

UMM QAYS-GADARA: A PRELIMINARY REPORT 1993 -1995

by
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Introduction

Excavation in Umm Qays has been carried out by the German Protestant Institute for Archaeology (Amman) since 1976, later also joined by the German Archaeological Institute (Berlin) and for shorter time periods by other institutions (Bol *et al.* 1990; Wagner-Lux *et al.* 1980, 1982).

The project of the last four years of the German Protestant Institute for Archaeology (DEIAHL) had two aims: to clarify the water supply and water distribution system of one of the major Decapolis cities and the inquiry into the domestic quarters of a Hellenistic-Roman city. The latter was also carried out in the hope of defining the internal pottery stratigraphy more precisely than the earlier excavations had been able to do.¹ Excavation work was done in areas 44 (subareas 1,2,3,4,5), 50 (subarea 1), and 51 for the domestic quarters and in area 39 (subareas 1-8), 41 (subareas 1-13), 50 (subareas 2 and 3), 52 and 46 (Fig.1) for the water-system. The first results were published in an earlier report (Kerner and Hoffmann 1993; Kerner 1992).

THE WATER-SYSTEM

The water-system in Gadara consists of two independent tunnels (Fig.2) which brought water to the city from a spring 11 km away. The older tunnel (A) was finished and in use for several centuries until the sixth century AD, while the younger tunnel

(B) never got finished and was most probably abandoned in the third century AD.²

Large water-systems are well known from the classical period. Not only Rome and other mainland cities had elaborate systems, but the Roman provinces also had impressive examples like Abila, Capitolias, Caesarea and the Nabataean cities like Ḥumayma (Mare 1995; Olami and Peleg 1977; Oleson 1995).

The Overland Tunnel

The spring is 12 km away, but two tunnels of roughly 23 km length each followed the contour lines along the hillsides. The tunnels can be traced from 'Ayn Turāb, which was believed to be the main spring, along the Wādī 'Ayn Turāb, the Wādī Ibdar and then on the south side of the modern road (Kerner 1997).

Today 'Ayn Turāb has a small output of water, while the channel in Gadara would have held an amount (as a maximum flow) to provide water for around 15,000 people. In order to supply a sufficient amount of water, the water-system collects on the way between 'Ayn Turāb and Umm Qays water from several smaller springs and also surface water.

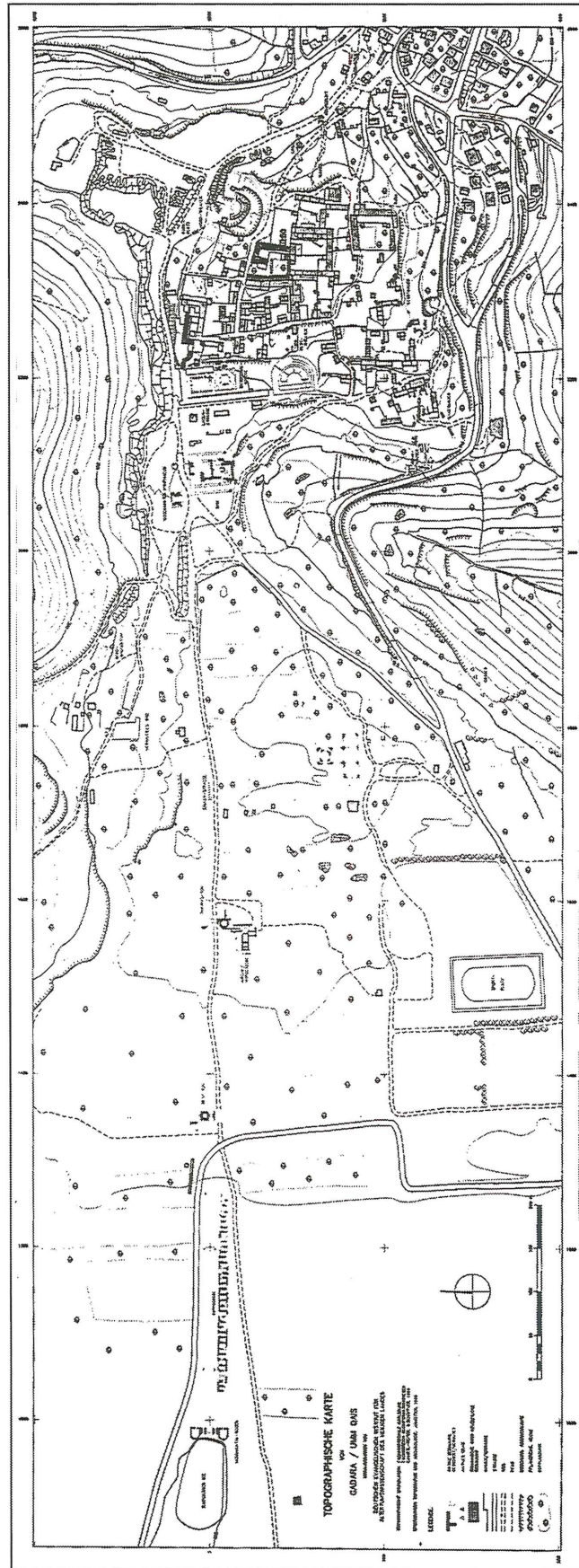
Water-Tunnels in Umm Qays

The overland tunnels end at Umm Qays, where the water is transported by means of an aqueduct over the small wadi (at the western end of the modern village of Umm

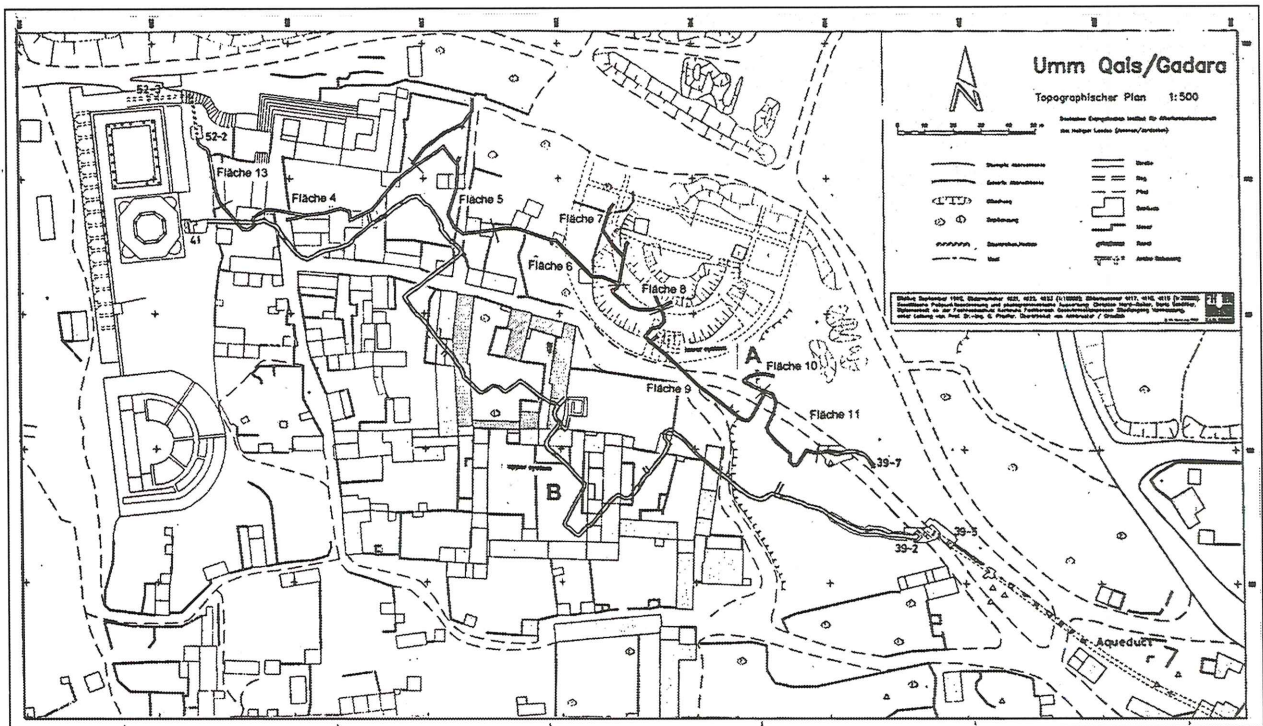
1. Most earlier projects in Gadara were concerned with monumental buildings, which are often used and reused for a long period of time and therefore less prone to show a clear inner stratigraphy. The contemporary excavation of the German Ar-

chaeological Institute under A. Hoffmann had similar goals so that a combined effort was possible.

2. Two longer articles about the water-system are published: Kerner 1992 and 1997.



1. General Plan of Gadara with excavation areas (Fachhochschule Karlsruhu).



2. Plan of upper and lower channel (Fachhochschule Karlsruhe).

Qays), which then brought the water into the channel in the acropolis hill (area 39-2, 7 and 8). The aqueduct is roughly 60m long (area 36). Most evidence of the construction on top of the aqueduct itself are gone (due to the modern road built in the last century), but the last arch is preserved (Fig.3) and two smaller channels with plaster and elaborate blocking systems (Fig.4) point towards a distribution outlet from the lower system on top of the aqueduct. With the exception of this last arch (area 39-5) the aqueduct itself is entirely gone, but the foundations of 11 piers, which originally held the arches, were revealed in 1994.

The Upper Tunnel

The upper tunnel (B) under the acropolis is 410m long, up to 2.50m high and between 0.80 and 1.50m wide. The floor is very uneven, partly not finished and certainly not levelled. Only the part outside and the first 50m inside show signs of finishing work. On the eastern end of the acropolis hill the tunnel starts on a very

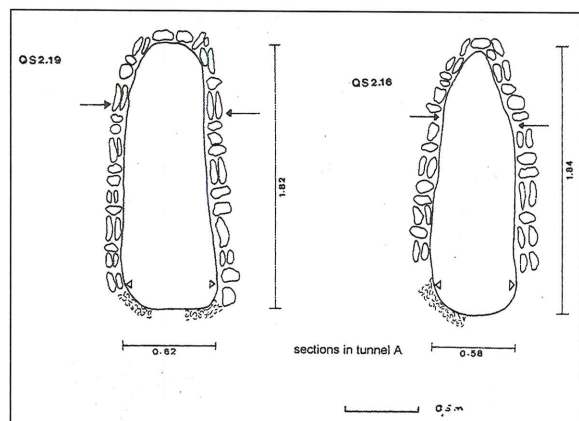
strong pier (see Fig.4) (area 39-2), which would have been able to hold any diversion-construction coming from the aqueduct. Tunnel (B) is here an entirely artificially built channel with constructed floor and walls which gradually cut into the bedrock as it is going further west until it disappears under the acropolis as a tunnel.



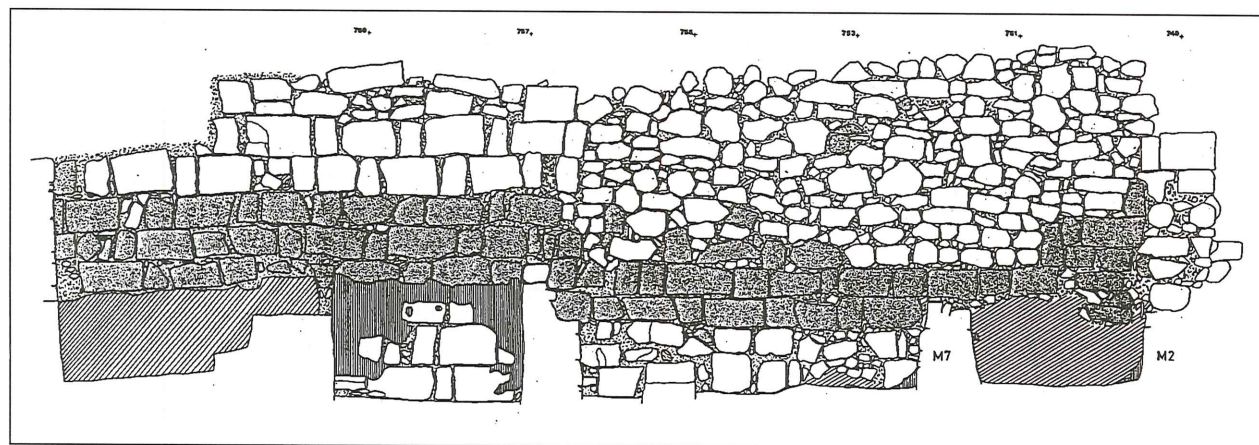
3. Area 3-5: Last arch of the aqueduct .



4. Area 39-2 Sleuce stones at the diverting point between aqueduct and channels.



5. Area 41-9: Sections in tunnel A: sketch of construction.



6. Area 41-9: Lower tunnel (A) with construction of walls inside the bedrock cut (planning: Krebs/Michaelis, drawing: S. Shreydah).

The upper tunnel was never finished, which is proven by the work at the western end of the tunnel (area 41-1): no construction to bring water into the city has been found. The final abandonment of the project is clear by finds from inside the tunnel, which had been placed there carefully. The western cut for the tunnel is filled by a midden from the fourth until the sixth century.

The Lower Channel

The lower channel (A) is also around 400m long, dates to the late Hellenistic/ Early Roman period and was built in at least three different stages. The building technique is the following: first deep shafts were cut down to the tunnel, then the tunnel was cut by two teams from the shaft in both directions,³ then facing was built on the floor (Fig.6), the sides, and sometimes on the ceiling to provide an entirely artificial insulation for the water as was common for Roman water-courses. (Fahlbusch 1987: 151). In constructing the floor artificially it was also possible to level it. Lastly, floor and sides were plastered with two different layers of waterproof covers.

Several outlets from the main channel (A) are made towards the north, all of these side channels are smaller in diameter and have pipelines for the transport of the water

3. This construction technique is recognizable from working signs along the walls (Neubauer 1993).

like in area 50-3 and area 41-4, 41-12.⁴ It was impossible to follow them for long, because of the damage done by modern streets. The waterflow is controlled by small weirs, which make it possible for water to be divided into the side channels. Towards the end of the channel a water chamber with three different levels controls the outflow (area 41-3) (Kerner 1997).

At the western end the channel was dammed by a weir, which again carefully controlled the amount of water, which was distributed to the public (area 52-2) outside the acropolis hill. The channel proceeded here through an older cistern. Once outside the hill the water is further distributed in smaller channels and again in pipes.

The system fell out of use at the very end of the Byzantine period, when it was not cleaned any longer and debris from the surroundings were thrown into the cistern at the end. The finds include large amounts of Late Byzantine/Early Umayyad pottery, lamps and the remains of a marble sarcophagus (see below, The small

Finds).

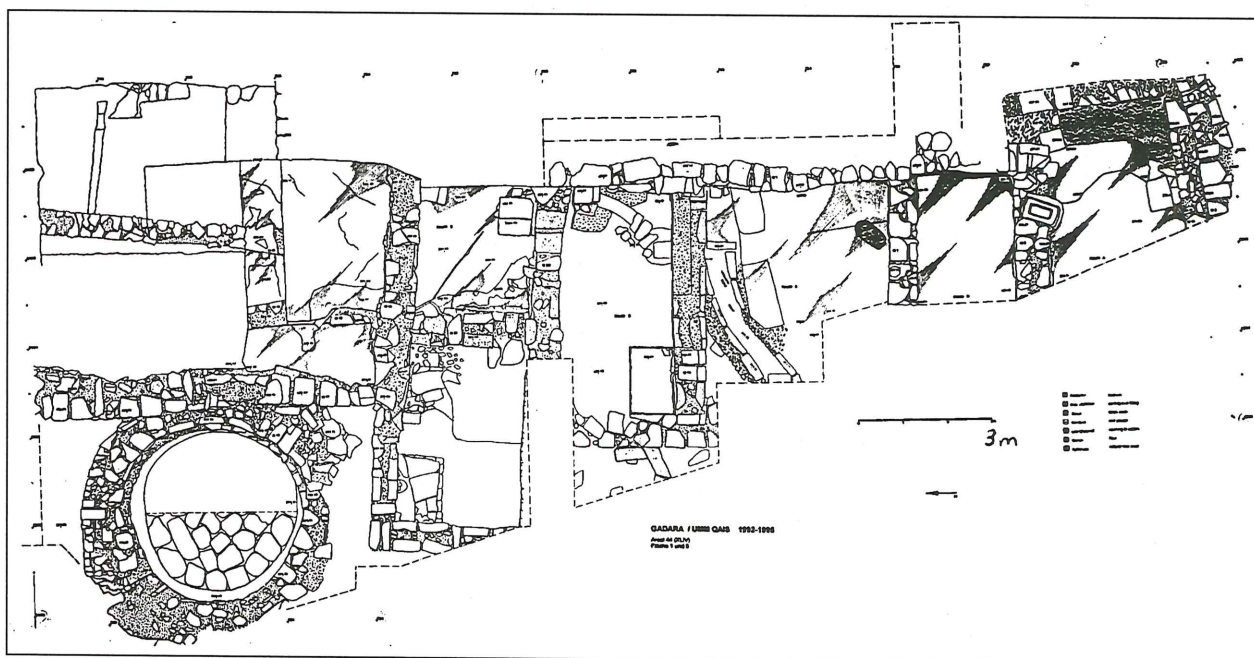
The City-system

After the channel (A) left the hill it continued as a smaller channel, which was covered with basalt slabs. It turned 90 degrees and continued in front of the basilica towards the west. A small part of this channel was already excavated in 1978 by Ute Wagner-Lux (Wagner-Lux 1982: 153ff). Lead-pipes have been found in the bath and the so-called nymphaeum, and in the latter also basalt pressure-pipes (Bol *et al.* 1990).

DOMESTIC QUARTERS

Living area on the Theatre Slope (Areas 44 and 51)

The excavation in area 44 by the modern road south-west of the Ottoman village revealed domestic structures in subareas 1,2,3,4, and 5. (Fig.7) on three terraces (upper, middle and lower). Terracing is a well-known practice for living quarters in classical times.⁵



7. Area 44-1 and 5: plan of rooms A-H (planning: Hirth/Müller-Neuhaus/Wolter, drawing: Feiler/Shreydah).

4. For details, see Kerner 1997.

5. Terracing was very popular in Western Asia where cities like Pergamon, Ephesos and Knidos show

this form of construction (for bibliographical references see Kerner and Hoffmann 1993).

Lower terrace

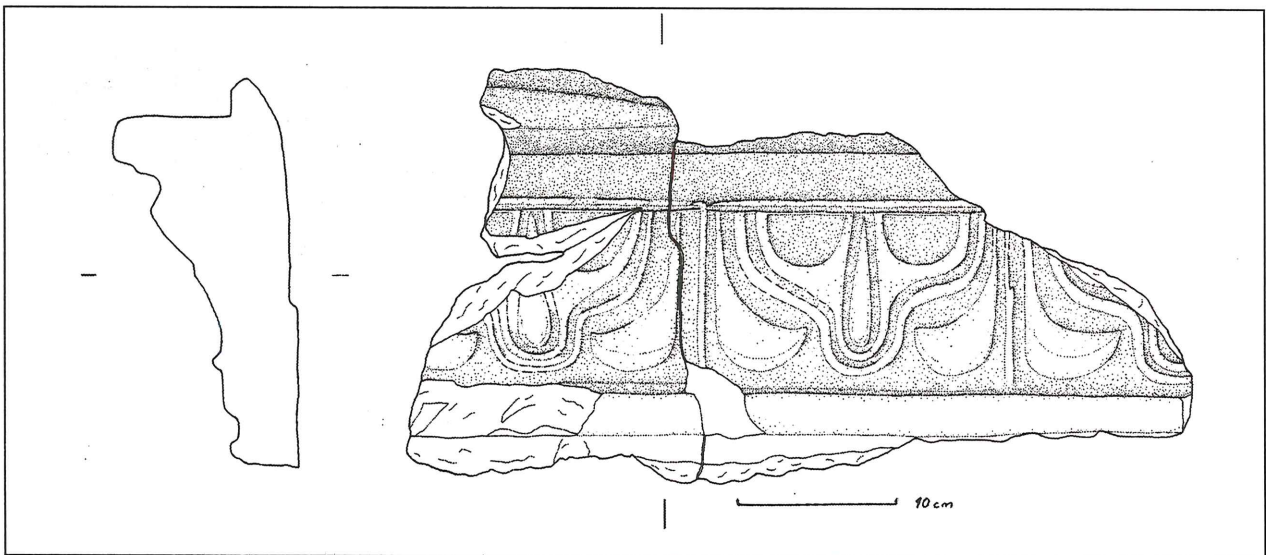
In subareas 1 and 5 eight rooms (A-H) and a large cistern (subarea 4) were excavated. Rooms B,C,D,E, and H all belong to one building (Fig.7). Rooms B to E all have the large terrace wall (M1) as their back wall in the east and regularly spaced walls between the rooms (M2, M7, M10, M20). The western walls are missing in most cases due to the modern road cut. Therefore only the door between rooms E and H was found. All rooms show signs of older walls (cut out of bedrock) with slightly differing orientation, which presumably date to the Hellenistic period. The existing walls are Roman, run parallel to the known Roman main road and the rooms have been used until the sixth/seventh century AD. The presumed change of orientation is particularly interesting, because the Roman walls are parallel to the general street pattern of Gadara. This could point to a change of orientation between the Hellenistic and Roman times, as it is not unknown from the Eastern Mediterranean (Owen 1991:141). It was not possible to recognize a courtyard, but that might be due to

the missing western part of the building.

Nearly all rooms had painted plaster on the walls, particularly room D was very richly decorated (Fig.8).⁶ The floors were made of dense clay-packing. In rooms C and D a small channel (20 cm wide), which was part of the drainage-system for the terrace-wall, fed the cistern which is under rooms A,B and C as well as partly under the modern road and M1.

Wall M13 divided room F from the other building. Into the western wall of room F (M14) the huge circular structure (room G) was built. It is assumed that room G was a lime-oven, although no sign of fire on the floor and no fire-hole were found, but the walls had been exposed to great heat. The lime might have been slowly burned and a hole was left in the dome. The oven would then have been filled from above and the dome would have been constructed new each time the oven was used.⁷

North of wall 13 in room F several different features are built, the oldest is a large bedrock cut, which looks like an unfinished tomb.



8. Area 44-5: Example of Wall-painting (drawing: S. Shreydah).

6. The decoration of domestic houses with wall-paintings is well known not only from the famous Roman example of Pompeii, and earlier places like Knidos (Love 1970: 152) but also from sev-

eral Herodian palaces.
7. There are some examples for this from Jarash and also from modern times.

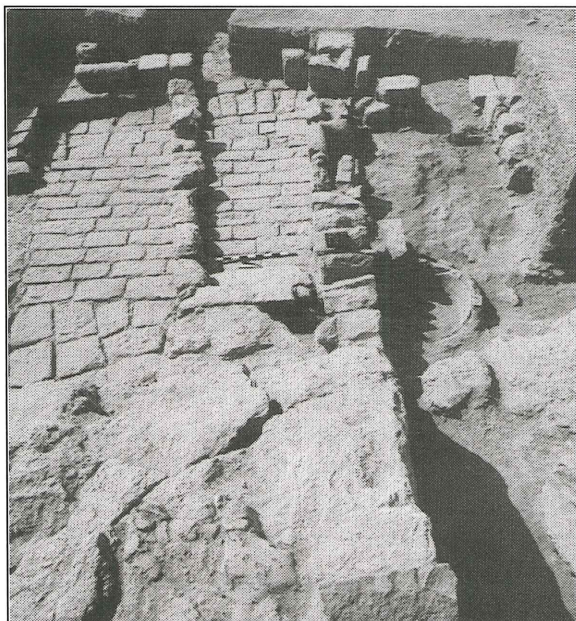
The Middle Terrace

Above some densely packed Hellenistic filling a Roman cellar was built. The roughly triangular structure was set on two sides with badly constructed walls into an existing midden. One wall holds a small staircase, which reaches nearly down to the floor.

The Upper Terrace

Here a large basalt pavement is surrounded by badly made walls. The pavement seems to be an old road or courtyard between walls M 29 and M 36, both of which once led up a staircase to the east onto a higher level of bedrock (Fig. 9). The very irregularly shaped bedrock was underpinned with small stones. The original walls, which had bordered the pavement were all dismantled in antiquity and scanty small walls were built on the pavement. The last use of the whole area was domestic: with bread-oven, cooking-oven, cisterns and a watering place. The original walls date to the Late Roman period, then the area seems to have been abandoned and was used extensively for a short period of time during the late sixth/early seventh century.

Area 51 (see Fig.1) was a test-trench to



9. Area 44-2/3: Pavement with walls M 2 (right) and M36 (left), in the foreground: bedrock.

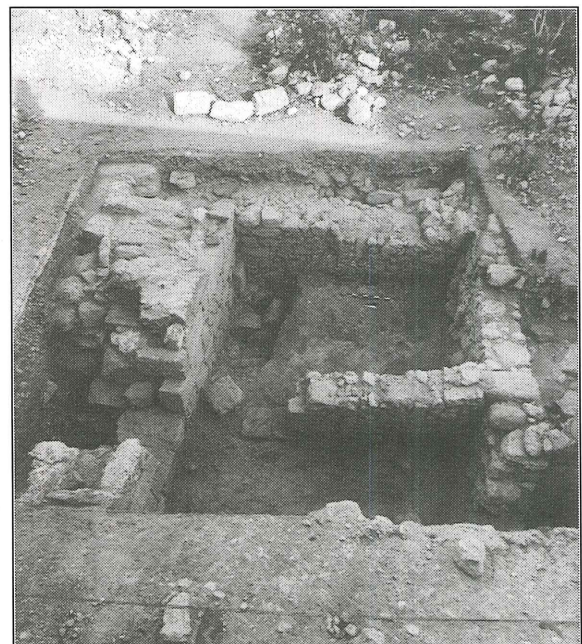
probe the extent of the living area on the theatre slope. It revealed several walls and small channels to a depth of 2.40 m.

The Acropolis Area (Area 50)

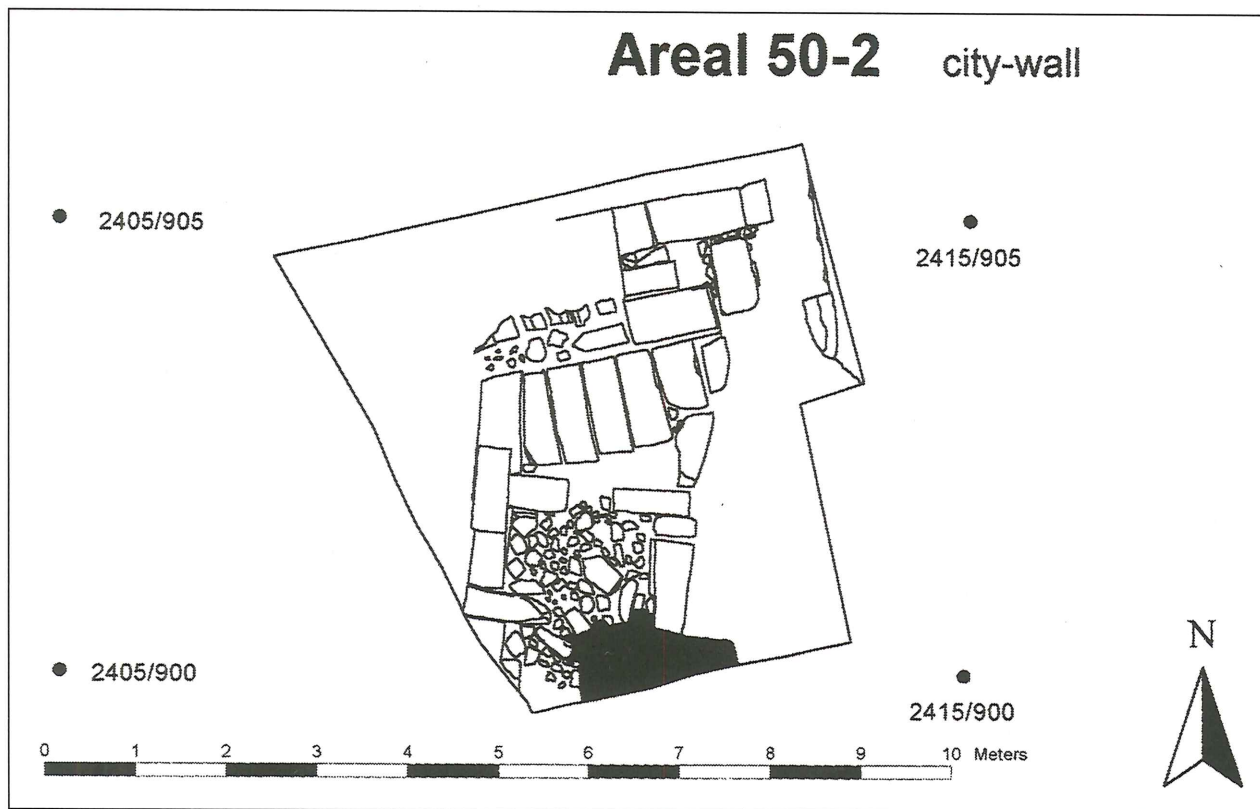
Just east of the museum in Umm Qays a trench was opened at one of the entrances to the upper water-tunnel (B). A one-room house with an adjacent courtyard was excavated. The house had a packed clayfloor and a well-made door with door sockets (Fig.10). In the courtyard was a small hearth on stone-footing. Unfortunately the entire north of the house was destroyed by a huge late antique wall. The house shows only material from the Hellenistic and Early Roman times, there is no later reuse.

THE CITY WALL (AREA 50-2)

In 1992 some work was done at an arrow-shaped tower of the city wall (area 40), which was then continued by the German Archaeological Institute. In 1993 a small trench was opened under the modern road to test the course of the city wall at the eastern side of the Ottoman village (Fig.11). The corner was found to be built using Ro-



10. Area 50-1: House 1 with courtyard and door.



11. Area 50-2: Corner of city-wall.

man construction technique: a rubble core between two stone surfaces.

MATERIAL

Pottery⁸ (Table 1)

The material is given here only according to presence and absence pattern. But a quantitative analysis has been done per loci: over 115,000 pieces of pottery were found, of which roughly 15,000 are of recognizable shape. A quantitative analysis seems to be important for the final interpretation of the pottery sample (Sabloff Smith 1969).

A short description of all wares is given in the appendix; in this preliminary report only a small amount of pottery is described more precisely.

The whole range of pottery from the Hellenistic period until the seventh century AD

was found in the different excavation areas. The fine Hellenistic material is divided into imported (*H SLIP A, B, C?*) and locally made wares (*H SLIP D and E*). The locally made wares imitate the imported material in look and shape.⁹ While the imported wares are very well levigated, very fine and normally covered with a good slip, the indigenous wares are coarser, show larger amounts of temper and rougher surfaces with a slip, which flakes off. The three typical shapes—small bowls with curving walls (Fig.12:1), small carinated bowls (Fig.12:2-3) and small fishplates (Fig.12:4), and small with slightly outflaring rims—are very similar in all *H SLIP* wares. These wares appear in the Hellenistic pockets in the domestic areas, in house 1 in area 50-1 and in the fillings at the east end of the tunnels. The im-

8. The following comments depend partly on the work of Elke Posselt and Michael Gerber, who are both working on a M.A. Thesis about pottery material from Gadara. The conclusions and interpretations are entirely due to the author - as are

the mistakes.

9. These imitated wares appear in several excavations in the classical Near East like in Pella in Jordan (McNicoll *et al.* 1982, 65ff.) or Berenice in Libya (Kenrick 1985: 39ff.).

Table 1.

	Provenance	Ware	Comparisons	preliminary dating
12.1.	39.2.62.22	H SLIP B	Failaka: 464-472, pl.47; Pella 1; pl.128.7-9, pl.130	2nd -1st B.C.
12.2.	39.2.30.54A	H SLIP B		Late Hell.
12.3.	39.2.10.59	H SLIP B4	Pella 2, pl.75.2	Late Hell.
12.4.	39.2.1.9	H SLIP B/D		Late Hell.
12.5.	39.2.17.36	MEG A		Hellenistic/Roman
12.6.	39.2.98.196	ETS A	Berenice:p.229-231, pl.323.3; Hama 16/17	2nd - 1st B.C.
12.7.	39.2.17.41	ETS A	Hama 14, pl.	50 B.C.-50 A.D.
12.8.	39.2.30.25A	ETS A		Roman
12.9.	41.1.4.48	ETS A	Hayes 46/47	Roman
12.10.	41.1.67.3	ARS	ARS: Form 62, p.107	2nd half 4th A.D.
12.11.	41.1.59.35	ARS	Berenice: pl.63 2.3,3; Hayes: Form 50, p.69	4th cent. A.D.
12.12.	44.2.183.36	HBUFF		Late Hell.
12.13.	44.2.159.52	FHBUFF	Failaka: pl.52 504	Late Hell.
12.14.	44.5.28.4	HRED	Pella 2: pl.78.2	Late Hell.
13.1.	41.1.28.3	BP		Roman
13.2.	41.1.28.63	BBP		Late Roman
13.3.	52.2.99.13	BSWP	Pella 1: pl.141.2,4	8th cent. A.D.
13.4.	39.2.62.198	CBUFF	Pella 2: pl.108.9	Late Roman
14.1.	44.1.3.232	CSTRAW	Pella 2: pl.110.12	Byzantine II
14.2.	44.2.53.1	RED	Berenice Fig.108 570	Late Roman/ Byz.
14.3.		RED		Late Roman
14.4.	41.1.28.1	RED	Pella 2: pl.109.4	Byz.I, 3-5th. cent. A.D.
14.5.	41.1.28.132	RED/CRED	Pella 2: pl.109.9	Byz.I, 3-5th. cent. A.D.
14.6.	44.1.3.111	CRED	Elephantine, pl.82.14	3/4th cent. A.D.
14.7.	44.1.3.113	RED	Pella 1: pl.138.1,3	Late Roman/ Byz.
14.8.	44.5.179-150-1	Lamp		Herodian
14.9.	44.3.74	Lamp		3rd cent. A.D.
14.10.	44.3.193 52	Lamp		5-7cent. A.D.
14.11.	41.1.5	Terracotta		Roman

ported Hellenistic fine wares are less than 1.5 % of the total material.

Other imported wares from the same areas span the time between the Hellenistic and Roman periods: Megarian bowls (Fig.12:5) and early forms of Eastern Terra Sigillata (Fig. 12:6).

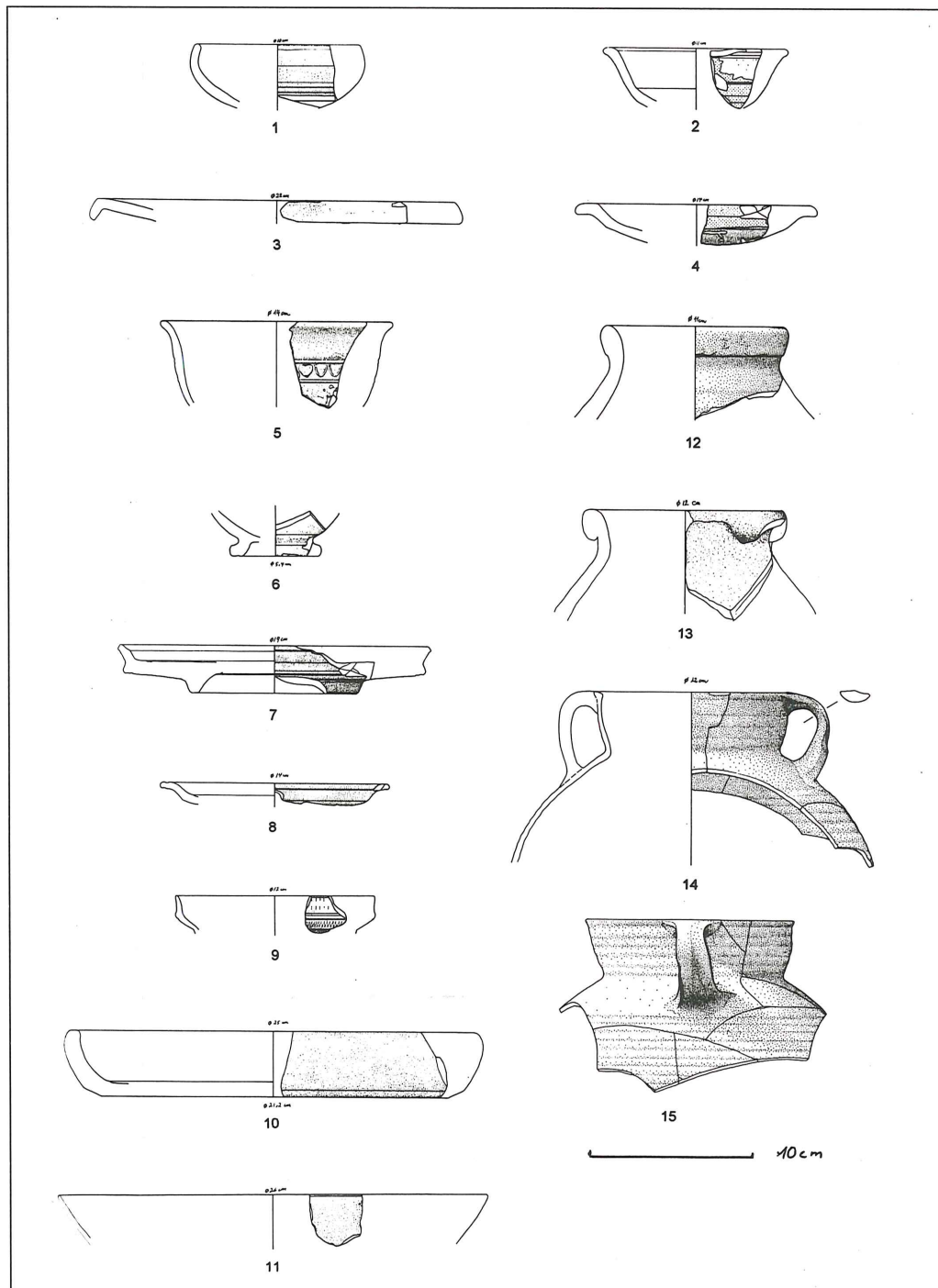
The Roman fine wares include also imported and locally made pottery. The main bulk of the imported pottery consists of Eastern Terra Sigillata (Fig. 12:7-9), which appears mainly in the shape of plates and smaller bowls (there are hardly any closed shapes like bottles). Other red slipped wares are very rare (Egyptian Red Slip, Cypriot Sigillata, Italian *TS*, *ETS B*).

At the end of the Roman period and into the Byzantine period other red slipped wares occur: mainly African Red Slip, but also Late Roman C and Cypriot Red Slip. The main shapes are middle-sized plates (Fig.12:10-11) with plain rims in ARS and variations in the rim in LRC and CRS. This material comes from the midden at the west end of the upper tunnel (area 41-2) and form the latest use of the domestic quarters in area 44 -2/3.

While the description of vessel shapes of fine wares (particularly imported wares) follows generally known and used terms,¹⁰ the coarse wares are described in more functional terms (Kerner 1993: 57ff.).

10. Although these terms are not always logical: "plate" can mean a vessel which would certainly

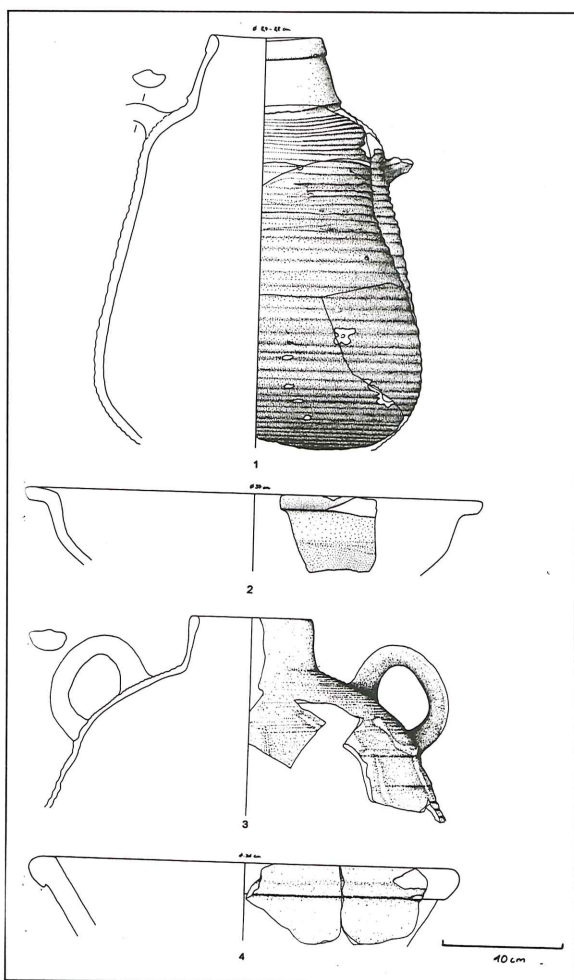
be called "bowl" if it were not for the long established name.



12. Pottery.

Coarse wares change more gradually. Large jars and jugs with relatively short necks and rounded rims in numerous variations appear first in a light, chalky ware, tempered with different grits (Hellenistic Buff, H Black Buff, H Fine Buff). The black basalt tempered version is the oldest. These wares (Fig.12:12-13) occur for some hundred years together with the Roman version

of this ware. The Roman ware is pink, often with a white slip (*BBP* or *BP*), well levigated, well-fired with a hard surface. Nearly all vessels have a ribbed body. The ware existed in jars and large bowls (Fig.13:1-2). At the end of the Byzantine period this ware is finally completely replaced by a reddish ware, which is brown-slipped and white-painted (*BSWP*) (Fig.13:3). These common wares



13. Pottery.

are two-thirds of the entire material in the excavation.

In Roman, Byzantine and Umayyad times each repertoire is complemented by first a coarse, gritty, buff ware (Fig.13:4), then a coarse, straw-tempered brownish ware (Fig.14:1) and last, a very hard, grey ware, which all have only one shape: a large, straight-walled bowl.

The cooking-pot wares change very little over time: from the Hellenistic (*H RED*) over the Roman (*RED*) to the Byzantine/Umayyad (*C RED*) ware there is only a gradual decline recognizable in surface smoothness. Although in the Hellenistic period, there existed a coarser variation (*COOK*)

too. The closed shapes develop from jars with oval-shaped bodies and a higher neck (Fig.12:14) to pots with strongly ribbed and carinated bodies with a short neck and mostly a small, horizontal rim (Fig.14:2-3) and became smaller (Fig.14:4). The open shapes show a wider variety in the later periods with a whole range of shallow, middle-sized bowls (Fig. 14:5-7). The amphora wares still need further research.

The Small Finds¹¹

Terracottas

The terracottas are generally small fragments, often too broken to identify them. The only frequently occurring element is the figure of Harpocrates or Dionysos (Fig. 14:11). Another interesting find was a theatre mask.

Lamps

Several Hellenistic lamps (wheel-made or mould made) were found in the fillings at the eastern end of the tunnel and in house 1 in area 50-1 (Fig.14:8). They are made from different wares and can be buff, grey or covered with a glossy black slip.

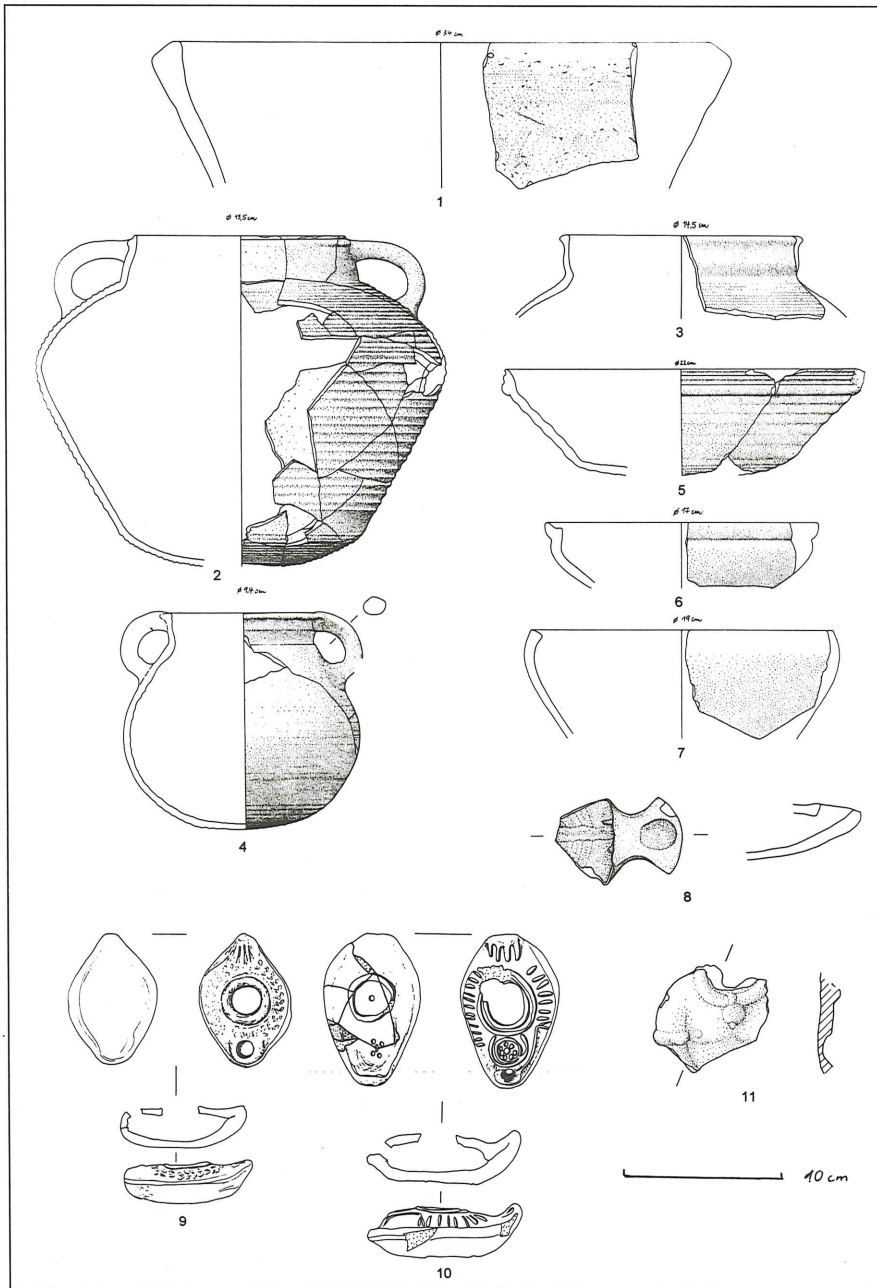
From area 44 are a few Herodian lamps (Fig.14.8), some complete Late Roman lamps, particularly of the bilanceolate type from the third-fourth century AD (Fig.14:9), and some later lamps of Northern Jordanian style from the sixth-seventh century AD (Fig. 14:10). Similar lamps were found in area 52 (west end of lower tunnel) which were thrown into the tunnel when it went out of use.

Marble Sarcophagus

Several pieces of a white marble sarcophagus were found in the cistern at the end of the lower tunnel (area 52-2). The cistern and the following tunnel were obviously not cleaned any more at the end of

11. The cataloguing of nearly all small finds was done by Nadine Riedl, the lamps are worked on

by Kate daCosta, the terracottas by Margaret O'Hea.



14. 1-7: pottery, 8: lamp fragment, 9: lamp, 10: lamp from 50-1 (h), 11: Harpocrates fragment. (Shreydah, Kehrberg).

their use. The sarcophagus dates to the first half of the third century AD and was imported from Athens (Wagner-Lux 1982). The lid had been reused as a chancel-screen in the basilica and is now in the museum together with the bottom part, while the sides were lost in antiquity. The relief fragments found in the channel had been cut from the lost walls of this particular sarcophagus. The fragments show probably mythological war scenes with warriors and horses. The

depiction is very lively and the work of high quality (Fig.15).

Wall-painting

The decoration of domestic houses with wall-paintings is well known, the most famous examples coming from Pompeii. It has a long tradition from the early examples in Knidos to the late antique houses in Ephesos. From rooms B, C and particularly D came a large amount of wall-painting.



15. Sarcophagus.

While rooms B and C have produced only small fragments of wall-plaster painted in two different reds, room D showed at least two if not three layers of plaster. While the last layer was plain white, the layer below consisted of panels imitating marble and architectural features mainly in ochre and red and exhibits the same succession of layers as the wall-plaster in the palatial mansion in Jerusalem (Avigad 1983: 102f.). But while some of the decoration in Umm Qays was moulded (see Fig.8), no ashlar imitation like in Jerusalem or the Herodian palaces in Jericho (Avigad 1983: pls.87-89 and Netzer 1975:95) was found. Ochre and red were the main colours, but green, pink and yellow as well as black-on-white patterns were also used. The dating is difficult, bearing in mind that the wall-painting in Jerusalem of the first century AD is reproducing an older

12. "... the earlier mode survived in the East much later

style.¹²

Some small 'stray' finds show that there were successful attempts at imitating architectural features very similar to some finds from Masada or Jerusalem (Yadin 1966: 67 and Avigad 1983: pl.105).

Bone, Stone, Metal Tools

Tools from different material were found in the domestic areas: needles, pins, knife-shaped instruments, spoons, handles and game-pieces from bone and ivory. Mortars and grindstones in basalt and limestone were found in all areas. The lower parts are roughly round or oval in shape and have little knob-feet (Fig.16). The upper parts of a grinding-set show often moulds for holding.

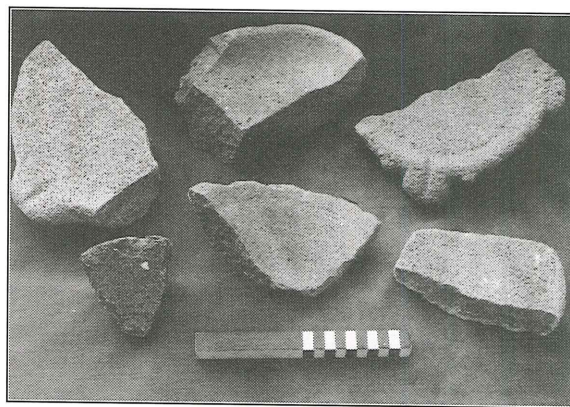
Metal finds include knives, scrapers, spatulas and nails in all shapes and sizes. A particularly nice find is a strigilis (scraper for use after a bath, Fig.17).

Jewellery

Ornaments and jewellery (buttons, beads and pendants) were made from different stones or glass. Several glass bracelets in different styles were found in areas 41 and 44.

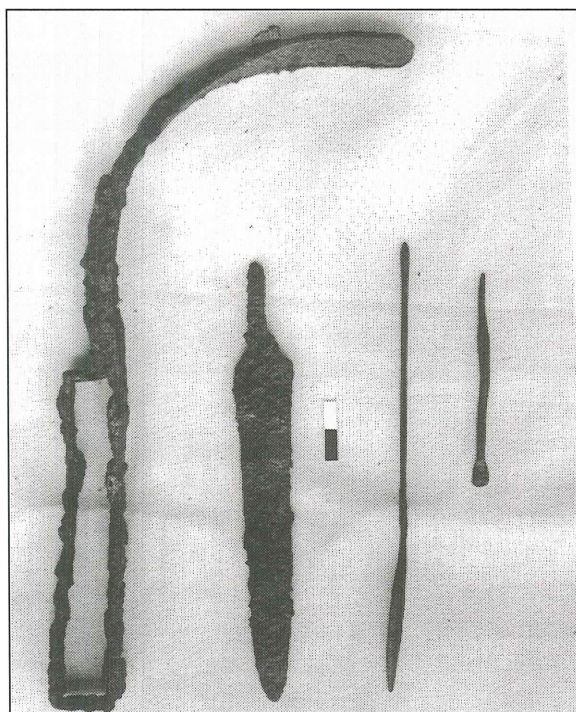
Architectural Ornaments

Architectural fragments are rather sparse in the contexts of this excavation. Some Corinthian and composite capitals were found reused at the eastern end of the tunnel (area



16. Stone mortars.

than in its original countries." (Avigad 1983: 102).



17. Metal scraper, knife, spatula and pin.

39-2 and 39-7). Area 44 (all subareas) and area 41-2 produced a large amount of marble fragments, which were used as encrustation stones for interior design.

Bones¹³

The most interesting bone collection comes from the midden in area 41-1. It contains a large amount of pig bones, the largest on the whole site. Other areas show more common waste characteristics with a higher amount of sheep/goat and cow bones.

CONSERVATION AND RESTORATION WORK

The Museum

The local museum of Umm Qays was opened in 1990 and several additions and improvements have been made since. In December 1994 a long hall was built to cover the mosaics from the Herakleides Bath.¹⁴

The Department of Antiquities moved a complete and unbroken door of a mausoleum into the museum courtyard.

A new room was added and three new showcases in the already existing room were set up. One of the new showcases in the museum room contains coins, which are partly minted in Gadara and span the time from the Ptolemies until the Mamluk period. The other case exhibits imported and locally made pottery from the Hellenistic until the Byzantine period. The new room in the back of the museum, which will be opened in 1996 has several showcases with exhibits from the water-system, examples of marble and stone decoration from the bath and the Monumental Gate, parts of the wall-painting and a whole collection of everyday items from the domestic quarters. A plan of the site and a general chronological chart were also installed in the museum.

The Western Theatre

Together with the Department of Antiquities work was carried out in the Western Theatre¹⁵. The Cultural Fund of the Foreign Ministry of Germany¹⁶ financed two architects Martin Klessing and Jörg Knütter, who made exact plans of the theatre (Fig.18) and co-supervised the work in the theatre. They finished their work with a report and suggestions for the consolidation of the building. At the same time archaeological research was done by a team led by Wagner-Lux and Vriezen (Wagner-Lux *et al.* 1993).

The Site

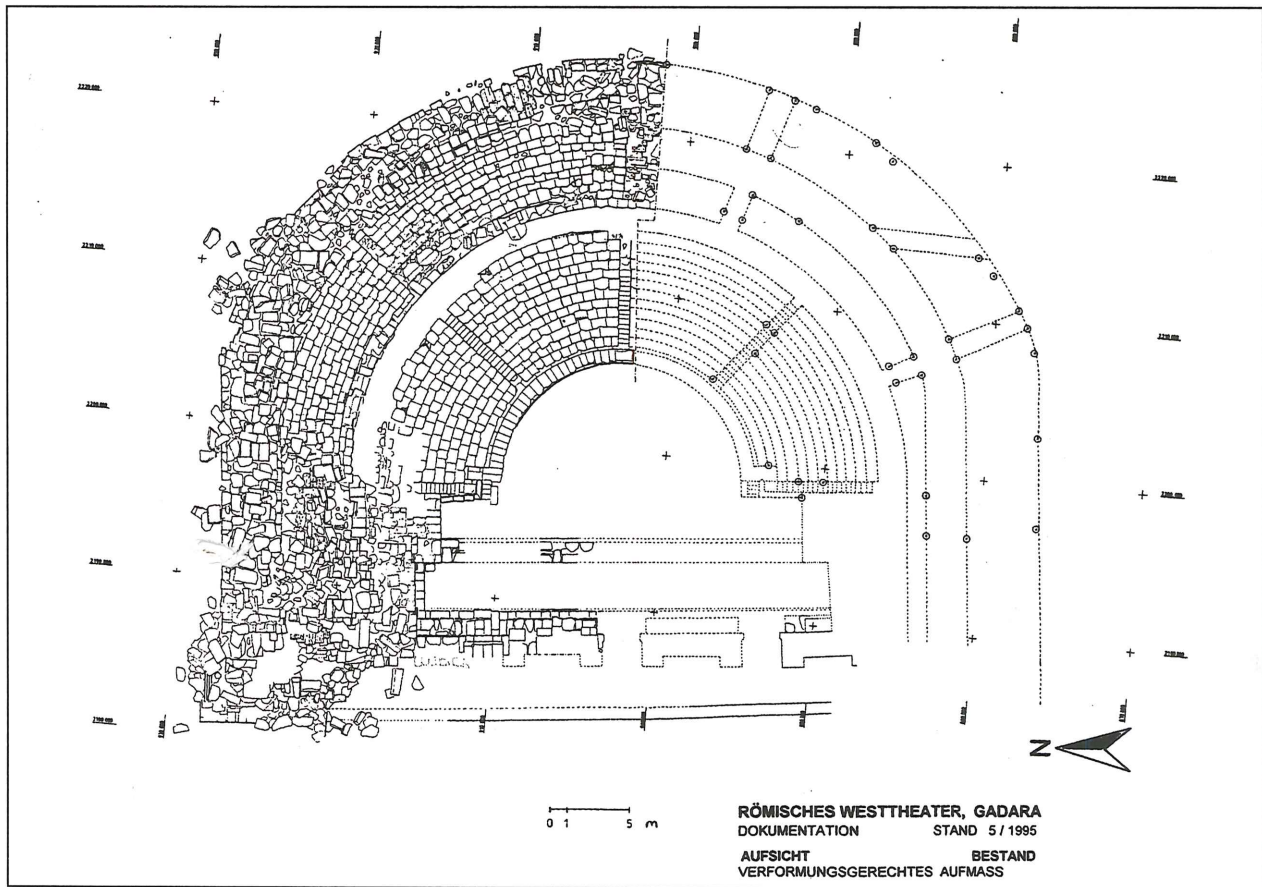
Part of the programme mentioned above was also a development plan for the site. Several measures were taken to make the site safe and possible to visit. Seven doors

13. The bone analysis was done by Kevin Rielley.

14. The architectural plan was made by Jörg Knütter.

15. Adnan Nakrash and Munthir Dahash have carried out the main bulk of the work on the Jordanian site.

16. The whole project was only possible through the help of the German Embassy in Amman and particularly through the help of the head of the cultural section Ms Ingrid Liedgens.



18. Plan of the Western Theatre (J. Knütter).

were installed in the different tunnels to secure them, and the eastern end of the upper tunnel (B) was opened to the public. Several poster signs were put up at different parts of the site to explain the excavations.

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APPENDIX

The following list gives all wares, which have been found in the author's excavation in Gaddara/Umm Qays, the description is very brief (for longer descriptions see Kerner, in Bol 1990: 241ff.). Several names are adapted from other excavations.

FINE WARES

HSLIP A Hellenistic Slip A, very fine buff to greenish-beige ware, very well levigated, no visible temper, slip in black or reddish-brown often only over half of the body. Imported ware. Always smoothed often highly burnished.

HSLIP B Hellenistic Slip B, buff to reddish ware, generally less fine and well made than *HSLIP A*. Four variations in temper, which is always fine and very small.

HSLIP C Hellenistic Slip C, fine greenish-white ware, less hard than *HSLIP A* and *B*, slip or paint in pale brown often rubbed off. Surface less smooth.

HSLIP H Hellenistic Slip H, fine, hard grey ware, sometimes darker grey slip. Small mineral temper, made in moulds (Moulded gray ware in Pella. McNicoll *et al.* 1982: 74).

HSLIP J Hellenistic Slip J, well levigated, reddish clay with shiny black slip. White paint. Very rare.

HSLIP K Hellenistic Slip K, pink, fine clay, often with grey core. Temper often recognizable on surface (chalky). With blackish, dull slip.

CAMP A Campana A - Ware, very fine, hard, reddish-brown ware, always shiny black slip (completely covering) with metallic shine.

MEG A Megarian A Ware (Ionian fabric), *MEG B* Megarian B Ware, *MEG C* Megarian C Ware. The definition follows the Berenice excavation (Kenrick 1983: 104ff.).

ETS I Eastern Terra Sigillata A, *ETS B* Eastern Terra Sigillata B.

ITSIG Italian Terra Sigillata. The term is used instead of the older "Arretine" Sigillata (Kenrick 1985: 125).

CYP SIG Cypriot Sigillata.

ARS African Red Slip, *CRS* Cypriot Red Slip (Hayes, Forms 1 and 9), *LRC* Late Roman C (mainly Hayes, Forms 3 and 10), *ERS* Egyptian Red Slip (Hayes 1972: 13ff., 371ff., 323ff., 387ff.).

COMMON WARES

HSLIP D Hellenistic Slip D, imitation of *HSLIP A* and *B* (same forms), buff, brownish, greyish ware with large amounts of fine temper (shell, quartz). Brownish slip of bad quality.

HSLIP E Hellenistic Slip E, imitation of finer *HSLIP* wares, beige, reddish, pinkish ware with large amounts of temper. Coarsest variation of the wares, thick walls.

POLY COUL Polychrome Coloured Ware, buff, fine with numerous minerals tempered. Outside relatively smooth. Hellenistic.

H BUFF Hellenistic Buff, buff ware with whitish, chalky surface. Soft surface, but hard ware. Small brownish mineral temper. Hardly ever ribbed.

H BUFF B Hellenistic Buff Bunt, same as above but larger amount and different temper in several colours.

FH BUFF Fine Hellenistic Buff, similar to *H BUFF* but finer variety, often more greenish ware.

BH BUFF Black Hellenistic Buff, same as *H BUFF* but with 50% of the temper in basalt, generally harder.

BP Buff to Pink, buff to pinkish/salmon coloured ware with a white surface, often thick slip. Very hard and little mineral temper. Body often ribbed. Roman to Byzantine.

B BP Broader Buff to Pink, same as above but only pink-salmon coloured or light brown without lighter surface. Surface softer.

GAD Gadara Ware, relatively fine buff-pink ware with well-smoothed surface. Often in dark pink/red painted. Thin walls, Roman.

RY STR Red-Yellow Striped Ware, not well fired, therefore stripes in yellow and red. Small amount of temper.

F BRN Fine brown Ware, middle fine light brown ware, surface always burnished and irregularly coloured. Late Roman/Byzantine.

GL BRN Glossy brown Ware, very thin brownish ware with polished outer surface (often in stripes). Byzantine/Umayyad.

CHAL RED Chalky Red Ware, reddish ware with large amounts of small chalky temper.

TC Terracotta, brick red ware with coarse texture, not very hard, surface hardly smoothed.

CTC Coarse Terracotta, see above but coarser, large temper.

BSWP Brown Slipped White Painted ware, very hard brownish ware, darker slip (purple-grey) and whitish, watery paint. Always strongly ribbed body. Variation: lighter version with light-brown surface and reddish paint (see McNicoll *et al.* 1982:149¹⁷). Late Byzantine/Umayyad.

PK PTD Pink Painted Ware, fine pink/salmon ware with a darker pink paint. Surface always smoothed. Late Byzantine/Umayyad.

GREY Grey Ware, very hard grey ware with slightly darker surface. Small amount of temper, coarser texture. Late Byzantine/Umayyad.

HAND Hand-made Ware, reddish-grey ware with clearly visible finger impressions on the inside. Middle-fine tempered and outside smooth. Byzantine and later?

COOKING WARES

All wares are reddish and darker outside, all are tempered with minerals like quartz to increase the heat resistance. It is very difficult to differentiate the *H RED*, *RED* and *C RED* wares.

H RED Hellenistic Red Ware, slightly rougher outside with generally very thin walls.

COOK Coarse Cooking Ware, much coarser than other wares, always dark-red/grey. Often burnished in stripes. Late Hellenistic.

RED Red Fine Ware, very smooth surface and very fine temper, often narrow black core. Roman/Byzantine.

C RED Coarse Red Ware, rougher surface, often black/grey core.¹⁸ Byzantine.

BYZ RED Byzantine Cooking Ware, buff to orange ware, very thin walled, hard.

COARSE AND AMPHORA WARES

C BUFF Coarse Buff Ware, buff ware with large amount of small temper in different colours (mainly reddish) often grog and basalt, not very hard. Surface rough with watery slip. Always well fired. Late Roman.

C STRAW Straw Tempered Coarse Ware, light brown-reddish ware with large amount of straw temper. Surface self-slipped (see Chaff tempered ware in McNicoll 1982:149). Byzantine/

17. A very good impression of the ware is given by the photo in Smith 1973: pl.92 A: 1156 and 1139 as well as B: 1141, 1162, 1165.

18. A very good colour impression and comparison to the frequent form 128 in Umm Qays is given in Smith 1973: pl. 90 D:1191.

Umayyad.

CHST Chalk Straw tempered Ware, very coarse straw tempered ware, temper large and frequent. Buff ware with grey core, often dark patches. Hellenistic/Roman.

C ORA Coarse Orange Ware, buff or light orange, straw and chalk tempered. Slightly lighter self-slip outside. Hellenistic.

AMPH Amphora Ware, well levigated, smooth buff ware. Exterior burnished.

SAND BRN Sand brown Amphora Ware, most frequent amphora ware, light-brown to buff ware with small, sandy temper. Outside smoothed.

RED AMPH Red Amphora Ware, coarsest of the amphora wares. Brick red ware (sometimes white slip) with gritty structure. Latest of the Amphora wares.