

EXCAVATION AND SURVEY AT KHIRBAT AL-MUDAYNA AND ITS SURROUNDINGS PRELIMINARY REPORT OF THE 2001, 2004 AND 2005 SEASONS

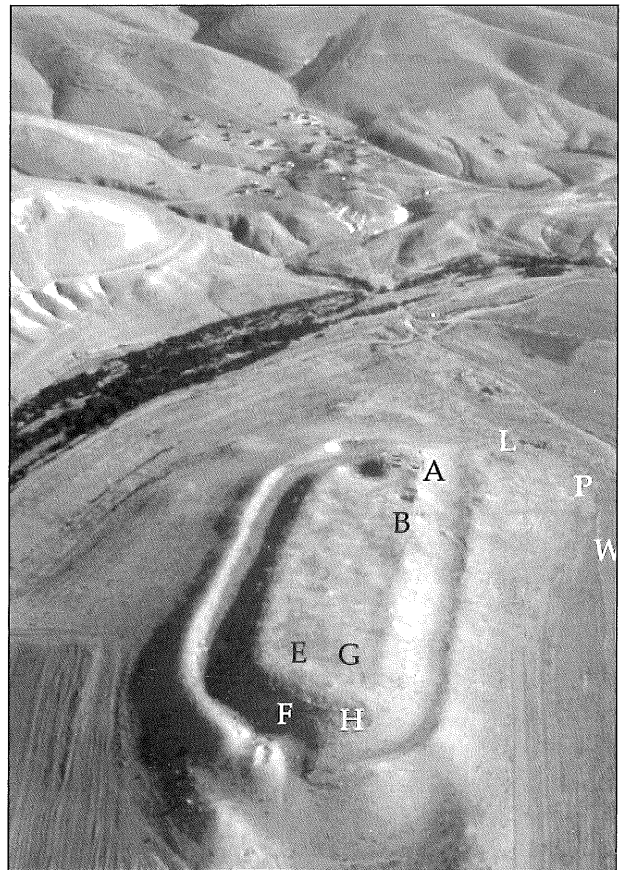
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Introduction

As part of its regional study of the Wādī ath-Thamad drainage area, archaeological excavation was carried out at both the fortified Iron Age town and the Nabataean-early Roman settlement at Khirbat al-Mudayna from July 1–August 10, 2001, June 28–August 6, 2004 and June 20–July 28, 2005. The project was directed by Dr. P. M. Michèle Daviau with Robert Chadwick, Assistant Director. Team members included scholars, volunteers and students from Canada, the United States, Mexico, the Netherlands, Austria, Germany, Iran and Jordan. Eighteen local workers also assisted us with our work each season¹. This report will present the results of excavation in Fields A+C (north), A (south), B and E on the mound, and of work in Fields L, P, and R+W at the foot of the site (**Fig. 1**), along with a report on two survey projects including documentation of cemeteries and burials, and mapping az-Zūna and Qaşr az-Za‘faran. A note on a special find completes this communication.

Fields A + C North (Robert Chadwick)

The past seven seasons of excavation at the north end of Khirbat al-Mudayna can be divided into two phases: during Phase I (1996-1999) a six chambered gate (North Gate 100; Chadwick *et al.* 2000: 257-270) was completely excavated, along with two towers, and a plaza with a gate shrine; in Phase II (2001, 2004, 2005), five stone silos (Daviau 2006), a stone-lined drain, and six retaining walls were exposed to the north and east of the gate.



1. Khirbat al-Mudayna, looking northeast; courtesy of Kennedy and Bewley APAAME 34/19.

Structures north of the North Gate 100

The principal research goal in Field A during Phase II was to locate the road that enabled people to reach the summit of Khirbat al-Mudayna from the wadi some 30.00m below. To the north of the gate entrance, the topography of the mound² drops vertically nearly 20.00m over

1. The Wādī ath-Thamad Project is sponsored by Wilfrid Laurier University, Waterloo, ON, Canada, and funded in part by the Social Sciences and Humanities Research Council of Canada. Additional funding is provided by friends and colleagues and by the volunteer programme.

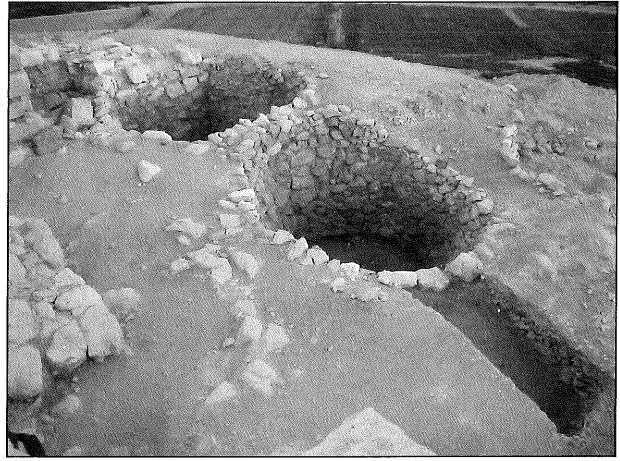
2. Although it contains several phases of human occupation, Khirbat al-Mudayna is not a *tāll* in the traditional sense of the word, but a geological formation which has several occupation layers dating from at least the end of the 9th century BC.

a short horizontal distance of only 24.00m. Because of this steep slope, a pedestrian access or vehicular roadway directly in front of the gate appears unlikely. The area immediately east of Tower 1013, particularly where the vertical drop is less pronounced³ and there is access to the surrounding moat, appears more promising.

Structures below the Vorplatz Surface⁴

Immediately north of Gate 100 is a Vorplatz or forecourt area, ca. 8.50 x 13.50m in size, with a stone threshold (A4:23) and door jamb (A4:24), all elements of a single construction phase. Beneath the beaten earth and cobble surface (A4:30) of the forecourt, which extends in front of East Bastion 1000 and West Bastion 1500, an earlier horizon (Stratum IV) was exposed with the discovery of five stone-lined in-ground silos. Although vertical in spots, the silo walls were slightly battered from 7° to 18° towards the interior of each structure. The number of preserved stone courses varies from 12 to 14, with a maximum depth of 2.36m. Although the topmost stones of all five silos (S4, S17, S20, S50, S59) were exposed in 2001, only one quarter of Silo 50 was excavated because part of it is situated under Threshold A4:23. In subsequent seasons, three other silos (S4, S17, S59) were completely excavated, studied and refilled⁵.

Silo 4 (Fig. 2): Silo 4, located 1.00m north of Bastion 1500, abuts Western Tower 1519, part of which forms its western wall. The uppermost stones of the rim of Silo 4 touch/abut the top stones of nearby Silos 50 and S59. This seems to indicate that most of the silo walls were in-



2. Stone-lined silos outside Gate 100; Silo 4 (background), Silo 59 (foreground).

tact when found. In 2004, Silo 4 was excavated to bedrock; the interior wall surfaces contained patches of mud and chaff plaster (C93:10) that was probably intended to be rodent and insect proof⁶. This plaster was harder than the more common lime plaster⁷ on wall surfaces in the gate and the industrial buildings at the site. In the silo, the fill layers contained pottery earlier in style than that of Gate 100, along with a limestone fragment containing an inscription (Weigl 2006).

Silos 17 and 20: (Fig. 3) Silo 17, located 3.50m north of Threshold A4:23, has an interior diameter is ca. 3.50m. Silo 17 was completely excavated to bedrock (2005). This silo and S20 to the east were both constructed prior to retaining Wall 1046 which runs over these silos.

Silo 59: Directly south of Silo 17 is another silo

3. However, despite the reopening of five squares on the northeast, no evidence of a roadway was found by end of the 2001 season.

4. Square supervisors were Ian Baird (2001), Faith Boughan (2005), Lars Christensen (2001), Christina Craig-Paul (2001), Kendra Drever (2004), Steven Edwards (2004, 2005), Adrienne foster (2005), Amleet Mangat (2004), and Tracy Scott (2004).

5. Part of a sixth silo was discovered in Field C at the end of the 2005 season, and plans call for it to be excavated in 2006.

6. The silo mud based plaster contains a mostly chaff and sand as temper (with the occasional very small pebble). The phasing of Tower 1519 in relation to the silo seems to indicate that west Tower 1519 was built before Silo 4. However, Square Supervisor Amleet Mangat notes in her final report; "the plaster may support the idea that the silo was built at a later date because the plaster

(C93:10) on the north and south walls continues onto the west wall (Tower 1519) in the places that the walls abut. Therefore, it appears that C93:10 is a plaster layer that is earlier than the plaster layer on tower 1519 (C93:17) as it appears to overlap C93:17 in the two places the north and south walls abut the west wall."

7. In this report, the terms mortar and plaster will be used in the following manner: mortar is a mud based material containing organic and or non-organic temper such as chaff, sand or gravel, used to bond stones or mud-bricks together, plaster may have the same ingredients as mortar but includes lime and is used to cover and seal surfaces such as walls and floors. It should be noted, however, that it is not of the same composition as the waterproof plasters used in Building 200 of Field B, which are specifically hydrofuge in nature, and were used to control and contain the flow of liquids.



3. Plan of North Gate 100 with silos and retaining walls.

(S59). In 2001, half of this in-ground structure was excavated to bedrock. The boulder-and-chink walls were standing 12-14 courses high and are battered 18 degrees from the vertical; they consist of one row of medium cobbles and small boulders. The silo contained several layers of ashy soil, some mud material, animal bones, clay oven fragments, and 556 Iron Age II potsherds. The interior dimensions of Silo 59 vary from 3.30-3.80m wide by 2.47m deep at its deepest point. Total estimated capacity is approximately 22.00m³.

Silo 50: Silo 50 was also located underneath the hard forecourt surface suitable for pedestrian traffic. This silo measures ca. 3.50-3.75m in diameter; the exposed portion that is not under the entrance ramp extends north 2.15m forming a three-quarter circle while the southern part extends under Threshold A4:23 and the benches (B1517+B151) north of Bastion 1500. Comparable to the other silos, the wall of Silo 50 was constructed of a single row of medium to large cobbles, 12-13 courses high. Because it was footed on sloping bedrock, the number of cours-

es varied with fewer on the south side and more on the north. Inside the silo, a hard mud plaster (A4:56) sealed the gaps between the stones. About one quarter of Silo 50 was excavated to bedrock reaching a depth of 1.63-1.83m. Tilt lines indicate the direction from which soil and ash with some mud inclusions and broken pottery was dumped into the silo. However, there was no preserved evidence for any kind of cover or roof structure over the silos, leaving it unclear whether or how they were sealed.

The four silos excavated to date all follow the same construction techniques and were footed on bedrock resulting in irregular bottom surfaces that conformed to the slope of the mound. Oven fragments found in Silos 59 and S17 suggests that one of these silos may have been vacant for a time, since the silo wall served as a windbreak. Eventually all the silos were filled in preparation for the beaten earth and pebble Vorplatz surface (A4:30) and the beginning of a new architectural phase (Stratum IIIB) on the mound at Khirbat al-Mudayna.

Between the silos, a section of drain (A12:13) associated with the Vorplatz runs parallel to

the front of Tower 1013 for 4.50m, stopping abruptly just before the terrain drops off east of the tower (**Fig. 4**). This drain segment does not connect with Drain 104c which runs along the central road through the gate, making it unclear what happened to the water after it passed under Threshold A4:23. At the same time, Drain A12:13 flanks a small plaza directly in front of East Tower 1013. Here was a bench and a niche that supported a pair of standing stones, (loci A12:28, north, and A12:17, south), preserved 0.60 and 1.05m high respectively. The two vertical stones abut a large, 1.30m long, horizontal monolith (A12:16). In their form and location in front of the tower, these standing stones resemble masebot found elsewhere in the Levant (Zevit 2001: 256-262) and suggest a cultic function.

Retaining walls east of Tower 1013

East of Tower 1013 is a series of three retaining walls (W1049, W1050, W1051). All three are dry-laid, boulder-and-chink construction. Because Tower 1013 is located at the summit of a steep 22–25° slope, it is clear that these stone retaining walls were designed to stabilise the tower as well as to control erosion. To the south, Wall 1052 runs in a straight north-south line, east and below outer Casemate Wall 2001. Wall 1052 was positioned very close to the steep (up to 25°) slope of the mound to the east of Casemate Wall 2001 that curves sharply to the south around the gate. Wall 1052 is 2-3 courses high



4. Gate shrine and drain to the left of Tower 1013; W1046 on the left; after Daviau and Dion (2002).

and 2 rows wide, built in dry-laid, boulder-and-chink construction.

The Pedestrian⁸ Vorplatz

Features north of Gate 100 and contemporary with it (Stratum IIIB) include the beaten earth and gravel surface (A4:30) which sealed against the main entrance, Threshold A4:23. Similar surface material, found sealing against east and west Bastions 1000 and B1500, is consistently found on top of a 0.20 to 0.30m thick layer of angular pebbles and small cobbles, footed on a layer of yellowish brown (10YR 5/6) or reddish (10YR 6/8) soil. Running east-west along the north edge of the Vorplatz is a dry-laid boulder-and-chink wall (W1046) consisting of 2-3 rows and at least two courses of large cobbles and small to medium boulders; Wall 1046 varies from 1.00-1.25m in width and is battered on its northern edge about 5°. A small portion of this wall was first exposed in 1999, with wider and longer sections exposed in subsequent seasons. The stones of Wall 1046 were built up and over the wall of Silo 17 on both sides. In order to strengthen the perimeter wall inside Silo 17 and to act as a support for Wall 1046, the northern half of the silo was filled with large cobbles and boulders. Wall 1046 served as a retaining wall built to support the soil and fill of the Vorplatz area. This wall and the beaten earth and pebble surface it retains are lower than the entrance to North Gate 100, meaning that the surface in front of the gate sloped gently towards the north.

Northeast Pavement and Stepped Stone Structure

Beginning at the east end of W1046 is a paved surface (A22:5+A21:3), 5.08m long x 1.08-2.28m wide that slopes to the north on a 16-20° slope. At its south (upper) end, this pavement begins north east of the cultic niche, while down slope to the north it ends abruptly at Bedrock A21:4, which continues west for over 14.25m across much of the northern end of the mound. Pavement A22:5 seals against a parallel north-south retaining wall (W1059), which begins at the same point as the pavement and continues

8. This surface is referred to as “pedestrian” because Threshold, A4:23 contains horizontally laid monoliths (forming door jamb A4:24) which extend for 3.73 m across the entrance of North Gate 100 between Walls

1001 and W1501; among these monoliths, Door Jamb A4:24 stands vertically up to 0.25m above the entrance surface. This would have prevented wheeled traffic from entering the town.

for almost the same distance down the slope. Retaining wall 1059 was made of small and medium cobbles and remains standing 0.15-0.78m in height and 5.38m long. Both the pavement and the retaining wall are dry-laid, boulder-and-chink construction and are situated 2.65m northeast of the egress of Drain A12:13, and it may be that they fulfill some kind of combined architectural function.

It is tempting to conclude that the sloping pavement is a section of the long sought-after roadway leading to the gate. However, there are problems with this interpretation since the excavated section of pavement is short and does not continue west towards the main gate entrance, which is more than 8.00m away. In addition, the lower or northern end of the pavement does not continue either east or west at the bottom of the mound; it simply ends on bedrock. Finally, with a declination of between 16 to 20°, the pavement appears to be too steep to be practical for a roadway.

The Stepped Stone Structure and its Retaining Walls: To the west of Wall 1059 (in Square A11) are two parallel retaining walls (W1057 and W1058) which extend west ca. 10.00m. Wall 1057 is only one row wide and from 1-3 courses high in some sections; its height varies between 0.15-0.78m. On both sides of this wall is a massive stone fill (A2:11) or capping designed hold the slope in place and to prevent erosion⁹. Farther to the north is the second retaining wall (1058) composed of rectilinear stones that appear to have been placed just above bedrock. Like Wall 1046 on the crest, these retaining walls, the pavement and Retaining Wall 1059 form a complex of installations designed to support the built up earth/cobble layers in front of the gate and prevent erosion. At the same time, this support structure does not appear to have fulfilled any defensive role. This system seems to have worked well over the millennia since the plaza has maintained its shape with only minor damage from erosion until modern times.

Area A Inside the Town (Margreet L. Steiner)
In 2001 and 2004, the area behind the gate (Squares A7-10, 17-20) was explored further and parts of Courtyard 150, Temple 149 and Building 140 were excavated to bedrock¹⁰.

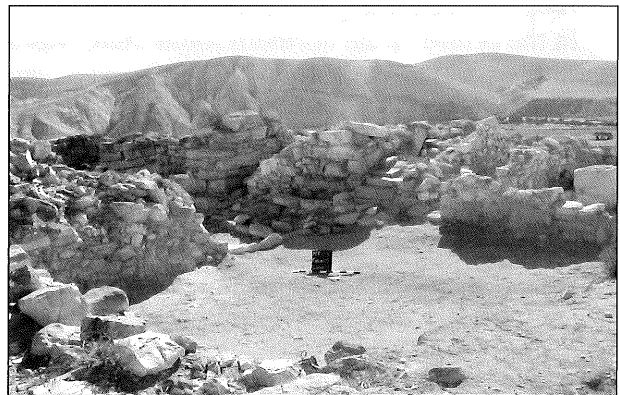
Courtyard 150 (Fig. 5)

Four surfaces were exposed and their relationships with architectural features of the gate and with Temple 149 were clarified. In our description, each surface constitutes an occupation phase.

Phase 1: The first phase on the west was the construction of Surface A7:38/39 in Courtyard 150, sealing against west Wall 1511 and possibly gate Wall 1505. Two benches were found in front of these walls. Surfaces and architectural features were built partly on bedrock and partly over a fill immediately above bedrock.

Phase 2: On top of a second surface (A7:33) were south Threshold A7:20, directing water into Drain 104c inside the gate, as well as the lowest step A7:40 of the staircase (or of an earlier staircase that lead to the upper storey room above Gate Room 103), and east Wall 1053. This surface also sealed against Walls 1511 and W1505, as well as the benches in front of them.

Phase 3: Superimposed Surface A7:30 is connected with a raising of the south threshold



5. Courtyard 150, looking east with Gate 100 on the left.

9. These stones appear to have been tossed haphazardly down the slope, although others are clearly in place above the soil of the mound itself. Disturbance of these stones may have been the result of the collapse of the upper stories of Gate Building 100 at the time of its destruction.

10. Margreet Steiner and Christopher J. Gohm were Field Supervisors in 2004; Square Supervisors were Annelie Dolan (2001), Denise Duling (2004), Paige Glennen (2004), Christopher Gohm (2001), Julie Parent (2004), Susanne Scott (2004), Dyan Semple (2004), Elod Hodossy-Takacs (2001).

(A7:20) of Gate 100 and of Bench 1011 in the central road (S104), and the building of north-south Wall 1036 (above W1053). This surface sealed against Walls 1505 and W1511, but ran over the courtyard benches.

Phase 4: The highest courtyard surface found was A7:13, sealing against the west wall (W1036) of Temple 149 and against the threshold and staircase of the gate, and of course against Walls 1505 and W1511.

The building of Temple 149 and Alleyway 109 (Daviau and Steiner 2000: fig. 2) in the third phase caused a major refurbishing of Courtyard 150 as well, with a raising of the threshold in the gate, the disappearance of the benches against Walls 1511 and 1505, and the building of a new staircase with a new bench against it.

Building 130 (Fig. 6)

Work started under the temple by digging through Floor A17:80 and the construction surface (A17:82) below it. The remains of earlier walls and surfaces of Building 130 were then exposed in the northern half of Square A17. Here several sub-phases could be discerned as well.

- 1) Above the bedrock and subsurface levelling, the earliest surface consists of a beaten earth floor (A17:111) that seals against north Wall 1056 (under staircase Wall 1032) and against inner Casemate Wall 2002¹¹. East-west Wall W1054 was built on top of Surface A17:111 separating the area into two "rooms". In the centre of the northern room there was a stone working platform (A17:124) and a clay bread oven (A17:116). On the east, a stone-lined bin (A17:121) was built up against the casemate wall, while Surface A17:111 extended west into Courtyard 150 (as Surface A7:38). Above this floor (A17:111), there was a superimposed beaten earth surface (A17:108) which was subsequently covered by a fill layer (A17:103).
- 2) Fill A17:103 is a layer of brown pebbly earth on which two north-south walls were built, west Wall 1053 and central Wall 1055, which divided the northern area into two rooms (R111, R112); southern Wall 1054 re-

mained in use. Above the fill layer, a beaten earth surface (A17:103+105) was laid, that sealed against all walls, including northern wall (W1056). On top of Surface A17:103, a new surface was laid on both sides of Wall A17:86: A17:84 and 88/100.

- 3) The walls of the second phase were levelled and only one course of both Walls 1055 and W1053 remained. A new surface of beaten earth (A17:82) was then laid, sealing up against the casemate wall and against north Wall 1056. This layer was used as a construction surface for the building of Temple 149. The north wall of the temple (W1033) and the pillars were built on this surface, as was western Wall 1036 (above W1053). The southern temple wall (W1035) seems to have been already in existence as part of Building 140 and was re-used for the temple building.
- 4) Phase 4 represents the use phase of Temple 149 and of Alleyway 109, giving access into the north room (R110) of the temple. Over time, a series of superimposed surfaces built up in Alleyway 109, with the result that there were two stairs leading down into Temple 149. Alongside north Wall 1032 there is a 20.0cm wide strip of loose earth with a limestone water channel (A17:33) embedded in it to collect water from above, possibly from the roof of the staircase at the south side of the gate. This drain directed this water westwards, possibly into the drain through the gate.

Building 140 (Fig. 6)

In 2001 and 2004, the area south of Temple 149 and Courtyard 150 was intensively investigated and a complete building (B140) was exposed; only the plan of the final phase has been retrieved. This plan revealed a building measuring 10.00 x 6.50m, with floors of beaten earth. It was entered from Courtyard 150 through an L-shaped stone ramp. This ramp overcomes the difference in height between the level of the uppermost surface in the courtyard and the floor in Corridor 113 (**Fig. 7**), which provides access to two large rooms (R114, R115) on the north, and a series of smaller rooms on the south. These an-

11. A doorway between Wall 1056 and the casemate wall led into Alleyway S107 which gave access to Case-

mate Room 106. However, this doorway was already blocked in this phase.

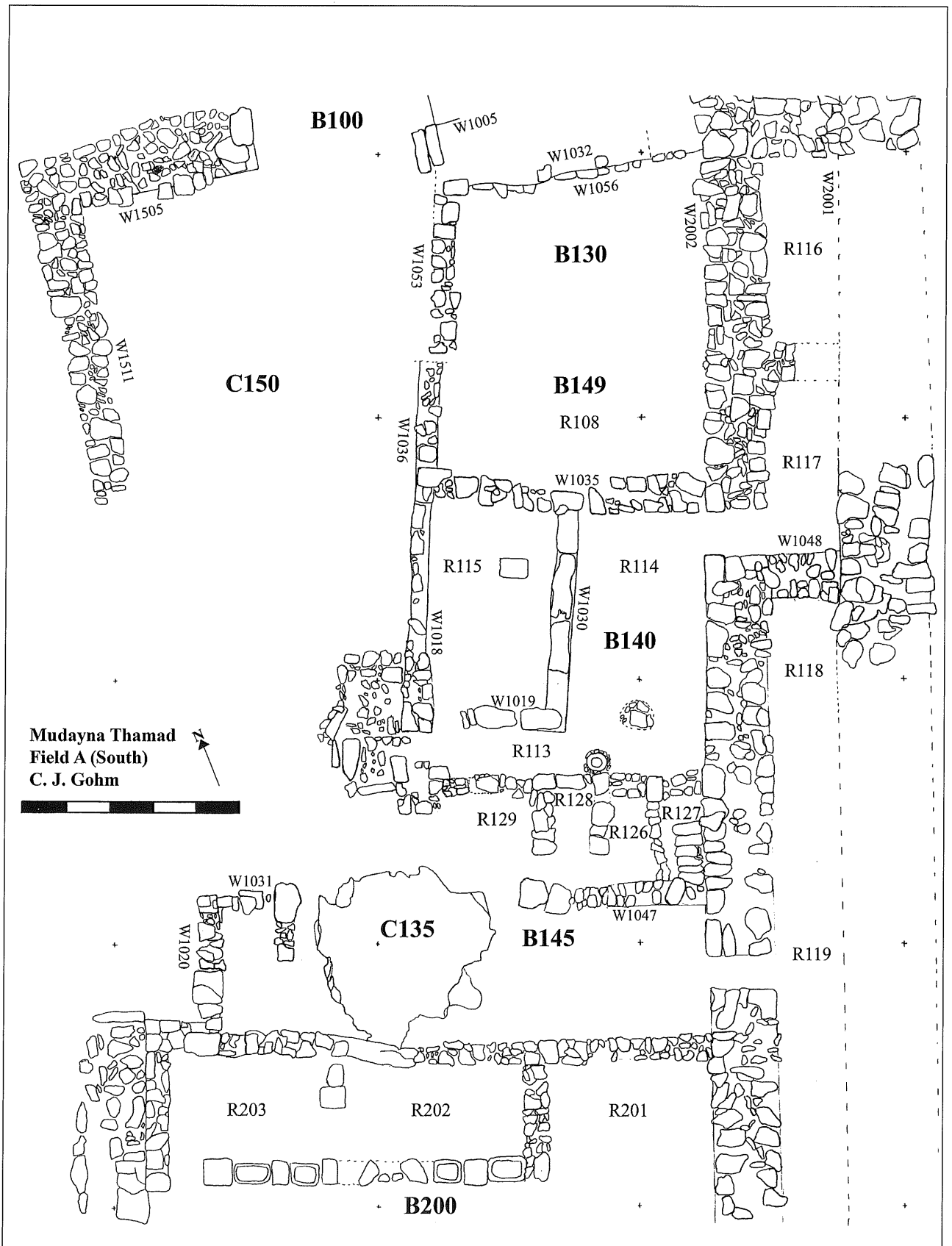


Fig. 6. Plan of Field A-south, showing Courtyard 150 and the area (B130) below Temple 149. Buildings B140 and Cistern 135 are to the south.



7. Field A-South, Building 140, Corridor 113 with boulder mortar; Storage Bin R128 to right of mortar.

nexes on the south side include Staircase R127 leading up to an upper storey or the roof, and a small Room (R126) leading to a large stone bin (R128). Thus Corridor 113 led into every part of the building as well as into Casemate room R118. Only storage bin R128 could not be reached from Corridor 113. The eastern end of Corridor 113 is actually part of Room 114. On the uppermost floor was a stone working platform (A19:54) and a large limestone mortar (A19:52), embedded in the floor.

Room 114: Room 114 was excavated down to its lowest floors and two probes were made alongside the walls to check the underlying debris layers. From R114 one could enter the hallway R113, the western room of building R115 and, at the north end, Casemate Room R117. The lowest surface (A18:51 /A19:64) consisted of an extremely hard lime plaster surface. No pottery was found on this surface and it seems to have been kept very clean. Several successive floor layers yielded some animal bones and pottery, but there was no mendable pottery. The uppermost floor (A18:40) extended into hallway R113. A small square working platform (A18:47) of flat stones was embedded in the floor and a reused saddle quern had been placed on its side to serve as a wind-break for a hearth. Up against the casemate wall were two bread ovens; the clay liner, (A18:34) of the larger oven (**Fig. 8**) was footed on a foundation of small cobbles. The smaller



8. Clay oven (A18:38) in place against the inner Casemate Wall in room 114.

oven to the south (A18:41) had a reused pot as its liner, which was placed directly on the floor.

Room 115: Room 115 measures ca. 5.00 x 2.50m; its west wall (W1036) was 0.70m thick and bonded with Wall 1035, the southern wall of Temple 149. The eastern wall (W1030) consists of four pillars topped with large lintel stones. In between the northernmost pillars were three linking walls. A 1.50m wide doorway south of the third pillar led into Room 114. A small doorway (0.60m) opens into corridor 113.

Several objects were recovered in this room, including a nearly complete ceramic lamp, a stone pestle, an iron blade, iron arrow heads and several basalt grinders. The latest surface yielded sherds of several large storage jars. This room seem to have been used for storage, at least in the latest phase.

Casemate Rooms: On the east side of Buildings 130 and B140, three casemate rooms were excavated in part. Room 117 was accessible from Room 114 through doorway A28:26. Room 118 on the south had two surfaces of hard packed soil with plaster inclusions footed on a fill of cobbles and boulders. The uppermost surface (A28:12) was heavily burnt with ash and charcoal. Finds include predominantly storejars and jugs, smashed *in situ*.

Field B (Michael Weigl)

Excavation in Field B during 2001, 2004 and 2005¹² uncovered an extensive complex of pil-

12. Margreet Steiner was Field Supervisor in 2001. Square Supervisors were Colin Cadieux (2005), Margaret Cohen (2001), Carmen Dalhke (2005), Dominik Elkow-

itz (2004), Rainer Feldbacher (2005), Kate Johnston (2004, 2005), David Kapala (2004), Heather-Jane Maurice (2001, 2004, 2005), Julie Witmer (2005).

lared buildings (B200, B205) located south of Building B140. Both buildings are oriented east to west and abut the western face of Inner Casemate Wall 2002 on the east. The following description will first discuss the general architectural layout of each building, and then give a more detailed description of individual rooms, starting with the central roadway (S220).

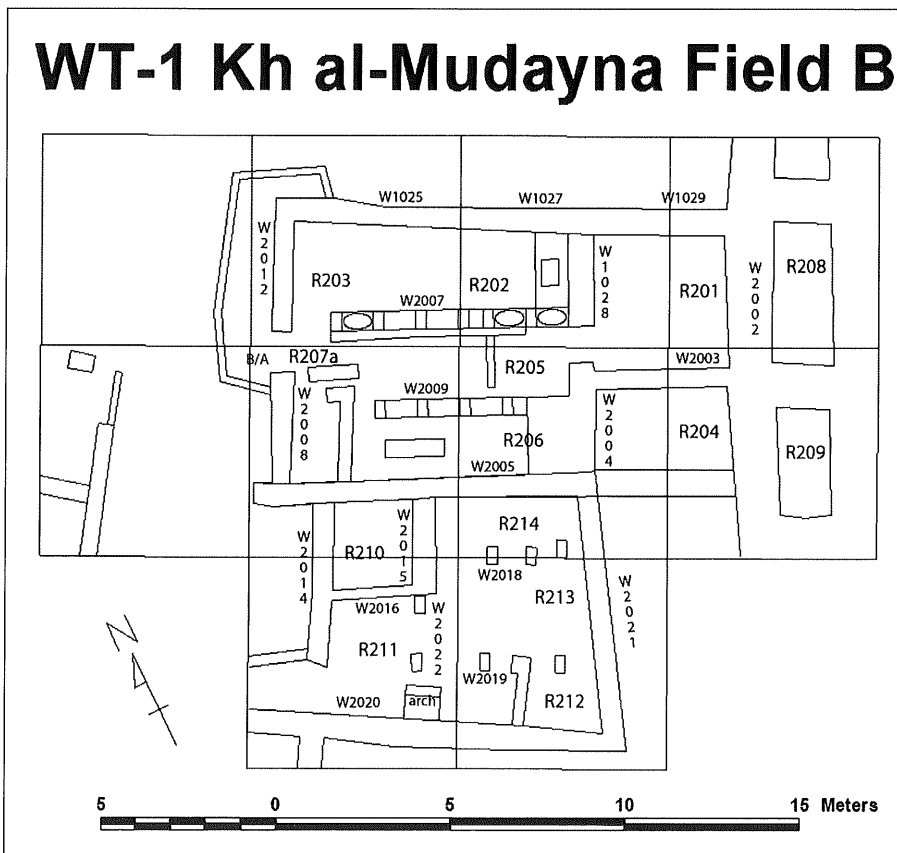
The Central Roadway (S220): To the west of B200 is the central road (S220) which runs from north to south through the centre of the site. The surface of the roadway (D91:6) represents the latest layer of occupation and has been exposed for a length of 12.0m; the road is ca. 4.50m wide. The southern half of this surface consists of beaten earth, pebbles, cobbles and some small to medium boulders embedded in the surface. The deposition immediately above the road consists mostly of rubbly and ashy soil with large concentrations of pottery, animal bones, iron

fragments, and grinding stones. Above it was a substantial layer of rock tumble (cobbles as well as medium to large boulders), most likely collapsed debris originating from the west walls of B200 and B250; within this debris layer was a limestone altar (MT 1333-7/6).

A stone-lined ramp extends south along the east side of the road and seals against the west face of B200¹³. At the north end of the ramp is a large threshold stone, serving as a barrier to water or sewage flowing down the stairs of the ramp, since at this point, the road runs at a much higher level than the south end, where the ramp turns east through Doorway B/A. This doorway opens into a small vestibule (R207a) between Rooms 203 and R207.

Building 200 (Fig. 9)

Building 200 was a rectangular structure measuring ca. 7.40 x 12.5m. The north wall (W1025, W1027, W1029) is partially destroyed while the



9. Plan of Building 200 and Building 205.

13. On its western side, the roadway seals against a north-south wall, consisting of two rows of medium boulders that were visible above topsoil. On its northern edge, an upright stone and a large flat-lying boulder

that may have functioned as a threshold stone mark the entrance to another building west of the road (B250).

south wall (2005), shared with Building 205, remains standing 2.30-3.31m high. This major boulder-and-chink wall is only one or two rows thick (ca. 0.65m). The central space consists of three rooms (R202, R205, R206) divided by two parallel rows of limestone pillars and rectangular basins (previously described in Daviau and Dion 2002: 32, 35). The northern row (W2007) is built on a plastered bedrock bench, whereas the southern row (W2009) is footed directly on bedrock; other surfaces were covered with beaten earth. The plan of Building 200 includes a small square room on either side of the central vestibule (R207, R203), three parallel rooms divided by two rows of pillars and limestone basins (R202, R205, R206), and two square rooms (R201, north and R204, south) built up against the inner casemate wall.

North Rooms 201 and R202: The walls of Rooms 201 and R202 are footed on bedrock which has been sculpted in Room 201 to form both the floor and a bench. Items in use in this room include pottery (a cup with textile fragments, storage jars and juglets, grinding stones, stone tools, a low work-table, loom weights and pieces of red mineral. In Room 202, a stone working platform, and a group of stone tools, an oversize basalt grinding quern (MT 160-1/160) and a loaf-shaped millstone (MT 155-1/155) suggest industrial activity, rather than a typical domestic assemblage. Artefacts associated with this platform include loom weights and hand grinders (MT 54-1/54), a rectangular mortar (MT 104-1/104), and a limestone roof roller (MT 105-1/105). Fragments of two limestone basins fallen from Wall 2007 were on top of this equipment.

Room 206: The central room on the south was entered from R205 through Vestibule 207a. The deposition above the floor consisted of a thick ash and charcoal layer mixed with burnt ceiling material. It included debris originating from the final occupation and destruction of B200. A total of 35 loom weights, a spindle whorl, broken pottery and animal bones were recovered from this layer. A burnt beam embedded in the debris along with a considerable amount of charcoal may represent the remains of a loom. Above this burnt material, a layer of hard packed ceil-

ing or floor/roof plaster, as well as reddish brick fragments and mortar, indicates the collapse of a second storey floor. This debris contained another 26 loom weights as well as a carved ivory spindle fragment, a stone pounder, utilitarian pottery and fragments of red mineral.

The Eastern Rooms (R201 and R204): Both Rooms 201 and R204 are square rooms built up against the inner casemate wall (W2002). The party wall (W2003) between them was of poor construction and was covered with a layer of lime plaster that bore the marks of intense burning. This stain marked the place where the upper storey burned and collapsed from north to south.

The living surface of R201 was founded on bedrock which drops off sharply to the east and is partially covered with plaster and hard packed soil. Astragali (talis bones of sheep/goat), some pottery, a large limestone stopper, seven loom weights, and a piece of uncharred wood are among the artefacts associated with this floor. The deposition immediately above this living surface consists of: wooden beams and large chunks of ceiling plaster, as well as objects in daily use; a large amount of pottery, pieces of red mineral, textile fragments, more astragali, a pestle, two grinders, eight loom weights, a scale weight, and a large limestone basin fragment. Given the amount of charcoal, wooden beams, loom weights and textile fragments, it seems plausible to suggest the existence of a loom in this room.

There was clearly a second storey room that also appears to have been a work area. Its destruction debris accumulated in a second debris layer and contained thick (15.0-20.0cm) chunks of ceiling material with reed impressions, brick material, a large quantity of charcoal, and burned wooden furniture with bronze fittings. Pottery (especially a pithos and a large ceramic basin), a low stone table, some loom weights, fragments of a woven reed mat and of textiles, metal objects (bronze pins, furniture fittings, iron hooks and rods), a large perforated bone, chert pounders, basalt hand grinders and querns, and pieces of red mineral were also present. A mixture of wall tumble, particularly of very large boulders fallen from Inner Casemate Wall 2002 and boulders fallen from W2003 covered this layer of

deposition.

R204: At the time of its construction and use, R204 was connected to Room 201 by Doorway D in the northwest corner. The entrance itself is of bedrock which had been worked in order to create a step up from R204. The floor/living surface of R 204 is made of a very hard beaten earth surface, as well as larger, flat lying stones above bedrock. All four walls were footed on bedrock that slopes downwards from the walls toward the floor. The amount of bedrock exposed in the western half of the room and the obvious chisel marks indicate that the bedrock sloped was very irregular and had been worked to form the floor.

The objects had were above this living surface contained pottery, including some intact vessels standing on the floor itself, textile fragments, chert pounders, a spindle whorl, a mortar and stopper, and a basin fragment. On top of this debris layer, the collapse of a second storey was deposited, containing ceiling material, white plaster and limestone chips. The roof plaster itself was approximately 15.0-20.0cm thick. It had a flat surface and a very crude and pebbly underside. Undoubtedly, it once formed the floor of a second storey room. Most importantly, there was a large wooden beam (1.80m long) and a section of floor plaster (50x13x3cm), both fallen in a north-south direction in the west half of the room along with an almost complete vessel. Lumps of very hard reddish-brown clay with impressions of oleander(?) wood as well as charcoal deposits indicate that the upper storey was burned in a conflagration. Artefacts in the collapse include two stone work tables, one richly decorated on all sides, a jar stopper, and a basalt hand grinder.

Casemate Room R208 Excavation of Casemate Room R208 resulted in a better understanding of the fortification system and its relation to Building 200. The outer casemate wall (W2001), composed of 4-5 rows of very large boulders (ca. 2.50m thick), and the inner casemate wall (W2002) 2-3 rows of large boulders (ca. 1.50m thick), enclose Room 208. Two parallel east-west walls (W2011, north, W2010,

south), each 1.30-1.60m thick form a room ca. 4.00m long and 1.70m wide. All inner faces of these walls (except for W2001) were covered with plaster¹⁴. The same pattern of collapse seen inside building 200 was also encountered in Casemate Room 208.

Building 205 (Fig. 9)

To the south of B200, a sister building (B205) was almost completely excavated as during the 2004 and 2005 seasons. Only the eastern rooms along the casemate wall and the west association Roadway S220 remain to be determined in future seasons. Building 205 was oriented west-to-east and shared party Wall 2005 with Building 200. The state of degradation of W2005 made it impossible to determine the exact number of rows of the uppermost courses.

The southern wall (W2020) of Building 205 that runs almost parallel to W2005 was partially defined along its northern face. The same is true of the easternmost wall (W2021); only its western face has been exposed. The floor level of Building 205 is higher than that of Building 200, but so far, there is no compelling evidence for the existence of a second storey. A doorway in the southwest corner is at the top of a flight of steps leading from the floor of Room 211 to the street. Although not completely exposed, the building plan consists of rooms separated by pilared walls in a slightly different arrangement from Building 200.

Room 211: Rectangular Room 211 in the southwest corner has a floor composed of flat-lying stones and beaten earth, joined together in some places by plaster. The preserved part of the floor was covered with ash pockets, containing a large quantity of bones, burnt stones and some pottery. Two door sockets (MT1239, MT1242), a basalt millstone (MT1251) and a large spherical stone bowl (MT1205) were on the floor. In the compact soil above the floor, pottery was frequent and artefacts included a zoomorphic ceramic figurine (MT1114), a limestone spindle whorl (MT1148), two basalt grinders (MT1149, MT1175), a millstone (MT1250), a limestone basin (MT1207) and a number of loom weights.

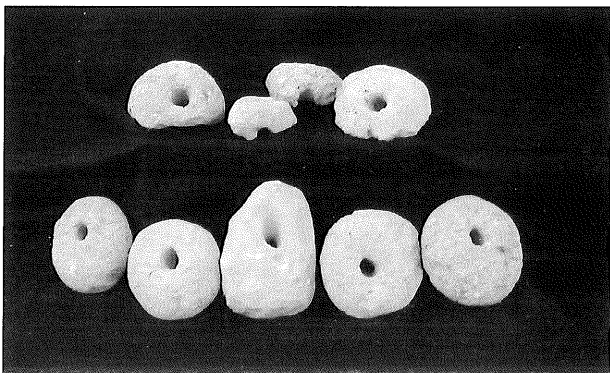
14. Although the construction phases have not yet been clarified, there was a single doorway (0.65m wide)

through Inner Casemate Wall 2002 that was intentionally blocked at some time during occupation.

In the eastern part of R211 the debris of the first deposition was sealed by a large chunk of extremely firm and dry intact ceiling/roof plaster, measuring 1.78 x 1.27m and 0.16-0.20m thick. The rest of the room was filled with several large stone slabs that obviously broke through the ceiling/roof when it collapsed. The debris that accumulated on top of the plaster ceiling was a mix of soil, burnt mudbrick fragments and rock-fall. Most importantly, an assemblage of more than 40 loom weights was recovered (**Fig. 10**) indicating the production of textiles on the roof or in an upper storey room.

The eastern limit of R211 is a north-south wall (W2022) which contained a limestone pillar topped by a large square boulder (B2:22). To the south of Wall 2022, an intact arched doorway, formed of limestone and chert boulders, and a corbelled lintel stone, connected Rooms 211 and R212 (**Fig. 11**). Although the arch was intact, the large upper lintel (1.25 x 0.37 x 0.22m) had fallen onto the floor.

Room 210: A small, almost square room (R210; 2.46 x 2.33m) located North of Room 211, most probably served as an area for storage. The living surface was a beaten earth floor, covered with some small ash deposits. Some objects were associated with this floor (pounders, a polishing stone and an iron arrowhead), as well as an assemblage of very large vessels (pithoi and kraters). When the building collapsed, the floor of Room 210 was covered with a thick layer of debris that contained significant amounts of broken pottery (large vessels) and 5 iron arrowheads with bent points. In a second layer of



10. Loom weights from R211.

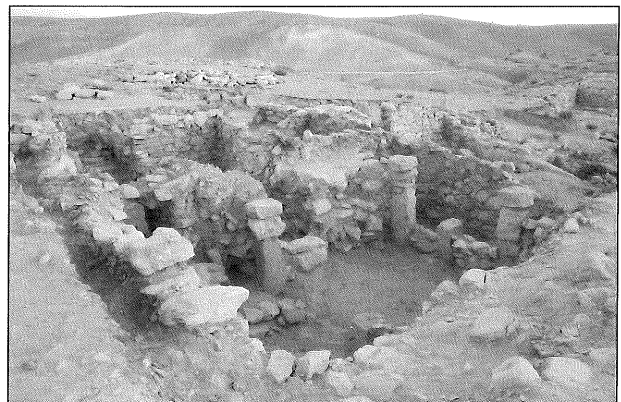


11. Field B, Pillared Building 205, looking east, with arched doorway on the right, attached to W2022.

debris on top of the ceiling/roof collapse, there was another stone work table along with more iron arrowheads¹⁵.

Rooms 214, R213, R212: In the centre of Building 205, three parallel rooms are divided from each other by two rows of pillars (**Fig. 12**). At its western and eastern ends, the northern row (W2018) consists of two intact pillars with square boulders on top of each pillar; the middle pillar collapsed into R213 in the final destruction. Four low linking walls connected these pillars. The southern row (W2019) is made up of three more pillars with their top boulders in place, as well as a fourth pillar embedded between the doorways leading to Room 211. Boulder-and-chink Wall 2020 is the southern wall of the building.

A sub-floor was the foundation of both the walls and floors of Rooms 214 and R213. In



12. Building 205, looking west into Room 213, with pillared walls.

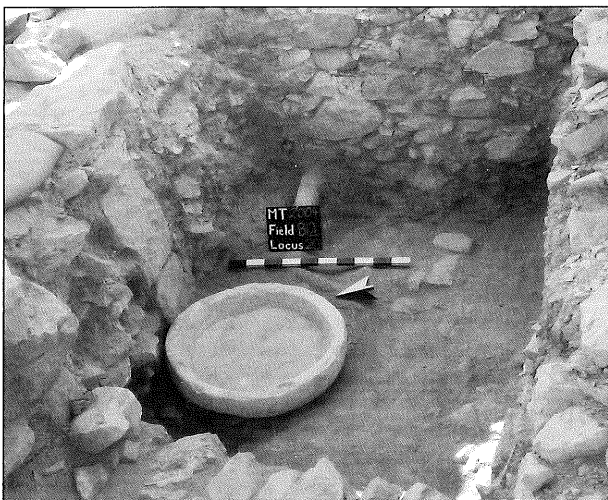
15. To the west of R210, a very large chunk of thick, multi-layered roof or ceiling plaster (1.20 x 0.90m) with a smooth surface and a layer of crude clay mate-

rial with pebble inclusions on its underside was sitting on top of all depositional layers at ground level. Outside of Room 210, was (missing text).

central Room 213, two tabun-shaped clay ovens were built above the sub-flooring. The eastern oven (B12:47) was probably built first. It was footed on a layer of cobbles and surrounded by two layers of plaster. The oven to the west (B12:38) was also footed on cobbles, and its side walls were covered with a layer of plaster. The principal floor (B12:38) with which both ovens were associated, was built up in stages. As it became too ashy, clean soil was applied to flatten and clean it. This accounts for several stratified thin layers in the floor material¹⁶. At the same time, ash residue was building up inside the ovens.

Debris inside the room included collapsed roof/ceiling material, pottery (mostly storejars broken *in situ*; 615 sherds), ash pockets, burned wood, charcoal and some unburned wood, one bead (MT1434), 2 grinders (MT1435, MT1496), one stopper (MT1472) and two lintel stones. Several layers of collapsed debris contained lintel stones, pounders, grinders and querns, stoppers, polishing stones and sling stones, along with some bronze, an iron arrowhead, a ceramic figurine some jewellery (beads and a pendent) and a shell.

Southern Room 212 was entered through the corbelled doorway and was divided into two parts by a north-south line of stones held together by mortar and faced with plaster. The floor of Room 212 is a cobblestone pavement. At the eastern limit of the room (Fig. 13), an rectan-



13. Room 212 with Basin MT 1025

gular installation composed of limestone and compacted earth abuts W2021. It was covered with dry and crumbly mud plaster. Probably the installation served as a kind of bin. The easternmost pillar was associated with a large shallow circular limestone basin (MT 1025; diameter, 0.90m; height, ca. 0.20m). Around the basin were basalt hand grinders, a millstone (MT1113), and chert pounders. These objects are of an industrial nature, probably related to the loom weights and the production and processing of textiles. The pattern of destruction in all of these rooms is comparable to that seen in Room 211 and in Building 200. So too, the ceramic repertoire of the two buildings is homogeneous (Fig. 14).

Field E Excavations (Annlee Dolan)

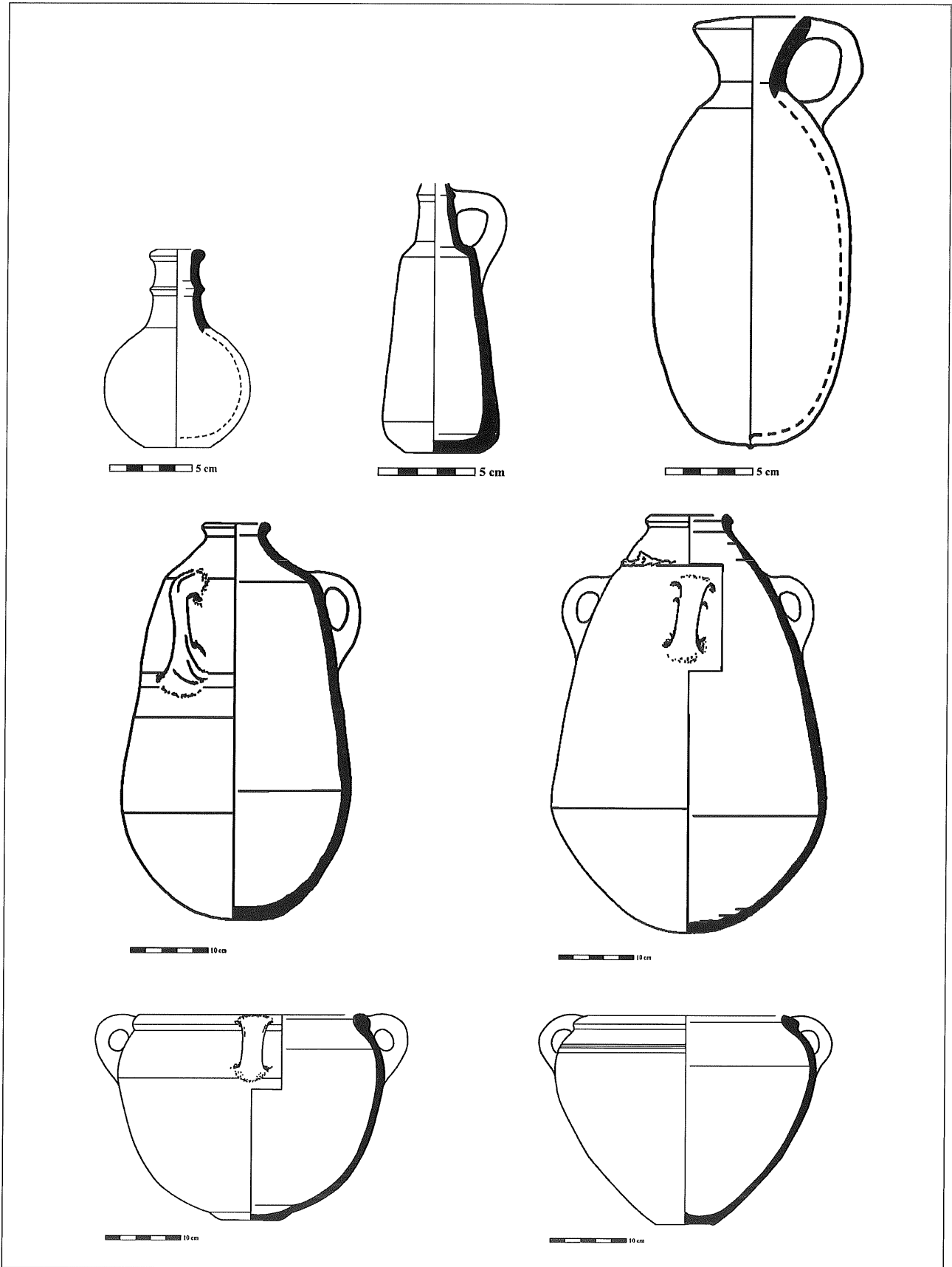
Field E is located at the south end of Khirbat al-Mudayna inside the line of the casemate wall system. Excavations began in five squares in Field E and Field F (E79, E80, F71, F72 and F73) in 2001 when a 2.00m wide trench was cut from the top of the site down to the surrounding moat. This limited probe revealed a casemate room and a structure built up against the fortification system, indicating the need to continue excavations in Field E¹⁷.

In the 2004 season, five 6.00 x 6.00m squares (E79, E80, E89, E99, G9) were opened; three squares ran east from the 2001 trench and revealed the continuation of the casemate fortification system along the south end of the site. As well, several rooms of Building 400 were opened although the full extent of the structure has not been fully delineated. Also at this time, a clearing operation in Field H (Fig. 15); was carried out along the southern (outer) face of the outer casemate wall (W2001).

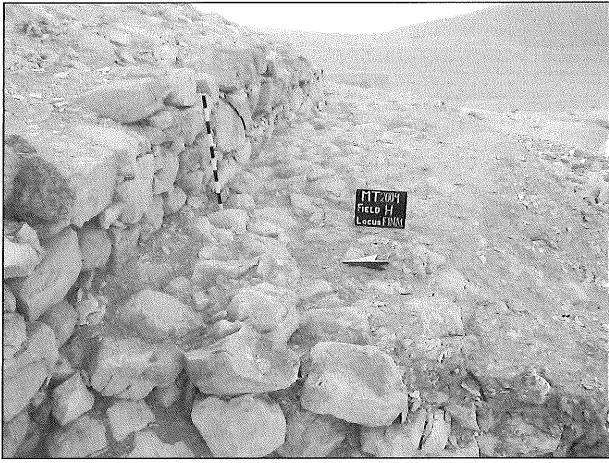
Although it is evident that there are several phases to the occupation in this area, this phasing was unclear in the 2004 season and further excavation was needed to clarify them. The major walls, initially excavated in the 2001 or 2004 season, were further exposed in 2005 and one new square (E78) was opened to the north. It is now possible to distinguish two main field phases, the first of which can be further divided into three sub-stages.

16. The same sequence was seen in Gate Room 153 where ash built up against two ovens.
17. Andrew Graham was Field Supervisor in 2004;

Square Supervisors were Melodee Dagenais (2004), Amanda DiLoreto (2004, 2005), Robert Stark (2005), Susan Tector (2004).



14. Pottery from Building 200; 1-2, juglets; 3, jug; 4, three-handled storejar; 5, four-handled storejar; 6-7, kraters.

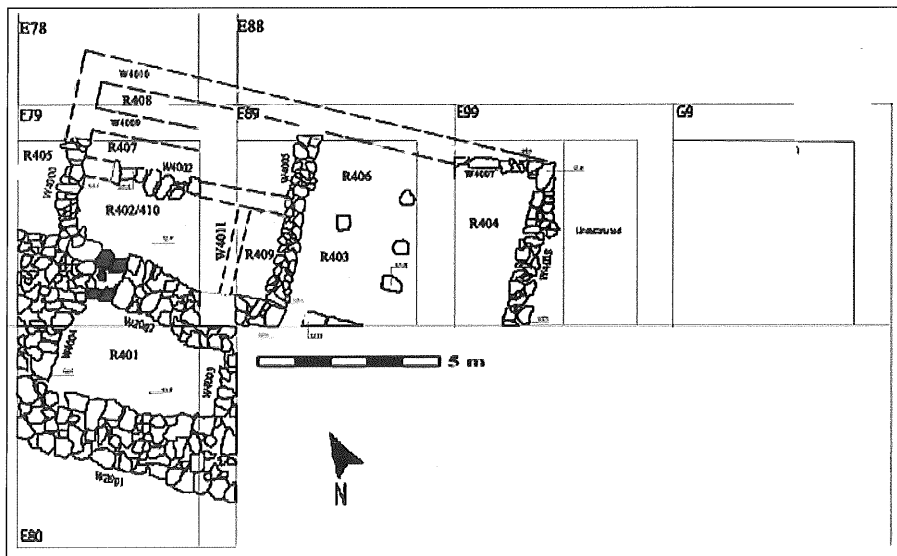


15. Outer Wall 2001 at south end of site (Fields F–H).

Field Phase 2c (Fig. 16): Construction began in Field E with the erection of the casemate walls, whose dimensions are consistent with those on the east side of the site; the inner casemate wall (W2002) measures ca. 1.50m thick and the outer casemate wall averages 2.20m (W2001). Two cross walls (W4003, W4004) form a trapezoidal casemate room (R401), which measures ca. 4.50m in length and ranges in width from 1.80-2.80m, due to the contours of the site, the edge of which turns sharply north (west of Square E80). Casemate Room 401 could only be entered from the north and was not linked to rooms on the east or west. Both cross-walls (W4003, W4004) are constructed of semi-hewn limestone boulders and cobbles, with an average

thickness of 2.00m.

Field Phase 2b: Following the construction of the casemate system, Building 400 was built; using the inner casemate (W2001) as its southern wall, with Wall 4001 forming its western extent and W4008 its eastern perimeter. The building is bisected in the middle by W4005, and all three of these north-south walls are ca. 0.65-0.70m thick and abut the inner casemate wall. Both W4008 and W4005 are boulder-and-chink construction and ca. 5.50m long, whereas W4001 is only 5.00m long and has two large stacked stone pillars (E79:18, E79:21; the latter is also integrated into W4002); between the pillars are low, boulder-and-chink linking walls (E79:34, 35)¹⁸. The earliest surface (E79:33) uncovered in Room 402 seals against the linking walls between the pillars making it clear that west Wall 4001 was constructed as a unit, instead of being blocked up at a later time (Fig. 17). This construction technique is also evident at Tall Jāwā, Tall al-‘Umayri, Saḥāb and Hazor, and functioned to make walls more secure (Daviau 1999:118–121). The north wall of Room 402 is an east-west line of four pillars (E79:11, 12, 20, 21=W4002) capped by a row of lintels (E79:10), and footed on a line of foundation stones (E79:36). Here too, there was a low partition wall (E79:40; maximum height of 0.40m) between pillars E79:11 and E79:21. Wall 4002



16. Plan of Building 400 in Fields E and G, with Pillared Room 402 and Casemate Room 401.

18. The full extent of Building 400 on the west is not yet known. However, it is unlikely that W4001 was in

fact the outer wall given its style of construction.



17. View of Room 402, looking northwest.

separates Room 402 from Rooms 407 and R408 to the north.

The northern wall of B400 (W4007+W4010) has a total length of 13.10m, bonding with W4008 and W4001. This boulder-and-chink wall is ca. 0.70m thick and serves as the north wall of R408. Based on what is currently known, the dimensions of Building 400 are approximately 13.50 x 5.0-5.5m.

Excavations in the 2005 season confirmed the presence of a second storey in Building 400, with intact wooden beams recovered west of W4001 and on the floor in Room 405. On the last day of excavation in E78, the discovery of a staircase ascending to the south provided additional evidence.

Excavation in 2004 and 2005 revealed six superimposed surfaces in R402; these surfaces were also located in R409 (east of partition Wall 4011). It is suggested here that the "upper" surfaces (E79:60, E79:63, 64, 67) may represent collapsed debris from second-storey Room 410, above R402. Excavations east of W4005 in Room 403 also revealed a series of superimposed surfaces, although these were at a greater absolute depth than in E79. However, the remains in Room 403 have a different depositional history than Room 402, with nearly 2.00m of collapsed limestone debris and nari. It is likely that when Building 400 was destroyed, many of the walls tumbled into Rooms 403 and R406, and in so doing may have compacted the existing surfaces. Alternatively, a second storey may not have existed in the rooms east of W4005.

Installations which were associated with this phase include a rectangular limestone ba-

sin (E89:20) situated between pillar E89:17 and W4005 and a plaster installation (E89:36) ovoid in shape suggesting domestic use.

The finds associated with the surfaces of Building 400 suggest a domestic, with textile production likely taking place here as well. Artefacts recovered west of Wall 4005 include a copper earring, a cowrie shell, a seal, a bead, a perforated shell pendant, a stone vessel, an animal figurine, 6 pounders, a limestone tool, 16 loom weights, 2 spindle whorls, 6 grinders, 7 millstones, a stone weight, a limestone basin fragment, 11 basalt tools, a polishing stone, 3 saddle querns and 4 mortar fragments. In Room 403, there were 8 grinder fragments, 3 stone weights, a scarab in a gold setting (see below, Z. McQuinn), a stone vessel, ceramic legs of a figurine, 5 mortar fragments, 3 pieces of worked bone, a limestone basin fragment, 6 millstone fragments, 9 pounders, an iron point, 3 spindle whorls, a stone pestle, an iron sickle blade, a wooden spool, an animal figurine fragment, a lamp fragment, a stopper, a spatula and a loom weight.

Field Phase 2a

There is also evidence for another phase of occupation in Building 400. North-south partition Wall 4011 was a later addition, running between W4002 and the inner casemate wall (W2002). It is ca. 2.50m long with a width of 0.35-0.54m. This wall, with W4005 on the east, forms Room 409 to which there appears to be no entryway. Installation E79:65, which is a U-shaped stone structure 4-5 courses thick on its north side, abuts the east side of W4011. Within this installation is a limestone basin (E79:81) was positioned on its long side. There were 2 loom weights found inside the basin and two more in the soil surrounding it.

Field Phase 1

The latest phase in this Field is represented by the Medieval (?) burials which were located in E99 and G9 (see below, M. A. Judd).

Outer Casemate Clearing Operation: In 2004, a clearing operation took place along the outer face of Outer Casemate Wall 2001 in order to better understand the construction techniques which were employed in building the fortifica-

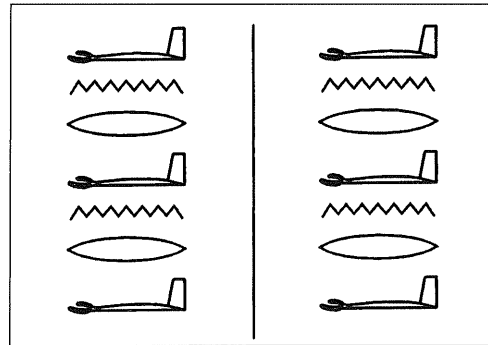
tion system¹⁹. Due to the curvilinear nature of the southern end of Khirbat al-Mudayna a revetment was necessary to support the fortifications. The clearing operations along the outer wall (extending west to east from E100/F91 through H1, H11/G20, up to H21/G30 and likely also into G29 and G39) revealed a tightly packed layer of cobbles, located at a consistent depth, sealing against the outer casemate wall (W2001). Apparently this rubble fill was placed against the outer casemate in order to maintain the structural integrity of the fortification system. That is, the curvilinear nature of the south end of the site would project outward pressure and this revetment would give extra support to the outer wall. No clearing occurred in the south-west sector of the site and it is unclear if the revetment continues in that area.

Although the results in Field E are still preliminary, it is clear that the monumental fortification system which has been uncovered in Field A on the north continues around the south end of the site. Future research will focus on extending this area northward and determining the relationship of Building 400 to the rest of the site.

What's a scarab like you doing in a place like this? An "Anra" Scarab in an Iron Age Context (Zoë McQuinn)

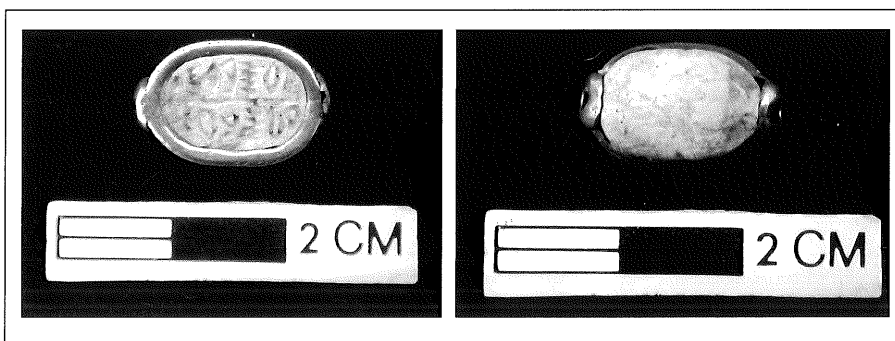
In 2004, during the sixth season of excavations at Khirbat al-Mudayna on the Wādi ath-Thamad, a scarab was discovered in Building 400, located at the south end of the Iron Age settlement. The oval-shaped scarab seal (MT 979-6/60; **Fig. 18**) is approximately 1.66cm in length, made of steatite and enclosed in a gold

setting for a metal ring. The back of the beetle scarab shows the head and clypeus clearly. A short, rounded notch on each side of the beetle demarks the point of division between prothorax and the wing-case. The base of the scarab is divided vertically by a single line and on each side of the division are identical hieroglyphs:



The three signs repeated in the inscription, a (D36), n (N35) and r (D21)²⁰, indicate that this seal belongs to a group collectively known as Anra scarabs, first identified by Weill (1918:193). The Khirbat al-Mudayna scarab is classified as an Anra scarab with a vertical bipartite division, Type C(i) according to Richards' typology²¹.

The nature and meaning of this combination of hieroglyphs (a, n, and r, which identifies and defines Anra scarabs) have been a subject of much debate. This three-hieroglyph combination has been interpreted in a number of ways: as the name of an unknown Hyksos Prince (Weill 1918: 193); in a variety of meanings associated with the god Re, including as an epithet *dw.n.ra* "gift of Re" (Petrie 1917: 46) and as a theophoric name *ra.n.ra* "Re gave" (Petrie 1925: 17; Rowe 1936: 327); as originating from the Neferzeichen patterns of the Middle King-



18. Scarab MT 979-6/60 from Room 403.

19. Excavation in Field E and the investigation of the Outer Wall in Field H was carried out under the direction of Andrew Graham.

20. Signs are identified according to Gardiner 1999.

21. For the full and comprehensive typology of Anra scarabs, see Richards 2001.

dom²² (Stock 1942: 24; Hornung and Staehelin 1976: 51); as the name of the Canaanite god, 'El (Pieper 1930: 190; Richards 2001: 150); and as being complete nonsense (Giveon 1985: 18). Though this issue is unresolved, the unique inscriptional patterns found on Anra scarabs are highly identifiable and thus their pattern of manufacture and use is well established. Anra scarabs first appeared in the 13th Dynasty (or possibly the late 12th Dynasty), but were in use primarily through the 15th Dynasty, until fading out in the early New Kingdom (Richards 2001: 33). This would suggest that our Anra scarab was manufactured in the Second Intermediate Period or Middle Bronze IIB/C.

The material and stylistic features of the Khirbat al-Mudayna scarab support this proposed date for its manufacture. Steatite was the most common material used in the manufacturing of scarabs from the 12th to the 20th Dynasties (Newberry 1908: 84; Haynes and Markowitz 1991: n.p.; Ben-Tor 1997: 165; Richards 2001: 6). Thus, it is not surprising that most Anra scarabs appear to be made of steatite²³. However, it is often difficult to perceive whether a scarab in its whole and glazed form is made of steatite or faience²⁴. Neutron diffraction, a new method of scientific analysis, has recently been tested and has successfully determined the composition of materials without destroying the objects (Richards 2001: Appendix A). The inscribed scarab features of the Khirbat al-Mudayna scarab also determine a relative date of manufacture. The scarab has a smooth stylized back with notched delineation of the prothorax and wing-case, which are stylistic traits found on scarabs dating predominately from the 15th to 17th Dynasties and correlate to the MB IIB/C period in the Levant (Newberry 1908: 72; Petrie 1917: 6-7; Niccacci 1980: 17).

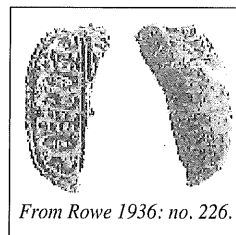
Anra scarabs are commonly associated with the Hyksos and are found in Syria, Palestine, Egypt and Nubia (Richards 2000: 11). It has been noted by Fiona Richards that of Anra scar-

abs found in an archaeological context 70 % were found in Palestine, while only 20 % were found in Egypt, with a further 8 % being found in Nubia and 2 % in Syria. The high distribution of scarabs found in Palestine seems to strongly suggest that these scarabs were manufactured locally (Richards 2001: 162; Ben-Tor 2004: 5). Of those scarabs found in Levantine contexts, 90 % of the sites lie either on the coast or on the inland trade routes of the MB IIB/C (Richards 2001: 117). Anra scarabs are found in a variety of different contexts at Levantine sites. Primarily found in MB II tomb deposits, Anra scarabs are associated with funerary practices and can be defined as having élite status (Richards 2001: 136).

Having thus quickly surveyed Anra scarabs in general and described the Khirbat al-Mudayna scarab, an immediate question springs to mind. Given that both the stylistic and inscription evidence point to a MB IIB/C date of manufacture for the Khirbat al-Mudayna scarab, what is an MB IIB/C scarab doing in an Iron Age context? No similar scarabs have been found in such a late context²⁵. A clue may lie in studying Middle Bronze examples of Anra scarabs found in proximity to Khirbat al-Mudayna.

There are three sites found in close proximity to Khirbat al-Mudayna where Anra scarabs have been found, namely the sites of Jericho, Pella and 'Amman. The site of Jericho is one of the few sites that provide any contextual evidence for the Anra scarab. Forty-three scarabs were found in tombs at Jericho and of these, twenty-two were found in secure archaeological contexts. (Garstang 1933; Kirkbride 1965: ??).

The closest parallel to our scarab is found at Jericho. Discovered by Garstang in Tomb 5, the right side of the scarab is damaged but the left side remains intact. The inscription is presented as the mirror image to the



22. *Neferzeichen* patterns were symmetrical designs that depicted correct hieroglyphic signs yet were nonsensical. Though *Neferzeichen* patterns are untranslatable, they seem to reflect royal power or blessing (Ben-Tor 1997: 168).

23. Scarabs were fired during the glazing process, converting the steatite into enstatite, a harder material (Richards 2001: 6).

24. Scarabs and amulets from sites in Palestine are usually white or buff, and nearly devoid of glaze, though the reason for this is unclear (Haynes and Markowitz 1991: n.p.).

25. The latest Anra scarabs found date to Dynasty 18 or Late Bronze contexts (Richards 2001:111), until the discovery of this scarab from Khirbat al-Mudayna.

Khirbat al-Mudayna scarab with the hieroglyphic signs a repeated twice, n twice and r twice. At the site of Pella, five Anra scarabs were found in MB II Tomb 62 (used consecutively for about 200 years; Richards 1992: 3-4). On the 'Amman Citadel, an MB tomb (partially disturbed in at least three later phases, including Iron Age II, Hellenistic, and Roman periods) contained one Anra scarab (Najjar 1991: 105).

A pattern emerges at these localities; tombs with Anra scarabs have been at least partially disturbed by successive phases. Given the elite status assigned to seals as both social emblems and status symbols (Richards 2001: 123), it seems most likely that either the scarab at Khirbat al-Mudayna was a prized heirloom that was misplaced or, after looking at the nature of the archaeological contexts of other Anra scarabs found in the area, the scarab was recovered from a MB II tomb and brought to the site as a treasure.

There are great difficulties involved in dating scarabs. As seen with the Anra scarab uncovered at Khirbat al-Mudayna, the date of deposit can post-date the date of manufacture. Due to the portable nature of and status assigned to scarab seals, it is not beyond the realm of possibilities that an MB IIB/C, Egyptian influenced but locally manufactured Anra scarab such as this would end up within an Iron Age context.

Fields L, P, R and W (Noor Mulder-Hijmans)

In the 2001, 2004 and 2005 seasons, work continued in the large Nabataean-early Roman reservoir, Building 700 (Daviau et al. 2000), located at the foot of the Iron Age mound, and traced a series of water management installations extending to the east in Fields P, R and W. Several features of the reservoir itself were investigated in detail, particularly the construction techniques under the floor, and the evidence for secondary use²⁶.

Field L (Reservoir 700) (Fig 19): In 2005, the remaining balk along the south wall was removed to more completely expose the face of South Wall 7005. Due to severe erosion along this wall, a stone cut channel (A34:13) plastered into the lower courses of the southeast corner could not be connected to a comparable section of channel located in the southwest corner where it was fitted into the top course of west Wall 7006 and south Wall 7005. The face of Wall 7005 was coated with lime plaster that continued below the level of the plastered floor surface. In the 2001 and 2004 seasons, a probe was made through the floor (L13:23) of the reservoir, beginning at Wall 7005 and extending north as far as Piers 8 and 9. Under the cement-like floor, three more sub floors (L13:24, 33 and 35) were found, consisting of stones and a very hard mortar in between the stones. The lowest



19. Reservoir 700 in Field L.

26. Square Supervisors were Sarah Bryant (2004), Kelly Glover (2004), Anna Labarius (2005), Travis March

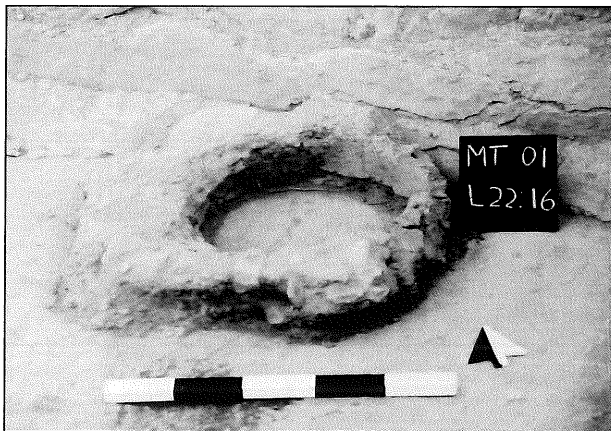
(2005), Michele Murray (2004), M. James Szudy (2004), Katrina Urban (2004).

sub floor rested on the virgin soil that consists of a very firm, brownish red coloured clay. The total depth of the three sub floors is ca. 0.60m. The lowest sub floor (L13:35) seals against three partly excavated foundation stones (L13:36) of Wall 7005.

The plaster of the uppermost floor sealed up against the four walls of the reservoir, at the point where a curb of plaster, containing small stones, sealed the join between the walls and the floor. The walls themselves were made watertight by three layers of hydraulic plaster, as hard as cement.

In the northeast corner of the reservoir and adjacent to the staircase, a large north-south balk was removed to better reveal the easternmost pier and expose additional evidence for the re-use of the building. Under the balk was a bread oven with an inside diameter of 0.30m, which had been constructed on top of a newly repaired plaster surface (Fig. 20). Only the ceramic liner of the base of the oven with some small stones packed onto the outside was still *in situ*. Roman style cooking pots and Nabataean painted potsherds were found around it, along with ash lenses that spread across the plaster floor.

In 2005, a second north-south balk still standing in the west part of the reservoir was excavated to provide a check on the phasing of the remains in the reservoir. The lowest layer excavated, directly on top of the plastered floor, consists of firm clayish soil (L12:4), containing some potsherds, mainly of Nabataean and early Roman date. The remains of two more bread ovens were found here. On the floor a tumble with collapsed architectural stones was excavated,



20. Base of clay oven (L22:16) footed on plaster surface in Reservoir 700.

revealing the pattern of destruction of the walls and piers of the reservoir.

It is clear now that the reservoir at Khirbat al-Mudayna has two phases of use. After it had gone out of use as a water reservoir, a new building was constructed, using the walls and floors of the reservoir. A row of ten piers, each about 0.65m apart, was constructed down the centre of the reservoir, on top of the floor of the reservoir, dividing the building into a south and a north half (Daviau, Mulder-Hymans and Foley 2000: fig. 4). These piers were built in header-stretcher technique and seem to be part of a large arch support system for a stone ceiling. The ceiling was further supported by pairs of opposing arches that extended from the central piers and rested on top of the perimeter walls. The piers were preserved 2-3 courses high, ca. 1.00m. No traces of plaster could be found on any of the piers, indicating that the building was no longer used as a reservoir. Between the piers low stone walls were erected, probably as an extra support for the piers to carry the heavy weight of the arches and the ceiling. The only opening between the piers was at the east side, where a staircase, excavated in 1996, descended. After repairing the plaster floor, the bread ovens were constructed and the building served a domestic purpose.

Field P: A probe, measuring 2.00 x 6.40m, was dug in 2001 in Squares P26-P27 to investigate a long stretch of wall line visible on the surface. This wall (W7025) runs from Site WT-4, Features A-C, toward Reservoir 700. The reason for opening this probe was to see how this wall was built, its width, depth of stone courses, and its structure, since the wall stretches through agricultural fields. The goal was 1) to be able to describe the full structure of the wall, and 2) to decide if it was contemporary with Reservoir 700, and 3) to describe the function of this feature in the landscape. The excavation was limited because the wall line (P26:2) was accompanied by a stone platform, and it was clear that additional excavation would be needed to understand these features.

The lowest loci were P26:7 and P26:4, which are located on either side of Wall 7025 (=P26:2). The wall was exposed for a length of 1.75m and a width of 0.80m. To date, three courses are preserved with a height of 0.80m. Wall 7025 consists

of 2 rows of limestone boulders with packed soil and cobble-size chinkstones. Soil layers P26:3, 5, 4 (on the south) and P26:6, 8, 7 (on the north) seal against the wall. Soil layers P26:4 and 7 are the soil in narrow trenches immediately against the south and north faces of the wall. For the most part, there are few stones and only 3 potsherds in these loci. Above P26:4 is a layer of chert fragments, cobblestone size, with patches of hard mortar in between the stones.

In order to better understand this wall and its relationship to Reservoir 700, excavations were undertaken in Squares L43–44, L53–54, and L64 and at the east end of the wall in Field R+W. Wall 7025 continued west from Field P into Field L where it was cut through its width by shallow drains and where it was associated with a series of parallel and perpendicular walls. The first of these walls is W7013, coming from the north-east side of the reservoir and extends east toward W7025. Wall 7013 is constructed of two rows of small boulders, cobbles and chinkstones; between the outer wall faces is a rubble fill. Along its length, W7013 is also cut perpendicularly by a drain (L53:4). Neither of these walls actually reached the east wall (W7004) of Reservoir 700, although they may have both served to channel water toward drain L33:20 through the wall.

At the opposite end of Wall 7025 is a small group of structures identified as Site WT-4, with three features (A-C). In 2004, excavation of the southernmost feature was undertaken (in Fields W and R). A single, two-room structure measures 10.50m long and 4.53m wide. The walls themselves vary in thickness from 0.70–0.90m. A north-south wall divided the structure into two discrete rooms with no entrance between them. Certain inner wall faces were coated with greyish coloured plaster, although it was only preserved on the lower courses of stone. Almost all these walls were in a bad state of preservation; many friable stones and large boulders had tumbled down alongside the walls as if an earthquake had shaken them. The principal function of this structure remains unclear, although it may have been used for water storage and/or as a water settling tank (Daviau and Foley 2007).

The Cemetery Survey: Excavation and Bioarchaeology (Margaret A. Judd)

The primary bioarchaeological goals for 2005 were to conduct a pedestrian survey along the sides of the Wādī ath-Thamad and its environs situated beside the Iron Age fortress of Khirbat al-Mudayna, record the tombs or cemeteries found, and assess the logistics of their excavation for the following year. If time permitted a sample burial excavation from each cemetery was conducted. Numerous new cemetery sites were located, but more significantly the mass looting of ancient as well as Islamic cemeteries was exposed. Other cemeteries and/or sites containing graves were discovered or revisited and recorded by the Survey Team directed by Jonathan Ferguson (see below). The funerary sites reported by the Survey Team included: WT-124, WT-127, and WT-128. With the exception of WT-17 (Khirbat al-Hiri), the new sites described below were recorded by the Bioarchaeology Team. GPS (WGS84) positions and elevations are stated when available and unless indicated otherwise, elevations listed were taken by GPS.

Cemeteries West of Khirbat al-Mudayna

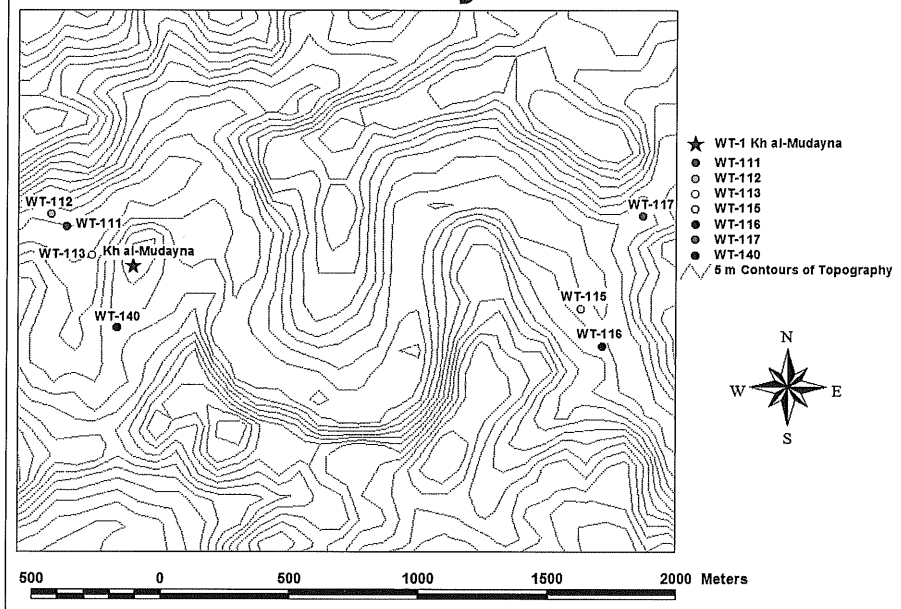
During the first week of the 2005 season, a walking survey²⁷ was conducted along the wadi that runs along the bottom of the western slope of Khirbat al-Mudayna and extends south towards an irrigated area. Three sites were identified as cemeteries due to the presence of linear and circular stone features typical of Levantine grave superstructures (Bloch-Smith 1992; Yassine 1984). Each cemetery was located at the most southerly tip of a 'finger' or 'bench' formed by erosion that projected into the wadi; ploughing had been avoided in these areas by the local people.

WT-III (UTM 775648 3498608, Elev. 593m) is located west of the wadi between the wadi 'low' road and 'middle' road, which extends into the irrigated fields about 300m southwest of Khirbat al-Mudayna (**Fig. 21**). The site is narrow and rectangular running about 50m north-south and 10m east-west. It is surrounded by plough zone in the west, north, and east borders while the south edge erodes into the wadi. At least 40

27. The bioarchaeology team included M. A. Judd, Mi-

chael Malloy, Melanie Grant and Khalid.

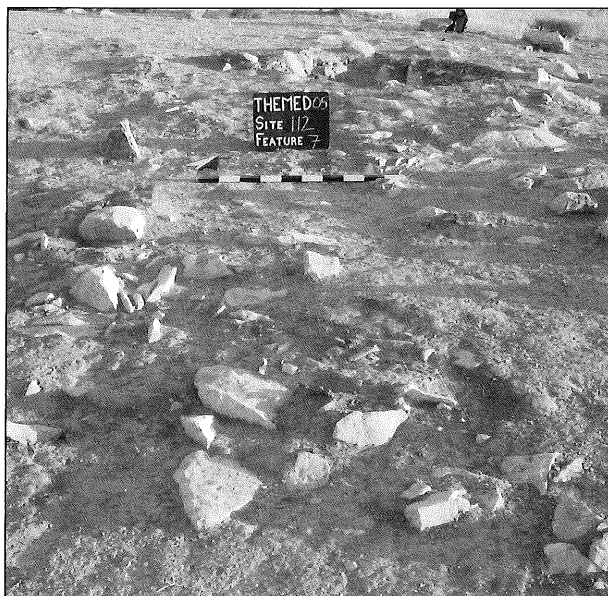
WT Cemetery Sites 2005



21. Map of cemeteries to the west and east of Mudayna.

graves of varying shapes and sizes were present. Some of the graves were marked by borders of medium sized stones, while others were in-filled with medium sized stones; large isolated square stones were also observed in this landscape. Two features were measured: Feature 1 (1.70m east-west, 2.20m NS, 160°) and Feature 2 (1.50m east-west, 2.00m NS, 180°). One feature was looted on the very south edge of the site, so that it was not immediately visible from the main section of the cemetery. A sequence of stones runs along the east side of one of the larger graves and may be the remnants of an early low wall that marked the limits of the cemetery. The survey produced two Roman period potsherds.

WT-112 (Elev. 601.56m from Total Station) is located approximately 400m from the southwest end of the Khirbat al-Mudayna and was selected for excavation. It was identified as a cemetery due to the circular and linear clusters of medium sized stones in addition to two robbed burial areas and three possible robbed graves (Fig. 22). The judgment of the grave robbers, however, was as misguided as was ours in our selection of 'burial' features for excavation. In Field A two undisturbed graves deemed not to be Islamic were excavated to depths of over 1.50m but produced no human remains, although there is a possibility that these empty tombs were cenotaphs. The skeletal remains of at least three indi-



22. Stone circles at WT-112.

viduals were recovered from the more southerly robbed area of Feature 1 in Field B. It is unknown whether these individuals were interred within the same grave or were interred originally in nearby robbed graves identified by depressions and associated spoil heaps overgrown with grasses. Future excavation of the area east and west of this feature would ascertain the presence of additional structures, while a deeper probe into the hillside may reveal earlier periods of use. A preliminary walking survey of this site, the excavation of two robbed features and the

excavation of two suspected burials produced numerous potsherds ranging from the Iron Age, Hellenistic, Roman and Byzantine periods.

WT-113 (UTM 775747 3498499; Elev. 597m) is situated south of three irrigated fields between the west side of the main tell and *WT-112* at the fork of the 'lower' wadi road. The site is triangular in shape with its western apex at the junction of the wadi roads and its base (12.00m) parallel to the tell where a local water collection point is located. Remnants of a stone wall or terrace run along the north border of this site for about 30m and may continue south of the road. The area north of this stone wall/terrace is ploughed land that runs to the wadi. The features on this site are delineated by medium sized stones forming round circles or rectangles. The site was divided into Field A (southeast) and Field B (northwest) and at least 10 probable burials were observed. Two features were selected for sample measurements: Feature 1 measuring 1.50m east-west x 1.25m north-south (220°) and Feature 2 was 2.40m east-west and 1.00m north-south (270°). None of the features were disturbed and no potsherds were recovered.

Cemeteries North and East of Khirbat al-Mudayna

A second pedestrian survey north-east of Khirbat al-Mudayna revealed isolated and clusters of suspected burial features.

WT-114 spans about 20.00m east-west and 10.00m north-south and lies northeast of Khirbat al-Mudayna. A freshly robbed grave (Feature 1) was situated right beside the road. Medium to large sized stones remained on its northern perimeter while the robber spoil and other structural stones were tossed to the south. Portions of the original cut were visible and it is possible that this was a shaft tomb. Feature 1 measured 1.50 north-south x 0.80m east-west and was oriented 180°. Only two potsherds were recovered from a quick investigation of the robber spoil heap. Feature 2 was a robbed round shaft measuring 0.75 north-south x 0.6 east-west and was cut into the bedrock. Bedrock features resembling *WT-140*, which revealed a burial when excavated, covered the 10.5m expanse between Feature 1 and Feature 2 to the north. Feature 3

was a chasm extending north into the bedrock. It was 7.80m west from Feature 2, aligned at 150° and measured 2.30 x 0.70m wide east-west. Disturbed fill was deposited on the north side of the feature and large cobbles were in disarray within the chasm. A single triangular potsherd was recovered south of this feature and all potsherds dated to the Roman-Byzantine period.

WT-115 (UTM 777645 2498294, Elev. 606m) is a flat-topped bench of land by the wadi road that overlooks the wadi 1.2km east of Khirbat al-Mudayna. This cemetery measures about 12.00m north-south x 13.00m east-west and consists of assorted grave shapes delimited by medium sized stones; two of these graves were robbed and evidence of 'pot-hunting' with a metal detector was ubiquitous. Surface finds included Hellenistic, Nabatean, Early Roman and T.S potsherds.

WT-116 (UTM 777727 3498149, Elev. 613m) is south of *WT-115* and is surrounded by worked wheat fields and an Islamic cemetery to the north-east. *WT-116* measures about 27.00m north-south x 18.00m east-west. Graves were identified by round or rectangular outlines of stone and Islamic graves were interspersed among others. Small patches of recent fires and extensive metal detector exploration were noted. Pottery associated with this site included Iron Age, Nabatean, Early Roman dominant and terra sigillata; one decorated stone bead (*WT-701*) was found near the fire patch and robbed grave. Four inscriptions were observed on randomly placed stones within the burial installation structure.

WT-117 (UTM 777887 3498650, Elev. 613m) is an expertly robbed cemetery which is visible from the hills surrounding it. It is positioned on the brow of a slope overlooking a road that travels north from Wādī ath-Thamad. The site measures 27.50m north-south and 40.00m east-west. Two small fire patches were noted in the southwest and northwest corners. Twenty-seven graves were visible, the majority outlined in large stones and linear running east-west, although there were many exceptions. Our worker maintained that these were 'Romani' burials, meaning that they were non-Islamic. Of these

burials, 16 were looted recently and six likely had been looted in the past and were distinguished by a 5.0cm soil depression, while the rest remained untouched; the eight graves that were round in outline were undisturbed. Robber spoil heaps were predominantly along the south, north and east sides, indicating an approach from the south edge of the pit, which was neatly cut and many of the balks were perpendicular. Grave robbers excavated the burial pits to about 1.15m in depth. The spoil heaps of WT-117:1, 2, and 3, which are located in diverse sections of the cemetery, were examined and no potsherds or other artefacts were recovered; one weathered fragment of human pelvic bone was found. One undisturbed burial at the south-west tip of the site was selected for test excavation, but no skeleton had been exposed by the time the 1.50m level was reached.

*Other cemetery sites*²⁸

WT-140 (Elev. 613.68m-Total Station) rests at the southern tip of Khirbat al-Mudayna immediately south of an Umayyad building (Field U) and large cemetery thought to be Bedouin (WT-35). The site is delineated by a soil depression (8.00 x 10.00m north-south) surrounded by bedrock with narrow slits about 20.0cm wide that offered a glimpse into the earth below. Because rock-cut tombs and cave burials were the preferred burial styles in the highlands of Jordan, particularly during the Iron Age (Bloch-Smith 1992), this feature was selected for test excavation.

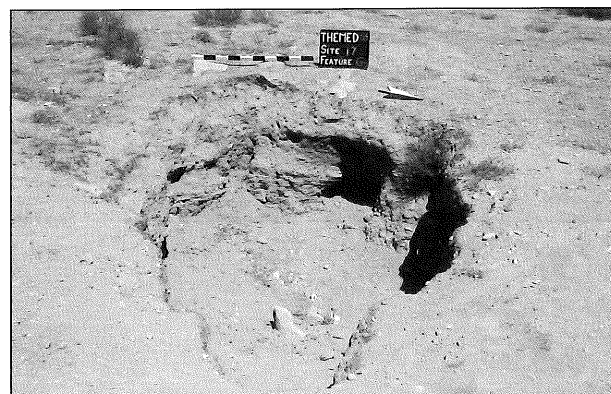
A skeleton was recovered about 1.25m from the earth's surface immediately under the roof of the 'cave'. Two artefacts near the skeleton included an iron tip of a spear (?) (WT 718) found north of the skull and a round wood linear object (lower spear? WT 724). The absence of clearly datable artefacts did not permit a temporal assignment, but the use of bedrock 'caves' as funerary chambers was confirmed.

WT-17 Khirbat al-Ḥiri (UMT 774458 3502213, Elev. 766m). Previous project surveys at Ḥiri²⁹, the most prominent site in the region, noted a

heavy scatter of potsherds on the fortress' north-east slope. The project visit this year revealed that this potsherd scatter, attributed predominantly to the Iron Age, covered an estimated 50 ancient burials and that many of these graves had been recently robbed. Five robbed graves were photographed and human remains were recovered from the robber spoil heaps (Fig. 23). The demographic spectrum included males, females and children, and it is possible that one burial contained two individuals. The landscape of Khirbat al-Ḥiri's north and west sides reveals a network of caves and cisterns. Since natural and rock-hewn caves were a common and preferential burial method among the people of the highlands, a systematic survey may ascertain whether these features were tombs that may possibly have escaped the notice of grave robbers. A similar network of caves existing at Za'faran I (WT-34) also warrants attention.

The Burials

Buikstra and Ubelaker (Buikstra and Ubelaker 1994) summarized and illustrated five key macroscopic features of sexual dimorphism for each of the adult skull and innominate. Each feature was scored from '1' to '5' with '1' being most feminine; the scores were averaged for each bone and biological sex assigned. Those scoring '3' were sexually ambiguous at the biological level. Morphological features observed on the skull included: the robusticity of the nuchal crest; the robusticity and inclination of the mastoid process; the definition of the supraor-



23. Looted grave at Rujum al-Ḥiri (WT-17).

28. Additional cemeteries were noted (not assigned a site number) on a return visit to Sites WT-115 and WT-116 on the last day of the season; these sites will be

recorded in more detail next season.
29. Rujum al-Ḥiri was visited by J. A. Dearman, Wādi ath-Thamad Survey Director in 1996.

bital margin (blunt vs. sharp); the distinctness of the supraorbital ridge; and the projection of the mental eminence (chin). Features observed on the innominate were: the presence of a ventral arc (female); the angle formed by the subpubic concavity; the morphology of the ischiopubic ramus; the angle formed by the sciatic notch; and the presence and depth of the preauricular sulcus.

The assignment of the age-at-death of an individual decreases with age, and therefore, the assignment of a smaller age range is possible among subadults. The dentition of nonadults is the most accurate method of determining age, with the eruption sequence illustrated by Ubelaker (Ubelaker 1978) universally employed. In cases where dentition was absent, long bone measurements were taken with sliding callipers and age was determined from growth charts presented by Scheuer and Black (Scheuer and Black 2000). Epiphyseal fusion and development of secondary ossification centers aid in establishing the age of children and adolescents, but are less precise when compared to dental eruption (Scheuer and Black 2000). Optimal methods of age determination include the degenerative changes to the pubis (Todd 1921a, b); changes to the auricular surface of the innominate (Lovejoy *et al.* 1985); and sternal rib end modification (Loth and Iscan 1989). When all elements were present, the ages determined by each method were averaged.

Stature was calculated from inserting the postcranial measurements described below into regression formulae developed for European males and females (Trotter 1970). All of

the long bones and many smaller bones of the extremities may be used to determine stature, however, the combination of the left femur and tibia is preferred and was used if possible.

MT B2:9 (Fig. 24)

The skeletal remains of a young child (MT B2:9) were interred on the step within Building 205, Room 210. The child was fully articulated and laid partially on its right side so that the body was oriented at 220°. The skull was turned to the right so that it faced the rise of the step. The arms were extended on either side, so that the left forearm was pronated and the right forearm was supinated. The right leg was slightly bent to about 150° and the left leg was crossed over the right lower leg. The complete skull and the most of the postcrania were recovered aside from a few hand and foot bones. The dental eruption sequence indicates that the child was 18 months +/- 6 months. No artefacts were interred with the child.

MT E99:27

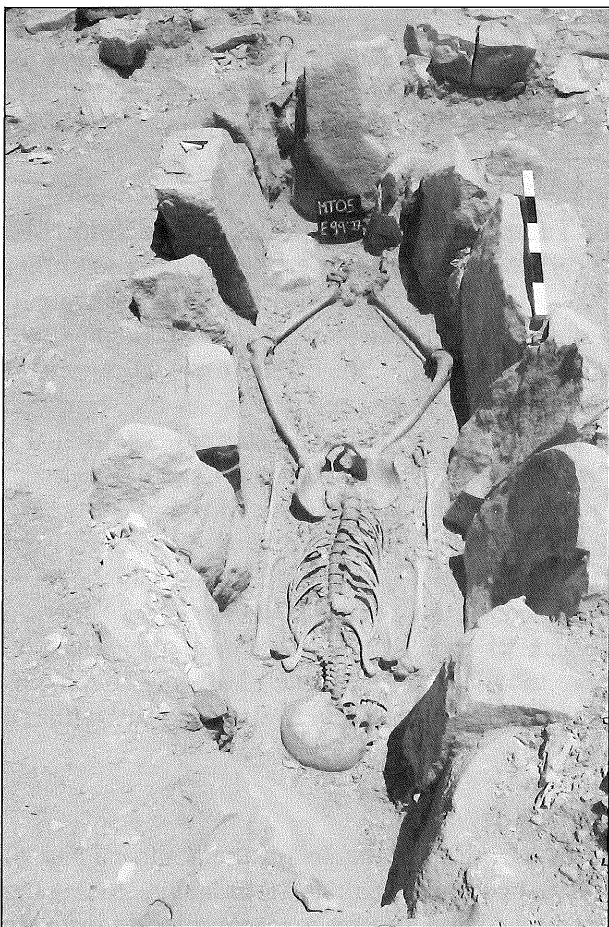
Square E99 is located at the southern end of the main site of Khirbat al-Mudanya. During the previous 2004 season a circular stone installation (E99:24), typical of funerary architecture, was discovered in the eastern balk of E99, straddling and intruding into Square G9. The excavation of the installation produced a burial pit lined with standing stones (E99:24) that surrounded a fully articulated adult skeleton (E99:27; Fig. 25), a configuration that is similar to the Caesarean graves described by Chase (1996). The skeleton was oriented to 150° in a supine position with the head turned to the right so that the skull faced east. The arms were extended at both sides with the forearms pronated so that the right hand lay beside the right innominate and the left hand lay underneath the left innominate. Both legs were positioned unusually so that the knees were directed laterally to create a medial angle of about 150° between the femur and lower leg of each appendage. The heels were drawn together and the left foot rested on a stone that was embedded in the floor of the burial. No artefacts were interred with the burial, however, two bracelet fragments (MT 808-6/2 and MT



24. Infant burial in Building 205.

30. Comparable glass bracelets have been reported from numerous tombs, some dating as early as the late Ro-

man period.



25. Grave in Field E.

809-6/3) dated to the Ottoman period (13th-17th centuries)³⁰ were recovered during the previous 2004 season. The individual was assessed as a male about 24-25 years of age who stood about 169.93 +/- 3.94cm. This young male suffered from a minor periosteal infection on two hand phalanges and slight dental calculus. Habitual squatting that resulted in the toes being dorsally flexed was indicated by the presence of facets on the heads of the left and right first metatarsals of the foot (Lai and Lovell 1992).

In addition to E99:27, isolated bones of an infant were recovered just north-east of the feature in the approximate location where a cluster of commingled adult and infant bones (G9:4) had been excavated at the end of the 2004 season. A few adult bones were found east of E99:27 where additional adult bones (G9:6) were recorded in 2004. It is suspected that the partial remains of G9:6 conjoin with the adult bones of G9:4, but this will be determined when the skeletal remains from the two seasons are examined together.

WT-140:3

The skeleton (WT-140:3) recovered from the shallow bedrock cave was supine with the left leg slightly flexed laterally but extended (Fig. 26). The right leg was sharply flexed at the knee to 90° so that the lower leg crossed the left leg at the left knee. A wooden circular linear object (WT 724), possibly a staff, rested alongside the left tibia. The left arm was flexed at the elbow so that the forearm crossed the abdominal area at 90°. The right arm was not visible and although we were able to remove all of the soil from behind the body and underneath it the arm was never recovered. The body was oriented at about 220° and faced SSW to the right. WT-140:3 was identified as a young male less than 25 years of age with no perimortem trauma or active lesions. The majority of the elements were recovered with the exception of the right patella, arm and numerous hand and foot phalanges. During his life this individual experienced a fracture of the first proximal foot phalanx that split the distal condyle. Nonspecific infection was present on the right tibia. Vertebral lesions were congenital and included spondylolysis of the



26. Cave burial at Site WT-140.

fifth lumbar and a partial cleft of the first sacral lumbar. Although little dental wear was present, this person suffered from extensive dental disease including dental calculus, periodontitis and antemortem tooth loss, which is unusual for such a young adult.

Taphonomic factors explain the absence of the left and right hand bones, and patella, particularly as there was faunal activity (pit vipers and toads) during the excavation of the feature. The absence of the right arm may be the result of post-mortem accident or surgery, but this cursory examination of the bones did not reveal any evidence of trauma or surgical intervention. The isolated human (female?) fibula recovered from WT-140:5 remains a mystery, but the extension of the excavation area may reveal the associated skeletal remains.

WT-112:13, 16, 19

A rectangular area 3.00 x 6.00m delimited the robbed area (WT-112:1) in Field B/112 to contain it and the southerly expanse of the robber spoil heap. A hard-packed threshold contiguous with that of the interior of the grave floor identified the original entrance. A cluster of commingled bones, predominantly those of the lower body of one individual (WT-112:19), were located outside of the threshold. About 1.00m south of this group was a second bone cluster that consisted primarily of this individual's upper body bones and a mandible. The bones of at least one additional individual were intermingled among these clusters and distributed throughout the disturbed fill. The minimum number of individuals was two adults (one male and one female) based on the presence of two left and right humeri and two right mandibles. An infant fibula and scapula fragments from the more southerly bone cluster indicated that at least one infant (WT-112:13) was interred with the adults. The distribution of the disarticulated bones within the spoil heap suggests that the adult male (WT-112:19) was the first body removed, while an infant (WT-112:13) and female (WT-112:16) were more inaccessible —either further back within the tomb's recess or perhaps they were from another nearby tomb subsequently robbed.

Conclusion

It is evident from this preliminary pedestrian survey and excavation that funerary structures and cemeteries are not as enigmatic in central Jordan as previously believed, although the discovery of Iron Age tombs and cemeteries continued to elude us. Nevertheless, the potential bioarchaeological data from the temporal range of human habitation (Neolithic to Byzantine) that is present in the Khirbat al-Mudayna region offers an exciting opportunity to evaluate and understand how environmental pressures and technological innovations influenced the health, diet, behaviour and migration patterns of past peoples in the Madaba region. The looting of the cemeteries jeopardizes this opportunity and is now endemic within this region where it previously was not a problem. The recently initiated year-round protection and the authorized systematic excavation of these cemetery sites by bioarchaeologists will preserve the integrity of ancient people in an ethical manner, while at the same time perpetuate the biocultural history of the Madaba region.

Wādī ath-Thamad Regional Survey 2005 (Jonathan Ferguson)

Introduction (Fig. 27)

The 2005 Survey team worked at 23 sites within the Wādī ath-Thamad drainage basin; this number includes eleven previously undocumented sites (WT-120 through WT-129 and WT-131)³¹, as well as twelve known sites which were revisited for further research, most notably Qaşr az-Za'faran I (WT-34), Qaşr az-Za'faran II (WT-32) and Khirbat az-Zūna (WT-24). In order to supplement previously published material, these last three sites will be the focus of this report.

WT-24, Khirbat az-Zūna (Fig. 28)

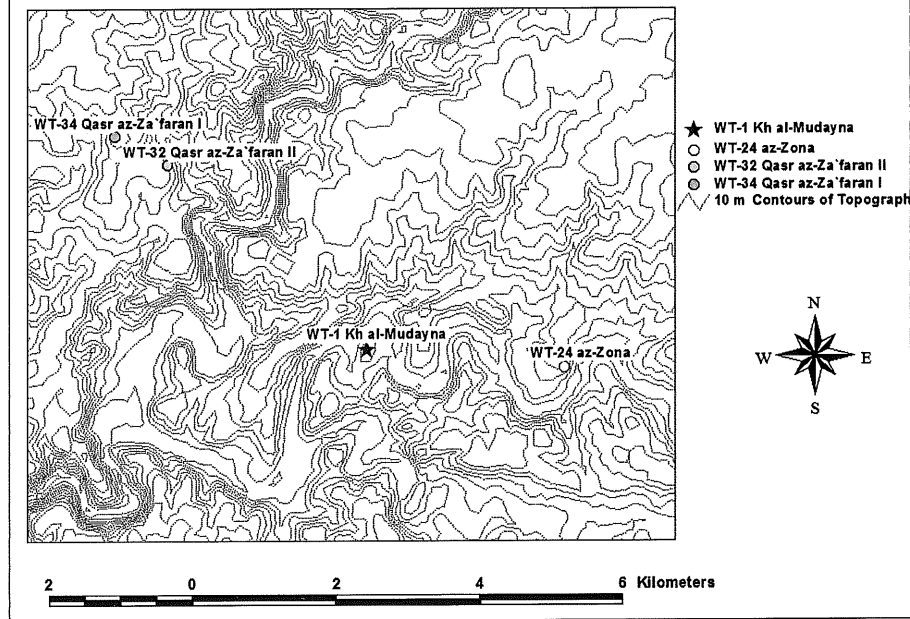
UTM: 778661E 3498204N 650m ASL; Bearing: 2.72km at 294°M to Khirbat al-Mudayna; JADIS: 2311.008 (Palumbo 1994: 2.133).

Khirbat az-Zūna is a Roman castellum located on the high (46.0m) western bank of the Wādī ath-Thamad, almost 3.0km east of Kh-

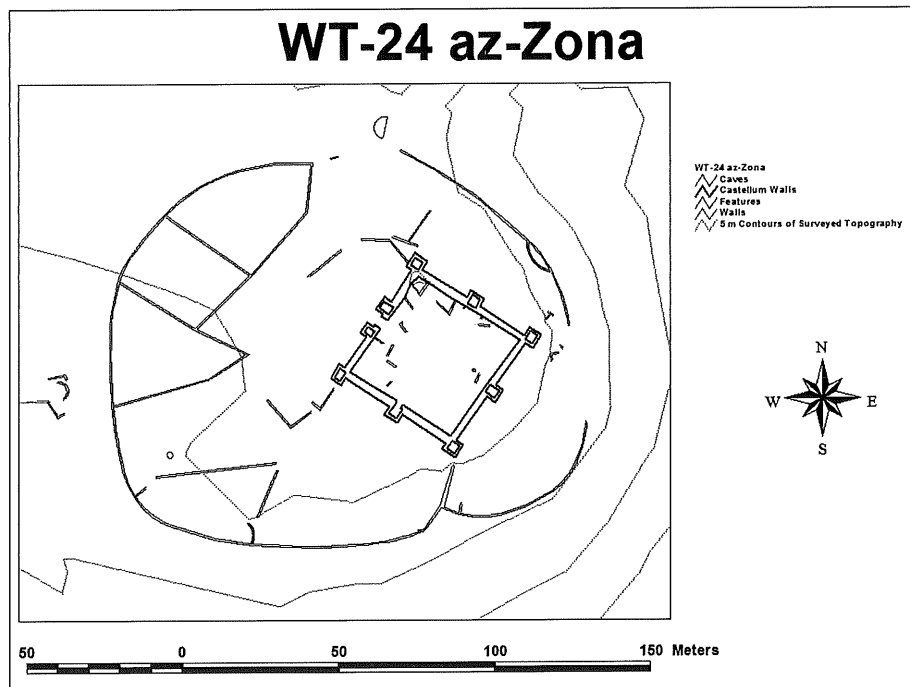
31. A Leica TCR705 total station was used for surveying, supplemented by a Magellan 2000XL handheld GPS

receiver for site location.

Wadi ath-Thamad Regional Survey



27. Wadi ath-Thamad Survey area; map by J. Ferguson



28. Plan of az-Zūna (WT-24) and surrounding features; J. Ferguson.

irbat al-Mudayna. According to Brünnow and von Domaszewski (1909: 335), the site was then known as “ez-Zânije,” while the 1997 Wādī ath-Thamad Regional Survey team reported that local inhabitants call it “Khirbat al-Mudayna East” or “Rujum of the Wells.” Although located on a high plateau with commanding views down into the wadi, the castellum’s placement southeast of the hill’s summit reduces its visibility to the

north and west.

The castellum at Khirbat az-Zūna is square, with a strong perimeter wall, four corner towers and interval towers on all sides except the northwest, where two smaller towers flank a gateway. The castellum is almost square, and measures approximately 47.8m per side, including the corner towers, or 42.7m without them. These four corner towers average 4.80m square, projecting

2.60m from the perimeter wall. The three interval towers are of similar size, at 5.00m wide and 2.90m deep, while the two gate towers are smaller, measuring 4.30m by 2.60m. The walls of the towers themselves are each about 1.00m thick. The perimeter wall averages 2.40m thick and stretches 16.80m between towers, except on the northwest, where it is 12.00m long between the corner and gate towers. Between the gate towers, 0.80m long wall stubs leave a passageway measuring 3.50m wide that gives access to the castellum's interior. The fort's perimeter wall is built of 3 rows of stones with rubble fill between them³², while the towers were built of ashlar blocks. The presence in the towers of some stones with tooling marks, and one bossed stone in the eastern corner tower, suggest that the castellum may have been partly built with reused masonry from an older structure in its vicinity.

Walls could be followed in places inside the castellum, but because of the profusion of later graves (some looted), no recognizable pattern could be discerned. However, most of these 15 wall lines appear roughly parallel to the castellum's perimeter. A particularly thick wall section is located just inside of the south-eastern interval tower. A decorated masonry block suggests that this rear tower may have extended into the fort, perhaps as a principia, as seen at Qaşr Bshir in Jordan and ad-Diyatheh in Syria (Kennedy 2004:148-151, 219). Ceramic water pipe fragments, some with plaster wall facing still attached, were found in and around the castellum, but particularly in the north-central portion of the fort's interior. Thus, it appears that the castellum's garrison may have had not only a headquarters, but perhaps a small bathhouse.

Outside the fort are a number of features contained within a large, oval enclosure wall, which encompasses a space 126.0m north-south and 153.0m east-west. Except on the western side, this wall follows the edge of the hilltop's slope down into the wadi below. Although substantial gaps now exist in the wall to the northwest and northeast, its circumference can be clearly followed elsewhere, and is best preserved in the southeast, where it curves inwards towards the

castellum, intersecting with another wall section. This stretch includes a course of one or two rows of horizontal stones, against which is placed a row of vertical stones along its inner face. Half of a limestone column drum, with clear tooling marks, was found reused here, built into the enclosure wall (another possible column drum was observed in the wall's southwest section). Unfortunately, the enclosure wall's generally poor preservation has obscured the oval's function and the location of any gates through it.

Within the enclosure wall are a number of other wall lines, particularly to the west and south of the castellum, where the outer wall extends farthest from the fort. On the west, a number of walls at right angles enclose large areas, perhaps used as animal pens. As in the fort's interior, there were a number of graves (both intact and looted) within the enclosure, clustered around the castellum's east and west sides. One grave is within the oval wall and another is at the wall's edge to the north. A few short walls west of the oval enclosure may represent an extramural building.

In his report of the site (his site 70) Glueck (1934: 27, 30, 90) mentions the corner and interval towers³³, but underestimates the fort's size at only 30m square, without the corner towers. Glueck also does not indicate the gateway on his plan, saying that it "was not clearly defined" (1934: 30). Khirbat az-Zūna was also visited by Parker (as his Site 16), which he reported to be built "on a man-made platform" (1979: 77) although no evidence for this could be found in 2005. Parker produced a plan of the fort measuring 44.0 by 40.0m, which he states "supersedes that of Glueck, which is somewhat inaccurate" (1979: 78), although in a later publication he reverts to Glueck's 1934 plan (1986: 45-46). Parker's description and plan of the castellum at Khirbat az-Zūna include a main gate at the midpoint of the southeast wall and a smaller postern doorway next to the southwestern interval tower. A gate in the southeast wall is supported by Kennedy on the basis of an aerial photograph (2004: 133). While the presence of Parker's postern gate has not been ruled out, no evidence for this gate in the southeast wall was apparent in

32. Cf. Parker (1979:78), who identified two rows with rubble fill.

33. Brünnow and von Domaszewski (1905: 335) mention Khirbat az-Zūna, but give no further details.

2005. In fact, the castellum's gateway was clearly identified on the fort's northwest side, so that Parker's 1979 plan must be rotated fully 180° to coincide with the features observed in 2005.

Glueck collected Roman, Byzantine and Islamic sherds from Khirbat az-Zūna (1934: 30), while Parker (1979: 78, 304-305) found pottery from Iron Age II (few), Late Roman, Early Byzantine (dominant) and Late Byzantine periods. The 1997 Wādī ath-Thamad Regional Survey also collected Late Roman and Byzantine sherds. The 2005 Wādī ath-Thamad Regional Survey collected 818 sherds, with preliminary readings of Iron Age II (few), Roman (dominant), Late Roman and Byzantine.

Iron Age ceramics recovered from the site support a pre-Classical occupation at Khirbat az-Zūna (cf. Kennedy 2004: 134), although no architectural remains have been found dating to this period. The reuse of decorated masonry and column drums suggests that the castellum may have incorporated an earlier structure on the site, although no Early Roman or Nabataean pottery was identified during the 2005 survey. Based on the surface pottery and the fort's quadriburgium design, Parker concluded that the castellum of Khirbat az-Zūna was founded in the late 3rd or early 4th century AD, together with a chain of other such castella, watchtowers, and the fortress at Lajjun, east of the *Via Nova Traiana*. However, while most of these other sites were abandoned by the late 5th century, Khirbat az-Zūna appears to have been garrisoned to protect the caravan route throughout the Byzantine period, as late as the Muslim conquest in the early 7th century (Parker 1979: 80, 1986: 45).

WT-32, Qaşr az-Za'faran II

UTM: 773138E 3500998N 681m ASL; Bearing: 294°M to WT-34 (Qaşr az-Za'faran I); JADIS: 2311.007 (Palumbo 1994: 2.133)

Site WT-32 is the smaller of two qusur near the village of Za'faran, above the Wādī az-Za'faran, and is generally known as Qaşr az-Za'faran II or B, or locally as "Little Za'faran."

The larger Qaşr az-Za'faran I is located uphill, to the west³⁴. The qasr structure of WT-32 has its corners pointed to the cardinal directions and measures 19.7m northwest-southeast by 15.5m northeast-southwest and still stands to a height of 10 courses (4.50m). These dimensions conform very closely to the description and photograph by Glueck (1934: 30-31)³⁵, so it appears the qasr has fared relatively well over the past seventy years. There is no apparent doorway, although the northern corner appears to be a good possibility. A possible window was observed towards the eastern end of the southeast wall, where a gap in the wall stones appears to extend through the width of the wall. The outer walls are built of large boulders and average ca. 2.20m thick. Unlike at neighbouring Qaşr az-Za'faran I, no substructure or foundation was evident for these defensive walls.

The internal arrangement of the qasr is difficult to discern, but at least three northwest-southeast walls and 4 northeast-southwest walls could be identified. Glueck's claim that Iron Age foundations could be distinguished among the interior walls of the Nabataean qasr (1934: 30) could not be verified. Some limited digging has recently taken place within the qasr, inside the northeast wall.

Compared to WT-34, Qaşr az-Za'faran II has a paucity of outlying remains, contrary to Glueck's claim that "various ruined houses and foundation walls are visible around the Qaşr" (1934: 30). Near the western corner of the qasr is a large elliptical ring of stones, apparently a grave. About 25.0m down-slope to the southwest is a rough wall of large stones running parallel to the building. Its ends turn towards the qasr, but these wall lines cannot be followed very far in that direction. Much farther down the slope, in the same direction, was found a smaller wall stub aligned roughly north-south, although this feature may be unrelated to the qasr.

A number of inscriptions were carved or pecked into the walls of Qaşr az-Za'faran II. Several inscriptions along the northeast and southeast

34. References by Brünnow and von Domaszewski (1905:326) and Musil (1907: 245) suggest that WT-32 may also have been known as "Qaşr al-Komrok." Qaşr az-Za'faran II (the "kleinerer Sigalturm,") was visited by Brünnow and von Domaszewski (1904:26), Glueck (Site 71, 1934: 30), Parker (Site 11, 1979: 73-

76) and by the Wadi ath-Thamad Regional Survey in 1997 and 2005.

35. Glueck's photographs of WT-32 and WT-34 are reversed (i.e., Qaşr az-Za'faran II is his figure 13d, rather than 13c).

walls are clearly Arabic, while others may be in Thamudic script. One clear Thamudic inscription with at least six lines of small, thin, pecked characters was discovered on the southeast wall, just left and below a possible window. Two gaming boards are visible on the upper course of wall stones in the qasr's northern corner. One consists of four rows of eight round holes, while the other has two sets, each with two rows of eight holes (cf. Glueck 1934: 30).

The dating of Qaṣr az-Zaʿfaran II is problematic because of the low frequency of sherds. Glueck (1934: 30) reported Nabataean sherds to be dominant, with Byzantine and Early Iron I periods also represented. Parker (1979: 76, 303) collected predominantly Iron II sherds, with some Late Roman and Early Byzantine examples. The 1997 Wādī ath-Thamad Regional Survey found mostly Iron II sherds, with a few Ayyubid/Mamluk examples. The 2005 survey team also recovered mostly Iron II pottery, although the late Hellenistic or Nabataean periods are also represented.

The function of Qaṣr az-Zaʿfaran II remains unclear, since its strong defensive architecture seems at odds with its inferior strategic location vis-à-vis WT-34. Located off the top of its hill, WT-32 has poor visibility to nearby hills and

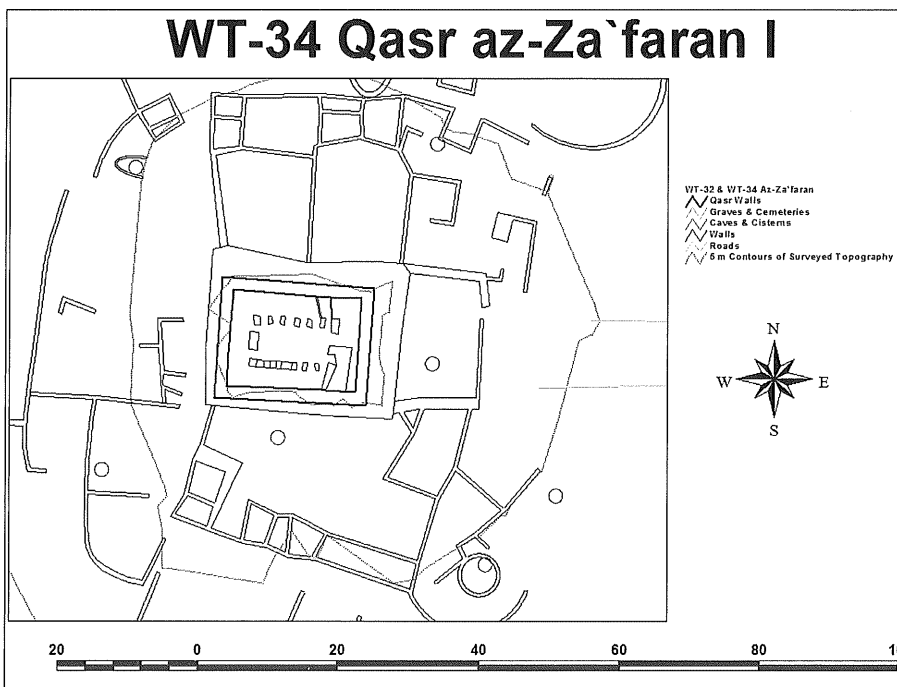
watchtowers, although it has good views down into the Wādī az-Zaʿfaran, to which Parker credits its *raison d'être* (1979: 74).

WT-34, Qaṣr az-Zaʿfaran I (Fig. 29)

UTM: 772408E 3501402N 714m ASL; Bearings: 65°M to WT-17 (Khirbat al-Ḥiri); 173°M to WT-18 (ar-Rumayl); 114°M to WT-32 (Qaṣr az-Zaʿfaran II); JADIS: 2311.001 (Palumbo 1994: 2.133)

WT-34 is the second qasr-centred site near the village of az-Zaʿfaran, but includes a much larger number of outlying features than its counterpart, WT-32. Its location on a hilltop is also more strategically advantageous, with clear views to other watchtowers, such as ar-Rumayl (WT-18) and Rujum al-Ḥiri (WT-17). The site is commonly known as Qaṣr az-Zaʿfaran I or A, or colloquially as “Big Zaʿfaran.”

WT-34 was visited by Brünnow and von Domszewski (1904: 26-27), who described the ruins and drew a plan with the qasr and a large structure immediately to its south³⁶. Glueck's description of his Site 72 (1934: 30-31) matches the 2005 Wādī ath-Thamad Regional Survey's observations at Qaṣr az-Zaʿfaran I³⁷, but the Nabataean house Glueck describes east of the qasr could not be located, but must be in the area of



29. Plan of Qaṣr az-Zaʿfaran (WT-34) and surrounding features; J. Ferguson.

36. The qasr was also noted by Musil (1907: 106, 245, 296).

37. However, it must again be pointed out that the photo-

graphs for his figures 13c and 13d have been reversed (see the discussion above for WT-32).

the modern school and house across the road³⁸.

The qasr at the centre of WT-34 measures 16.80m north-south and 21.70m east-west. The main walls are average 1.70m thick, standing to a maximum of height of 16 courses (6.20m). These walls were built above a 1.28m high podium (partially visible on the east, west and south) that is identified with Glueck's "earlier substructure" (1934: 30). Parker (1979: 74) reported that the qasr was supported by a round platform measuring 30.0m diameter, which was surrounded by a retaining wall. The 2005 Wādī ath-Thamad Regional Survey's work found that Glueck had better described the extant architecture, whether or not his chronological argument is correct. This substructure projects an uneven distance from the qasr's walls, from 1.60m on the west and south sides to 4.30m on the east³⁹.

The interior arrangement of the qasr forms another rectangle within the structure's outer walls. Most striking about this design is a series of 6 square pillars on both the north and south sides. Wall sections can be seen between 4 pillars on the west end of the southern side, but are not visible elsewhere. A thick rectangular wall fills most of the space between the westernmost pillars. At the eastern end, walls connect to the north and south qasr walls, forming an interior east-west doorway. This internal arrangement suggests that the qasr's entrance was on the narrow, eastern side, which is poorly preserved and covered with collapsed stones.

A large number of ruined walls, caves and debris cover the large terraces and hill slopes around the qasr (283m north-south x 146m east-west)⁴⁰. Some of these walls appear relatively modern and makeshift and may be animal pens made by shepherds exploiting the site's ready supply of stone. Other more substantial walls appear to be permanent constructions connected to the qasr's occupation. The best preserved of these is a building to the southwest, which Glueck describes as "a series of courtyards and rooms" (1934: 30), and which were mapped by Brünnow and von Domaszewski (1904: 27). While many of the walls run parallel to the qasr, some substantial walls are at entirely different

orientations and may represent earlier occupation.

There is a curved defensive wall that is best preserved along the terracing west of the qasr. Glueck (1934: 30) also identified a "megalithic" perimeter wall on the north that was tentatively relocated by the 2005 survey team, together with a possible southern segment.

At least 22 caves and cisterns were examined at WT-34 in 2005, including a natural cave at the site's northern limit and a well-carved cistern just northeast of the qasr. A concentration of caves, many with lintels, entrance walls and smoke-holes appears to form a troglodyte village at the site's southern end. Some of these caves appear to be used as sheep pens today.

A cemetery southeast of the qasr has rings of stones similar to those seen at other sites. Some of these graves appear old and overgrown, while others are obviously modern, with cinderblocks substituted for stones. One area showed signs of digging, possibly representing looting or a more recent burial.

Glueck (1934: 31) reported collecting a large number of Nabataean sherds along with Early Iron I-II ceramics, the latter especially on the site's southern slope. Parker (1979: 74, 302-303) recorded a few Iron I, Iron II, Early Roman/Nabataean (dominant), Late Roman and Umayyad sherds. The 2005 Wādī ath-Thamad Regional Survey recovered Iron II, Early Roman/Nabataean, Umayyad and Ayyubid sherds (Pails 309, 311, 312). The high concentration of Iron II sherds on the south slope suggests that this was the location of a midden. Islamic pottery was also collected from this same area.

Based on its design and inter-visibility with other sites such as ar-Rumayl and Khirbat al-Ḥiri, it appears that Qasr az-Za'faran I functioned primarily as an Iron Age watchtower and defensive fortification. Its role in Early Roman/Nabataean times may have been similar, but surface finds appear less frequent. Parker (1979: 76, 1986: 45, 145) suggests that both qasr at az-Za'faran were garrisoned until the 4th century, as detachments from the castellum at Khirbat az-Zūna. However, the settlement which grew

38. Parker also studied Qasr az-Za'faran I (as Site 10) in his dissertation (1979: 73-76).

39. The northern side of this podium is not visible amid the tumbled stones, and has been extrapolated on the

2005 plans to the intersecting walls.

40. For a good view, see the aerial photograph in Kennedy 2004: fig. 12.11C.

around the qasr may have outlasted the site's military function.

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