

محمد عبدالعزيز المراحله
دائرة الآثار العامة

نبيل عديلات
صدقي الحامد
سلطة المصادر الطبيعية



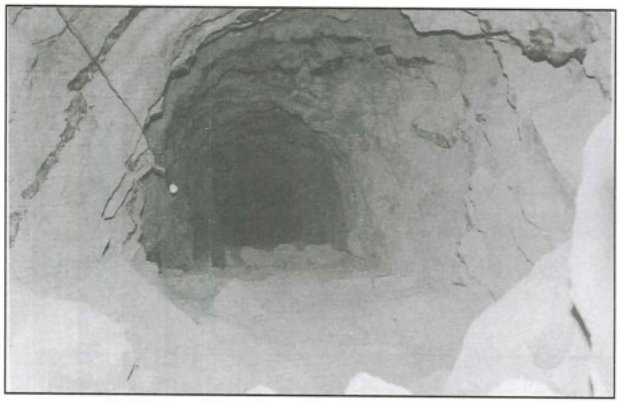
٧ . الجدار الشرقي (R10) بعد التكشيف وقبل الترميم.



٨ . الجدار الشرقي (R10) بعد أعمال الترميم.



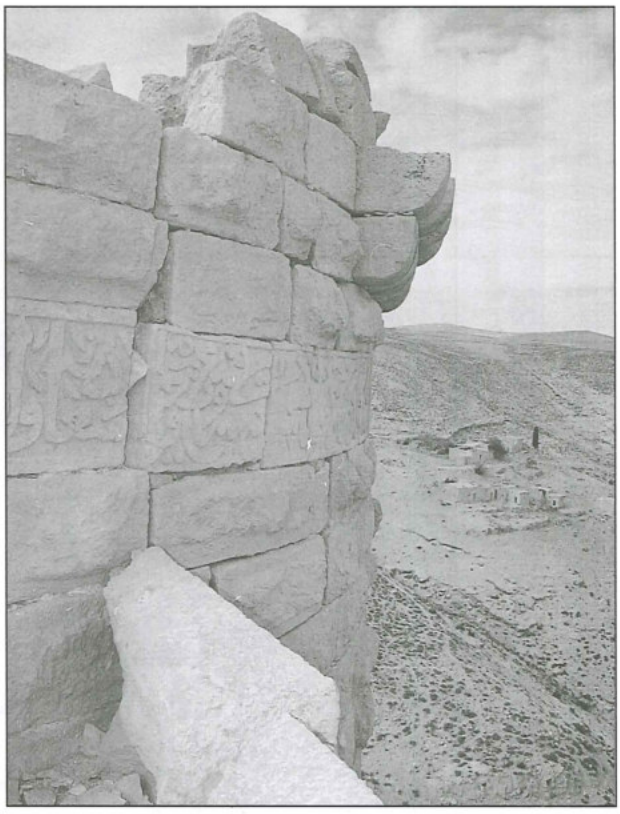
٩ . الفتحه شبه دائرية الموجودة في أسفل الجدار الخارجي للكنيسة الجنوبية.



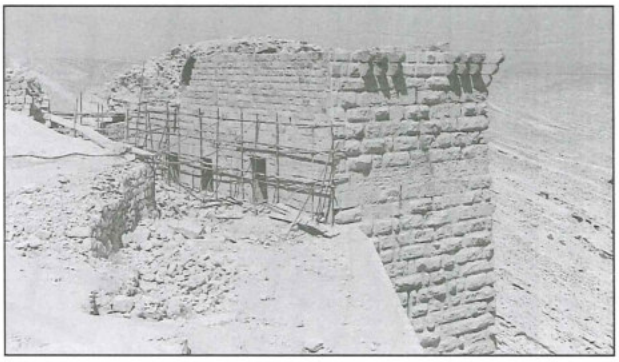
١٠ . أعمال الصيانة والترميم للنفق المؤدي إلى البئر من الداخل.



١١ . واجهة البوابة الغربية من الخارج للكنيسة الجنوبية قبل الترميم.



٢ . البرج الشمالي (T6) أثناء عمليات الترميم.



٣ . البرج الشرقي (T9) أثناء عمليات الترميم.



٤ . غرفه مبلطه من البرج (T9).



٥ . الجدار رقم (R10) قبل الترميم.



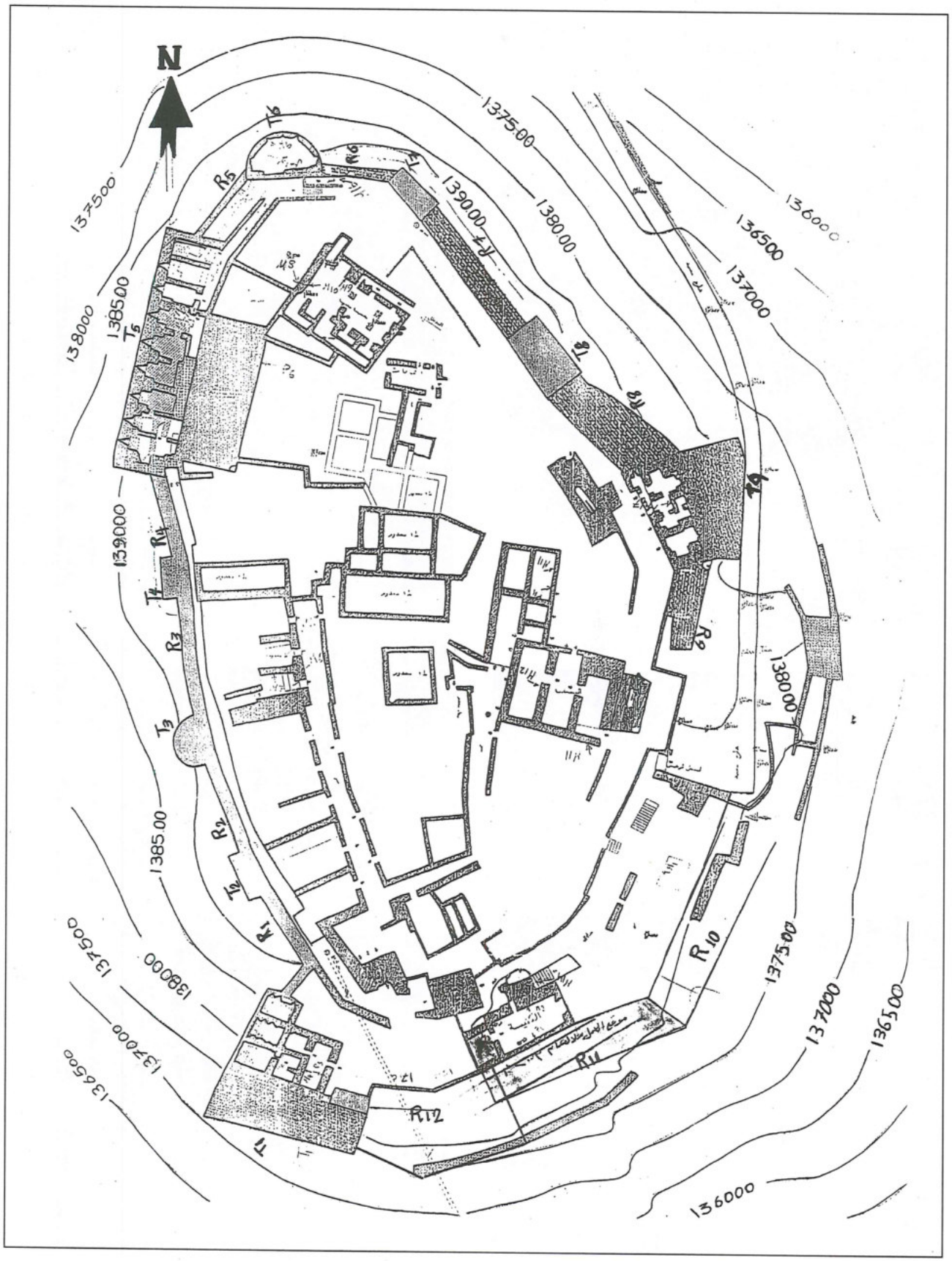
٦ . الجدار رقم (R10) بعد أعمال الترميم.

الكنيسةالجنوبية (**الأشكال ١٣و ١٤**).

- أما في الجزء الخارجي تركز العمل على إعادة بناء وترميم الجدار الجنوبي (R11) وجدار الكنيسة الخارجي من الجهة الجنوبية (**الأشكال ١٥و ١٦**).

الخلاصة

من أجل المحافظة على الأماكن الأثرية التي تعتبر من المعالم الحضارية والشواهد التاريخية على حضارات الشعوب في هذه المنطقة وحمايتها والحفاظ عليها واعادة صيانتها وترميمها، والتي تعتبر قلعة ألشوبك واحدة من هذه المعالم



١ . مخطط عام للقلعة مبين عليه المواقع التي تم صيانتها وترميمها.

الأعمال المنجزة في مشروع ترميم وصيانة قلعة الشوبك

إشتملت أعمال الترميم والصيانة على الأسوار المحيطة بالقلعة والجدران الداخلية والأبراج بالإضافة إلى الكنيسة الجنوبية والنفق المؤدي إلى البئر (**الشكل ١**).

وتتلخص الأعمال المنجزة على النحو التالي

١- **البرج الجنوبي (T1) والمنحدر الداعم له:** إعيد بناء وترميم البرج الجنوبي الذي تبلغ ابعاده ٢٣,٥ × ٢٣,٥م بارتفاع ١١م من بداية الجدار والمنحدر الداعم له وذلك بصيانة واجهات البرج والمنحدر وتدعيمها، وتبليط سطح البرج وتكحيل جدرانه وتجريف وإزالة الأتربة والمخلفات من الموقع.

٢- **البرج الدائري الرئيسي الشمالي (T6):** تم ترميم وبناء الجزء المنهار من البرج الشمالي بعدما تعرضت أساساته للانهيار عام ١٩٩٥ وذلك بإعادة حجارته إلى مكانها الأصلي وتكحيله، بالإضافة إلى بناء وتثبيت وتكحيل سقف وزاوية البرج المذكور من الداخل والخارج فبلغت أبعاده ١٣,٨ × ٨,٥م بارتفاع ١٣م (**الشكل ٢**).

٣- **البرج الغربي (T5) والممر التابع له (السوق):** رمم المدخل وستة أقواس داخل الممر الذي يشكل الطابق الأول من البرج، وبنيت قاعدة حديدية بطول ٢,٥م لتدعيم المدخل كما تم ترميم وتكحيل واجهة الجدار من الجهة الشرقية للممر وترميم سقف بوابة الممر حيث بلغ طول البرج ٤٢,٨م وعرضه ٩,٨م وارتفاعه ١٤م.

٤- **الأبراج الغربية (T2.T3.T4):** تركز العمل في هذه الأبراج على التكشيف عن اساساتها المغطاة بالكامل بالأنقاض ومن ثم ترميمها وتكحيلها بالإضافة إلى تبليط سطح هذه الأبراج لاعادتها إلى صورتها السابقة وهي أبراج صغيرة بالمقارنة مع الأبراج الأخرى بحيث لا تتجاوز أبعاد اكبر برج فيها وهو T3 ٩ × ٥,٥م.

٥- **الجدران الإستنادية الغربية (R1.R2.R3.R4):** بنيت هذه الجدران بشكل عشوائي من قبل السكان المحليين الذين كانوا يقطنون القلعة في بداية القرن الماضي حيث تم الكشف عن أساساتها علماً بأنها تربط بين الأبراج الرئيسية في الجهة الغربية فأعيد ترميم ثلاثة جدران مع عمل بسطة حجرية وتكحيلها بحيث بلغ مجموع أطوالها ٥٩,٣م ويتراوح ارتفاعها مابين ٤م و٤,٥م.

٦- **الأبراج الشمالية (T7.T8):** إشتمل العمل على تكشيف وإزالة الأتربة والأنقاض وترميم الأجزاء المنهارة وأجراء عمليات الحقن وإعادة التكحيل، وتبلغ أبعاد البرج T8 ١٢,٧ × ١٦,٥م بارتفاع ٦,٣م، أما البرج T7 فتبلغ أبعاده ٩,٢ × ٨,٤م بارتفاع ٧م.

٧- **الجدران الإستنادية الشمالية (R7.R8) والبسطة اسفل الجدران:** إشتمل العمل على إزالة الأتربة والأنقاض وإعادة بناء وترميم وتكحيل وحقن تلك الجدران، حيث بلغ طول الجدار R7 ٢٥,٥م وارتفاعه ٤,٥م عن البسطة الحجرية التي يبلغ ارتفاعها٤,٥م، أما الجدار R8 فيبلغ طوله ١٩م وارتفاعه ٤,٥م عن البسطة.

٨- **الجدار الاستنادي الشرقي (R9) والبسطة التي أسفله والجدار الإستنادي الشرقي والمنحدر الداعم للبرج (T9):** نتيجة لتآكل الطبقات الصخرية الحورية تحت اساسات البرج وتعرضه للتصدعات التي لم تصل إلى الأساسات فقد تم بناء جدار استنادي مع منحدر داعم للبرج وإعادة بناء الأجزاء المنهارة وصب الباطون خلفها وتنظيفها وتكحيلها، حيث بلغ طول الجدار ١٨,٥ بارتفاع ١٣,٥م عن البسطة الحجرية.

٩- **البرج الشرقي (T9):** يقع هذا البرج في الجهة الشرقية من القلعة ويعد من الأبراج الرئيسية حيث يبلغ طول الواجهة الشرقية حوالي ٢٠م والواجهة الجنوبية ١٠ أمتار وبارتفاع يصل إلى ١٦م، يتكون من ثلاثة طوابق حيث اشتملت أعمال الترميم والصيانة على

- إزالة الأتربة والأنقاض عن أساسات البرج.
- بناء جدار استنادي داعم للبرج.
- بناء منحدر داعم للبرج بسبب تآكل الطبقة السفلية من الجدران وكذلك تآكل الطبقة الصخرية الحورية أسفله.
- إعادة بناء وترميم واجهات البرج (**الشكل ٣**).
- إعادة بناء وترميم وتبليط جزء من غرف البرج (**الشكل ٤**).

١٠- **الجدار الخارجي (R10) في المنحدر الشرقي والجنوبي الشرقي:** أشتمل العمل على تدعيم وتثبيت أساسات الجدار بعد عمليات الكشف وإزالة الطمم (**الأشكال ٥، ٧**) فأعيد بناء وترميم الجدار الذي يبلغ ارتفاعه ١٢م (**الأشكال ٦و ٨**)، واثناء عملية الكشف عن أساس الجدار ظهرت فتحة شبه دائرية بقطر ٦٠سم أسفل الجدار تؤدي إلى داخل القلعة عن طريق نفق موجود أسفل الكنيسة الجنوبية (**الشكل ٩**)، بالإضافة إلى تكحيل حلول الحجر وتنظيفها من المواد العالقة وازالة كميات كبيره من الاتربة والحجارة الموجودة على المنطقة المحاذية للكنيسة من الخارج.

١١- **نفق البئر:** نظراً لأهمية هذا النفق باعتباره أحد المعالم ألرئيسية في القلعة فقد وضعت له خطة من اجل إعادة ترميمه وصيانته وذلك بتنظيفه من الحجارة والاتربه المتراكمة بداخله واعادة ترميم وصيانة أول ١٢٥ درجه من النفق (**الشكل ١٠**).

١٢- **الجدار الخارجي الجنوبي (R11) والكنيسة الجنوبية:** تركز العمل في هذا الموقع على ما يلي:

- إعادة بناء وترميم واجهة البوابة الغربية من الداخل والخارج للكنيسة الجنوبية (**الأشكال ١١و ١٢**).
- ترميم واعادة بناء البوابة ألمؤدية لأحواض التعميد في

مشروع صيانة وترميم قلعة الشوبك
١٩٩٥ - ٢٠٠٣

محمد المراحلة وصدقي الحامد ونبيل عديلات

تقع قلعة الشوبك على بعد ٢٢٠كم جنوب العاصمة عمان وترتفع ١٣٥٠م فوق مستوى سطح البحر وهي ضمن قطعة أرض تعود ملكيتها لدائرة الآثار العامة مساحتها ١٠٦ دونمات، تتميز القلعة بموقعها الإستراتيجي والمشرف على طرق المواصلات القديمة ما بين بلاد الشام والحجاز.

(والشَوبك بالفتح ثم السكون ثم الباء الموحدة المفتوحة، وآخره كاف: قلعة حصينة في أطراف الشام بين عمان وايله والقلزم قرب الكرك، وذكر بن علي التنوخي في تاريخه أن يقدور ملك الفرس سار في سنة ٩٠٥ إلى بلاد ربيعه من طي، وهي ياق والشراه والبلقاء ووادي موسى، ونزل على حصن قديم يعرف بالشوبك بالقرب من وادي موسى فعمره ورتب فيه رجاله وبطل السفر من مصر إلى الشام بطريق البرية مع العرب بعمارة هذا الحصن) (الحموي ج٣: ٣٧٠).

قام ببناء هذه القلعة بلدوين الأول عام ١١١٥م للسيطرة على الطرق التجارية بين مصر وبلاد الشام.

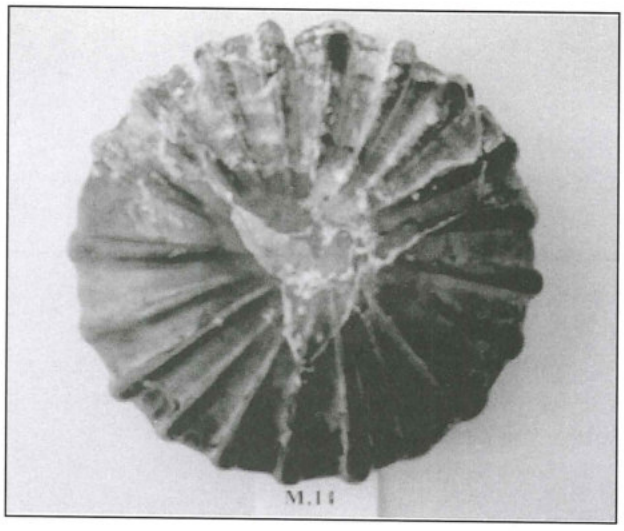
مرت القلعة بالعديد من الحقب والعصور التاريخية المختلفة ففي عام ١١٨٩م دخلت تحت الحكم الأيوبي وعام ١٢٥٣م سيطر عليها المماليك وفي عام ١٥٦٣م قام الأتراك بإحتلالها والسيطرة على المنطقة. أما القلعة فكانت محاطة بتسعة أبراج رئيسية تتصل بعدد من الأسوار المحيطة حولها وهذه الأبراج منها النصف دائري والمستطيل والمربع بالإضافة إلى العديد من المعالم داخل القلعة منها الإيوان الذي يقع في الجهة الشمالية الشرقية وهو عبارة عن قاعة كبيرة مستطيلة الشكل يبلغ طوله ١٣م وعرضه ٦م تتألف من ثلاثة أروقة، ومن المعالم الأخرى البئر الذي يقع في الجهة الجنوبية الغربية وهو عبارة عن نفق لولبي الشكل يتم النزول إليه عبر درجات منحوتة في الصخر يبلغ عددها ٣٦٥ درجة وفي قاع النفق عين ماء وبركة صغيرة كانت القلعة من خلالها تتزود باحتياجاتها من الماء أثناء الحصار، بالإضافة إلى كنيستين الأولى في الجهة الجنوبية الشرقية والثانية في الجزء الشمالي الغربي من القلعة، ومن المعالم الأخرى المعصرة ومنطقة الحمام وعدد كبير من الاقبية والعقود، إضافة إلى الكتابات والزخارف التي تزين العديد من الأسوار وأبراج وجدران القلعة.

ونتيجة لتقادم الزمن وتعاقب الأمم وما شهدته من حروب للسيطرة على هذا الموقع الهام ومع الإستعمال الجائر لحجارته بالإضافة إلى عوامل التعرية من رياح وامطار وهزات أرضية، أثرت جميعها على بناء القلعة والجدران الداعمة لها مما تسبب بإنهيار بعض الأجزاء وتكشف الاساسات وتعرض طبقات الأساس الصخرية إلى الضغط مما شكل خطراً على بناء القلعة وديمومتها. مما دفع دائرة الآثار العامة إلى توقيع اتفاقية تعاون مع سلطة المصادر الطبيعية ممثلة بقسم ميكانيكا التربة والصخور لدراسة الوضع الهندسي الجيولوجي للقلعة، حيث باشر الكادر الفني بأعمال الترميم والصيانة منذ منتصف عام ١٩٩٥ ضمن خطط سنوية ومراحل متعددة حسب ما تقتضيه ظروف العمل وطبيعة الموقع.

مراحل العمل

١- دراسة الموقع: قام الفريق بدايةً بدراسات جيولوجية هندسية ميدانية ومخبرية للتعرف على الخواص الفيزيائية والميكانيكية للتربة وحجر البناء والصخور الحاملة للأساسات لتحديد قوة التحمل للصخور، ودراسة الطبقات الصخرية وأنواع الحجر من حيث النوع والشكل والحجم، كما قام الفريق بإجراء فحوصات مخبرية شملت على: النفاذية، الكثافة، الوزن النوعي، معامل الثني، والتآكل السطحي.

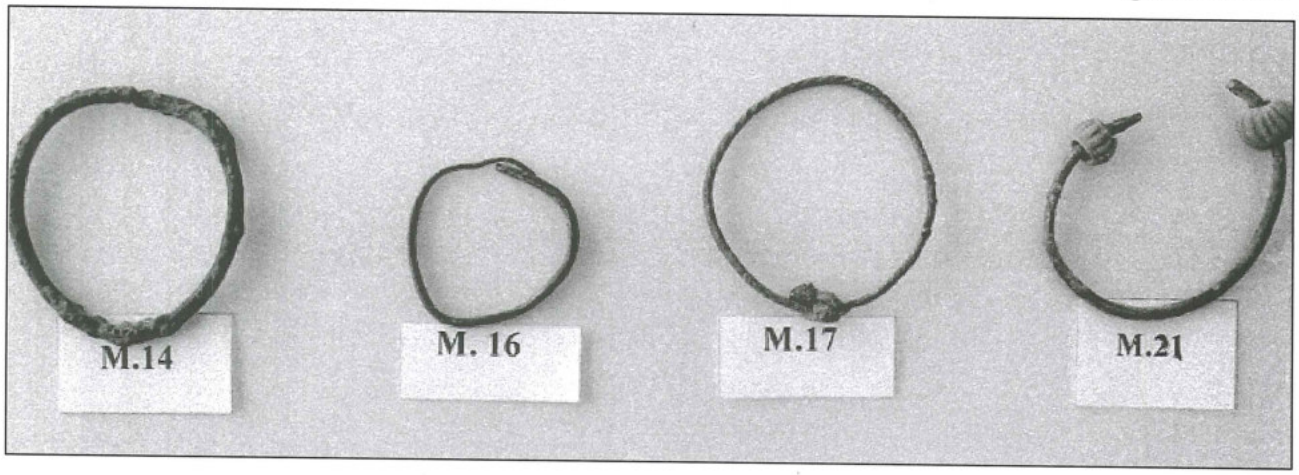
٢- أعمال الصيانة والترميم: قام الفريق بتجريف وإزالة الأتربة والأنقاض من موقع العمل وفصل الكتل الحجرية وتنظيف المنحدرات بواسطة الهواء المضغوط والماء. والعمل على تثبيت الطبقات الصخرية الحاملة بواسطة حفر ثقوب بقطر ٢٥ملم وعمق (١ - ١,٥م) وتثبيت قضبان حديدية وحقنها بالمونة الإسمنتية لربط الصخور الضعيفة بالطبقات المتماسكة. ومن ثم إعادة ترميم الأجزاء المنهارة والمتآكلة باستخدام الحجارة من داخل القلعة بعد جمعها وفرزها ونقلها بناء على مواصفات خاصة بالحجر تشمل اللون والشكل والأبعاد لتتم بعدها عملية صب الخرسانة العادية خلف البناء لربط الجدران مع الصخور ليتم بعد ذلك تنظيف حلول حجر البناء في واجهات الجدران التي أعيد ترميمها من مخلفات البناء والأتربة والمواد العضوية العالقة وغسلها بالماء تمهيداً لعملية التكحيل بواسطة حقن حلول الحجر بالمونة الإسمنتية المناسبة بنسب مدروسة ودرجة ليونة مناسبة للحصول على خلطة متجانسة ذات لون وقوة مناسبة لربط الحجر في الجدران وإبراز الناحية الجمالية مع المحافظة على شكل ولون ومواصفات البناء القديم.



٥. زبدية من الزجاج.



٦. سراج فخاري.



٧. مجموعة من الاساور البرونزية وخلخال برونزي.

قطره (٥سم) فيه فتحة لتسهل عملية وضعه في اليد، عثر عليه في القبر T.1 (**الشكل ٧**).

(M.16) سوار برونزي دقيق الصنع، صغير الحجم قطره (٤سم) عثر عليه في القبر T.6 (**الشكل ٧**).

(M.17) سوار برونزي دقيق الصنع مجدول، عليه قطعة حديدية صغيرة، قطره (٥سم) عثر عليه في القبر T.6 (**الشكل ٧**).

(M.21) خلخال من البرونز عليه خرزتان، قطره (٥,٠٥سم) عثر عليه في القبر T.2 (**الشكل ٧**).

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٢. الدمار الذي تعرضت له بعض القبور.

يبلغ عدد قبور المدفن ثمانية وهي محفورة بشكل بيضاوي نصف دائري داخل القطع الصخري (**الشكلين ١ و ٣**) ضمن مقاييس دقيقة حيث نجد ان أطوال هذه القبور تتراوح ما بين (٢٠٥-٢٠٧سم) وعرضها (٦٠-٦٥سم) بارتفاع (١١٥-١٣٠سم) مع وجود حنايا بسيطة فوق مداخل القبور لإعطاء نوع من الجمالية المعمارية، بالإضافة إلى وجود كوة صغيرة ما بين القبرين T4وT5 (**الشكل ٣**) لوضع سراج فخاري، وهي عادة متبعة في المقابر الرومانية، ولكن لم يعثر على اية آثار حرق داخل هذه الكوة.

طريقة الدفن

نظراً لوجود الرطوبة العالية التي أثرت على الهياكل العظمية لم نستطع التعرف بشكل دقيق على وضعية الدفن ولكن من خلال الدراسة الدقيقة للموقع نستطيع التأكيد على الأمور التالية

١- وضعت الهياكل العظمية داخل القبر بشكل طولي نظراً لوجود مساحة كافية. كما تشير الدراسات التي أجريت على المقابر الرومانية أن الرومان لم يحددوا وضعية معينة للجثمان داخل القبر فقد كان يوضع بشكل عشوائي (بشارة ١٩٩٥: ١٦١).

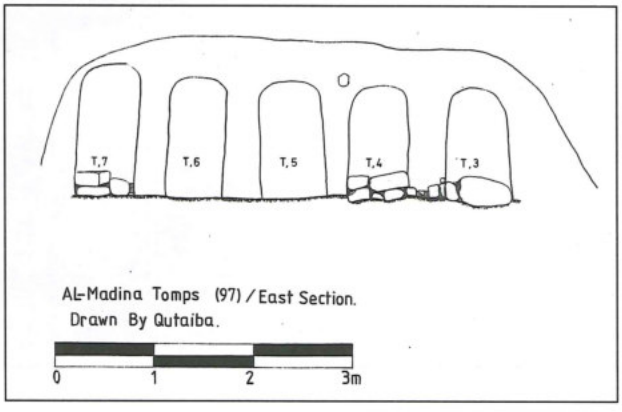
٢- تقر المعتقدات الرومانية بوضع بعض المتعلقات الشخصية مع الميت فقد عثر على بعض الخواتم والأساور مدفونة مع الميت في هذا المدفن.

٣- من أهم مراسم الدفن المتبعة عند الرومان والواضحة في هذا المدفن وضع كمية من التراب الأحمر الزراعي أسفل الجثمان ومن ثم وضع متعلقاته الشخصية معه.

٤- عثر ايضا على مقبض حديدي بشكل دائري مثبت عليه قطعة برونزية مستطيلة الشكل في القبر رقم M.T5 وهذا دليل على ان هذا المقبض كان مثبت على تابوب خشبي وضع داخل القبر.

٥- إغلقت القبور بواسطة مداميك حجرية توضع على المدخل لحمايتها (**الشكل ٤**).

٦- بعض هذه القبور أعيد استخدامها مثل القبر M.T6 حيث عثر بداخله على بعض العظام مكومة بطريقة عشوائية في نهايته.



٣. المقطع الشرقي للمدفن.

الخلاصة

ومن الجدير بالذكر أن عددا من المدافن ظهرت في نفس الموقع، وهنا لا بد من البحث في تاريخ هذه المنطقة، حيث يوجد إلى الشمال الشرقي من المدفن موقع يسمى قطنة الجنوبي وهو موقع غير واضح المعالم وذلك بسبب عمليات التجريف المستمره له، فقد عثر على بعض الكسر الفخارية في موقع قطنة وبعد المقارنة وجدت انها تعود إلى العصر الروماني، وهذا دليل واضح على ارتباط المدافن القريبة بهذه المستوطنة الرومانية.

المكتشفات

(M.11) زبدية من الزجاج جميلة الشكل، مكسورة ومرممه، وهي ذات لون بني فاتح قطرها (١١سم) وسمكها (٣ملم)، القاعدة تشكل صدفة مضلعة، عثر عليها في القبر T.3 (**الشكل ٥**).

(M.12) سراج فخاري كامل الشكل مصنوع بالقالب، عليه بطانة حمراء اللون وهو مشوي بشكل جيد على الفوهة آثار للحرق، أرخ إلى الفترة الرومانية القرن الثاني الميلادي تحديدا مثال (Bisheh 1973: pl.xxxv III)، عثر علية في القبر T1 (**الشكل ٦**).

(M.14) سوار برونزي عليه بعض الزخارف الصغيرة،



٤. طريقة اغلاق القبور.

مدفن المدينة الرياضية / عمان

جهاد هارون

الموقع

يقع المدفن إلى الشرق من دوار المدينة الرياضية في عمان، وقد عثر سابقا على مدفن آخر[1] في نفس المنطقة على بعد حوالي (٤٠م) إلى الجنوب من المدفن الحالي الذي كشف عنه خلال أعمال الحفريات لإنشاء موقف للسيارات في شهر أيلول من عام ١٩٩٧ وقد ساعد الباحث في التنقيب كل من الزملاء بسيم الريحاني واحمد الطواهية، لهم منه كل التقدير.

طابع البناء

كشف خلال عمليات الحفر الدقيق يدويا على مدفن من الحجر الجيري ويتميز هذا النوع من الحجارة بسهولة القطع، وهو السبب الذي دعى أهل المنطقة لإختيار هذا الموقع لحفر مدافنهم في القطع الصخري. عثر بداخل هذا المدفن على ثمانية قبور منها ما هو مغلق بحجارة وطين بمستوى مدماك أو مدماكين، أما الشكل الخارجي لهذه القبور عبارة عن حنايا قوسية مقطوعة في الصخر الجيري (**الشكل ١**)، بعضها كان يحتوي على هياكل عظمية مختلفة في حالة سيئة جداً، ولم يعثر فيها الا على بقايا جمجمة، ذلك نتيجة لإرتفاع نسبة الرطوبة والإنجرافات التى نتج عنها دخول المياه إليها مما ادى إلى اتلافها. كما وجدت بعض القبور مغلقة وعند فتحها كانت محتوياتها كاملة لعدم تعرضها للخراب والنهب، بعض هذه القبور اعيد استخدامها في فترات لاحقة وهي T.6وT.5.

وقد كان لطريقة حفر الأرض من قبل الجرافات ضرر كبير على القبور مما ادى إلى إنهيار بعض أجزاء من سقفها الداخلي محدثة بعض الدمار (**الشكل ٢**).

يلاحظ من خلال طريقة بناء المدفن انه ذو طابع روماني بحت، حيث عثر على كثير من الأمثلة المشابهة لهذا المدفن في كل من مقبرة اللويبدة (Dana 1970: 37)، والرجيب (Bisheh 1973: 65) وجبل الحسين (Zayadine 1981: Fig. 1.6).

إن هذا النوع من المقابر يتكون من مدخل رئيسي يؤدي إلى حجرة مركزية ذات ساحة مربعة أو مستطيلة تحيط بها القبور من كافة الجوانب، الا أن التجريف الذي تعرض له المدفن في الجزء الغربي بشكل كامل أدى إلى إزالة ملامح المدخل (**الشكل ١**)، ولكننا نستطيع ان نتخيل شكل المدخل الذي يليه قطع صخري في أرضية المقبرة بعمق "٣٠سم" وعلى طول الحجرة، أما عرضه غير معروف لنا.



١. منظر عام للقبور مع التجريف.

١ . تقرير غير منشور

على ذلك المعثورات المتمثلة بالاجران الحجرية والمطاحن البازلتية الضخمة التي استخدمت فيما مضى لطحن الحبوب وعدد من الطوابين. وتعود بدايات الاستقرار في هذه المنطقة إلى الفترة الرومانية المتأخرة، إلا أن الاستيطان الفعلي كان في الفترة البيزنطية بكافة مراحلها ويدلنا على ذلك القراءة التي تمت لكميات الفخار الهائلة المستخرجة من الموقع وهي مختلفة الانواع والاحجام معظمها وجدت مهشمة.

يلاحظ من خلال أعمال التنقيب التي جرت في الموقع خلال المواسم الثلاثة الماضية أن هناك عدد من مراحل الاستيطان وهي

المرحلة الاولى: وهي المرحلة الرومانية، تمثلت بعدد قليل من المظاهر المعمارية المكتشفة، نذكر منها على سبيل المثال الجدار رقم (٢)، وهو جدار محكم البناء ظهر في موقع المسرات (٣)، وكذلك المدافن التي تم الكشف عنها في المقبرة الخاصة بالموقع.

المرحلة الثانية: وهي الفترة البيزنطية بكافة مراحلها حيث تظهر في اغلب المظاهر المعمارية المكتشفة في الموقع، ونذكر منها مثلا الكنيسة الواقعة في الجهة الشمالية من المنطقة (B) في موقع المسرات (١).

المرحلة الثالثة: وهي المرحلة الإسلامية المتاخرة، وتظهر بشكل ضئيل من خلال قراءة الكسر الفخارية المستخرجة من الموقع، ولم نعثر لغاية الان على مظاهر معمارية تعود لهذه الفترة.

المرحلة الرابعة: وهي المرحلة الحديثة، ويمكن مشاهدتها من خلال انتشار عدد من البيوت التراثية التي بنيت في الثلاثينيات من القرن الماضي مستخدمة حجارة الموقع الأصلية، وكذلك المنازل الحالية لأهل القرية التي تقوم في معظم الاحيان على أراضي هي جزء لا يتجزء من الموقع الأثرى.

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الجدول ٢: أهم المعثورات في موقع المسرات ٢٠٠٢-٢٠٠٤ .

رقم القطعة	مسمى القطعة	Area	Sq.	Loc.	Pail	الوصف العام للقطعة	تاريخ العثور	الحالة للقطعة	القياس	التاريخ	مشرف لمربع	ملاحظات
1	مكيال كحل	B	C1	5	15	نحاسية مدببة من الأمام وتمتد بشكل طولي ليتصل بصفحتي عريضة ومجوفة بطول (٣ سم) وعرض(١سم) استخدمت كمكيال الشكل :طولي	08/27	كاملة	الطول (١ سم)		انار	
2	مشبك	B	C1	6	17	مشبك مصنوع من العاج مذنب من طرفه ومكسور من الطرف الاخر استخدمت للملابس	08/28	غير كامل	الطول (٧ سم)		انار	اللون Pale Brown
3	خاتم Ring	B	B 1	1	4	برونز من الاعلى يظهر مستطيل بارز له اطار من نفس المعدن و من الداخل صفيحة من البرونز يعتقد انه كتبت عليها حجر كريم	09/12	كامل منحني	المحيط ( )		عارف	مساحة مستطيل ١,١سم×٠,٩سم
4	Juglet	B	D2	2	6	جرة صغيرة مغطاة ببطانة من نفس العجينة عليها تحزيز من الداخل القاعدة مجـــــــوفة البد طوابة عادية لا تظهـــــــر عليها اية زخارف اللون (5yr /6/8 Reddish Yellow)	09/10	كاملة	قطر فوهة (٣سم) القاعدة(٥,٥سم) الارتفاع(٨سم)	Byz	انار	
5	فلكة مغزل Spindle Worrie	B	B1	1	8	مصنوعة من حجر Steatile دائرية مثلوبة من الوسط مسطحة من الاعلى ومن الاسفل اللون Dark Gray	09/15	كاملة	القطر الخارجي (٣,٥سم) القطر الداخلي (١,٣سم)	Byz Umm	عارف	
6	مسكوكة coin	C	Tr.A	4	18	برونزية، الملامح واضحة على وجهي العملة ، صورة الامبراطور مكللا ويرتدي ثياب ملكية وحوله احرف غير واضحة صورة لثلاثة اشخاصObv	10/02	كاملة	القطر (١,٤سم)	Byz		
7	مسكوكة coin					برونزية ، واضحة ، صورة الامبراطور obv مكللا ويتجه راسه لليمين ويلبس ملابس ملكية وحوله الاحرف التالية صورة لجنديين يتجهان للامام rev	10/05	كاملة	قطر (١,٨سم)			
8	انية زجاجية glass vase	B	H2	1	10	انية زجاجية البدن اسطواني ارتفاعه ١٤ سم يحتوي على تحرير ribbing من الخارج و الداخل متساوي في المساحات . القاعدة concave المقبض loop يظهر الجزء الاسفل منه و يظهر انه يمتد من الكتف إلى الرقبة أو الفوهة	11/13	مكسورة	قطر(١٤سم) السماكة(١mm) ارتفاع(١,٥سم) حتى الكسر	Rom	انار	زجـــاج نـــقي ومحروق حـــرق جيداً لون الزجاج ٦/٢ Pale Grean
9	ختم صليب	B	I2	2	5	قاعدة انية فخارية يظهر عليها نقش بارز لصليب داخل اطار مزدوج حول الصليب. لون العجينة (5 Yr 5/6 Yellowish red) مغطاة ببطانة في نفس اللون ومشذب جيدا. الصليب نفسه عبارة عن خط بارز وفي المنتصف معين و ثلاث نقاط في كل ضلع ترمز إلى الأب والأبن والروح القدس (المعين يرمز إلى الجهات الأربع في العالم)	10/21	غير كامل	الطول والعرض (٣سم)	Byz	احمد لاش	
10	سوار نحاسي أو برونز	B	I3	2	6	صغير الحجم مفتوح بحالة جيدة جداً loop wine	10/24	كامل	المحيط (١١)سم		احمد لاش	
11	قطعة خرزة Bead	C	Tr.A	5	21	قطعة خرز كاملة طوابة مصقولة من الخارج صنعت من حجر صابوني ابيض و عليه خطوط بنية و زرقاء	10/26	كاملة	ارتفاع (٨) سم قطر الثقب (٠,٢) سم القطر الخارجي (٠,٥)سم		عارف	وجد خيط معدني ملفوف في الخرزة طوله (١,٢)سم
12	سراج Lamp	C	Tr.A	4	24	سراج فخاري كامل بيضاوي الشكل تظهر آثار الحرق عليه خاصة في الجزء الامامي حيث تغطي اللون الرمادي والاسود عند الفتل . القاعدة مائلة قليلاً بشكل دائري وتتصل بخطين بارزين . أفوه الزيت محاطة باطارين بارزين وحول الفتحة خطوط شعاعية وبين الفتحتين اشكال نباتية وحلزونية والمقبض بشكل راس حيوان وشكل صليب	10/27	كامل	الطول (١١)سم العرض(٦)سم قطر فوهة الزيت (٢,٣)سم قطر فوهة الفتيل (١,٨)سم الارتفاع (٢,٨)سم الارتفاع عن المقبض (٤,٢)سم	L.Byz	عارف	لون العجينة (٥Yr ٦/٦ Reddish Yellow Mould Made عمق المصباح
13	جرة صغيرة	B	G2	2	2	ملساء من الخارج (وصف خاص) Dipper Juglet	11/03	مكسورة عند الفوه	ارتفاع حتى الكسر (٧,٢سم) القطر (٤,١سم)	Byz	انار	اللون رمادي غامق
14	سراج Lamp	cemetey/المقبرة	tomp 1	3	5	سراج فخاري بالقالب له فتحة زيت دائرية مزخرف بخطوط مروحية لون العجينة بنى رمادي .	06/13	كامل	سراج فخاري :- الجزء الامامي مفقود الطول:٩,٦سم اقصى عرض : ٦سم الارتفاع مع المقبض :٣,٣سم بدون مقبض ٢,٦سم		احمد لاش	
15	سراج Lamp	cemetey/المقبرة	tomp 1	5	7	سراج مزخرف بخطوط بارزة ذو شكل مثلثية له مقبض يرتفع بشكل قوسي وغير سميك له قاعدة دائرية .	06/14	كامل	سراج فخاري كامل بمقبض الطول: ١٠سم الارتفاع :٤,٥سم مع المقبض اقصى عرض :٥,٦سم		احمد لاش	
16	Copper ring +bangles خاتم البرونز	cemetey/المقبرة	tomp 1	6	12		06/15	كامل			احمد لاش	
17	small Juglet قارورة	cemetey/المقبرة	tomp2	5	15	ابريق صغير ذو حافة مثلوبة للخارج وعريضة ، له رقبة قصيرة ضيقة وبدن اسطواني الشكل تقريباً يتسع قليلاً عند الكتف وقاعدة قرصية disc مضلع بضلوع خفيفة المقبض يمتد من الحافة حتى اسفل الكتف بقليل لون العجينة : Reddish مائل للحمرة .	06/26	كامل	ابريق صغير مع مقبـــــض قطر الحافة : ٢,٦سم قطر القاعدة :٢,٣سم اقصى قطر : ٣,٦سم الارتفاع : ٦,٨سم		احمد لاش	
18	مدمعة	cemetey/المقبرة	tomp2	5	17	قارورة زجاجية ذات حافة مستديرة ورقبة ضيقة وطويلة البدن يتسع عند القاعدة وهي تبرز للداخل (omphlus)	06/27	كامل	قارورة زجاجية كاملة قطر الحافة :٢,٢سم قطر القاعدة ٣,٣سم الارتفاع :١٢سم اقصى قطر :٣,٣سم		احمد لاش	

٤. **جرار الطبخ:** إمتازت المنطقة بكثرة أواني الطبخ وتعدد انواعها والوانها وهذا يدل ان المنطقة هي منطقة سكنية بالكامل.
هناك نوعين من الجرار المغلق والمفتوح، أما الأغطية فلها مقابض مختلفة الأشكال وبعض الاغطية لها ثقوب صغيرة لخروج البخار.

٥. **المقالي:** لها فوهة مستوية وسميكة وتحمل مقابض مستقيمة عريضة بمقطع بيضوي وهي قليلة الوجود في الموقع.

٦. **الأباريق:** معظم الأباريق تمتاز بالفوهة الضيقة والرقبة القصيرة والصغيرة والأيدي الطولية Vertical loop han-dle تمتد من الرقبة أو الفوهة إلى الكتف.
أما العجينة فالوانها رمادي أو أحمر فاتح أو بني.

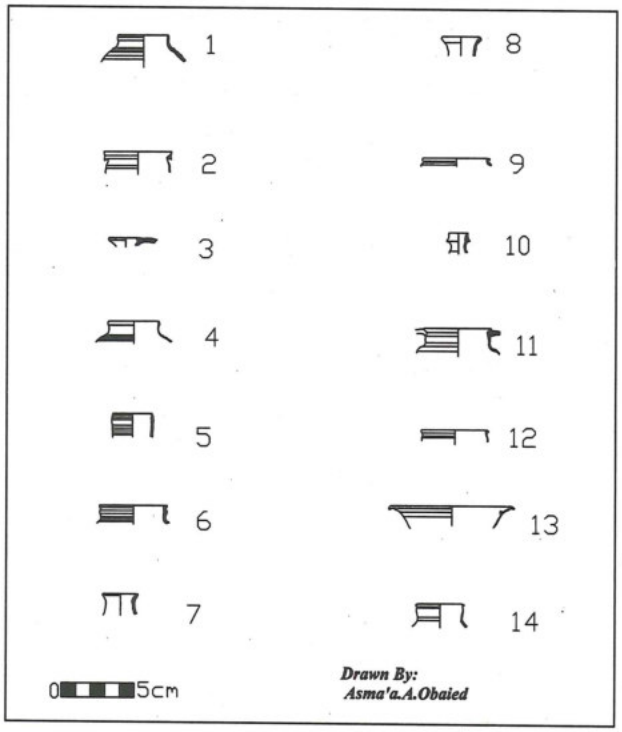
٧. **الأحواض:** رمادية اللون أو رمادي غامض تمتاز بالفوهة السميكة والمشطوفة، وتأخذ V-Shaped Body، القاعدة مستوية وتحتوي زخارف محززة على الفوهة أو البدن.

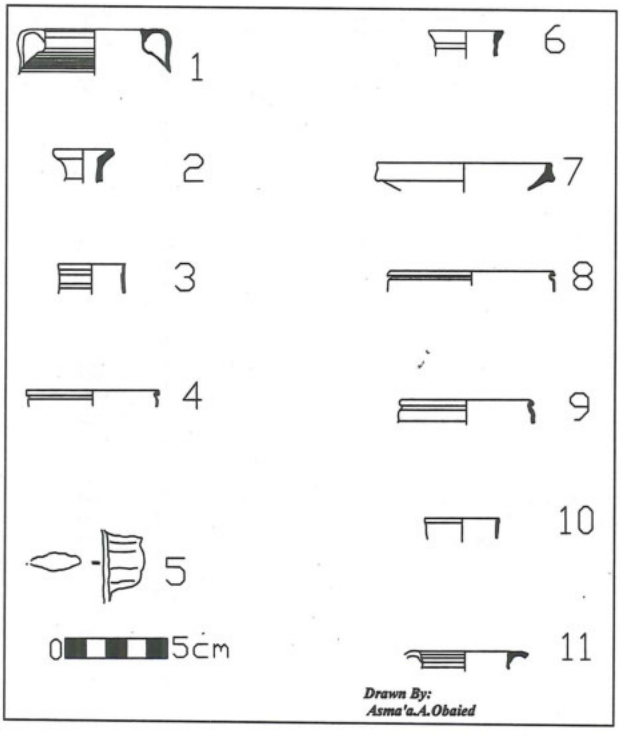
٨. **الزبادي:** إمتازت بإختلاف أشكالها وألوانها من العميق Bowls إلى Plates ، أما الحواف فقد تنوعت اشكالها من حواف مثلثية إلى دائرية الشكل تميل إما للخارج أو للداخل. والعجينة ذات لون أحمر أو وردي وهي إما ناعمة الملمس أو خشنة.

بعض الصحون Plates فقد زخرفت في المنتصف بواسطة الختم وأخذت أشكال نباتية وهندسية وأحيانا شكل الصليب. فقد عثر على جزء من صحن أخذ شكلاً آدمياً يحمل ملامح الوجه والشعر وقد أستخدم في الكنائس.

وفيما يلي مجموعة من الرسومات التي توضح أهم أنواع وأشكال الأدوات والقطع الفخارية التي عثر عليها في المواسم الثلاثة السابقة في موقع خربة المسرات (**الشكل ١٩أ، ب، ج**).

أما باقي المعثورات فهي موضحة بشكل تفصيلي في **الجدول ٢**.

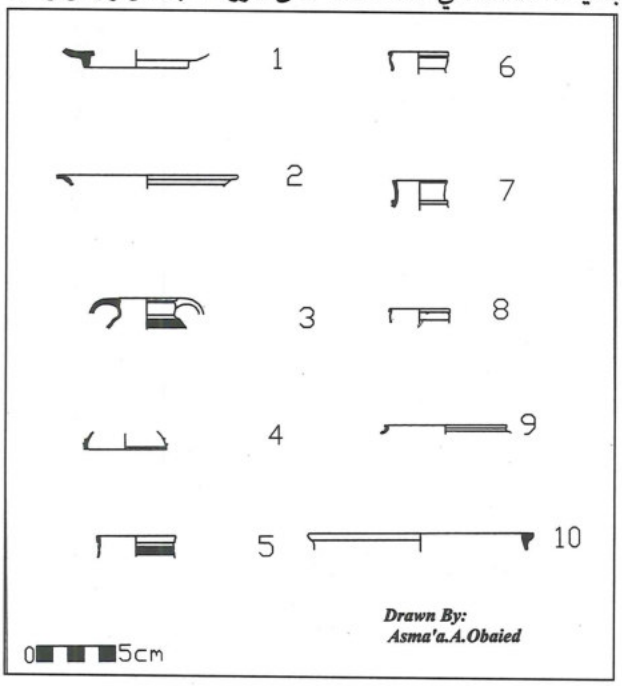


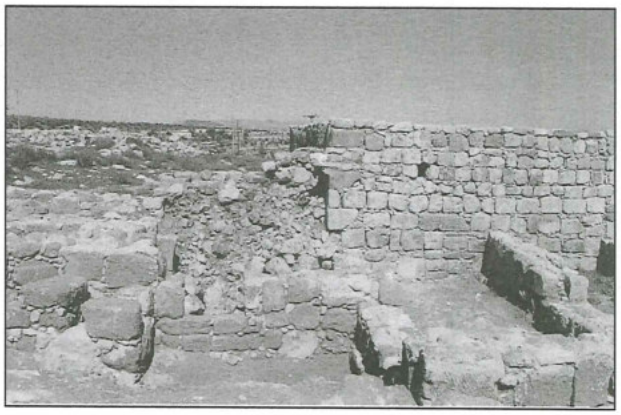


١٩أ، ب، ج، كسر فخارية مختلفة من موقع المسرات.

الخلاصة وأهم النتائج

نستطيع القول أن هذا الموقع قد شكل بدوره قرية زراعية بسيطة تعتمد في اقتصادها على الزراعة بشكل رئيس وتدل





١٧. الجدار الغربي الملاصق للمنزل التراثي قبل الترميم.



١٨. الجدار الغربي بعد الترميم.

- المجموع الكلي للفخار في الموسم ٢٠٠٣ يبلغ ٣٣٧٢٩.
- أما بالنسبة لموسم ٢٠٠٤ فلم ننتهي بعد من دراسة الفخار.

دراسة للأشكال الفخارية

١. **الأسرجة:** إمتازت بخشونة الملمس نظراً لوجود الرمل في العجينة التي صنعت بواسطة القالب، أغلب الاسرجة متشابهة حيث زخرفت سطوحها بخطوط شعاعية بارزة تلتف حول فتحة الزيت بعضها مزخرف برمز الصليب، وهي ذات عجينة إما حمراء او رمارية او بني فاتح مع إحتوائها على حجارة جيرية صغيرة وكوارتز وصوان.

تشابهت هذه الأسرجة مع الأسرجة في جرش والتي تعود إلى القرن السادس والقرن السابع الميلادي

٢. **جرار الخزين:** بعضها صنع بواسطة الدولاب والبعض الاخر Slab-constructed war حيث صنع البدن بواسطة اليد ويلصق به الفوهة المصنوعة بالدولاب Wheel made rim امتازت العجينة بدرجة نقاوة متوسطة فيها بعض الشوائب مثل الحجارة الجيرية والصوان وجزيئات رمادية داكنة. لون العجينة إما احمر فاتح أو رمادي فاتح.

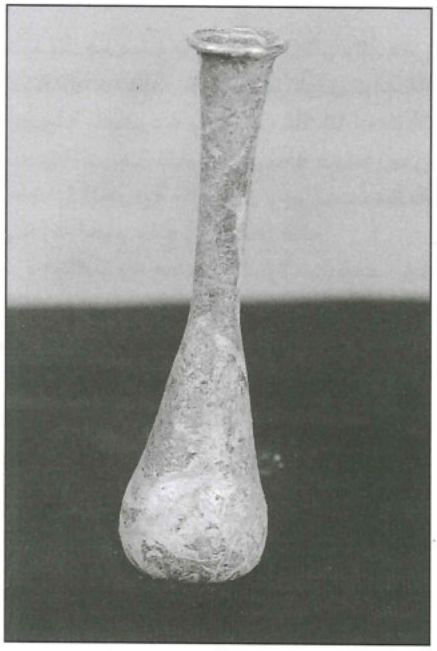
٣. **الجرار الصغيرة والكبيرة:** صنعت بالدولاب أضيف لها مقبضان على الكتف، امتازت هذه الجرار بأنها متوسطة السماكة، العجينة ذات لون احمر فاتح وخشنة الملمس، معظم الجرار لها رنين معدني (Metalic ware)، أما القاعدة فتكون إما دائرية أو Omphalos base أو String cut base.

الجدول ١: الأواني الفخارية التي تم العثور عليها في موقع المسرات.

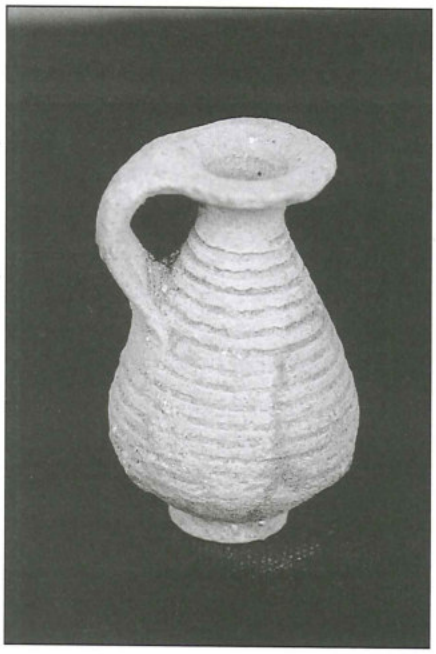
نوع المادة الفخارية	العدد خلال ٢٠٠٢	العدد خلال ٢٠٠٣
الاسرجة "كسر"	١٠٢	–
الاسرجة "كاملة"	١	٢
جرار الخزين "كسر"	٢٨	٢٢٩
الجرار	١٣٨	٩٧٢
اواني الطبخ "كاملة"	١	٥
اواني الطبخ "كسر"	١٠٩	١٩+١٥٥٧
الزبادي	٤٧	٤٤٧
الصحون	٢٥	١٢٤
الاباريق "كاملة"	٢	٠
الاباريق "كسر"	٥٠	٢٧٨
الاحواض "Vats"	٢٥	٢٣٠
الاغطية	٩	١٤٥
الفوهة	٣٩٦٢	٢٤٢٣
المقابض "handle"	٤٦١٣	١٨٩٥
القواعد "bases"	٥٧٠	٤١٨
Pithoi	–	٢٢
Basin	–	٣٧
Cup "الاكواب"	١	٧٣



١٢أ. سراج فخاري من المدفن رقم (١)، يعود للفترة البيزنطية المتأخرة.



١٢ب. مدمعة زجاجية من المدفن رقم (٢)، تعود للفترة الرومانية المبكرة.



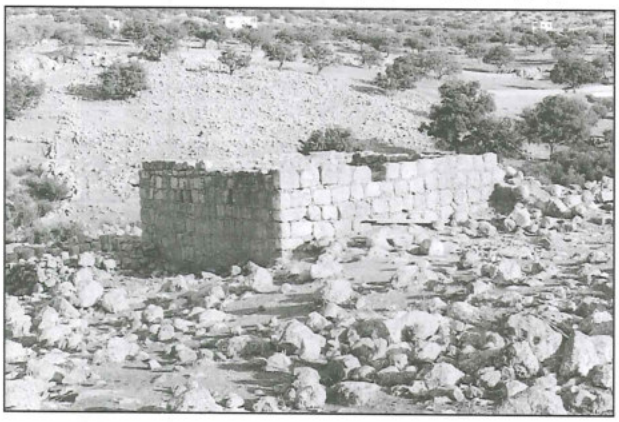
١٢جـ. جرة فخارية صغيرة من المدفن رقم (٣)، تعود للفترة الرومانية.



١٣. أحد جدران الموقع قبل الترميم.



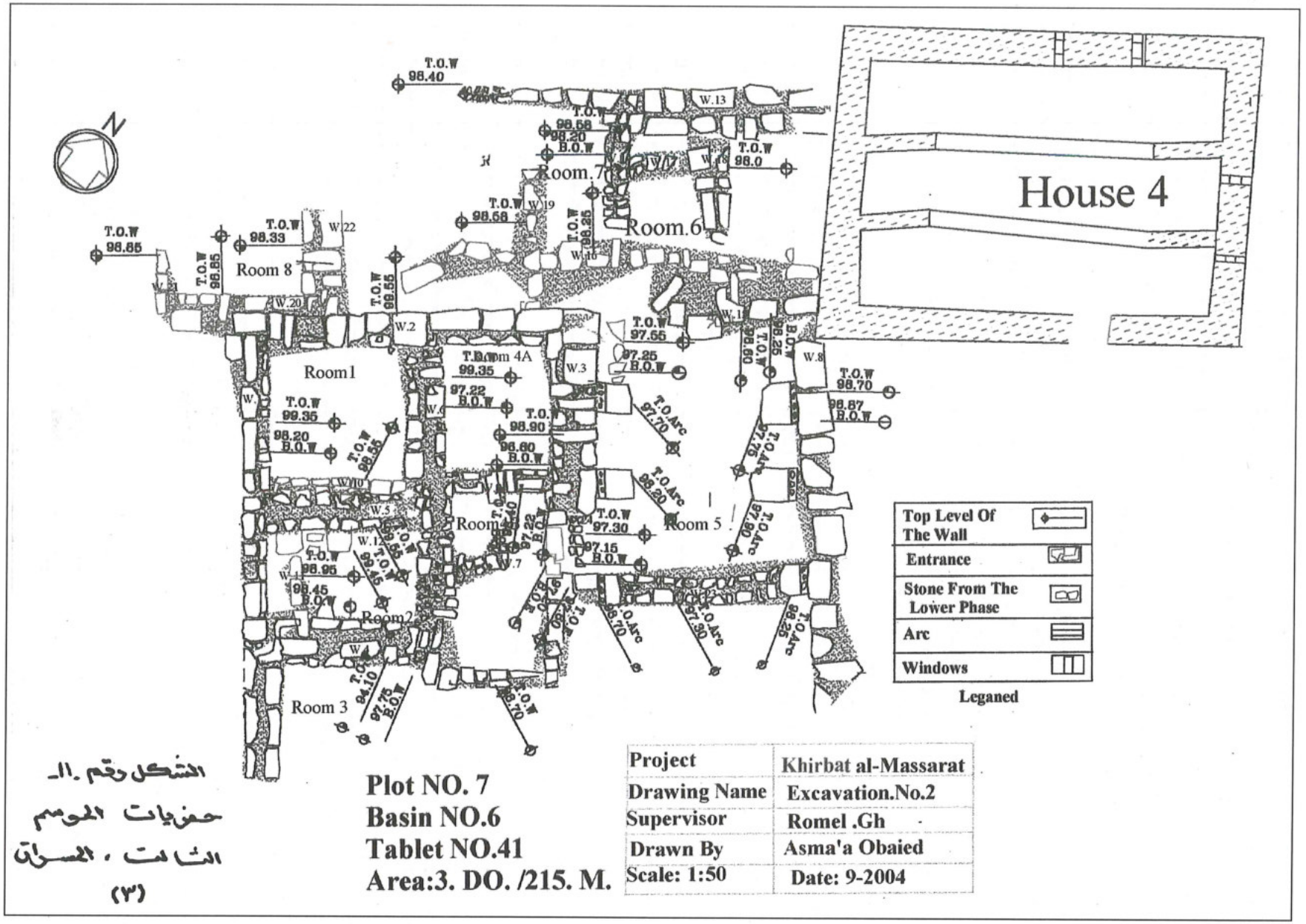
١٤. الجدار السابق بعد الترميم.



١٥. المنزل التراثي رقم (٢) قبل الترميم والتسقيف.



١٦. المنزل التراثي بعد الترميم.



الشكل رقم ١١ـ
حفريات الموسم
الثالث ، المسرات
(٣)

١١. مخطط يوضح حفريات الموسم الثالث، المسرات (٣).

الا أن أحدها يظهر محكم البناء يحتمل انه قد بني في الفترة الرومانية، أما أرضيات الموقع فهي عبارة عن طين مدكوك يميل إلى الاصفرار مخلوط بتراب احمر يشبه الأرضيات الموجودة في المسرات (١)، وتظهر احياناً أرضيات طينية مخلوطة بجير مائلة للون الاخضر ويمكن مشاهدة بعض بقايا الملاط على الجزء الجنوبي من الجدار رقم (٨)، أما البوابات فقد ظهرت بوابة واحدة في الجدار رقم "٣" تصل ما بين الغرفة رقم (٥) والغرفة رقم (B4)، كما تم الكشف في هذا الموقع عن طابون يبلغ قطره ١١٠سم مصنوع من الفخار.

و. المدافن

كشفت أعمال المسح الأثرى التي تحدثنا عنها سابقاً عن وجود "١١" مدفناً، نعتقد إنها تشكل جزءاً من المقبرة الخاصة بموقع المسرات الأثرى، ثمانية منها على شكل كهوف محفورة بالصخر ويوجد بها حجرات دفن يتراوح عددها من ٦-٨ قبور، وثلاثة منها محفورة في الصخر بشكل مستطيل بعمق ١٨٠سم نصل من خلالها إلى ثلاثة قبور اخرى، وباشرنا العمل في هذه المدافن بتاريخ ٢٠٠٤/٦/١٢ وذلك بعد ملاحظتنا لوجود عبث من قبل الباحثين عن الدفائن في المدفن رقم "٣" حيث تم التنقيب في ثمانية مدافن، ووجود هذا الشكل من المدافن بجانب الموقع الأثرى يعطينا تصوراً عن حجمه والفترات التاريخية التي تعاقبت عليه والمستوى الثقافي والاقتصادي لسكانه في العصور الرومانية والبيزنطية وذلك بعد أن أثبتت عمليات الحفر والتنقيب أن هذه المدافن تعود إلى الفترة الرومانية وقد أعيد استعمالها بالكامل في الفترة البيزنطية حيث أن القراءة التي تمت للمعثورات التي استخرجت من هذه المدافن وخاصة الأسرجة والقوارير جاءت لتؤكد إعادة استعمال هذه المدافن.

وكمثال عن هذه المدافن فسوف نستعرض ما تم الكشف عنه في المدفن الأول الذي كان مطمورا في التراب باستثناء بعض حوافه الظاهرة للعيان، وبعد ازالة الطمم المتراكم فيه كشف عن حجر كبير الحجم مشغول بطريقة جيدة وقد شكل حجر الاغلاق لفتحة المدخل ولكنه تعرض للإزاحة من مكانه الاصلي فظهرت لنا الفتحة المؤدية للمغارة (المدفن)، وعند الدخول إلى حجرة الدفن الخاصة به تبين أن هناك ثمانية قبور محفورة في الصخر باتجاهات مختلفة ويبدو واضحا للعيان عملية العبث التي تعرض لها هذا المدفن نظرا لعدم وجود هياكل عظمية كاملة باستثناء مجموعة من العظام متناثرة هنا وهناك وسط المدفن ويبدو أن بقايا أحد الهياكل العظمية كان موضوعا امام القبر رقم (١) اخرج من هذا القبر خلال عملية العبث بالمدفن، كما أن معالم هذا الهيكل العظمي لم تكن واضحة، ويبدو انه يعود لانثى حيث عثر بجانبه على ثلاثة أقراط ذهبية مختلفة إلى جانب كمية من الخرز الذي يبدو انه كان عقدا يعود لها.

كما تم العثور في هذا المدفن على قطعة ذهب صغيرة وكسر من الفخار والزجاج وسراجين فخاريين كاملين وخواتم واساور نحاسية وسوار زجاجي (**الشكل ١٢**أ، ب، ج)، وبعد أن تم الكشف بشكل كامل عن هذا المدفن اتضح لنا شكله من الداخل حيث بلغ ارتفاع سقف المدفن١٨٥-١٩٠سم. أما مساحة أرضيته فتبلغ ٤٥٠ . ٣٤٠سم، وكما ذكرنا سابقا فإن الدراسات التي اجريت على معثورات هذا المدفن تدل على انه استخدم في الفترة الرومانية واعيد استخدامه في الفترة البيزنطية:

ثانيا: أعمال الصيانة والتقوية

رافقت أعمال الحفر والتنقيب التي جرت في الموقع أعمال الصيانة والترميم والتقوية وبصورة ملازمة ومباشرة لكل ظاهرة معمارية تم الكشف عنها، وكان ذلك ابتداءاً من الموسم الأول، وقد جاءت أعمال الصيانة والترميم لتحاكي النمط السائد في الموقع، حيث تم الاقتصار على ترميم وتقوية الارتفاعات الأصلية لداميك الجدران وذلك باستخدام خلطه مكونه من الأسمنت الأبيض ورمل صويلح والشيد إضافة إلى كمية من تراب الموقع المنخل حتى تكون قريبه من الملاط المستخدم في تلك الفترة، حيث تم ترميم وصيانة وتقوية معظم المظاهر المعمارية التي كشف عنها في الموقع، ونورد على سبيل المثال الظاهرة المعمارية المتمثلة **بالشكل ١٣** والتي توضح أحد الجدران قبل الترميم **والشكل ١٤** يبين نفس الجدار بعد ترميمه.

كما أن أعمال الصيانة والترميم لم تقتصر فقط على المظاهر المعمارية الأثرية بل شملت أيضا صيانة أحد المنازل التراثية الموجودة في الموقع مثل المنزل رقم "٢" الذي تمت صيانته وسقفه لاستعماله كمستودع ومخزن لحفظ الفخار والمعدات (**الشكل ١٥**) الذي يمثل المنزل رقم "٢" قبل الترميم وبعد الترميم (**الشكل ١٦**).

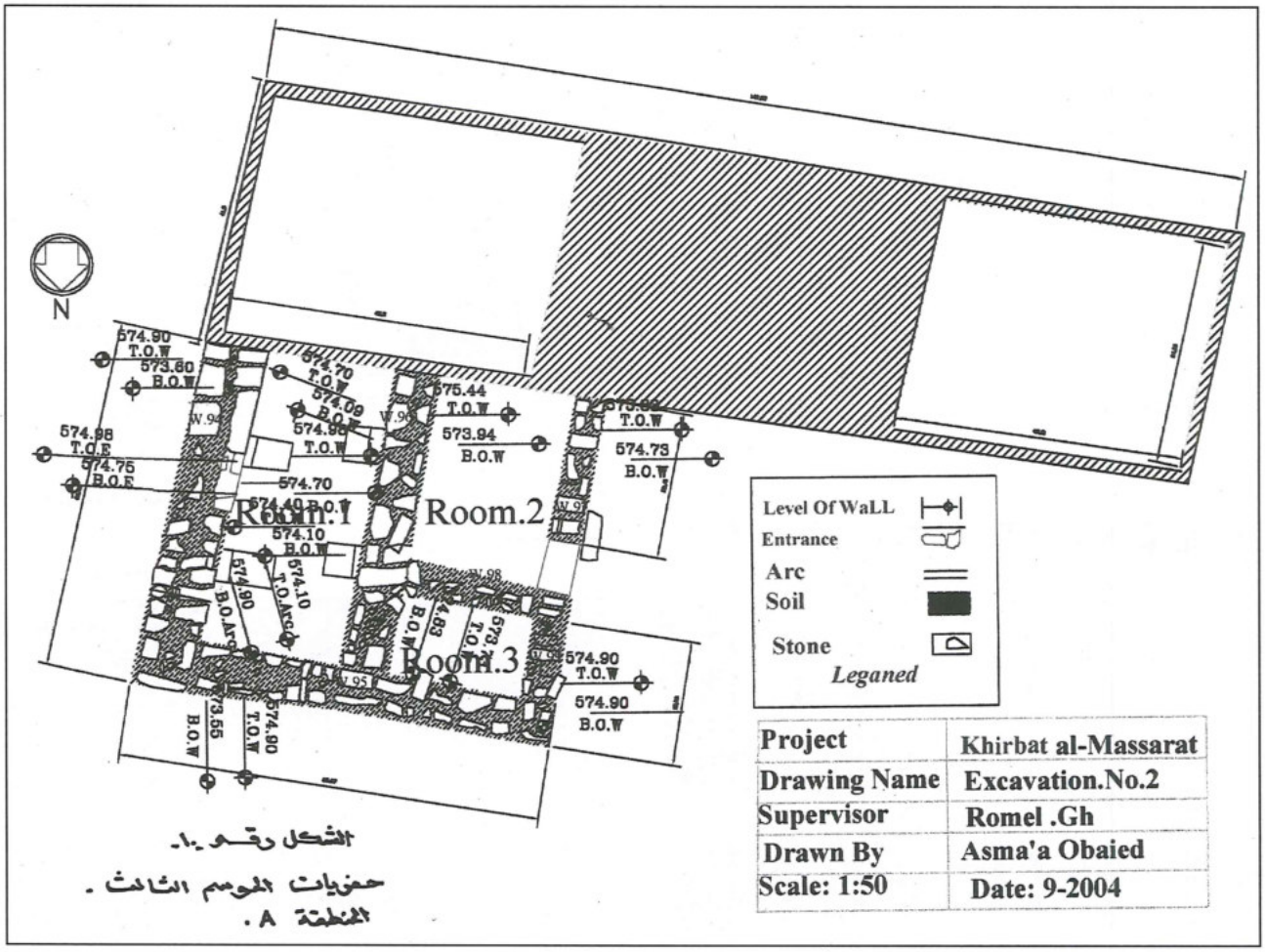
إضافة إلى القيام بأعمال ترميم كاملة في بعض الاحيان لجدران تعرضت للانهيار جراء العوامل الجوية كما يظهر في (**الشكل ١٧**) ويمثل الجدار الملاصق للمنزل التراثي رقم "٢" من الجهة الغربية بعد الانهيار و(**الشكل ١٨**) يظهر به نفس الجدار بعد عمليات الترميم.

ثالثا: قراءة الفخار

خلال أعمال التنقيب في الموسمين ٢٠٠٢ و٢٠٠٣ عثر على عدد كبير جداً من الكسر الفخارية وعدد قليل من كسر الاسرجة داخل المنطقة السكنية، تميزت هذه الكسر بتنوعها وشمولها لعدد غير قليل من الاشكال الفخارية التي أرخت للفترة البيزنطية المبكرة وبعضها للفترة البيزنطية المتأخرة، عدد قليل منها للفترة الرومانية والفترة الإسلامية المبكرة حيث وجدت بعض القطع الملونة باللون الاحمر وبطانة بيضاء أو كريمية.

وقمنا بعمل دراسة إحصائية للفخار من خلال نماذج خاصة تحدد من خلالها اعداد الاسرجة الكسر الفخارية والاشكال المختلفة للفخار فوضعت القطع المميزة لهذه الاشكال لتكون بمتناول الباحثين والدراسين لهذه المنطقة. ويمكن توضيح هذه الدراسة من خلال المعلومات التالية (**الجدول ١**)

- المجموع الكلي للفخار في الموسم ٢٠٠٢ يبلغ ٦٣٨٧٨.



الشكل رقم ١٠.
حفريات الموسم الثالث.
المنطقة A.

١٠ . مخطط يوضح حفريات الموسم الثالث، المنطقة A.

ج. معصرة العنب

اثناء عملية تنظيف موقع خربة المسرات من الحجارة المتناثرة والمنتشرة بشكل عشوائي على سطح الموقع، لوحظ وجود معصرة للعنب منحوتة في الصخر الطبيعي في اقصى الجهة الشرقية للموقع وتتكون من حوضين للعصر بينهما فاصل حجري وفي كل حوض يوجد تجويف تتجمع به السوائل بعد عملية العصر.

ويلاحظ أن الطرف الشمالي للحوض الثاني في المعصرة قد تم تدميره، بينما يظهر الحوض الأول (من الجهة الجنوبية) سليماً باستثناء وجود كسر واضح في منتصفه.

ومن خلال حجم هذه المعصرة نستطيع أن نلاحظ أنها صغيرة نوعاً ما مما يدل على أن استخدامها كان محدوداً وليس لانتاج كميات كبيرة، ولكن ميزة هذه المعصرة أنها موجودة داخل حدود الموقع، وبذلك فإن إنتاجها كان مقتصراً على سكان القرية.

د. المسرات ٢

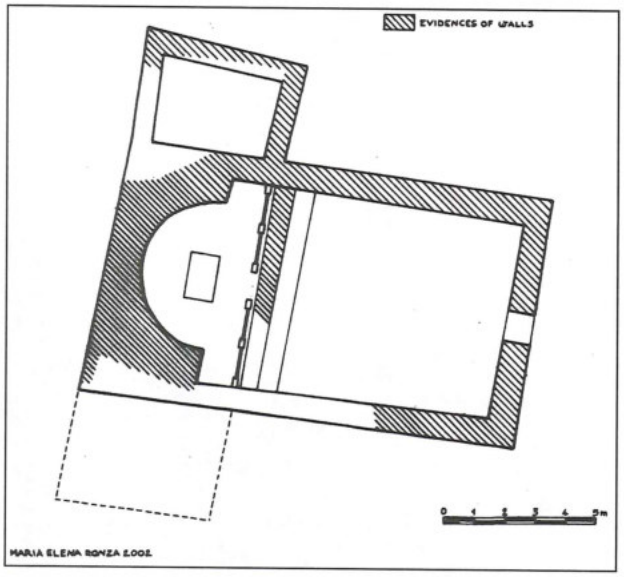
شملت أعمال التنقيب في الموسم الثالث العمل في مسرات "٢" وهي عبارة عن تلة صغيرة منحدرة ويلاحظ فيها انتشاراً كبيراً للحجارة الساقطة والتي تشكل في معظمها حجارة مشغولة، ويمكن مشاهدة بعض أساسات الجدران الواضحة للعيان وعدد من المغر التي كانت مستخدمة حتى وقت قريب من قبل سكان المنطقة سواءً لتخزين الحبوب أم لإيواء ماشيتهم في أوقات الشتاء، كما تنتشر بها اشجار البلوط بشكل كبير.

قام الفريق بعمل مجموعة من المربعات في هذه المنطقة، فكشف في احدى المربعات عن مجموعة من الطبقات الأثرية التي تراوحت سماكتها بين ٨-٢٢سم وتحوي على كمية كبيرة من الحجارة المتوسطة وكميات لابأس بها من الكسر الفخارية، ومن خلال القراءة الأولية فإن معظم هذه الكسر تعود للفترة الرومانية والبيزنطية.

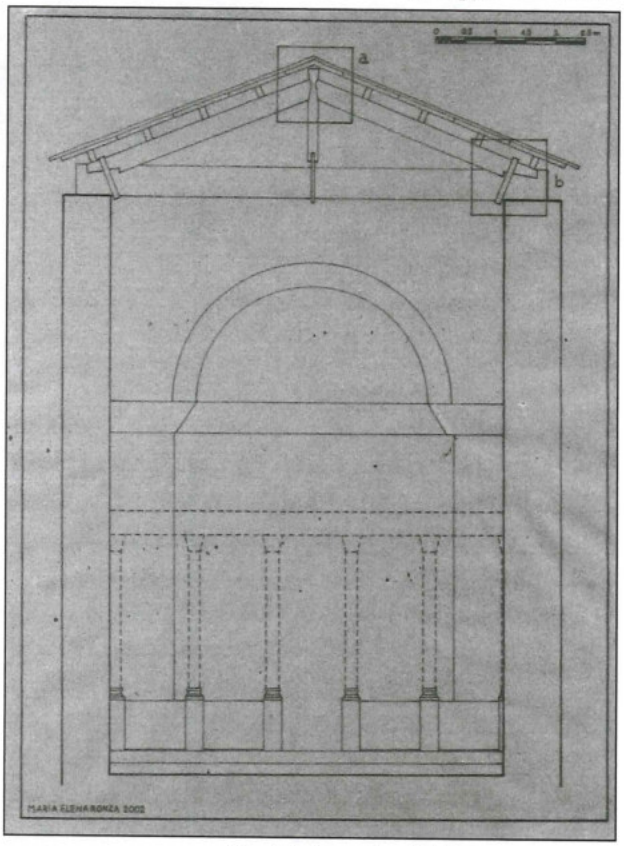
ولوحظ وجود عدد كبير من قطع الحديد الخام على سطح موقع المسرات "٢" وهذا يثير تساؤلاً فيما إذا كان هناك نوع من التعدين في الموقع.

هـ. مسرات ٣

تقع إلى الغرب من المنطقة (B) في موقع مسرات (١) اطلق عليها مسرات (٣)، جرت في هذه المنطقة تنقيبات أثرية كانت أشبه بعمليات إنقاذية كشفت من خلالها عن عدد من الغرف والجدران بلغت (٩) غرف و(٢٧) جداراً (**الشكل ١١**)، وهذه الجدران مشابهة لتلك الموجودة في موقع المسرات (١)

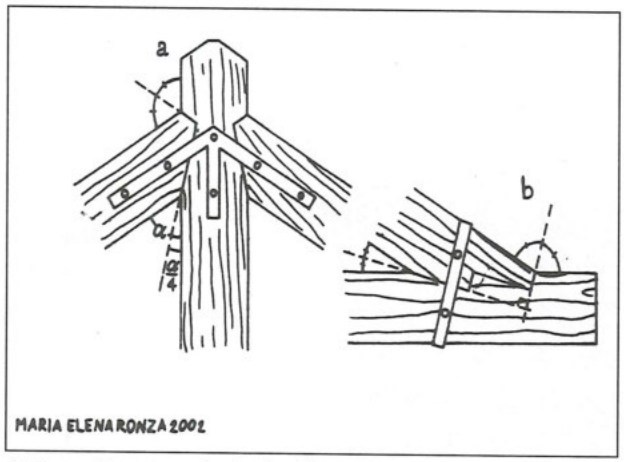


أ٧. مخطط عامودي للكنيسة.

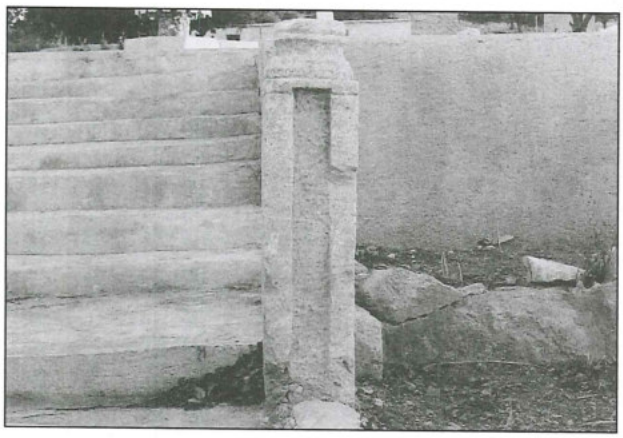


ب٧. رسم توضيحي لما كان عليه مدخل الكنيسة.

المواسم السابقة، كما تم حفر (١٠) مربعات في المنطقة (B) إلا إنها لم تكشف عن مظاهر معمارية مميزة كما كان الحال في الموسمين السابقين، ثم أنتقلنا للعمل في المنطقة (A) حيث تم إختيار المنطقة الملاصقة للجدار الشمالي للمنزل التراثي رقم "١"، حيث لوحظ وجود بعض الدلائل التي تشير إلى وجود مظاهر معمارية على شكل أساسات لجدران ظاهرة للعيان، إضافة إلى عدد من الحجارة المتساقطة المشغولة، وعليه فقد



٨. رسم توضيحي لكيفية ربط الدعامات الخشبية مع بعضها البعض لرفع السقف.



٩. أحد حجارة الكنيسة المستخدم في بناء بلدية المسرات.

قمنا بترحيل نقطة الارتفاع إلى المنطقة (A) باستخدام جهاز (الثديولايت) وقد قسم هذا الجزء من المنطقة (A) إلى غرف بدلاً من المربعات.

بدء العمل برفع كميات الطمم الموجودة في الغرفة رقم "١" وذلك بعد تصويرها، حيث اتضحت معالم هذه الغرفة ثم بوشر بأعمال التنقيب فيها.

وقد تم الكشف عن أربعة طبقات معظمها عبارة عن طمم حديث حتى تم الوصول إلى ارضية الغرفة والتي هي عبارة عن طبقة حرق متماسكة تميل احياناً إلى اللون الاصفر وهو لون الارضيات السائدة في الموقع (**الشكل ١٠**).

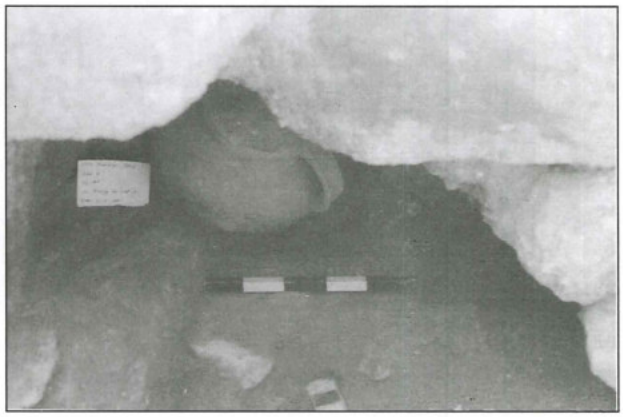
وكشف عن قوسين وثلاثة مداخل الاول في الجهة الشرقية والثاني في الغربية والثالث في الجهة الجنوبية، ثم انتقلنا للعمل في الغرفة الثانية وهي ملاصقة للغرفة رقم "١" من الجهة الغربية حيث تم التنقيب في خمس طبقات، أول طبقتين هما عبارة عن طمم حديث كما في الغرفة رقم "١" أما الثلاث الباقيات فهن عبارة عن طبقات أثرية يوجد بها آثار حريق، وبعد ازالتها تم الوصول إلى ارضية الغرفة التي هي عبارة عن طبقة من الحور المتماسكة ذات لون مائل للاصفرار. كما كشف عن مدخل الغرفة في الجهة الغربية وهو مغلق بالحجارة المتساقطة التي تم ازالتها (**الشكل ١٠**).



٤. إحدى بوابات الموقع والدرج التابع لها.

فهي في الغالب من الطين المدكوك مشابهة لحد كبير لطراز العمارة المستخدمة في خربة ياجوز سواء أكانت جدران أم أرضيات، كما عثر في هذه الغرف على عدد كبير من الأواني الفخارية الخاصة بالطبخ والتي تعود إلى الفترات البيزنطية بكافة مراحلها (**الشكل ٥**)، إضافة إلى العثور على عدد كبير من المسكوكات البرونزية والنحاسية التي تعود إلى الفترتين الرومانية المتأخرة والبيزنطية بكافة مراحلها، ومن اهم تلك المسكوكات مسكوكة نحاسية تعود للعصر الروماني تحمل على الوجه رأس للامبراطور يتجه لليمين، مرفقاً بشريط كتابي نصه (IMP CAES DOMIT AUG GERM COS XI) ويعود تأريخ هذه المسكوكة للإمبراطور دوميتيانوس الذي حكم في الفترة الواقعة ما بين ٨١-٩٦م. أما المسكوكات البيزنطية فقد عثر على عدد كبير منها أهمها مسكوكة نحاسية تحمل على الوجه صورة لرأس الإمبراطور متجهاً لليمين وشريط كتابي نصه (IVSTINIANVS PP. AUG)، أما الظهر فنقش في وسطه حرف M كبير الحجم يعلوه صليب يقع على يمينه نجمه وعلى شماله صليب، كما يظهر عليه رمز (CON) والذي يمثل مدينة الضرب وهي القسطنطينية وتعود هذه المسكوكة إلى عهد الإمبراطور جستنيانوس الذي حكم في الفترة الواقعة مابين ٥٢٧-٥٦٥م.

وقد تركزت أعمال الحفر والتنقيب في المنطقة (B) والتي كشفت عن عدد من المظاهر المعمارية المميزة وكان منها على



٥. جرة فخارية مكتشفة في الموقع.

سبيل المثال غرفة الفسيفساء، وقد سميناها بهذا الاسم لكثرة المكعبات الفسيفسائية التي وجدت فيها وقد بلغ عددها حوالي (٤٥,٠٠٠) قطعة فسيفسائية بيضاء (Tesserae) مقارنة بباقي غرف الموقع، كما أن جدران هذه الغرفة المستطيلة الشكل اتسمت بنوع من التشذيب والتنظيم خلافا لما هو موجود في سائر جدران الموقع - عدا الكنيسة، وعدد من الأقواس الجيرية المشذبة والتي يفصل بين حجارتها ملاط طيني غطيت بقصارة رمادية خشنة واخرى بيضاء ملساء، ولها مدخل يمثل بوابة جيرية ضخمة حديثة التشذيب، أما ارضيتها فقد كانت من الطين المدكوك المتماسك، وتعد من اكثر غرف الموقع وضوحا وتميزا (**الشكل ٦**)، كما يظهر فيها عمليات اعاده الاستخدام لعدد كبير من الحجارة، ويعود تاريخها بالغالب للفترة البيزنطية وأكبر دليل على ذلك وجود عدد من زخارف الصلبان فضلا عن العثور على عدد كبير من المسكوكات النحاسية البرونزية.

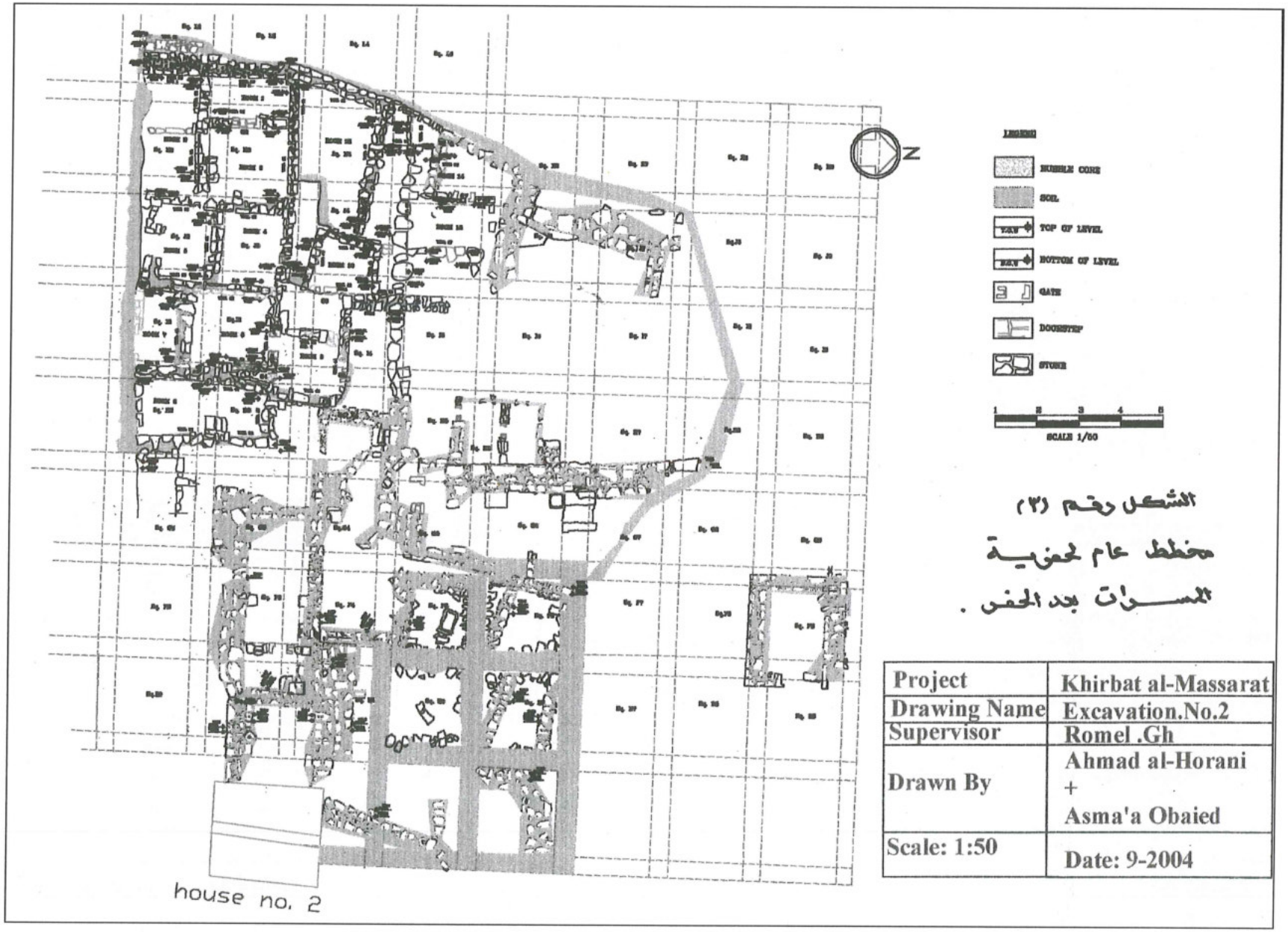
كما يظهر في المنطق (B) أهم معلم ديني مكتشف إلى الآن وهو عبارة عن كنيسة صغيرة الحجم مبنية من حجر جيري مشذب، منتظمة البناء، وهي بطول (١٤,١٠م) وعرض (٨,٣٠م)، ولم يتم التنقيب بها خلال المواسم الثلاثة السابقة وذلك لعدم توفر الحماية اللازمة لها، ولحمايتها من التعرض للعبث فتم تصويرها ورسمها ووصفها وتوثيقها توثيقاً علمياً منظماً على امل التنقيب بها والتعرف على باقي مرفقاتها وعلاقتها بباقي المظاهر المعمارية الاخرى، وعلاقتها أيضاً بالمظاهر المعمارية الدينية التي يمكن أن تكتشف فيما بعد، فتبين لنا من خلال (**الشكل ٧**أ) المخطط W العام للكنيسة والذي يوضح الشكل المعماري الذي كانت عليه هيئة بوابة الكنيسة، كما يوضح (الشكل ٧ب) المواد المستخدمة في السقف الجملوني وآلية ربطها مع بعضها البعض (**الشكل ٨**). تعود هذه الكنيسة للفترة البيزنطية، أعيد استخدام بعض حجارتها وخاصة في الفترة الحديثة، ويمكن مشاهدة بعض الحجارة الموجودة في مبنى بلدية المسرات (**الشكل ٩**).

ب. الموسم الثالث

بناءاً على خطة العمل الموضوعة لموسم عام (٢٠٠٤) في خربة المسرات، فقد قمنا بتنظيف المربعات المحفورة في



٦. غرفة الفسيفساء في المنطقة أ من الموقع المسرات "١".



الشكل رقم (٣)

مخطط عام لحفرية المسرات بعد الحفر .

Project	Khirbat al-Massarat
Drawing Name	Excavation.No.2
Supervisor	Romel .Gh
Drawn By	Ahmad al-Horani + Asma'a Obaied
Scale: 1:50	Date: 9-2004

٣. مخطط عام لحفرية المسرات.

شرق الأردن وجزء من الضفة الغربية في تلك الفترة. وربما تدل الحجارة الرومانية المتشققة في الكثير من الغرف والأقواس وحجارة الأقواس الساقطة والميلان الواضح في العديد من البوابات على آثار هذا الزلزال.

هناك العديد من المواقع الأثرية التي تعود على الأغلب للفترة البيزنطية ولفترات اقدم منها والمحيطة بموقع المسرات حيث تشترك معها بكونها مناطق زراعية خصبة بوجود نفس طبقة التربة الزراعية الخصبة والمناخ (**الشكل ٢**) مثل ياجوز وجبال العالوك والمشوبش والصنمة وجرش.

تكمن أهمية الموقع في وجوده على الطريق المؤدية إلى جرش حيث يمكن الترويج له من خلال مرور السياح به قبل التوجه إلى جرش، ولايزال الموقع بحاجة إلى العديد من عمليات التنقيب والترميم والتنظيم ليكون قادراً على استقبال الزائرين وعندها سيساهم في دعم التنمية الوطنية وزيادة الدخل القومي.

اولاً: أعمال التنقيبات الأثرية

تعتبر منطقة المسرات من أهم المواقع الغنية بالمخلفات الأثرية، حيث تبين من خلال أعمال المسح السطحي لهذه المنطقة إنها تحتوي على بقايا قرية زراعية كبيرة تعود للفترة البيزنطية وذلك من خلال المظاهر المعمارية التي يمكن أن نشاهد بقاياها منتشرة على سطح الموقع مثل بقايا المنازل والجدران، كما لوحظ انتشار عدد من المغاور المحفورة بالصخر ووجود عدد من المقالع الحجرية التي تعود للفترة الرومانية والبيزنطية وعدد من المنازل التراثية الموجودة في الموقع والتي يظهر فيها بوضوح عمليات اعادة الاستخدام، حيث تم نقل الحجارة المستخدمة في بناءها من حجارة الموقع الأصلية إضافة إلى حجارة من مواقع قريبة، واهم ما يمكن مشاهدته ظاهرا للعيان هو بقايا كنيسة صغيرة بجدرانها وحنيتها، كما تم التعرف على عدد من المواقع الأثرية الواقعة ضمن منطقة المسرات والعالوك مثل موقع الصنمة والسحارة والمشوبش والطريق الروماني الذي يربط عمان (فيلادلفيا) بجرش (جراسا) وعدد من الحجارة الميلية التي تعود لهذه الطريق.

كما دل المسح الأثري على أهمية موقع المسرات وضرورة القيام بالتنقيبات فيه، وقبل المباشرة بالحفر فقد شرع العمل بالرفع المساحي والمعماري له قبل أي نوع من انواع الحفر الميداني، فقسمت القطعة رقم (٦٨) والبالغ مساحتها (٢١٤ , ٢٦) دونماً إلى أربع مناطق وهي (A, B, C, D)، وقد تم تقسيم كل منطقة من هذه المناطق إلى مربعات تنطلق من نقطة مركزية.

توزعت أعمال الحفر والتنقيب في هذا الموقع على ثلاثة مواسم هي

الموسم الأول من ٢٠٠٢/٨/١٠ ولغاية ٢٠٠٢/١٢/٣١.

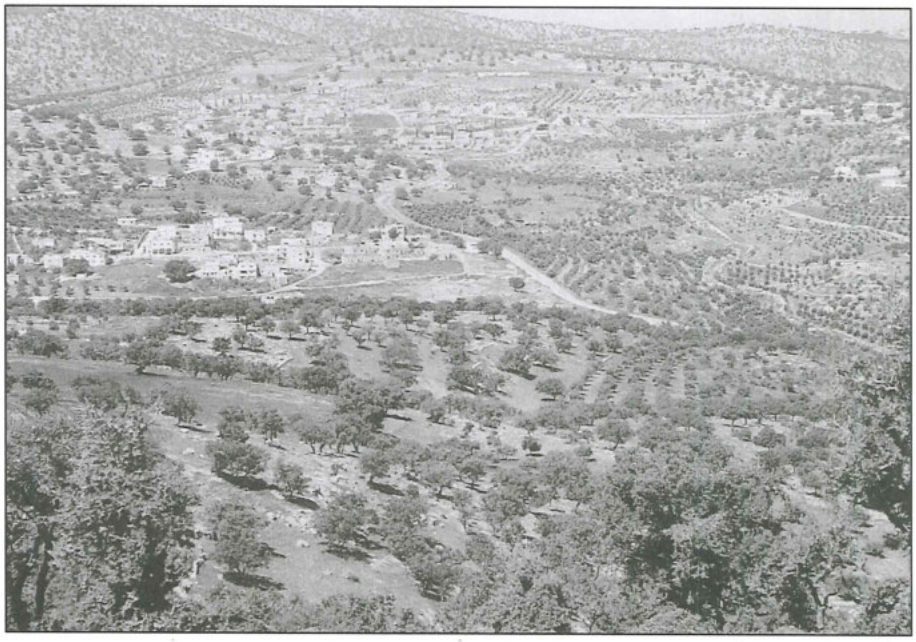
الموسم الثاني من ٢٠٠٣/٤/١ ولغاية ٢٠٠٣/١٢/٣١.

الموسم الثالث من ٢٠٠٤/٤/٣ وسينتهي العمل به في ٢٠٠٤/١٢/٣١.

كشف في هذه المواسم عن عدد من الغرف والجدران والمظاهر المعمارية موزعة على عدد كبير من المربعات وكانت كالآتي:

أ. الموسمين الأول والثاني ٢٠٠٢/٢٠٠٣

كان التركيز في هذين الموسمين على ٤٤ مربعا تقع غالبيتها في المنطقة (B) (**الشكل ٣**)، كشف فيها عن ٣١ غرفة، كما عثر على غرفة واحدة في المنطقة (C)، أما المربعات المتبقية فقد ظهر فيها عدد من الجدران والارضيات والغرف التي اعطت صورة شبه اكيدة عن طبيعة البناء المتسم بالبساطة وعدم التعقيد، حيث تظهر الجدران قليلة التشذيب تميل إلى الانتظام نوعاً ما والبوابات المبنية من الحجر الجيري المشذب والمنتظم مع وجود عدد من الأدراج لبعضها (**الشكل ٤**)، أما الارضيات



٢. منظر عام لموقع المسرات.

تقرير أولي عن التنقيبات الأثرية في موقع العالوك والمسرات (المسرة الشرقية) للمواسم ٢٠٠٢/٢٠٠٣/٢٠٠٤

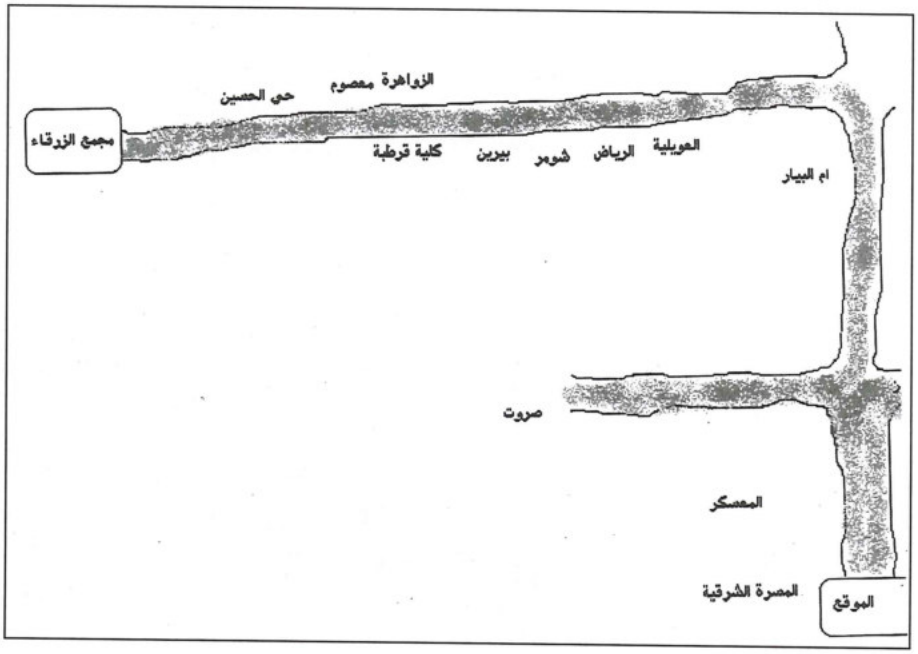
رومل غريّب

المقدمة

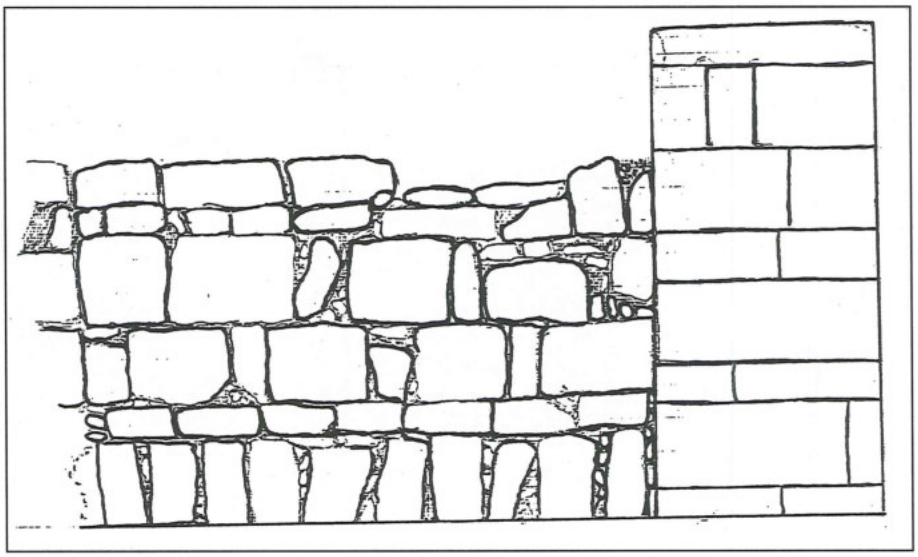
تعد قرية (المسرات والعالوك) أحد قرى قضاء بيرين في محافظة الزرقاء، تقع شمال غرب مدينة الزرقاء بحوالي ٢٧كم، ويبعد سيل الزرقاء حوالي٦كم شمال شرق موقع المسرة ويدعى حالياً بالمسرة الشرقية، وعلى بعد حوالي ٢٠كم عن عمان وتحديداً ٢٠كم شمال ـ غرب موقع ياجوز الأثري (**الشكل ١**). وقد زار الموقع الرحالة نلسون جلوك في الثلاثينات من القرن العشرين ولم يذكر المنطقة باسم المسرة بل ذكرها باسم العالوك (Glueck 1939) .

وقد وردت كلمة العالوك في معجم لسان العرب تحت الجذر علك: وهو ضربٌ من صمغ الشجر كاللبان، أو من الفعل علك أو العلاك: وهو شجر ينبت بالحجاز فربما سميت المنطقة بالعالوك نظراً لوجود شجر الصمغ في المنطقة في فترة من الفترات. وربما يدل على اسم زوجة الحاكم الروماني في منطقة جرش آنذاك وهي (هالوك)، وكلمة المسرة ربما أخذت من الفعل: سَرَر أو سَرارة اي الروضة، وهي بالنهاية تدل على علاقة الاسم بالخصوبة والأرض الطيبة الكريمة (المعجم الوسيط ١٩٧٢). والمسرات اطراف الرياحين أيضا. ومن هنا تظهر دلالة كلمة المسرة وايضاً العالوك، وهما تدلان حالياً على بلدة واحدة، ومع كون المنطقة زراعية خصبة فقد كانت محط انظار الإنسان منذ أقدم العصور حيث دل المسح الأثري والكسر الفخارية على أن هناك إستيطان منذ العصر البرونزي المتأخر، ومع القيام بأعمال الحفر والتنقيب وقراءة العملة في الموقع التي دلت على أن اساسات المساكن تعود للفترة الرومانية المتأخرة والفترة البيزنطية المبكرة والمتأخرة مع إعادة استخدام للمباني وعمليات إغلاق البوابات. وهناك فترة استخدام إسلامية في العصر الأموي ويبدو ذلك واضحا من خلال العثور على مساكن بغرف مختلفة ويمكن القول بأنها عبارة عن تجمعات سكنية زراعية وذلك لوجود الأجران الحجرية والبازلتية لطحن الحبوب وطابونين من الفخار، فقد عثر أثناء التنقيب على أواني طبخ وكسر زجاج، كذلك على كنيسة شمال المنطقة أ ومعاصر للزيتون قريبة من الموقع. كما وتظهر فترة إستيطان عثمانية متمثلة بوجود عدد من المنازل التراثية التي اعيد استعمالها في فترة الأربعينات والخمسينات من القرن العشرين. كما إستوطن السكان المحليون الكهوف والمغاور في المنطقة، وكذلك الكنيسة التي استمر استخدامها حتى نهاية الستينات من قبل أبناء المنطقة.

وقد تعرض الموقع لزلزال عام ١٩٢٧م فضرب منطقة إمارة



١. مخطط يبين كيفية الوصول من الزرقاء إلى الموقع-المسرات/العالوك.



٢٥ . جدار أنشئ بعد فترة بناء الجدار الداعم لواجهة المسرح في المنطقة C المربع B3 وينطلق من الجدار الداعم باتجاه الشمال.



٢٦ . الزاوية الشمالية الشرقية للمسرح من عمارة الجدار الداعم الإضافي في المنطقة D.

المسرح الشرقية مارا من أمام مداخل الأقبية المؤدية للمسرح في فترة متأخرة وبإضافات معمارية عديدة أضيفت اليه في أكثر من مرحلة، ثم عملية إغلاق قبو المستوى الثاني وإنشاء حجرة مبلطة لها مدخل في الجهة الأخرى من القبو "الجهة الغربية" وذلك في الفترة الأموية علما أن أرضية القبو الرومانية غير موجودة وهي أخفض من مستوى هذه الأرضية. كذلك تعرض الجدار الشرقي وخاصة قبو المستوى الثالث للإنهيار أغلق على أثره المدخل الرئيسي بحجارة كلسية مشذبه ويبدو أنه أنهار في مرحلة ما واعيد بناؤه في العصر الأموي باستخدام الحجارة البازلتية وتثبيته بالمونة الكلسية.

أشارت بعض القراءات الفخارية في الموقع إلى وجود فخار يعود إلى العصر الروماني المبكر وأخرى للفترة المتأخرة منه، كما عثر على فخار يعود للقرنين الخامس والسادس الميلاديين الفترة البيزنطية وعلى فخار إسلامي يعود للفترة الأموية القرنين السابع / الثامن. كما أشارت قراءة المسكوكات التي عثر عليها والتي تعود هي أيضا للفترة الرومانية المتأخرة القرن الرابع الميلادي ومسكوكات برونزية بيزنطية للقرن السادس الميلادي ومسكوكات إسلامية تعود للفترة الأموية (الشامي ٢٠٠٢: ٦٩).

أحمد جمعة الشامي
دائرة الأثار العامة
A1shami66@yahoo.com

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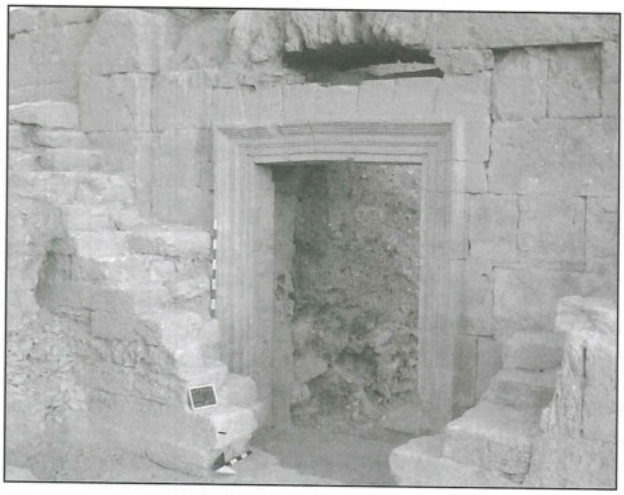
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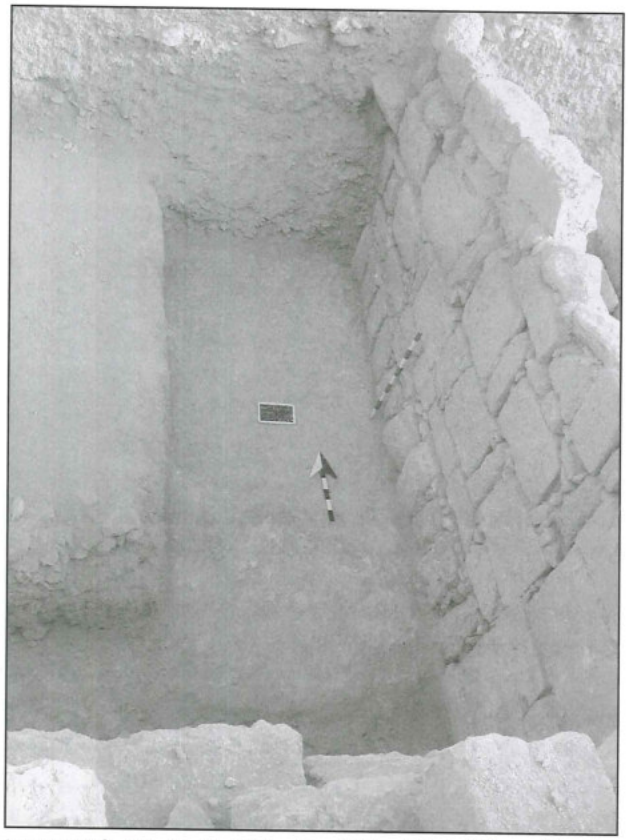
٢١ . تظهر المدخل الرئيسي وعملية اغلاقه بكتل حجرية أولا ثم إضافة الجدار الداعم أمام المدخل.



٢١ . المدخل المغلق من الخارج بالجدار الداعم الإضافي.



٢٣ . عملية فتح المدخل بعد إزالة جزء من الجدار الداعم.



٢٤ . الأرضية الترابية الصلبة في المربع B2، والجدار الذي أنشئ فوقها بعد فترة بناء الجدار الداعم لواجهة المسرح في المنطقة C المربع B3 ينطلق من الجدار الداعم باتجاه الشمال.

على مدخل في الجدار الداعم يوازي المدخل الرئيسي وبنفس المسافة بعرض ٢,١٠م ومساوي لبوابة الواجهة الرئيسية وهي البوابة المركزية للمسرح وبقي المدخل مفتوحا لفترة ما ثم أعيد إغلاقه، إذ يعتقد أن بقاؤه مفتوحا كان بهدف سهولة الدخول للمسرح عبر البوابة الرئيسية من اجل نقل الحجارة من الداخل، ويشير إلى إعادة استخدام حجارة جدران المسرح الداخلية التي كانت تشكل غرف تغيير الملابس وحجارة المقاعد إذ تم نزع كافة حجارة مقاعد المسرح في فترة متأخرة وأستخدامها في إغلاق كافة مداخل المسرح من جميع الجهات وجدارن التقسيمات المعمارية الأخرى في بناء الجدار الإضافي/ السور أمام واجهة المسرح (الشامي ٢٠٠٢: ٦٨).

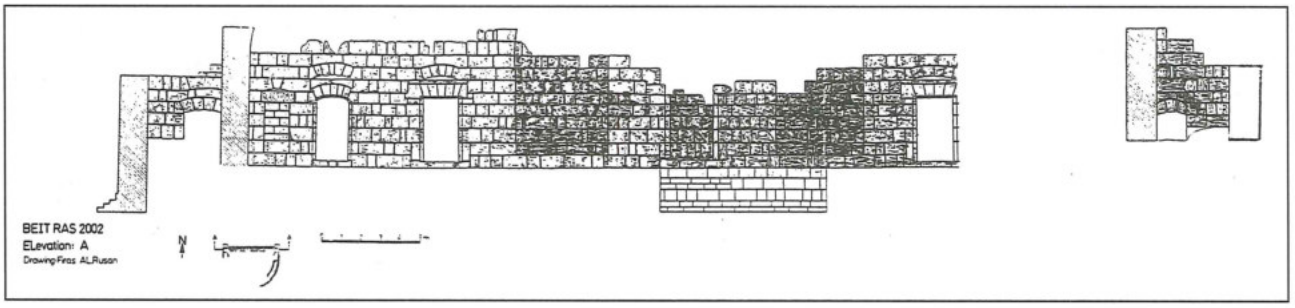
إن المتتبع لعمارة الجدار الشرقي الذي يضم أربعة مداخل والتغيرات المعمارية التي طرأت عليه يرى مدى التغيير الذي طرأ على عمارة المسرح من حيث بناء جدار ضخم أمام واجهة



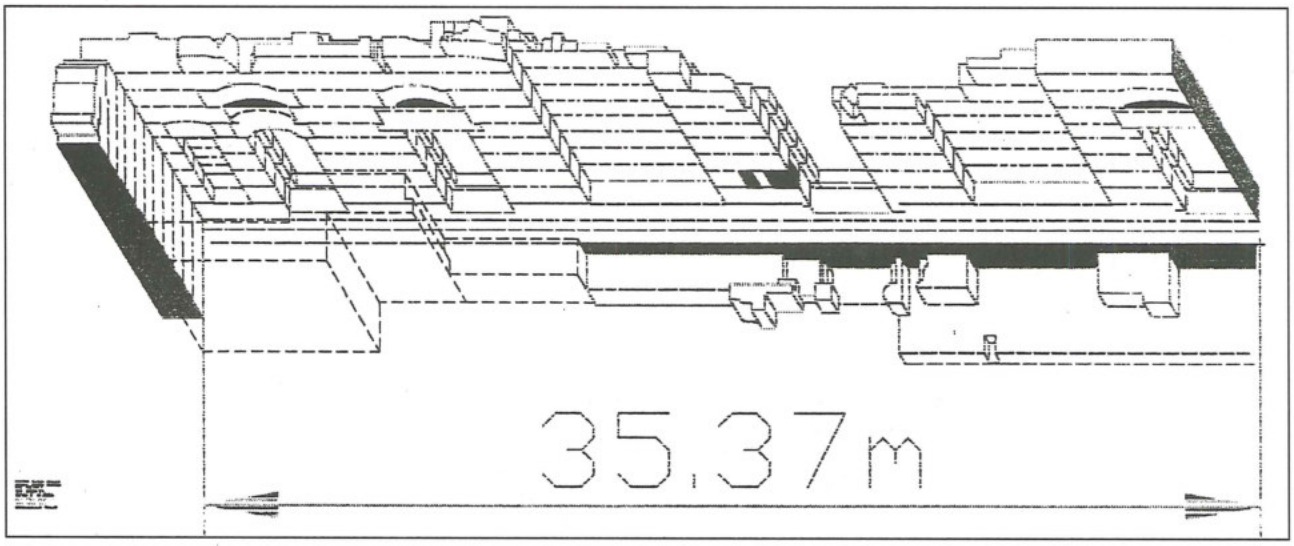
١٧ . منظر عام للعمارة الرومانية المكتشفة في المنطقة C ضمن المربعات E1 وF1 وG1 وH1 .



١٨. بقايا من السقف تدل على نمط العقد البرميلي الذي كان يحمل السقف في المنطقة C المربع K1 .



١٩. واجهة المسرح الروماني من الداخل بعد فتح المداخل المغلقة.

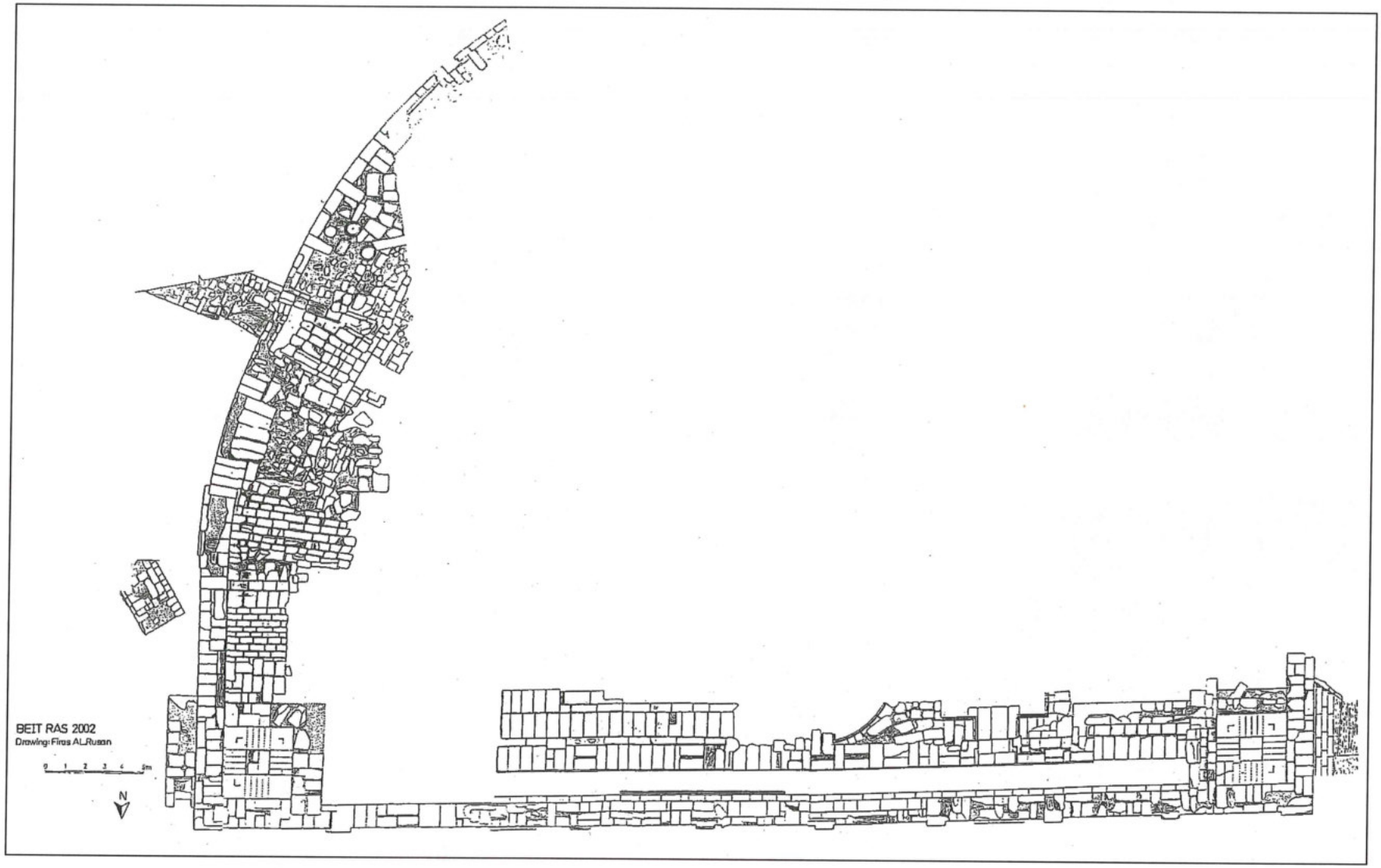


٢٠ . تجسيم لواجهة المسرح من الداخل ويظهر عدد من المداخل ويبدو إنهيار الجزء العلوي من البوابة المركزية.

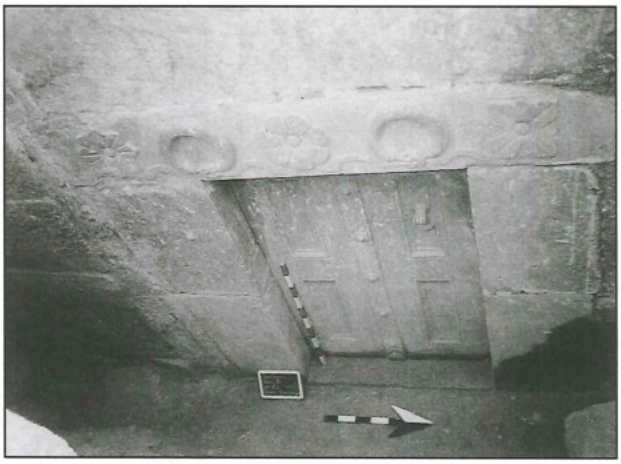
اجل الحصول على معثورات صغيرة ودقيقة تثري العمل الأثري والتقرير العلمي النهائي بعد انتهاء التنقيب والكشف عن المسرح.

النتائج

تميزت العمارة المكتشفة في الموقع بثلاثة مراحل معمارية في البناء أكدتها الشواهد الأثرية وتمثلت بعمارة الواجهة الرئيسة للبناء (واجهة المسرح الشمالية) التي تضم سبع بوابات، وهذه الواجهة تمثل العمارة الأقدم وهو العصر الروماني القرن الثاني الميلادي، ثم أضيف لاحقا الجدار الداعم الذي شيد أمام الواجهة الرئيسية وملاصق لها ويغلق مداخلها بالكامل، ويعود للفترة الرومانية المتأخرة إذ تم الإبقاء



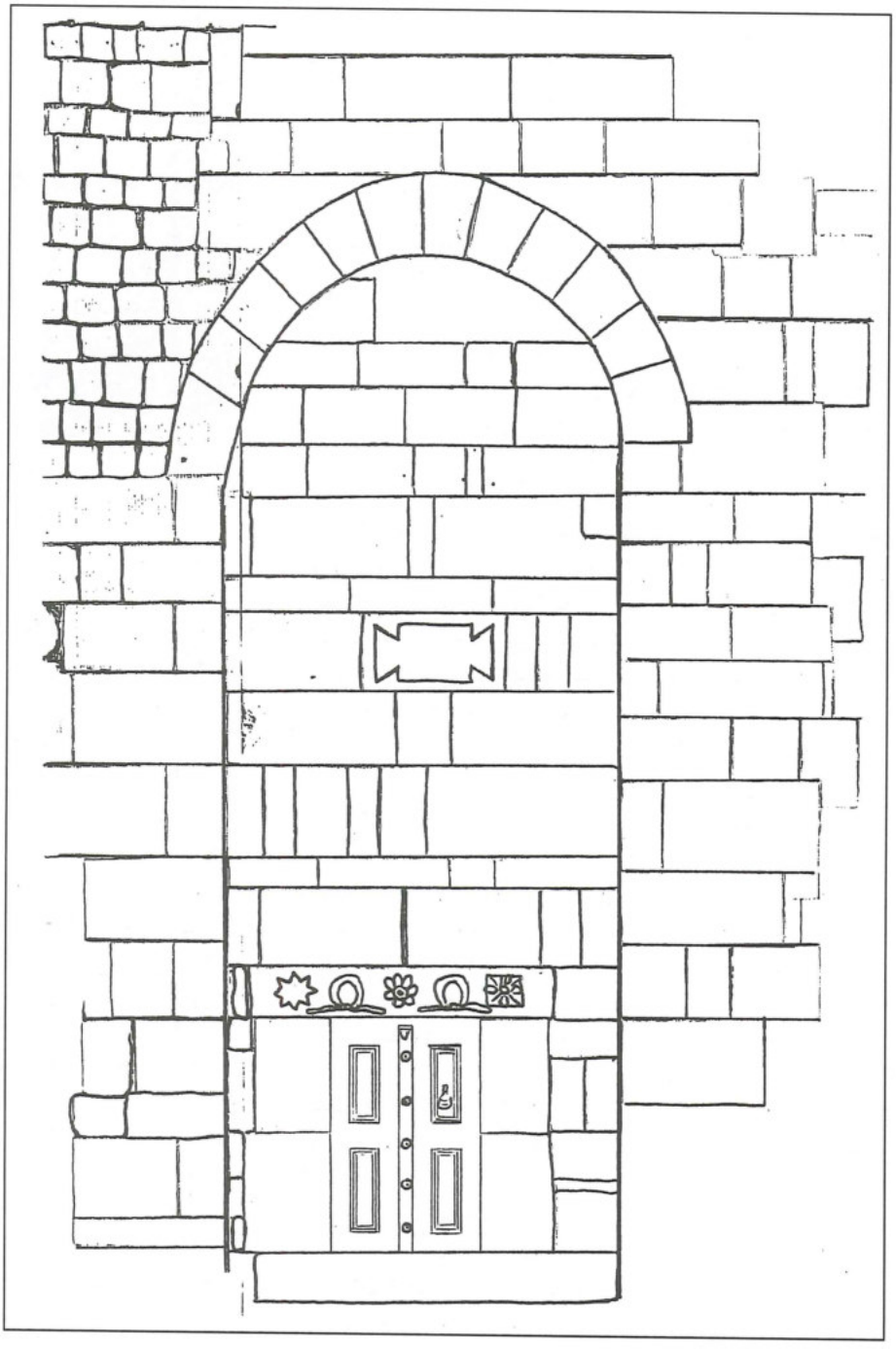
١٦ . المخطط العام للمسرح الروماني ويظهر زخم العمارة في المنطقتين A و C والجدران الإضافية في المنطقة B .



١٥ . مدخل القبر البازلتي أسفل مدخل قبو المستوى الثاني في المربع A2 المنطقة B والذي أنشئ بعد تغير وظيفة المسرح.

فتم العمل على فتح عدد من المداخل الرئيسية للمسرح لتكون ممراً سهلاً وسريعاً لنقل التراب والحجارة التي تنتج من العمل داخل المسرح في المنطقتين C وA، وأزيلت في المربع K2 الكتل الحجرية المتساقطة من جدران البرج الغربي ثم التنقيب في طبقات التربة التي كانت تغلق المدخل والدرج، عثر على مجموعة من المسكوكات البرونزية الصغيرة التالفة وأجزاء من قدر طبخ روماني متأخر تم ترميمه، وكذلك تم فتح مدخل البرج بإزالة الحجارة والأتربة التي تغلق مدخل البرج الغربي فلا سبيل لاخراجها الا من خلال فتح مدخل البرج باتجاه الشمال والعمل على ازالة اجزاء من حجارة الجدار الداعم امام المدخل والواجهة الرومانية الرئيسية للمسرح في المربع K3 ليسهل ايضا نقل الاتربة، ثم جرى العمل على فتح المدخل المجاور للبرج وهو احد بوابات المسرح في الجزء الغربي من الواجهة الشمالية في المربع J2 ولم يتم ازالة أي من حجارة الجدار الداعم لانخفاض مستواه ويمكن اخراج بعض الطمم من خلاله وكذلك فتح المدخل بشكل كامل في المربعين H2 وI2 إذ أن الجزء الأكبر من هذا المدخل يقع في المربع I2 وجزء بسيط منه يقع في المربع H2 وهو مبني من حجارة كلسية كبيرة مشذبة ثبتت باستخدام المونة (مادة الملاط الكلسي) وازيل الجزء الموازي للمدخل من الجدار الداعم أمام واجهة المسرح مع مستوى ارضية عتبات المداخل ليسهل خروج العمال والعربات في عملية نقل الاتربة. أما البوابة المركزية فبقيت مغلقة والتي اشرت اليها سابقا (الشامي ٢٠٠٢)، جزئها العلوي من العتب والقوس متهدم وعثر على حجارتها في الطمم الموجود أمامها في المربع F2 اذ جرى في هذا المربع عمل مجس أمام الواجهة الرئيسية من الداخل فكشف عن اساسات البناء وتبين انه عبارة عن خندق بني في الصخر البكر، جدرانه من الحجر البازلتي بارتفاع يزيد عن ١م متدرج بشكل بسيط (الشامي ٢٠٠٣: ١٠٣). أما المدخل الذي يقع في المربعين D2 وC2 فقد قمنا بفتحه فوجدنا أن الجزء الاكبر منه يقع في المربع D2 وجزء بسيط منه في المربع C2 والذي اغلق ايضا من الداخل ببناء حجري جيري مشذب من الحجارة الكبيرة والمثبتة باستخدام الملاط الكلسي، من ثم بناء الجدار الداعم أمامه والذي فتح أيضاً مع مستوى المدخل لتسهيل نقل الاتربة من الداخل إلى الخارج (**الشكل ٢٣**)، وأثناء ازالة حجارة الجدار الداعم عثر على عتب علوي من الحجر الكلسي الطري المزخرف بأشكال هندسية ونباتية والذي وثق بالتصوير والرسم، كما كشف ايضا عن الجدار الداعم الاضافي امام الواجهة الرئيسية في المربعات C2 وB2 وA2 وتم العمل في المربعين B2 و A2 بشكل اساسي، ففي المربع B2 ازيلت طبقة من الردم الموجودة امام الجدار الداعم بارتفاع من ٣-٤م يتخللها حجارة كلسية متآكلة ساقطة من الواجهة الرئيسية من الجدار الداعم والوصول إلى ارضية ترابية صلبة (**الشكل ٢٤**)، استمر وجودها في المربع B3، عثر فوقها على قطع من المسكوكات البرونزية والرومانية المتأخرة، وفي الزاوية الشرقية الشمالية من المربع B3 عثر على جدار يمتد من الجنوب إلى الشمال غير متقن البناء بطول ظهر منه ٣م وبارتفاع يزيد عن ٢م، بنى من الحجارة الكلسية المشذبة (**الشكل ٢٥**)، وهي من حجارة الواجهة الرئيسية للمسرح والجدار الداعم اعيد استخدامها، وجزء من هذا الجدار يقع ايضا في المربع A3 والذي تم العمل به بمنطقة البرج الشرقي ضمن مربعات A3 وA2 وA1، فالمربع A1 يضم جزء من عمارة البرج الشرقي جرى العمل على تنظيفه من الاتربة والحجارة الساقطة من بقايا الادراج العلوية، المتهدمة بالكامل باستثناء الجزء السفلى من الدرج لا يزال على حاله، أما المربع A2 يضم الجزء الآخر من عمارة البرج والجدار الداعم الاضافي الذي كان يمثل مكاناً لإلقاء الطمم، فجرى العمل على تنظيفها والكشف عن الجدار الداعم الاضافي وظهر جلياً وجه الجدار في المربع A3 عمل به مجس في الجزء الجنوبي من المربع وإزالة ما يزيد عن ٣م من الطمم وبالتالي ظهر جزء كبير من الجدار الداعم الذي تغطيه الاتربة بسبب الانهيار الذي حل بالجدار وتآكل حجارته.

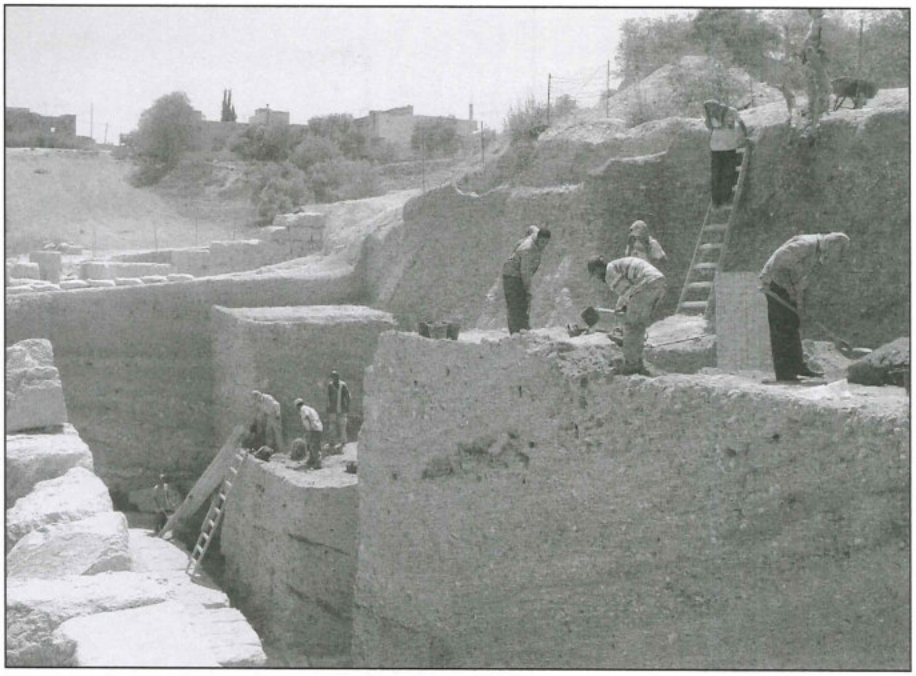
المنطقة D (الشكل ٥): تعتبر المنطقة D خارج نطاق عمارة المسرح باستثناء المربعات D3 وD2 وD1 فكان من المناسب العمل ضمن هذه المربعات وذلك لانها تمثل الزاوية الشمالية الشرقية للمسرح والجدار الداعم الاضافي، ففي المربع D1 جرى العمل على ازالة ما يزيد عن ٤م من الطمم وما يتخللها من حجارة كلسية كبيرة متساقطة من الجدار، وكذلك المربع D2 تم العمل به بنفس المستوى، أما المربع D3 فقد عمل به مجس في الزاوية الجنوبية الغربية والتركيز على ما تبقى من عمارة الجدار الاضافى فحفر بعمق يزيد عن ٤م وبالتالي مشاهدة كامل عمارة المسرح الخارجية في الجهة الشمالية والشرقية أصبح ممكنا (**الشكل ٢٦**) وجزء كبير من الجهة الغربية وبهذا يكون العمل في المناطق D وC وB قد انتهى لحين اكمال العمل في المنطقة A والتي تمثل جسم المسرح بشكل عام، وهي بحاجة لعمل متواصل وتنقيب حذر، خوفا من استخدام الآليات من خلال المداخل المؤدية للمسرح وحرصا على عدم فقدان الكثير من التقسيمات المعمارية التي أضيفت في الفترات اللاحقة التي تلت العصر الروماني المبكر، ومن



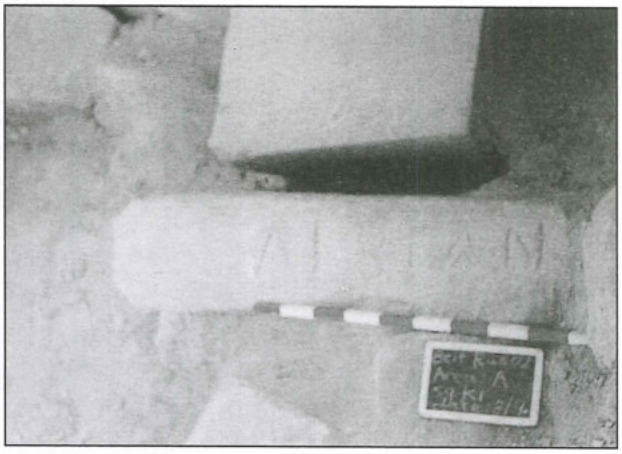
١٤ . رسم للقبو الثاني المغلق.

المداميك العليا المنحنية كدلالة على نمط التسقيف القوسي (البرميلي) (**الشكل ١٨**)، وهذا المربع والمربع K2 كشف فيهما عن بناء مربع الشكل أبعاده ٣,٧٠ × ٣,٧٠م يشبه بناء الأبراج في القلاع وبداخله درج صاعد للأعلى وبجداره الغربي نافذة مربعة الشكل تتسع من الداخل وتضيق من الخارج (الشامي ٢٠٠٣: ٩٨-١٠٣).

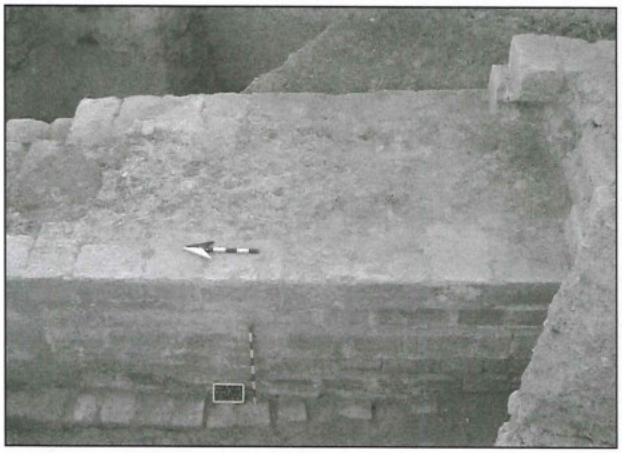
بعد الانتهاء من العمل في مربعات المنطقة C كشف عن الواجهة الرئيسية وهي بطول ٥٧م (**الشكلين ١٩ و٢٠**)، تبين أنها اغلقت باستخدام حجارة كلسية كبيرة الحجم ومشذبة وذلك بإضافة المونة بين المداميك لتقويتها وتثبيتها (**الشكل ٢١**)، ومن ثم بناء جدار ضخم داعم أمام الواجهة بارتفاع من ٢-٥م، بني على عمق اساسات البناء الرئيس في المسرح (**الشكل ٢٢**) وذلك بعمل خندق تأسيسي لبناء هذا الجدار على الصخر البكر. وجرى التنقيب أمام واجهة المسرح على مستوى عتبات المداخل الرئيسية للمسرح ولم ينقب لمستوى اعمق من ذلك للأستفادة من هذه الأرضية لتكون ممراً سهلاً لحركة العمال والاليات خلال العمل ونقل الاتربة، فقد اصبح من الصعب العمل داخل المسرح وازالة طبقات ردم بارتفاع ٣-١٣م من جسم المسرح،



٩ . العمل بأسلوب المنطقة المفتوحة في التنقيب يعطي سهولة أكثر في الحركة والعمل للحد من خطورة المناطق المرتفعة.



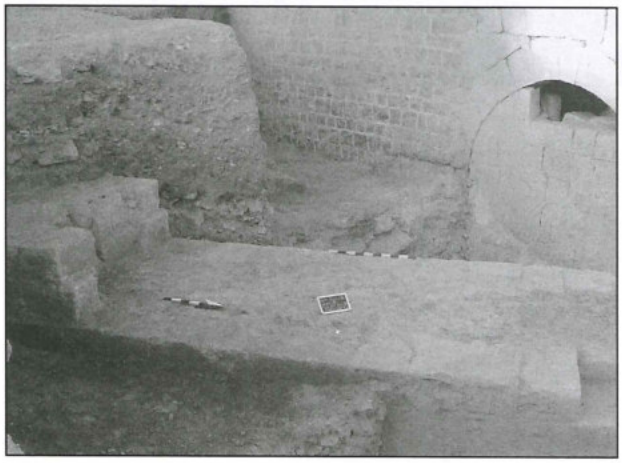
١٠ . كتلة حجرية مشذبة من العتب العلوي عليها نقش لاتيني بالحفر الغائر وبالدهان الأحمر.



١٢. الجدار الإضافي الضخم في المنطقة B المربع A1 وتظهر عليه التغيرات المعمارية والإضافات المتلاحقة.



١١. بقايا القبو الغربي الثاني وإنهيار السقف البرميلي في المربع K2.



١٣ . مدخل القبر البازلتي أسفل مدخل قبو المستوى الثاني في المربع A2 المنطقة B والذي أنشئ بعد تغير وظيفة المسرح.



٨ . المقطع الترابي الذي ظهر بعد فتح المربعات F1, H1, G1, I1 E1, والذي يرتفع من ٥-١٣م.

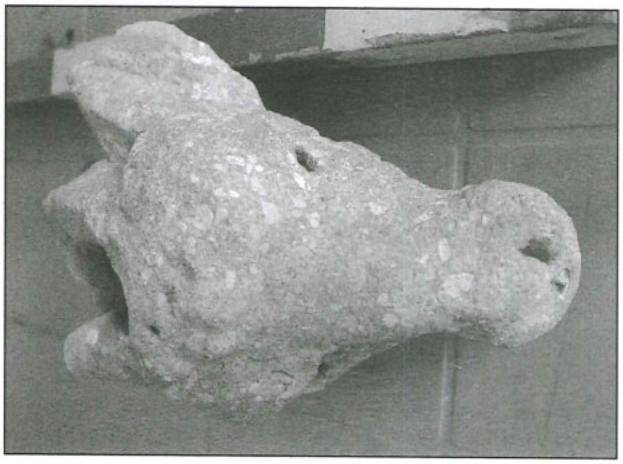
التي استخدمت في البناء هي من الحجر الطباشيري الذي يتعرض للتآكل بشكل أسرع من غيره.

أما الاعتداءات البشرية فقد تمثلت بحفر خنادق واستحكامات للجنود وإنشاء أرضيات إسمنتية حديثة محاطة بجدران تعود إلى ما بعد النصف الثاني من القرن الحالي (الشامي ٢٠٠٣: ٩٧-٩٨)، تركز العمل هنا أمام القبو الأول في المربع A1 في محاولة لتظيفه لإكمال ما بدء به في الفترتين السابقتين من موسم ٢٠٠٢ وانتهى العمل في هذة المرحلة الحالية، ويعد هذا القبو من أكبر الأقبية في الجهة الشرقية من المسرح، أما المربعات E1 وF1 وG1 وH1 بعد انتهاء الحفر فيها كشف عن أساس جدار يمتد في هذه المربعات كافة بعرض ١,٥٠ م (**الشكلين ١٦ و١٧**)، فالمربع F1 كان قد حفر في السابق بشكل جزئي (مجس بعرض٢م وبعمق ٨-١٠م) وتبعا للحفر بنظام المنطقة المفتوحة استكمل الحفر بهذا المربع بالتساوي مع المربعات السابقة G1 وH1 وذلك للحد من خطورة العمل ولتجنب أن يبقى هذا المجس كالمصيدة ولتجنب مخاطر السقوط فيه، وبعد إكمال العمل ظهر أساس مدخل بعرض ١,٧٥ م يؤدي إلى أرضية المسرح وتميز المربع G1 بظهور جدار منحني مشذب ومزخرف بأفاريز بارزة، وكذلك المربعان H1 وI1 ظهر فيهما مدخل بني من حجارة كلسية صلبة مزخرفة بأفاريز بارزة.

أما المربع K1 فتميز بجداره الشرقي تظهر فيه بقايا

وتماسك طبقات التربة وعدم حدوث أي إنهيارات خلال مواسم الشتاء (**الشكل ٩**). أما المربع J1 كشف في زاويته الغربية من الجزء الشمالي والجنوبي على السواء عن بقايا بناء من الحجر الكلسي الصلب المشذب والذي يمثل مدخل واسع يفضي إلى قبو المستوى الأول بعرض ١,٥٠ م ولكن العمل لم يكتمل بعد. أما المربع K1 والذي كشف فيه عن قبو المستوى الاول الغربي بعد ازالة طبقات ردم بإرتفاع يزيد عن ٥م، ظهرت فيه حجارة القبو منهارة في مكانها وهي حجارة كلسية مشذبة بأحجام مختلفة، تم توثيق عملية انهيار القبو في مكانه بالرسم والتصوير، عثر في ركام انهيار القبو في الجزء الجنوبي الغربي على حجرين من الكلس الصلب، ربما يمثلان جزء من العتب العلوي فوق المدخل، وعليه نقش لاتيني من عدة أحرف نقشت بالحفر الغائر اضيف اليه اللون الاحمر في رسم الحرف الغائر (**الشكل ١٠**). أما المربع L1 فقد كان العمل بشكل جزئي في الجهة الشرقية داخل حدود جدار المسرح الغربي للكشف عنه، عثر فيه على مدخل من الجهة الغربية يؤدي إلى المسرح مقابل مدخل القبو الأول الغربي بعرض يزيد عن ٢م. جرى العمل أيضا في المربع K2 الذي كشف فيه عن بقايا قبو المستوى الثاني الغربي وتظهر جدران القبو الجانبية وهي من الحجارة الكلسية الصلبة المشذبة، عرض القبو ٣م بطول يزيد عن ٦م (**الشكل ١١**)، فالقبو متهدم بإستثناء الجزء الشرقي منه والذي لم يكشف عنه بعد لوقوعه ضمن المربع J2 الذي شرع التنقيب به ولم يكتمل بعد. أما المربعين K4 وK3 كان العمل بهما بشكل جزئي فبعد ازالة الطمم من ٢-٣م كشف فيهما عن الجدار الغربي للمسرح. والمربع K3 كشف فيه عن ارضية حجرية عشوائية تغطي مساحة المربع ٥ × ٥م.

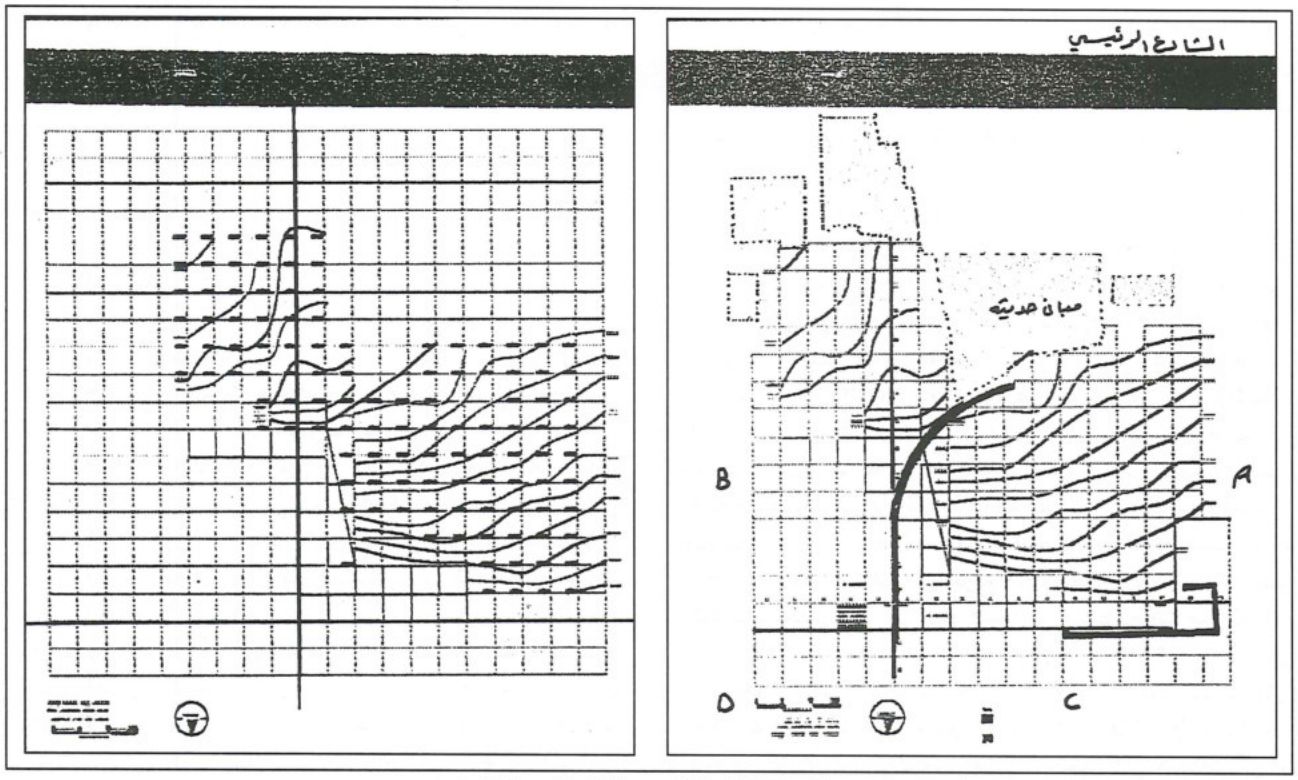
المنطقة B (الشكل ٥): في هذه المرحلة من هذا الموسم كشف عن المنطقة الواقعة أمام الأقبية الشرقية، وعن العمارة التي أضيفت في فترة لاحقة أمام العمارة الرومانية المتمثلة بأقبية ومداخل المسرح الشرقية، وهذه المربعات هي A1 و A5، في المربع A1 الواقع أمام مدخل القبو الأول في الجهة الشرقية



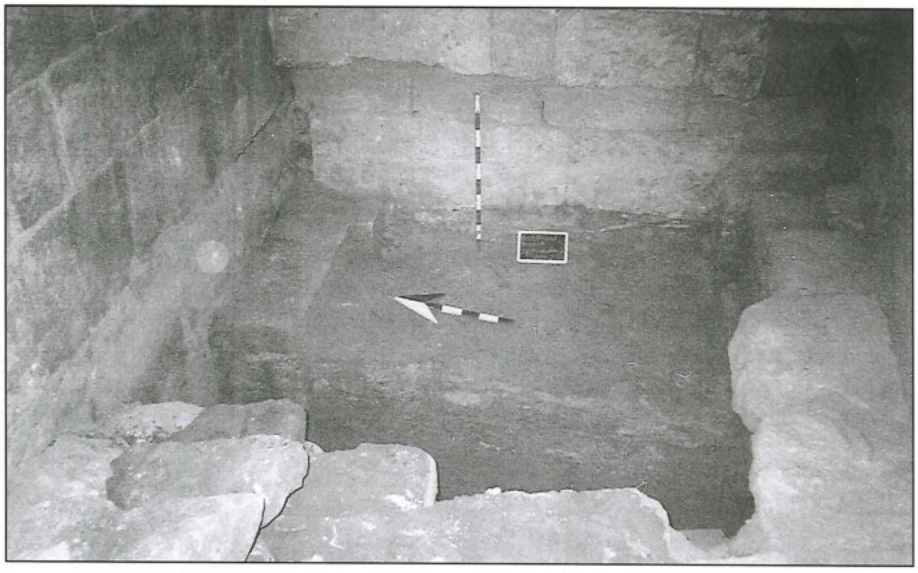
٧ . رأس غزال من الحجر الجيري الصلب يبدو أنه جزء من إفريز زخرفي مكسور كان يزين واجهة المسرح.

والذي لا يزال مغلقا أنشئ جدار ضخم يمر من أمام الأقبية من الجهة الشرقية ويتجه من الجنوب الشرقي إلى الشمال الغربي، ويبدو أنه بني في فترات متعددة يظهر ذلك من خلال الإضافات المعمارية والإختلاف في طريقة بناء الحجارة الجيرية، يبلغ عرض الجدار ٢,٧٥م، وإرتفاعه ٣م (الشامي ٢٠٠٢: ٦٧) (**الشكلين ١٢ و١٣**). لقد تركز العمل في المربع A2 والذي يقع أمام مدخل المسرح (القبو الثاني) والذي أغلق من الخارج بكتل حجرية كلسية ضخمة مشذبة يتوسطه حجر كلسي متوسط الحجم يضم نقش كتابي شبه متأكل باللغة اللاتينية، يعتقد أنه في غير مكانه الأصلي إذ إعيد استعماله في هذا الجدار في فترة متأخرة عن فترة بناء المسرح (**الشكل ١٤**)، وهي المرحلة التي طرأ فيها تغيير كبير على عمارة المسرح تمثلت بإغلاق كافة مداخل المسرح في كل الإتجاهات. واثناء إزالة طبقات الردم والاتربة أمام القبو كشف عن الجدار الإضافي في الزاوية الشمالية الشرقية والذي امتد أمام الأقبية السابق ذكرها في المربع A1، وخلال العمل وازالة تلك الطبقات لعمق يزيد عن ٤م، كشف عن مدخل مغلق من الحجر البازلتي المشذب والمزخرف بثلاث وريدات نافرة وأكليل الغار تعلو العتب العلوي وكذلك زخرفة تشمل مساحة الباب تمثل أطر وأفاريز زخرفية نافرة (**الشكل ١٥**)، فكان الإنطباع أننا أمام مدخل قبر لم يتعرض للعبث كالقبور التي كشفت في أم قيس، واثناء العمل عثر على أرضية من الصخر الطبيعي أمام المدخل، وإلى الجنوب من المدخل ظهر المقطع الصخري الطبيعي وفيه فتح مدخل يؤدي لكهف صغير يبدو أنه استخدم للدفن وقد تعرض للعبث من اجل البحث عن بعض المكتشفات إذ عثر أمامه على ركام من التراب وبعض الكتل الحجرية التي كانت تغلق مدخل الكهف، ويظهر التدمير الذي حدث من خلال وجود بقايا أجزاء من جرة كبيرة وسراج صغير من مخلفات الفترة الرومانية. وجرت محاولة لفتح مدخل الحجر البازلتي ولكن دون جدوى، وخوفا من كسره تم العمل على إزالة أحد حجارة واجهة القبو المغلق في الطرف الشمالي من المدخل لمحاولة الدخول إلى القبر والمفاجأة كانت بعد الإنتهاء من إزالة الحجر وتكسيره هي ظهور جدار آخر من الداخل يدعم الجدار الرئيسي الخارجي فتوقف العمل هنا وانتقل إلى الجهة الأخرى داخل القبو في المنطقة A، (المربع A2)، أما العمل ضمن المربعات A3 وA5 فكان بشكل جزئي وذلك من أجل الكشف عن الجدار الشرقي للأقبية، تميز المربع A5 بالكشف عن جدار ينطلق من جدار المسرح الشرقي القوسي مع بداية إنحناءه في الزاوية الجنوبية الشرقية ويمتد هذا الجدار من الغرب إلى الشرق (**الشكل ١٦**) منطلقا من المربع A5 في المنطقة A .

المنطقة C (الشكل ٥): لقد تعرضت المنطقة C لاعتداءات متعددة منها بشرية وأخرى طبيعية تمثلت في تراكم طبقات من الأتربة والترسبات الناجمة عن مياه الأمطار كون جسم المسرح يقع في سفح منحدر ولانتشار أشجار الزيتون والرمان التي أثرت على المباني الأثرية خاصة إذا علمنا أن حجارة بيت رأس

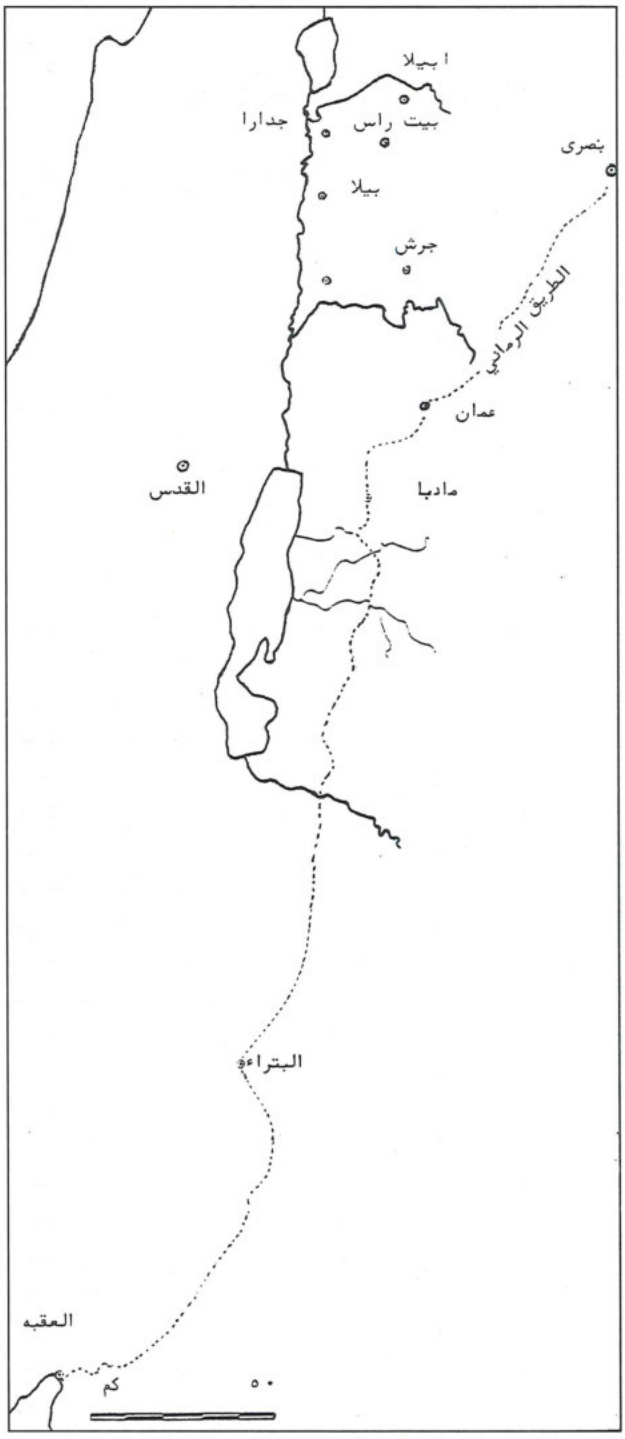


٥ . المخطط الطبوغرافي والتقسيم الشبكي لموقع المسرح بالنسبة للشارع الرئيسي والمباني الحديثة المجاورة.

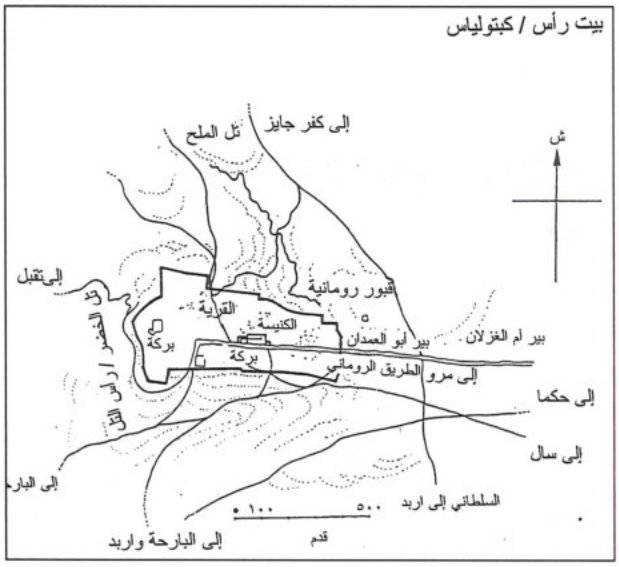


٦ . البناء المستطيل أسفل الأرضية المبلطة في فترة متأخرة المنطقة A المربع A2.

D1 فقد ازيلت منه طبقات من الردم بإرتفاع ٣م ولم يتم الانتهاء منه. أما المربعين E1 و F1 فكشف في الجزء الشمالي منهما عن امتداد أرضية المسرح المبنية من الحجر الجيري بأحجام كبيرة والتي كانت مستمرة في المربعين E1 و F1 من المنطقة C فتم العمل في هذا الجزء من المنطقة A في المربعين E1 و F1 فكشف عن مقطع من الصخر الطبيعي الذي جهز لبناء منصة المسرح عليه وقد بني فوقه مدماكين من الحجر، كما تم تنظيف المربعين E1 و F1 والوقوف على الارضية الطبيعية المستوية في الصخر الجيري، فكشف في المربع E1 في الظاهرة ١٣ على رأسين من الحجر الجيري لحيوانين ربما يمثلان رأس ماعز أو غزال (**الشكل ٧**)، وبهذا يكون ارتفاع المقطع الترابي الجنوبي حتى الارضية حوالي ١٣م (**الشكل ٨**). واستمر العمل ضمن المربعات G1 و H1 و I1 و J1 بإزالة عدد من طبقات الردم ما بين ٣-٥م وذلك للحد من خطورة المقطع الترابي المرتفع للمربعين E1 و F1 حيث جرى العمل في المربعات G1 و H1 و I1 و J1 بنظام المصاطب الأثرية المتدرجة لسهولة السير من المربع J1 صعوداً إلى I1 و H1 و G1 مما ساعد على الحد من خطورة الارتفاع للمقاطع الترابية



١. موقع بيت رأس في شمال المملكة بالنسبة للطريق الروماني وما يجاورها من مدن الديكابولس.



٢. مخطط عام لأثار بيت رأس/ رأس التل والسور الذي يحيط بها حسب تصور شوماخر.



٣أ. منظر عام لبلدة بيت رأس الحديثة التي أنشئت على أنقاض مدينة كابتولياس الرومانية.



٤. يظهر جزء من المسرح الدال على مدينة كابتولياس والمباني الحديثة تحيط بالمسرح.

على ارضية ترابية. كما جرى العمل ضمن مربعات B6 فإزيلت بعض أشجار الزيتون لتنظيف طبقات ردم بارتفاع ٤م، وذلك من اجل اظهار جدار المسرح الخلفي وتوسيع المنطقة الجنوبية لربط المسرح بمخطط واحد، وأكمل العمل ضمن المربعين C6 وC7 في الجزء الشمالي الغربي منه حيث كشف عن السطح العلوي للقبو الجنوبي الشرقي وعثر فوقه على بقايا قواعد أعمدة دائرية الشكل متناثرة على سطحه، وتوسع العمل ليشمل أمام القبو من الجهة الشمالية في المربع C5 بتنظيف طبقة ردم بإرتفاع ٥م بعد ازالة اشجار الزيتون التي كانت تغطيها، وكذلك جرى العمل ضمن المربع C4 بنفس الاسلوب، أما المربع

مشروع التنقيبات الأثرية في بيت رأس موسم ٢٠٠٢*
تقرير أولي

أحمد جمعة الشامي

تقع مدينة بيت رأس شمال محافظة اربد بحوالي ٥كم وترتفع ٦٠٠م عن سطح البحر (**الشكل ١**)، وتعتبر واحدة من أهم المدن العشر (مدن الديكابولس) حيث يعتقد أنها تأسست سنة ٩٨/٩٧م، وربما تعود لفترة حكم تراجان، سميت بالمدينة الجديدة "جوبتير كابيتوليانس" Gupiter Capitolinus نسبة للمعبد الرئيسي في المدينة والذي ظهر على المسكوكات (Piccirillo 1978: 96-107) .

زار المدينة العديد من الرحالة والرواد الأوائل أمثال سيتزن وبكنجهام وميرل ومتمان وشيري لينزن ومكويتي وشومخر الذي قام بإعداد المخططات لبعض المناطق المهمة في المدينة حسب اعتقاده بين عامي ١٨٧٨-١٨٧٩م، فأشار إلى منطقة رأس التل، وأظهر أن المدينة كانت محاطة بسور (**الشكل ٢**) (Schumacher 1890). كما أدرجت مدينة بيت رأس ضمن المسح الأثرى الذي أجراه نلسون جلوك عام ١٩٥١م لمواقع شرقي الأردن.

وبالرغم من الزحف العمراني الحديث منذ بداية القرن الماضي والذي أدى إلى نشوء مدينة حديثة على أنقاض المدينة الأثرية ومخلفاتها الحضارية (**الشكلين ٣ و٤**) فأننا لا زلنا نشاهد بعض من بقايا المدينة مثل الأقبية التسعة والكنائس البيزنطية والأرضيات الفسيفسائية المنتشرة في رأس التل المعروف بتل الخضر، وفي عطروز والبركة المشيدة من الحجر الجيري والتي تبلغ مساحتها ٦٤ x ٤٤م، وهي مدعمة بعقود برميلية وبجدران عريضة تزيد عن ٢,٥م، أما السرداب/النفق الواقع على السفح الغربي لتل الخضر ويصل إلى البركة الرئيسية فجدرانه من الداخل مغطاة بعدد من طبقات القصارة، ويضم في أحد جوانبه قنوات لنقل الماء إلى البركة (Schumacher 1889: 162-163) كذلك المدافن والكهوف والتوابيت الحجرية البازلتية والجيرية المنتشرة حول المدينة في الجهة الشمالية والجنوبية ومعاصر العنب والزيتون (الشامي ٢٠٠٢: ٣)، ومن ثم مقام الخضر الواقع على المنحدر االغربي لتل الخضر/ رأس التل والذي يمثل بناء مربع الشكل صغير الحجم لاتزال أساساته واضحة المعالم (Schumacher 1889: 154-155).

أعمال التنقيب

المسرح الروماني: يقع المسرح في الجهة الشمالية من المدينة ويبعد ٢٥٠م عن تل الخضر/ رأس التل، لم يتعرض المسرح للامتداد العمراني إلا من الجهة الجنوبية حيث بدأت أعمال التنقيب الأثري فيه منذ عام ١٩٩٩م، ولا يزال العمل مستمرا حتى الآن.

المنطقة A (الشكل ٥): تعرضت المنطقة A لإعتداءات بشرية بشكل واسع فبالإضافة لغرس أشجار الزيتون في جسم المسرح (منطقة المدرجات) أنشئت جدران حديثة فوق أرضية ترابية تحيط بالمنازل المجاورة للمسرح في الجهة الجنوبية. بدأ العمل في هذه المنطقة ضمن المربع C6 وجزء من المربع D6 وتركز في المربعات من El-K1 لمحاولة الكشف عن مرافق المسرح الداخلية المتمثلة بالحجرات الداخلية ومنصة وأرضية المسرح للعمل بها في هذه المرحلة.

لقد توسع العمل ليشمل عدداً كبيراً جداً من المربعات التي تم فتحها وهي C1 وB1 وA1 وذلك بإزالة طبقات ردم بإرتفاع ٢م، والعمل في المربع A2 داخل القبو لأزالة الأرضية الحديثة الذى جرى الحديث عنها سابقا (الشامي ٢٠٠٢: ٦٥)، وأثناء إزالة هذه الأرضية في الجزء الشرقي من القبو أسفل الجدار المتأخر الذي يغلق مدخل القبو عثر على بناء متقن مستطيل الشكل بعرض جدارين بينهما فراغ - أي حيز مفرغ - ازيلت بعض الحجارة من أجل الدخول إليه فشكل البناء المستطيل يوحي بأنه قبر (**الشكل ٦**)، وبعد إنهاء العمل تبين أنه مفرغ من الداخل وهذه الجدران أنشئت لغلق ودعم مدخل القبو الثاني من الجهة الشرقية.

وبمتابعة العمل لمعرفة عمق الارضية الحقيقية في المربع A1 تبين لنا أن الجدار الذي اغلق المدخل (القبو) قد انشىء

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* سمي المشروع بإسم مشروع التنقيبات الآثرية بيت رأس ـ إربد موسم ٢٠٠٢، Bayt Ras-Irbid Archaeological Project (B.R.I.A.P) عن الفترة الواقعة من ٨/١ حتى قبيل نهاية عام ٢٠٠٢، علماً أن العمل ما زال مستمرا بفريق مكون من ١٧٠ شخص ما بين عامل وعامل فني وفريق توثيق وتسجيل المعثورات. قام بأعمال الرسم المهندس محمد سيدي وامجد صوالحة وفراس الروسان، ورسام قطع صغيرة عبد الباسط الحموري، والتصوير أحمد عبد السلام الحموري، والمنقبون تيسير علاونة، محمد العمّرات، زيد الخطيب، محمود أبو خرمة، محمد الصفدي، محمد الناصر، تيسير كنعان، وائل عيسى موسى، وأيسر ردايدة. أعمال الكمبيوتر حسين عبد السلام الحموري. وشكر خاص للسيد عصام كريم الحموري ومحمد كريم الحموري ويزيد عليان على المساعدة الكبيرة التي قدموها لإنجاح المشروع، وشكر موفور لأهالي بيت رأس عامة وأخص بالذكر الشاعر محمود أبو خضرة (شاعر البرّين).

Kastron Mafa'a first compaign, August. *ADAJ* 30.

Chang Ho, C. and Atiat, T.

1996 Archaeological Survey of the Dhiban plateau 1996 Preliminary Report. *ADAJ* 40.

Atiat, T.

forthcoming Amphora Types in Jordan from Byzantine to the late Islamic period. *BAR.*

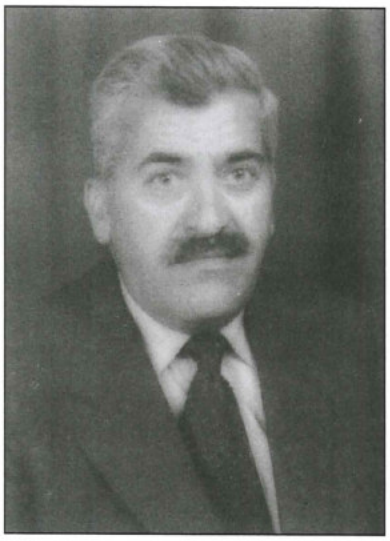
forthcoming An Egyptianizing Cult at the Citadel-Hill, "Jabal al-Qala'a", Jordan. *Levant.*

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باسم المحاميد
دائرة الآثار العامة

في الذاكرة
تيسير عطيات



من مفارقات الحياة أن نلتقي لنفترق، ومن مفارقات الحياة أن تجمعنا الدقائق والساعات والأيام حتى نحسب أن لا فراق، ويجمعنا الأمل والطموح والأحلام والفرح حتى الألم كان يجمعنا. ثم تفرقنا اللحظات و الأيام حتى يكون اللقاء لحظة من الزمان نسرقها، نذكر الماضي ونضحك وأحياناً نذكره ونبكي، أما أن نفترق ولا لقاء يا تيسير..... يا ذاك الجبين المتعرق، يا من ارتسمت الشمس على ملامحك، هيا ندعو الزمان ليقف عندك يا تل حسبان، يا قلعة عمان ويا ام الرصاص، قولوا أننا ما زلنا نذكر ذاك الصوت الهادر، وما زلنا نذكر تلك الأكف تربط خيوط المربع، هنا وقفنا وهنا مشينا وهنا تركتنا يا تيسير وكذلك نحن سنترك المكان وتحمل الخيوط أكفاً لا نعرفها ولكنهم سيعرفون .....

كان أول لقاء جمعني بتيسير في قلعة عمان عام ١٩٩٥، حينها كان أول عهد لي بالعمل الأثري، أذكر أنني كنت أقف حائراً بين جموع العمال أنظر الى وجوههم تارة والى المربعات تارةً أخرى، انتبه إلى حيرتي وتقدم اليّ سائلا عن الحال قبل الاسم، وبعدها شدّني من يدي وأسهب شارحاً عن اسلوب العمل حتى فاجأني وقال هنا تبدأ ... وتوالت الأيام وقابلته في ساحة متحف آثار مادبا وكان في زيارة مع بعض طلاب قسم الآثار من جامعة مؤتة، واجهني بإبتسامه عريضة وقال لي هنا كنت وهنا مشيت ما زلت أذكر المكان بكل تفاصيله وأسهب، وكان ذلك آخر لقاء لي بتيسير.

تيسير محمد خلف عطيات ولد في عمان عام ١٩٥٤ وتوفي عام ٢٠٠٤ بعد مسيرة طويلة من الكفاح والعطاء.

حصل على شهادة الثانوية العامة من مدرسة السلط الثانوية عام ١٩٧١ وتخرج من جامعة بغداد في مجال الآثار عام ١٩٧٧ بعدها عمل في دائرة الآثار الأردنية، وكان له العديد من الحفريات الميدانية، كما عمل مفتشاً للآثار في العديد من محافظات المملكة.

مادبا والتي كانت من أهم المحطات في تاريخه العملي والعلمي، عندما عمل مفتشاً للآثار فيها شغف في دراسة الآثار البيزنطية وسحرته ألوان مكعباتها الفسيفسائية ليكمل دراسته العليا في الآثار البيزنطية، حيث حصل على درجة الماجستير من جامعة كليرمونت الفرنسية عام ١٩٩٠ في موضوع المذهب العمودي في أم الرصاص، ثم حصل على درجة الدكتوراه من جامعة السوربون في موضوع تقنية صناعة الفسيفساء في مادبا بين القرنين الخامس والثامن الميلاديين عام ١٩٩٤ وبتقدير ممتاز.

عاد بعدها ليعمل في دائرة الآثار الاردنية كباحث علمي عام ١٩٩٤ ثم مديرا لمشروع تطوير جبل القلعة عام ١٩٩٦ وبعدها مديرا لمتحف الآثار الاردني عام ١٩٩٩.

في عام ١٩٩٩ عين كعضو هيئة تدريس في جامعة مؤته حتى توفاه الله.

وقد شارك الدكتور تيسير عطيات في العديد من المؤتمرات العلمية:

- مؤتمر دراسات في تاريخ وآثار الأردن الذي عقد في كوبنهاجن عام ١٩٩٨.
- مؤتمر دراسات في آثار الأنباط الذي عقد في البتراء عام ١٩٩٩.
- المؤتمر الأول حول الفخار في حوض البحر المتوسط الذي عقد في برشلونه / إسبانيا عام ٢٠٠٢.
- مؤتمر العلوم والتكنولوجيا في الآثار والمحافظة عليها في الجامعة الهاشمية عام ٢٠٠٢.

له العديد من الابحاث المنشورة باللغتين العربية والانجليزية اهمها:

١٩٨٦ الحفريات الاثريه في أم الرصاص (ميفعة) **حولية دائرة الآثار العامة ٣٠ .**

Piccrillo, M. and Atiat, T.

1986 The complex of Saint Stephen at Umm ar-Rasas

في الذاكرة
حمد خليف القطامين



من مواليد مدينة الطفيلة عام ١٩٥٨، حصل على الثانوية العامة منها عام ١٩٧٧ والبكالوريوس في الآثار من الجامعة الأردنية عام ١٩٨١ ودرجة الماجستير في الآثار من جامعة أوهايو/ امريكا عام ١٩٨٧، ثم حصل على درجة الدكتوراه في الآثار الكلاسيكية من جامعة كولومبيا/ امريكا عام ١٩٩٢، عين محاضراً متفرغاً في قسم الآثار والسياحة في جامعة مؤته عام ١٩٩٠ وأستاذاً مساعداً في القسم نفسه عام ١٩٩٢ ومديراً لدائرة الدراسات/ جامعة مؤته عام ١٩٩٧ ورئيساً لقسم الآثار والسياحة في جامعة مؤته. للمرحوم حمد القطامين العديد من الأبحاث المنشورة في مجلات علمية، كما شارك في العديد من المؤتمرات والندوات محلياً ودولياً منها:

١ . محاضرة في جامعة كولومبيا الأمريكية حول التأثير الإسلامي في الحضارة العالمية ١٩٩٣م.
٢ . المؤتمر الدولي السادس لدراسة تاريخ وآثار الأردن، جامعة تورينو/ ايطاليا ١٩٩٥م/ قدم فيه ورقة عن إكتشافه لمسلة ملكية بابلية في سلع ـ الطفيلة.
٣ . ندوة مشروع تنمية السياحة المستديمة في الأردن ١٩٩٦م.
٤ . ندوة في جمعية اصدقاء الآثار حول اكتشافات جامعة مؤتة في موقع السلع الأثري ـ عمان ١٩٩٦/٣/٣ .
٥ . مؤتمر المناطق السياحية والقرى التقليدية والتطوير السياحي/ الأردن ١٩٩٦/١٢/٣٠ ـ ١٩٩٧/١/١٨م.
٦ . مؤتمر مئة عام على اكتشاف خارطة مأدبا الفسيفسائية، عمان ١٩٩٧م .
٧ . مؤتمر ذكرى تحرير القدس/ بغداد ١٩٩٧م، قدم فيه ورقة بعنوان " الوجود البابلي في الأردن وفلسطين" .
٨ . المؤتمر الدولي السابع لدراسة تاريخ وآثار الأردن، جامعة كوبنهاجن/ الدينمارك ١٩٩٨م قدم ورقة عن الآلهة الأدومية والنبطية في ضوء مكتشفات السلع الأثرية.
٩. المشاركة في ندوة حول مستقبل السياحة في الأردن ١٩٩٨م.
١٠. مؤتمر المواقع الإسلامية في غور الأردن ١٩٩٩م، قدم ورقة عن الآثار المملوكية في موقع الحارث بن عمير الازدي.
١١. رئيس اللجنة التحضيرية لمؤتمر الأنباط الذي عقد في البتراء، قدم ورقة عن نظام الري عند العرب الأنباط في السلع ١٩٩٩م.
١٢. ورشة عمل عن استخدام تكنولوجيا المعلومات في إدارة وإدامة الفعاليات المتعلقة في الثروات الطبيعية، ١٩٩٩م.
١٣. ندوة حول السياحة في الأردن (المحددات والرؤى)/ جامعة مؤتة ٢٠٠٠م، قدم ورقة بعنوان "أثر السياحة على الإقتصاد الأردني".
١٤. المؤتمر الدولي الثامن لدراسة تاريخ وآثار الأردن في جامعة سيدني/ استراليا ٢٠٠١م، قدم ورقة بحثية بعنوان "The Rock-Cut Tombs in Sela/Jordan" .
١٥. سلسلة من الندوات واللقاءات الصحفية والإذاعية والتلفزيونية حول الآثار والسياحة.

هيئة التحرير

الفهرس

في ذكرى حمد القطامين

هيئة التحرير ـــــــ

٢٠٠١ فترات التاريخ العربي، نظرة شاملة. ص ٤٣-٥٩ في أبحاث ودراسات في التاريخ العربي، مهداة إلى ذكرى مصطفى الحياري ١٩٣٦-١٩٩٨. تحرير صالح الحمارنه. عمان: الجامعة الأردنية.

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

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

٣- في حالة الكتب:

عباس، إحسان

١٩٩٠ تاريخ بلاد الشام من ما قبل الإسلام حتى بداية العصر الأموي، ٦٠٠-٦٦١. عمان: لجنة تاريخ بلاد الشام.

Peacock, D.P.S.

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

- المستلات: يتسلم الباحثون ٢٥ مستلة (نسخة) عن كل بحث ينشر لهم، وبالإمكان طلب المزيد من النسخ بسعر التكلفة.

- الملكية الفكرية: من حق الباحثين.

تعليمات نشر البحوث في حولية دائرة الآثار العامة

تعني **حولية دائرة الآثار العامة** بالبحوث المختصة بالتراث الحضاري للأردن والمناطق المجاورة، بما في ذلك تقارير التنقيبات الأثرية ونتائجها.

ترسل البحوث في موعد أقصاه ٣١ أيار (مايو) من كل عام للنشر في مجلد العام نفسه إلى العنوان التالي: حولية دائرة الآثار العامة، ص.ب ٨٨، عمان ١١١١٨ - الأردن (هاتف ٤٦٤٤٣٣٦).

ويمكن الاستفسار عن طريق الفاكس رقم ٤٦٥٨٤٨-٦- (٩٦٢) أو البريد الإلكتروني
Publication.doa@nic.net.jo

- **لغة البحث:** العربية أو الإنجليزية.
- **مسودات البحوث:** يجب ألا تتجاوز مسودة البحث ١٥,٠٠٠ كلمة (٣٠ صفحة تقريباً) ولا يشمل هذا قائمة المراجع، والمواد التوضيحية (الأشكال) . ويرجى تضمين اسم الباحث (أو الباحثين) وعنوانه في نهاية المسودة، ويكون ترتيبها كالآتي:
  ١- عنوان البحث واسم الباحث (الباحثين).
  ٢- النص الكامل للبحث.
  ٣- عنوان الباحث (الباحثين).
  ٤- قائمة المراجع.
  ٥- الهوامش إن وجدت.
  ٦- قائمة شروحات الأشكال.
- **تسليم النصوص:** يُسلم النص على قرص حاسوب، إضافة إلى نسخة مطبوعة تباعد الأسطر فيها مزدوجاً، والرجاء إضافة نسخة محفوظة على شكل Rich Text Format على قرص الحاسوب. كما يجب أن تكون المسودة بشكلها النهائي دون إجراء تغييرات كبيرة لاحقاً.
- **الصور والرسومات والمخططات:** يجب أن ترفق مع النسخة الأصلية عند التقديم. ويجب الإشارة إلى جميع المواد التوضيحية سواء كانت صوراً أم رسومات أم مخططات باستخدام مصطلح (الشكل) في متن النص، وترقيمها حسب تسلسل ورودها في النص (الشكل ١، الشكل ٢، ... الخ.). ويجب ألاّ يزيد حجم الشكل عن ١٧×٢٢سم. وبالإمكان تقديم الأشكال إلكترونياً jpg (ولا تقبل الأشكال المحمولة على Word)، بحيث تكون حجومها ٢٥٠ pixels/in للصور الفوتوغرافية و ٦٠٠ pixels/in للرسومات والمخططات.
- **الهوامش:** يفضل الابتعاد عن الهوامش قدر الإمكان. وتوضع مصادر البيبلوغرافيا بين قوسين ضمن المتن، مثلاً (الفلاحات ٢٠٠١: ٦٥-٦٧) أو (Brown 1989: 32-35) للمراجع الأجنبية.
- **قائمة المراجع:** يجب أن تكون ضمن جدول في نهاية البحث وحسب التسلسل الأبجدي. واتباع النموذج الآتي :

١- في حالة المقالات المنشورة في دوريات:

النوافلة، سامي
٢٠٠٠ تقرير عن حفرية الجي (جايا) في وادي موسى / ١٩٩٩. حولية دائرة الآثار العامة ٤٤: ١٧-٢٤.

Zayadine, F. and Farés - Drappeau, S.
1998 Two North -Arabian inscriptions from the Temple of Lat at Wadi Iram. ADAJ 42: 255-258.

٢- في حالة المقالات المنشورة في مجلدات:

الدوري، عبدالعزيز

رئيس التحرير
د. فواز الخريشه

هيئة التحرير
د. رافع حراحشه
هنادي الطاهر
سامية الخوري

سكرتير التحرير
قمر فاخوري

قام بمراجعة النصوص الانجليزية
سمانثا دنيس

الاشتراك السنوي:
١٥ دينار أردني (داخل المملكة الأردنية الهاشمية)
٥٠ دولار أمريكي (خارج المملكة شاملاً البريد)

الآراء المطروحة في المقالات لا تمثل رأي دائرة الآثار العامة بالضرورة

تقبل المقالات حتى ٣١ أيار من كل عام حسب التعليمات الواردة في هذا المجلد وتُرسل باسم سكرتير التحرير على العنوان التالي:

حولية دائرة الآثار العامة
ص.ب: ٨٨
عمان ١١١١٨ - الأردن
فاكس: ٤٦١٥٨٤٨-٦-٩٦٢+



المملكة الأردنية الهاشمية

حولية دائرة الآثار العامة

المجلد (٤٨)

في ذكرى

حمد القطامين و تيسير عطيات

عمّان

٢٠٠٤