PRELIMINARY REPORT OF EXCAVATIONS AND SURVEY AT KHIRBAT AL-MUDAYNA ATH-THAMAD AND IN ITS SURROUNDINGS (2004, 2006 AND 2007)

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Introduction

Two seasons of archaeological excavation were carried out from June 18-July 27, 2006 and 1June 18-August 2, 2007 at Khirbat al-Mudayna ath-Thamad, both in the fortified Iron Age town and the Nabataean-Early Roman settlement. Excavation was also undertaken at a number of cemetery sites by M. A. Judd (including WT-112), and at the Roman *castellum* of az-Zūna (WT-24), directed by J. Ferguson. In 2004, C. M. Foley and L. Foley directed excavations at the Neolithic village of Umm Mishraṭ (survey sites WT-40+WT-104), and in 2007, A. Lykke and M. Ladurner revisited several sites previously located in the Wādī ath-Thamad Survey area as part of a special Nabataean survey project.[1] The senior project director is Dr. P. M. Michèle Daviau; Dr. Robert Chadwick is Assistant Director and Dr. Michael Weigl is Associate Director (2007). Team members included scholars, volunteers and students from Canada, the United States, the Netherlands, Denmark, Austria, the United Kingdom, Nigeria, Iraq, and Jordan. Colin Cadieux served as camp manager and in 2006, Zoë McQuinn was the chief photographer. Eighteen local workers also assisted the team each season. This report will present the results of excavation in Field B, Fields C (south)+D, and Field E in the Iron Age settlement (**Fig. 1**). Also included are the results of investigations of burials at cemetery site WT-112 and in Fields U and V at the south end of

1. Khirbat al-Mudayna ath-Thamad with excavation and survey sites excavated in 2006 and 2007; aerial photo courtesy R. Bewley and D. Kennedy.

1.The Wadi ath-Thamad Project is sponsored by Wilfrid Laurier University, Waterloo, ON, Canada, and was funded during 2005-2007 by the Social Sciences and Humanities Research Council of Canada and Wilfrid Laurier University. Additional funding was provided by the University of Pittsburgh, the Catholic University of America, the Deutsche Palästina-Veriens, the University of Saskatchewan and by friends and colleagues. Our work at az-Zūna during 2007 was supported in part by a Harris Grant from the American Schools of Oriental Research.

Khirbat al-Mudayna ath-Thamad, as well as the salvage excavation at az-Zūna (2006, 2007) and at Umm Mishraṭ (2004).

Field B (Michael Weigl)

Excavation continued in Field B during the 2006 and 2007 seasons in Buildings 205 and 210 which are part of a series of three textile production buildings, built up against the casemate wall on the east side of the Iron Age settlement.

Building 205

In 2006, excavations resumed in the central pillared building (B205). The precise tasks involved the excavation of debris layer B2:26, to clarify the stratigraphy and phasing of Rooms 210–R214 and to more accurately define the northern (W2005) and southern (W2020) walls of the building.

Results: Left in place at the end of 2006 was the soil covering Wall 2022 and forming the eastern perimeter of Room 211. Upon excavation, it became clear that this wall was the western support wall of Staircase B2:52 and was most likely built in the last occupation phase of B205. Each support wall of the staircase, W2022 on the west and Wall 2023 on the east, has a monolithic pillar at its northern end footed on bedrock, while the boulder-and-chink wall units were constructed above a hard-packed floor layer filled with potsherds and animal bones. The staircase itself was composed of five steps up to a landing (**Fig. 2**), located above corbelled Arch B2:24, connecting Rooms 211 and R212 (Daviau *et al*. 2006: fig. 11) on the ground floor. Each step had a rise of 13.0-16.0cm, an average width of 50.0cm, and a depth of approximately 25.0cm.

In the three parallel rooms to the east of the staircase, bedrock was located under the beaten earth surface in north Room 214, providing evidence that North Wall 2005 was footed on bedrock and dates to the earliest use phase. In central Room 213, the stratigraphy was more complex, because the bedrock begins to slope as it approaches the eastern edge of the mound. On the north side of R213 is pillared Wall 2018 (**Fig. 3**), which separates this room from R214.

2. Staircase B2:52, looking south.

There was a pillar (B12:30) with a footing stone (B12:75) located in the wall for support. Approximately 40cm below the base of the footing stone was a later soil layer (B12:69). It was a beaten earth floor which was covered with ash and oil spots from the *ṭābūn*(s) directly across the room on the SE end. The next soil layer (B12:67) was also a beaten earth floor with ash spots, also from the *ṭābūn*(s). Cut into the floor was a boulder mortar (B12:56) in the NE corner. A footing stone (B12:71) was discovered wedged underneath supporting it (**Fig. 3a, b**). Plaster (B12:64) was also found partially surrounding the mortar to keep it from moving. Covering these loci was a soil layer (B12:35) which could possibly be wall debris from the wall (B12:4). On top of everything was a layer of debris (B12:0.5) which

3. a) Boulder mortar, b) Worn-through mortar.

had collected over the year.

Building 210

Two other squares were opened (B3, B13) to the south of Building 205. At the beginning of the season, it seemed reasonable to assume that these squares contained the remains of yet another pillared building (B210) that might be related to B205 by a party wall (W2020). The entryway and the western half of three parallel rooms of a new building (B210) were indeed excavated. This (third) pillared building excels in very substantial architecture, especially two very well built and massive North-South walls flanking a doorway at the western side of the building.

Results: The southern room (R223) of Building 210 was filled with collapsed wall stones and ceiling material sloping toward the northwest. In this debris, there were pillar bases from the upper storey and a saddle quern which fell onto an ash layer above a cobbled floor. Under the cobble floor, there was a sterile fill layer above bedrock. Room 223 is separated from the central room (R222) by a pillared wall (W2033) and a doorway. Room 222 was separated from northern Room 221 by a second pillared wall running east-west. In each of these walls, there were limestone basins between each pair of pillars.

A cistern-like installation carved in bedrock (B3:46) in the northern room (R221) undoubtedly represents one of the significant features of B210 (**Fig. 4**). It was found associated with an earlier, very well constructed wall which served as the foundation for North Wall 2020. Although far from being fully understood, the discovery and partial excavation of B210 represented one of the most important insights of the 2006 season.

Rooms 221, 222, and 223 were reopened in 2007 to the east and found to extend the full length of B210 up to the inner casemate wall (W2002), revealing a tripartite plan (**Fig. 5**). There were 10 pillars in the south wall with intervening basins supported by elaborate plastered footings. Nine pillars were exposed in the north wall (W2034), and nine basins, although its full length remains unexcavated. In total, an uninterrupted sequence of 9 pillars, 9 basins, and 7 lintels connecting the pillar-tops were excavated (note that two pillars and one basin were left unexcavated in the balk between B13 and B23). Above the lintels were the remains of an upper-storey wall.

In south Room 223, there were two industrial size basalt saddle querns fallen upside down from an upper storey. A collection of textile tools was recovered from both the central and northern rooms, including 51 loomweights, 3 bone spatulae, a spindle whorl, 2 limestone jar stoppers, 3 perforated stones, a tripod motar, 2 zoomorphic figurines, 3 limestone altars, a miniature table, and a large limestone "table" or stool.

Field C (South) and D (Christopher J. Gohm)

Excavations were carried out in four principle areas of Fields C (South) and D during the 2006 and 2007 seasons, including the eastern street system and three large buildings situated west of the street itself. Seven squares were investigated, including the north-south line of C98, C99 and C100 along the street, the east-west line of D71, D81 and D91, plus C90.[2] This area was

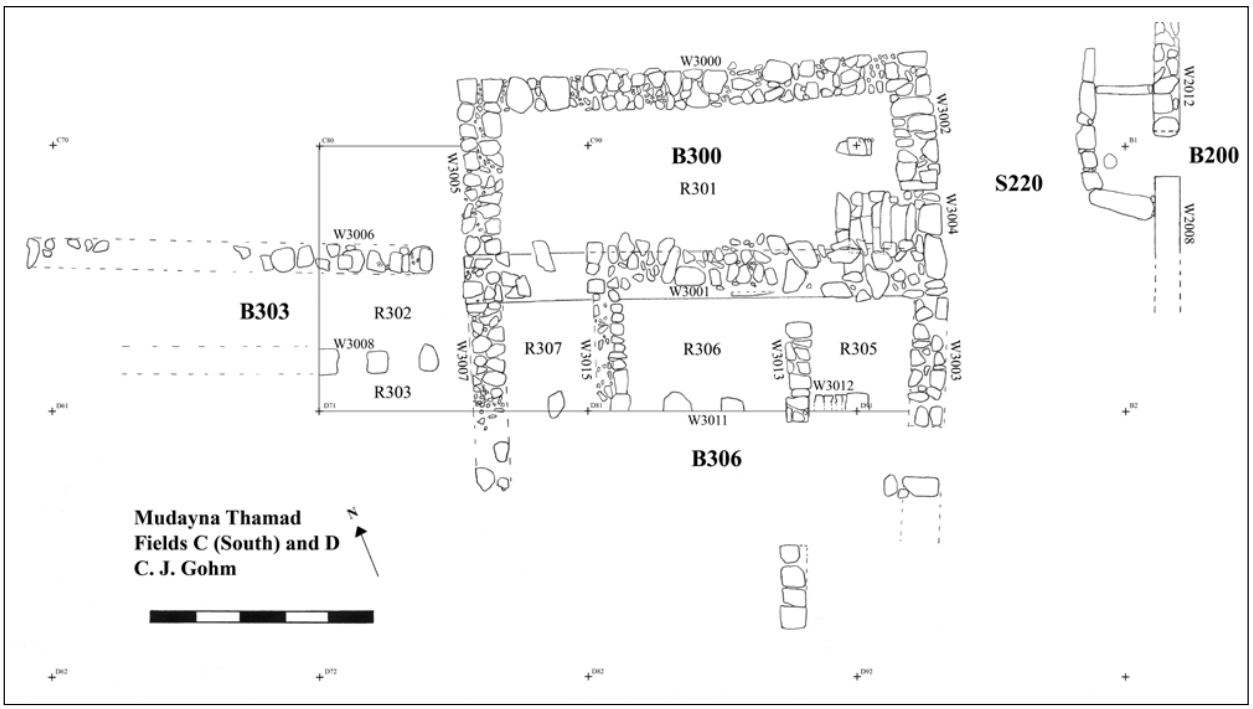
4. Interior of cistern/storage cellar in B210.

5. Tripartite Building 210 with pillars and basins, and a large inverted saddle quern fallen from the upper storey.

largely unexplored in past seasons, aside from the partial excavation of the "Central Roadway" in Squares C100 and D91, immediately west of Pillared Building 200 in Field B (Daviau *et al.* 2006: 257). Here excavators noted the presence of large walls, which have now proven to belong to two buildings of very dissimilar plans, the rectangular Building 300 to the north and the much larger Building 306 to the south. Immediately to the west another structure was identified, Building 303, along with what may prove to be part of the western street system.[3] Only one Field Phase (FP 1) was identified during these excavations (**Fig. 6**), dating to the Iron IIB and IIC periods, with clear distinctions between construction phases (FP 1C), use/modification phases (FP 1B) and destruction/abandonment phases (FP 1A). For the purpose of this summary, emphasis will be placed on the construction and use phases. This Field Phase appears to have been fairly long-lived, as between one and two construction phases (1C-1 and 1C-2) and two use/modification phases (1B-1 and the later 1B-2) were identifiable in each area.

The Eastern Street System (S220)

The principle goal of the 2006 excavation season was to investigate the area immediately southwest of the six-chambered gate and Courtyard 150, and west of pillared Building 200, in order to better define the nature of the settlement's eastern ('central'?) street system and, more importantly, its stratigraphy. This area was initially explored in 2005, resulting in the discovery of several large walls along the west and a unique ramp installation along the face of B200 on the east. During 2006 and 2007, excavations were carried out in Squares C98, C99, C100 (reopened) and D91 (reopened), several parts of which were excavated to bedrock to obtain a complete sequence of deposition. The results were very similar in these four squares, and a series of laminated surfaces, up to 0.73 m in depth, were identified overlying bedrock and hard-packed pebble and cobble fill layers. These were much deeper in the south due to the increased amounts of traffic and debris between the buildings, with northern areas consisting of approximately 4 superimposed layers (matching



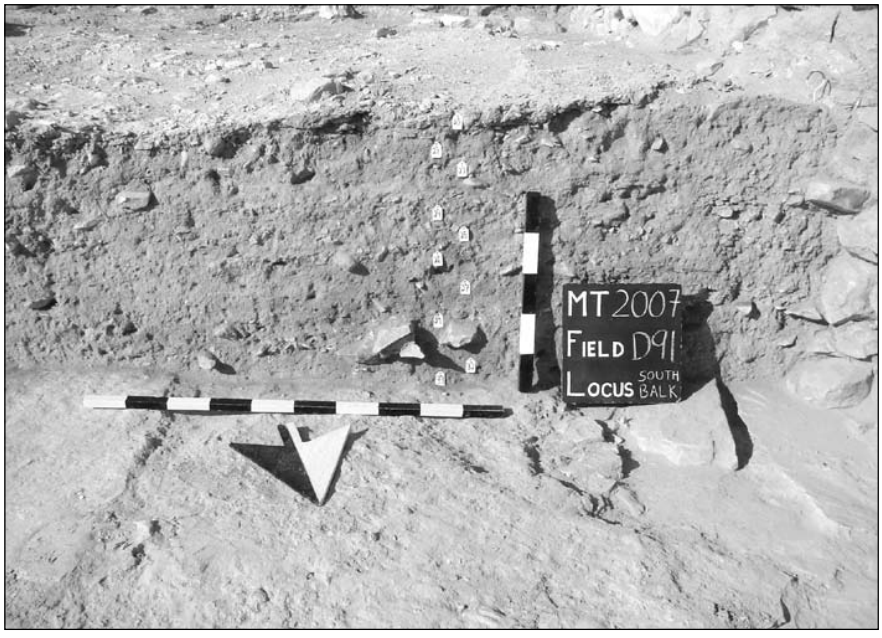
6. Major wall lines of Field Phase 1 in Fields C (South) and D.

2. Square Supervisors for the 2006 season were C. Dahlke, S. Edwards and J. McDermid, while those for the 2007 season were G. Braun, C. Dahlke, and E. Zeran.
3. The investigation of the area west of Buildings 300 and 306 will be the focus of the 2008 season in Field D (under the supervision of S. Edwards) to locate the settlement's western street system and Building 303's relationship with the western casemate wall.

well with the past results from Courtyard 150), compared to 10 in the south.

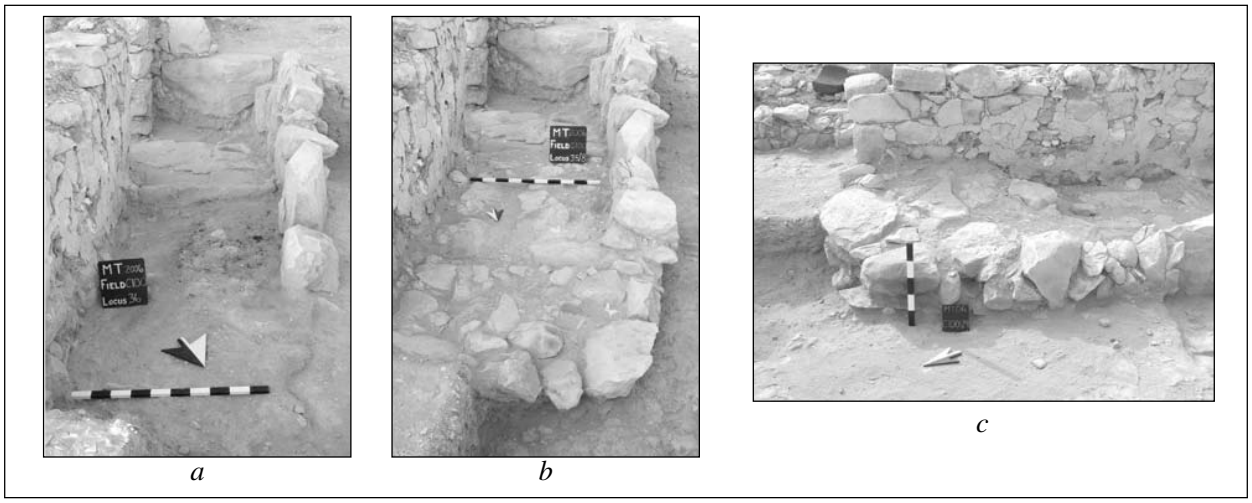
The most complete sequence was identified in an east-west section across the street from Building 300 to the ramp of Building 200, where the deposition was deepest. Here layers associated with leveling of the bedrock during the construction phase 1C were identified (D91:34=C100:34=C99:14) (**Fig. 7**) and the earliest intentionally laid surface (D91:33). Later accumulations of surfaces (D91:32, D91:29, D91:27–23, D91:21), as well as the latest Iron II street surface (D91:20), correspond to use phases 1B-1 and 1B-2. Finds from these various surfaces include over 560 animal bones, small ceramic sherds, broken ceramic figurines, perforated shell pendants and broken spindle whorls, just to name a few. Most notably, the latest Iron II surface (D91:20) was very hard and grey in colour, possibly lightly baked by fires associated with the destruction/abandonment phase of Field Phase 1. Over this, extensive accumulations of windblown soil, rockfall, animal bones, Iron II sherds (plus a few belonging to the Roman period), fragmentary limestone containers, stone altars, ceramic figurines and numerous other finds were identified, all of which were extremely dirty and caked with lime, possibly due to decaying limestone mixing with seasonal rains in the years following abandonment.[4]

Another goal for the excavations in Street 220 was the investigation of the ramp installation initially discovered outside Building 200 in 2005. This ramp proved to have a very complex history, and three principle phases were identified (**Fig. 8**). First, the entrance to B200 consisted of a simple porch consisting of two walls (C100:18 and C100:6), finished with a slightly raised sill along the north (C100:38). These features enclosed an area of 1.30 × 2.25 m marked by an oval depression in the bedrock in the southwest corner. The earliest layer D91:34 acted as a foundation for the western porch wall in places where the bedrock dipped, suggesting that the initial porch construction should be assigned to the construction phase (1C). Later, as the street surface was raised due to debris and soil accumulation, modifications were made to the entrance in the form of a raised step (C100:8, C100:35). This addition extended northwards for approximately 3.15m beyond the sill (Phase 1B-1). Finally, as the street surface continued to rise, an additional step (C100:30; 1.42 x 1.30m) was added over the northern end of the earlier step, which maintained a level high-



7. East-west section through Street 220.

4. Soil layer D91:6, a layer filled with ceramic sherds, animal bones and fragmentary artefacts that was previously identified as the latest surface of the street, can more accurately be called the earliest layer of this accumulation. As excavations continued and our understanding of the street sequence improved, it became clear that this debris layer overlaid the latest street surface.



8. Architectural modifications to the entrance ramp leading into Building 200: the entrance porch (a), the single tiered ramp (b) and the two-tiered ramp (c).

er than that of the street (Phase 1B-2). These efforts were likely aimed at preventing water, sewage and other runoff from flowing into the main room of Building 200, whose floor was at a much lower elevation.

Building 300

Following the discovery of the eastern wall of an unidentified structure during the 2005 season, Building 300 was fully excavated in 2006 and 2007. This building consists of a single long rectangular room (R301) measuring 8.70 x 3.20m, enclosed by walls 1.0m thick on average (W3005, W3001, W3004 and W3000), yielding an overall exterior measurement of 10.70 x 5.20m. These walls were footed on sculpted bedrock ledges, with clearly visible tool-marks along the north and south (Phase 1C). Access to the building itself was rather restricted, as the sole doorway (threshold D91:41) was located in the southeastern corner approximately 1.07m above the earliest street surface. Considering the difference in elevation between this surface, the threshold of the doorway and the earliest surface of R301 (D91:58), it is plausible that in its earliest phase access was gained to this building via wooden ramps or stairs. During this phase a 1.69m high plastered pillar of fieldstones (D91:44) was erected over bedrock in the northeast corner of R301, and a hard packed surface (D81:35, D91:53, D91:55, D91:58) accumulated over the bedrock and an unusual trapezoidal depression in the centre of the room.

In the earliest use phase (1B-1) a rectangular arrangement of flat-lying cobbles (D91:52) was laid in the southeast corner as a foundation for a monumental stone staircase (D91:40), which itself consists of 6 large steps (ranging in width from 1.25-1.36m and extending over an area 1.62m long). This staircase does not bond with the surrounding walls, indicating that it was not part of the original building plan (Phase 1C). A low north-south partition wall was also set up at this time between the pillar and the north wall (W3014), creating a small, enclosed area of unknown function. Hard packed layers accumulated in the eastern part of the room (D91:50) and similar layers accumulated further to the west (D81:29 and D81:31). These layers in turn sealed against an unusual and roughly rectangular formation of stones set against the western wall (D81:30). This formation, likely a platform or foundation for another type of installation, measured 2.53 x 1.63m x 0.23m, and acted as a focal point for the long room (**Fig. 9**). Although initially thought to have acted as some sort of subfloor fill for a bedrock void, excavations beneath the stones of the installation identified a hard-packed soil layer (D81:36) containing dozens of sherds and faunal bone fragments over the earlier construction surface (D81:35), negating this possibility. The function of the building's earliest phase of use is difficult to ascertain owing to the near complete lack of material culture remains, aside from Iron II ceramic sherds and limited faunal material. Whatever the function,

9. View of B300 looking west with pillar in the bottom-right and rectangular stone formation along the rear wall from the first use-phase (1B-1). Floor layers excavated in the centre revealed bedrock voids and depressions visible here.

either for storage, habitation or even religious activities, the room was cleared out prior to its reuse later in the Iron II.

In the building's second phase (1B-2), the rectangular installation went out of use, and it was covered with a fill layer of loose soil and cobbles (D81:33) above which a later packed earth and plaster surface was laid (D81:22 and D81:24). This latest surface covered the entire room, sealing against the existing staircase and pillar as well (D91:48 and D91:51). This later use-phase was clearly associated with a food processing and/or industrial function, as numerous grinding tools, such as an anvil (MT 2179), several upper loaf-shaped millstones (MT 2180, MT 2161) and a quern fragment (MT 2147), were found on the floor and immediately above, amongst burnt beams and fragments of ceiling material. This burning was very pronounced around the staircase area, with ashy layers and burnt beams deposited at steep angles down and off the side of the steps (D91:42).

Building 303

A secondary goal of the 2007 excavation season was to explore the area west and south of the monumental Building 300, which led to the discovery of a new rectangular structure oriented east-west. This building was only partially excavated, but its general layout was identified and its stratigraphic history thoroughly documented. Building 303 consisted of at least two parallel rooms (R302, R303) divided by a pillared wall (W3008) with regular spacing of 0.70m, with an entrance in the northeastern corner separating its northern wall (W3006) from the western wall of Building 300. These pillars (Phase 1C-1) were laid over both bedrock outcroppings and arrangements of flat-lying boulders (D71:39), filling voids in preparation for the earliest hard packed construction surface (D71:37 in R302; Phase 1C-2).

Over this, a series of beaten earth layers accumulated during the use phases of Building 303, including surface D71:34 (Phase 1B-1) and the latest surface D71:26 (Phase 1B-2). In the latest phase, modifications were made to the central aisle and an area of stone paving was installed (D71:32) along with two low partition walls between the pillars (W3009 and W3010). Finds from the floors of the building were related to food preparation and industrial activities, including a basalt mortar (MT 2301), a basalt anvil (MT 2303), a stamp seal (MT 2317) and an upper loaf-shaped millstone (MT 2311) from the earlier phase 1B-1, plus a mortar fragment (MT 2289) and hand grinder (MT 2277) from phase 1B-2. In the debris layer associated with the ceiling collapse further finds of a similar nature were made, such as basalt mortars (MT 2209, MT 2266), a basalt upper loaf-shaped millstone (MT 2219) and a basalt lower grinding stone (MT 2195), along with two limestone basins, D71:25 (0.65 x 0.44 x 0.21m, with a depth of 0.14m) and basin D71:11 (0.69 x 0.58 x 0.40m, with a depth of 0.24m), which fell at angles from the second storey floor and the uppermost roof, respectively.

Based on the finds and the lack of parallels to the industrial pillared buildings along the east side of the settlement (i.e. the lack of loom weights, intra-pillar basins, etc.), this structure may instead belong to the domestic realm. Excavations outside of the northeast doorway of this structure also identified the latest Iron II street surface in this area (D71:51) beneath layers of windblown soil and wash, much like those over the eastern Street 220. A probe through this layer, which sealed against a stone threshold (D71:54) across the doorway, resulted in the discovery of the earlier street D71:55, and excavations were halted in anticipation of a sequence similar to Street 220.

Building 306

Immediately south of Building 300, a third structure was identified, whose eastern wall was first noted in 2005 as D91:9.[5] Judging from wall lines visible on the surface of the mound, the building (B306) appears to have measured approximately 6.25 x 7.50m, with a central hall (unexcavated) and doorway along the central street system, with rooms to the north and south. Building 306 was only preliminarily explored along its north side, with one room in the northeast (R305) completely excavated to bedrock and a room to the west (R306) left partially unexcavated. This structure appears to have been contemporary with Building 300, as the corners of W3001 and W3003 were bonded in the lowest courses. However, Building 300 was certainly completed earlier than Building 306, as the uppermost courses of W3003 abutted those belonging to W3001 and were on a slightly different orientation. The western wall (W3007) of B306 also abuts the southern wall of Building 300 (W3001).

Excavation results from the two rooms on the north side indicate that B306 had rather unique architectural features. Just below topsoil, a line of 6 pillars was discovered (W3011), measuring on 0.50 x 0.30m on average spaced at intervals between 0.70 and 1.00m, suggesting at first that the layout may be similar to the pillared buildings in Field B. Over the course of excavation in the northeastern room, however, a different method of building was noted (Phase 1C). The pillar in this room is footed on an east-west stone wall (W3012) rather than on the floor itself, with a height difference of 1.20m from the top of the wall to the earliest surface (D91:70). At this time the west wall of R305 (W3013) was built as well, which terminated short of northern W3001 to create a doorway between R305 and R306. Based on the preliminary results, the pillars appear to belong to the second storey, unlike any of the pillared buildings investigated to date (**Fig. 10**).

That the structure was in use for a lengthy period of time is supported by the recognition of several superimposed floor surfaces in R305.

10. Details of architecture from R305 in the northeast corner of Building 306, with pillar footed on east-west W3012.

The earlier floor (D91:70) was packed over bedrock and likely functioned as a construction surface (Phase 1C). Over this two distinct layers accumulated, including the earlier layer D91:69 (Phase 1B-1) and the later layer D91:61 (Phase 1B-2). Over the latest surface an interesting layer of soil and debris from collapse was identified (D91:57); it contained large amounts of mendable sherds, small finds and high status goods, including a beautiful female figurine applied to the neck of a painted jug (MT 2402). Unique finds were also made in the unfinished R306 in the form of a well-made stone table (MT 2425), bowl fragment (MT 2359) and gaming board (MT 2412), likely deposited during the collapse of the uppermost storey. Excavations in 2009 will focus on the further exploration of this unique structure and the complete documentation of its history and layout.

Field E (Annlee Dolan)

Five seasons of excavation in Field E have exposed the casemate fortification system that runs around the perimeter of the site, along with an adjoining structure, Building 400 (B400).[6] Excavation has indicated that B400 is much larger than initially anticipated and though specific aspects of B400 are well defined, the extent of the building was not yet known at the end of the 2005 season. Therefore, the 2006 and 2007 seasons focused on delineating B400, and at-

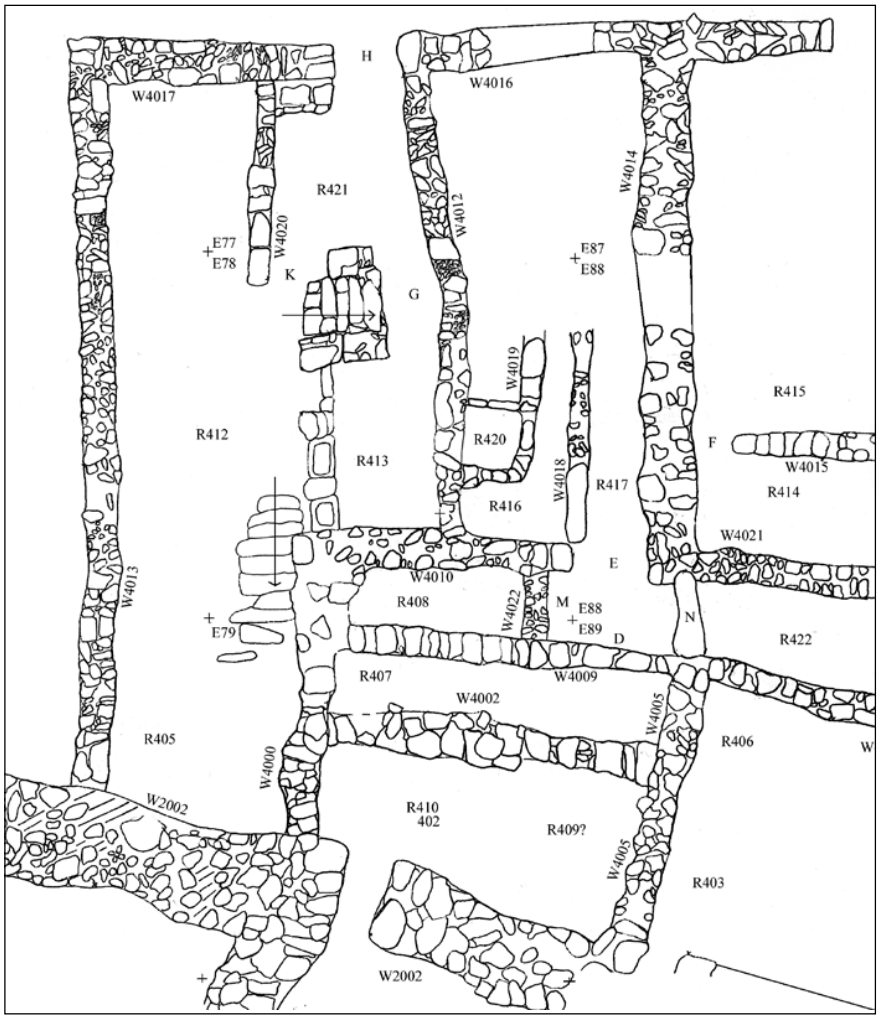
5. This building was temporarily assigned a Field B Building number (B250), but was later reassigned a Field D Building number (B306).

6. For a full description of previous excavations in Field E, see Daviau *et al.* 2006.

tempting to understand its function (**Fig. 11**).

B400 is unique at Khirbat al-Mudayna, not only for its unusual sprawling plan, but also in that it appears to be the domestic area of the site. Constructed against the inner casemate wall (W2002), B400 is rectangular, measuring at least 17.00m (E-W) x 12.5-15.00m (N-S), though the eastern extent of the building is still not certain. On the west side of B400, Wall 4013 extends from the casemate for 12.5m, conforming to the fortification system as it curves north around the site. This wall was constructed in a boulder-and-chink style with mud mortar. The size of the stones is considerably smaller and less well hewn than those that were used in the northern sector of the site near Gate 100. Some walls in B400 had a well-preserved fine plaster facing, while others were not faced. The discovery of two staircases indicates that a portion of the building had a second storey. Evidence for this second storey was preserved in Room 419 (above R405) and Room 410 (above R402).

The finds from B400 support the theory that this was a domestic complex, with common utilitarian objects found in abundance. These include cooking, storage and serving vessels, grinding tools, loom weights, bone implements, stone weights, limestone basins, and other utilitarian items. It is possible to suggest functionally specific use areas for B400, based on concentrations of artefacts. The 'work areas' of B400 were located in the west and the south. Situated next to the casemate wall, R402 contained more than 20 loom weights, along with groundstone tools, mortars, and pounders. To the east of W4005, R403/R406 had a large basin situated between two pillars, along with a bone spatula, an iron sickle, two pieces of worked bone, a wooden spool, pounders, groundstone tools, a mortar, a spindle whorl, and a stopper. This suggests that



11. Building 400 after the 2007 season.

small-scale textile production took place in the southern sector of B400. Similarly, on the west side of B400, R413 contained two basins that were situated between the pillars which span the distance between W4010 and Staircase B. Finds from R413 include loom weights, a bone spindle, a limestone table and a limestone utilitarian container (**Fig. 11**).

The remains of a kitchen were found on the east side of the building in R415 (**Fig. 12**). This kitchen contained two ovens, one of which sealed against W4015 and was surrounded by a thick plastered platform, as well as a layer of ash. Many animal bones and cooking pots were also recovered from R415. To the west of the kitchen in the central portion of B400, was a possible storage area, with several intact storage vessels in R416, and bin-like installations in R420.

Not only was the 2007 season successful in better defining the function of B400, along with delineating its northern and western perimeter walls, but also in clarifying its phasing; it is now evident that there are three distinct phases of occupation in B400.

a

b

12. a) Pillars and basins in Room 413, with Staircase B to the right; b) Kitchen in Room 415.

Interpretation and Phasing in Field E

Field Phase 2C-1: Construction Phase of Fortification System

The earliest phase in Field E is represented by the construction of the casemate fortification system. The inner casemate (W2002) and outer casemate (W2001) walls bond with cross walls to form the casemate rooms. The revetment system (in Field H) may also have been constructed at this time running from the south end of the site eastward around the curved perimeter. This revetment consisted of a tightly packed layer of rubble, located at a consistent depth and sealing against the outer casemate wall. It was exposed in the 2004 season on the south and southeast side of the site, but does not appear to continue north along the east side. Nor does it extend around the southwest perimeter of the town. As noted in the 2004 season, it is likely that this cobble and boulder fill was placed against the outer casemate in order to maintain the structural integrity of the fortification system. However, it should be noted that these stones were laid relatively flat, forming a pavement-like surface. The stone pavement extends approximately 1.20-2.40m from the outer wall. It is also worth noting that at the very south end of the site, the stones of the outer casemate appear larger than those which are visible near the southeast corner where the pavement ends; those in the south end average 0.60-1.00m in length, while those east of the pavement range between 0.30-0.40m in size.

Field Phase 2C-2: Construction Phase of Building 400

Following the construction of the casemate fortification system, B400 was built abutting the inner casemate, W2002. In order to form a level building platform, the unevenness in the bedrock was packed with a cobble and pebble fill. The walls of B400 were then constructed either directly on bedrock or on this fill layer. From west to east, the original north-south walls extending from the inner casemate include W4013, W4001, W4005 and W4008. W4013 bonds with North Wall 4017 in what appears to be the northwest corner of the building. Thus, W4017 and W4016, separated by Doorway H, are likely the northern limit of B400, with access through Doorway H from the north. Building 400's in-

ternal walls belonging to this initial construction phase include W4002, W4007, W4009, W4010, W4021, W4014, W4015 and W4019. Although the eastern extent of the building has not yet been determined, it appears that there are at least 16 first storey rooms which belong to the earliest phase of the building. The earliest surfaces of B400 sealed against the bottom of these walls.

Field Phase 2B-I: Earliest Use Phase of Building 400

The earliest use phase of B400 is marked by the surfaces that were initially placed over the fill and bedrock, sealing against the walls of B400. Fully excavated rooms that have surfaces sealing against the lowest courses of the original walls include Rooms R405, R412, R421, R413, R402, R403, R406, R420, R416, R414 and R415. Based on the pottery from these surfaces, the earliest use phase of B400 began in the Iron II Period and extended into the Late Iron II Period.

Field Phase 2B-II: Secondary Use Phase of Building 400

This phase is represented by several major additions or alterations to Building 400. In areas where these later alterations occurred, it seemed to be indicative of a change in function of an area. It should be noted that not all rooms contained evidence for more than one surface. This is due to the fact that if the room did not have any major architectural changes, the original floor of the room likely remained in use throughout the life span of the building.

There are 10 rooms that have evidence for secondary floor surfaces including; R405, R421, R413, R402, R403, R406, R420, R416, R417 and R414. Some rooms also exhibit evidence architecturally for this secondary use phase. In R421, several architectural features were added. Wall 4020 was constructed abutting Wall 4017 and ends abruptly to allow access to Staircase B. Bench E77:24 was also constructed at this time, abutting both W4020 and W4017, next to Doorway H.

W4018 is also a secondary wall which was constructed upon the earliest surfaces of Room 416. Wall 4018 abuts Wall 4010 and has a new surface sealing against it. The addition of this wall is significant because it cuts R416 in half, turning the area east of it into a narrow corridor or passageway, R417. At this time, access between R416 and R417 was through Doorway J in W4018.

In the 2006 season of excavations, it was apparent that the eastern-most portion of Wall 4015 was secondary and was constructed of smaller stones. This secondary portion of W4015 was faced with a very thick layer of plaster (up to 0.50 m in depth) to level out the face of the new extension with the rest of W4015. The extent of this wall is still not clear, but the second surface level found in R414 sealed against it.

Phase 2B-III: Final Use Phase of Building 400

This phase is represented by several minor modifications to Building 400; however, these are significant due to the fact that they resulted in a third (and final) surface in some areas. In the 2005 season it was noted that Room 409 was a later addition with Wall 4011 enclosing a small area against the inner casemate (W2002) and Wall 4005. During the 2005 season it was unclear how R409 was entered. However, it is now evident that R409 can be entered from casemate room R401. Wall 4011 was constructed on top of the Field Phase 2B-II surface in R402, placing it in Field Phase 2B-III.

In the 2007 season, this phase was also identified in a blocked up doorway (J) within W4018, closing off access from R417 to R416. As a result, a new use surface was laid over the Field Phase 2B-II floors of Rooms R416, R417 and R420. The blocking of Doorway J drastically altered the function of R416; turning it in a storage room, with many pithos fragments found just west of the blocking wall. Similarly, many pithos fragments were found in the northern portion of R417, thus turning what had once appeared to be a main corridor into a storage area.

Although it cannot be said with certainty, as it has not been fully exposed, it is probable that Wall 4022 also belonged to the latest use phase, blocking up Doorway M and restricting access to R408. This wall is made of small cobbles in a similar manner to blocking wall E88:54, which blocked Doorway J.

Field Phase 2A- Abandonment

This phase is represented by the destruction and abandonment of Building 400 and the

casemate system. B400 was not destroyed by a massive conflagration, nor did the south end of the site suffer the same destruction as the north end did. However, it would seem that the final occupants of B400 left in haste, as the building was not cleared of its contents. Instead of being destroyed, this structure gradually and naturally gave way to erosion processes with walls tumbling and roofs collapsing, preserving the floors beneath. This phase was represented by the post-occupational debris that is situated above all latest and second storey floor surfaces.

Field Phase 1

Phase 1 is represent by the Medieval burials which were found in E99 and G9 in the 2004 and 2005 season of excavations. For full details of these burials and this field phase, see Judd in Daviau *et al*. 2006.

Cemetery Excavation and Bioarchaeology, 2006 (Margaret A. Judd)

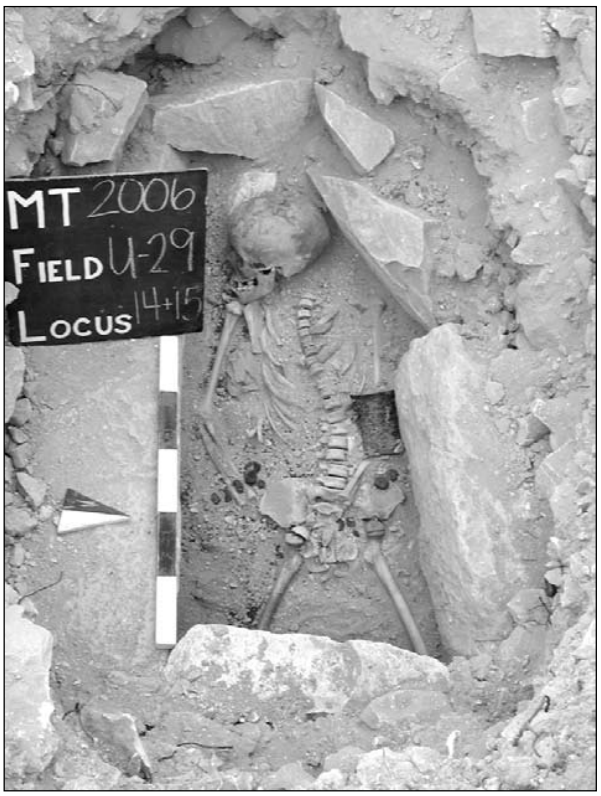
Introduction: The bioarchaeological[7] field goals of the 2006 field season were to first conduct a test excavation at the low-lying area that extended south of Khirbat al-Mudayna ath-Thamad that was believed to be a large cemetery. The second goal was to fully expose the burial complex at WT112 that was begun in 2005 (Daviau *et al*. 2007: 275) and extend the excavation vertically to determine if the site had an earlier use.

Khirbat al-Mudayna ath-Thamad: Variations of linear and circular clusters of stones suggested that the low-lying mound that extended south from the main tall of Khirbat al-Mudayna was a multi-period cemetery; the annually increasing pockets of looting implied this activity although no bone was found. Eleven suspected burial features were contained within three 6.00 x 6.00m squares (U29, U30, and V21), and of these, three features were completely excavated and are presented here.

Burial MT U29:4

Grave: A one course ring of free standing, unhewn limestone boulders (MT U29:4) marked the grave cut that contained a rubbly fill consisting of soil, pebbles and cobbles. Large rectangular medium-sized limestone boulders lined the sides of grave cut to form a crypt 0.75 x 0.30m at the greatest points; the eastern most section formed a small niche where the lower legs of the skeleton (U29:14) extended. The skeleton was supine upon the bedrock (616.00 masl) 1.14m from the surface and oriented west-east about 220° (**Fig. 13**). Both arms were extended along the sides and pronated so that the ulnas were lateral. The legs were fully extended and bowed laterally at the knees.

Objects: A wooden two-sided comb (MT 1775) was placed beside the left elbow; six large beads encircled the right wrist (MT 1766a-f) and five large beads were associated with the left wrist (MT 1756a-e). A metal ring with a square stone had discolored a proximal phalanx green; a cloth disc was associated with the ring (MT 1774a-b). A necklace of small beads (MT 1778, MT 1816a-p) surrounded the neck region, and finally a round metal-trimmed glass disc (MT

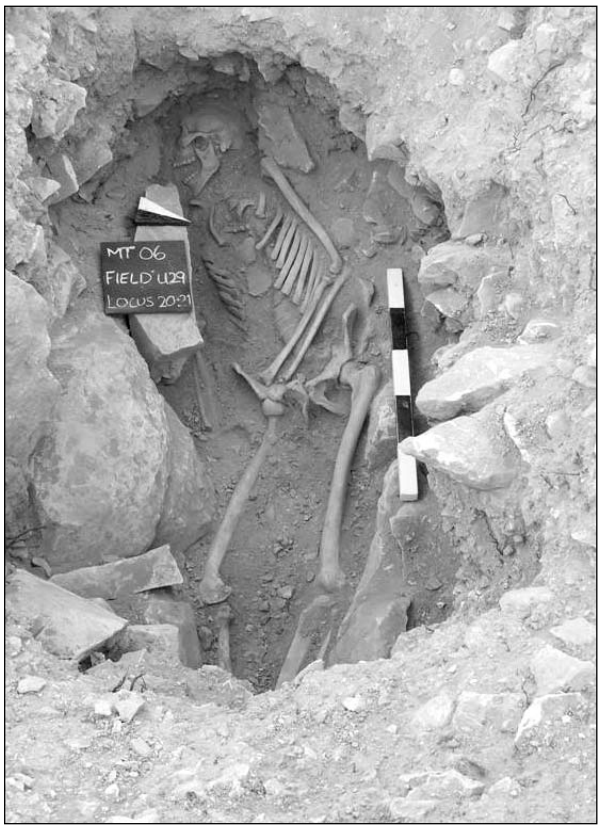


13. Burial MT U29:4. Subadult within a lined burial pit, wooden comb and beads in situ.

7. The bioarchaeological team included Margaret Judd, Kara Golya, Sarah Leentjes, Cathie Marcks, Laura Morss, Josh Sadvari, Dyan Semple and Bonnie Wilson.

1814) wrapped by a piece of cloth and bound by a thin cord (MT 1765) was just under the right shoulder. No pottery was recovered.
Skeleton: The skeleton (U29:14) was about 10 years old ±30 months, based on the dental eruption sequence (Ubelaker 1978: 47). The skeleton was well preserved and nearly complete, with only some extremity bones missing. No visible pathological lesions were observed, but the right upper first premolar was erupting at an angle.

Burial MT U29:2
Grave: A ring of free-standing limestone boulders (U29:2) surrounded three rows of flat stones dry-laid in bolder and chink style to mark grave cut U29:16. The fill was moderately firm and rubbly sandy textured soil with pebble and cobble inclusions that covered a layer of unhewn and dry laid small boulders. The grave cut measured 1.35 x 0.25m at bedrock (616.42 masl) and was lined with flat stones. A completely articulated supine adult male skeleton (MT U29:20) was extended in a west-east direction about 300° with head facing right to about 220° (**Fig. 14**). The legs were fully extended and crossed at the ankles, left over right. The right arm was extended with the hand under the hip and the left arm was pronated so that it lay across the pelvis. No grave goods were recovered.



14. Burial MT U29:20. Adult male laid supine in a lined burial pit.

Skeleton: The preservation of the skeletal remains (MT U29:20) was exceptionally good and nearly all of the remains were recovered. Morphological features of the skull and pelvis were masculine, though not exceptionally robust (Buikstra and Ubelaker 1994: 16-20). The medial clavicle was completely fused so the individual was at least 30 years of age (Scheuer and Black 2000: 251). The pubic and auricular surfaces suggest 19-34 and 30-39 years of age respectively (Buikstra and Ubelaker 1994: 23-32); the age of the individual at the time of death was likely between 30-34 years. Slight amounts of dental calculus and periodontitis were observed. Osteophytosis was noted on the vertebral column especially T7-T12; T11 and T12 were fused. A thick band of osteophytes extended from the joint margins of the three articulating bones of the right knee; surface osteophytes and eburnation were intermittent.

Burial MT V21:4
A circular ring of soft limestone boulders (1.75-1.90m diameter) surrounded unhewn and dry laid pebble chink stones. Three large unhewn flat limestones and cobble chink stones lay immediately below this locus. Bedrock was reached at 616.02 masl with no evidence of human or animal skeletal remains in the burial fill. The grave cut (V21:12) measured 0.87 x 0.46 and was 0.76m deep. It is possible that this feature functioned as a cenotaph.

Discussion
Some of the 11 superstructures located within the excavation area, such as U29:2 and V21:4, surrounded a surface layer of large flat stones laid side to side along the long axis of the structure. The interior surface of other superstructures was filled with soil and cobbles with no distinct top layer of stone, although windblown soil and debris may actually cover a layer of stones. Graves marked by superstructures U29:2 and U29:4 contained a layer of large stones balanced on a lower limestone pit liner that appeared at approximately the same level

(616.00-616.33 masl). In both cases a space was hollowed at the east end of the pit to contain the lower legs and feet. Both individuals were supine, oriented approximately west to east and facing south. These similarities suggest that the two individuals were of the same kin group or culture and that biological sex or age-at-death were not factors in the grave construction or burial configuration. The burial pit of the child is somewhat deeper than that of the young man (1.14 vs. 0.66m) but this is more likely due to the bedrock barrier encountered. The structure of the graves were similar with both consisting of a circular stone superstructure, a stone lining and a lower leg niche.

No pottery was recovered from the excavated graves. The few pottery shards recovered from the grave fills were likely unintentionally included when the graves were infilled; shards spanned from Iron Age, Early Roman, Byzantine, Early Islamic and Umayyad periods. Based on the excavations in squares V21 and U29, bedrock was reached less than two meters below the surface; the presence of earlier (Iron Age) burials is therefore extremely unlikely, at least in this part of the cemetery. However, the two skeletons recovered from the features in Square U29, confirm the supposition that the ring-like stone structures on the southern expanse of Khirbat al-Mudayna were burials and therefore form a large cemetery.

Ethnographic work records slight variations in historical Bedouin burials, but in all cases the funerary ritual was swift and any form of physical contact with the deceased was shunned; in the past non-Bedouins were often paid to perform funerary tasks, such as cleansing, dressing and burying the body (Burckhardt 1831: 99; Dickson 1949: 211; Musil 1928: 670-71; Toombs 1985: 93). Some variation for the burial pit and superstructure was recorded. For example, when the death occurred near the settlement the Ruwala Bedouin required that graves for females be at least shoulder height, while those of males need only be as deep as the knees at standing height (Dickson 1949: 212; Musil 1928: 670). Archaeological features associated with Muslim burials (Insoll 1999) were noted by Hobbs (1989: 65) who observed that graves among Egyptian Khushmaan Bedouin were six feet deep and long in an east-west direction. A side niche on the north side held the body so that soil would not fall onto the face of the deceased during infilling; no grave goods were included (Hobbs 1989: 65). Among Kuwaiti Bedouin, Dickson (1949: 209) also noted the side-niche, but graves were no more than four feet deep; the deceased was placed on their side with the right hand under the right cheek facing the open grave. A stone was occasionally placed at the head and foot of the grave to serve not as a memorial, but as a marker so that the grave would not be dug into (Dickson 1949: 210). The Ruwala Bedouin also required deeper graves for females (Musil 1928: 670). A stone was placed under the head and the body laid on the right side facing south. Stones covered the corpse, then soil; two large stones were erected for a male and one for a female. When death occurred in transit, a shallow grave about 20-25cm deep was dug; the body was laid in the same position and covered with stones or earth (Musil 1928: 670-71) or according to Burckhardt (1831: 121) the deceased was often interred in ancient ruins if conveniently located. Toombs (1985: 70-71) found that the interments of children less than three years of age were tended to with less care: the structures were more frequently simple pits, children were placed in a flexed position and they did not necessarily face Mecca. After the age of three years, children's burials followed patterns observed among adult interments, which led Toombs to conclude that their status within the family changed at that point. These ethnographic accounts can provide reasonable explanations for the funerary record, but also emphasize subtle regional variations in funerary practices. Without a large sample size any interpretation here would be speculative.

Burying an individual with a few or no grave goods to honor their life may be the normal practice for all adults interred in this area of Khirbat al-Mudayna regardless of other factors, such as status, wealth or cause of death. Alternatively, Toombs (1985: 93, 106-108) attributed the variation in burial wealth to the fact that the Bedouin were buried with the accoutrements that they wore or carried on their bodies at the time of death, such as beads, rings and armlets; pottery was extremely rare. Burkhardt (1831: 33) observed that male Bedouin did not favor jewelry or other adornment, thus supporting

Toombs' explanation. However, Toombs (1985: 92-3) pointed out that women's jewellery was found frequently in the graves of subadults and men, likely placed there by bereaved wives and mothers.

The jewellery observed in the burial of the child here was typical of that worn by historic female Bedouin (Dickson 1949: 156; Toombs 1985: 104). The large beaded bracelets of amber, coral or mixed stones were universally worn on each wrist by the Bedouin females with whom Dickson lived among in Kuwait. It is also noteworthy that wood combs were also interred with unmarried females by traditional Jordanian villagers (Granqvist 1965: 63). Although it is tempting to conclude U29:14 was female based on the grave goods, as has been suggested for other skeletal samples (e.g., Levy *et al*. 2004: 81), the biological sex of this individual cannot be confirmed macroscopically from the skeletal remains as dimorphic skeletal features only develop during puberty (Chamberlain 2006: 93-94).

While it was assumed that V21:4 marked the grave of a child, the complete lack of bone fragments suggested that if functioned as a cenotaph. The age-at-death of this individual for whom this cenotaph was dedicated cannot be confirmed, and it cannot be assumed that the small size of the feature reflects the age of the absent individual. If this feature was indeed a cenotaph it suggests that the person's body was not recovered for burial in their homeland and tradition dictated that some form of marker be erected to mark their passing or memory.

Site WT112

Site WT112 sits atop a small hill at the tip of a terra rosa finger formed by the wadi and erosion just west of Khirbat al-Mudayna (Daviau *et al*. 2007: fig. 21). The eroded wadi walls reveal little in the way of material culture or stratigraphy and the landscape is littered with small to large limestone boulders. It was believed that this site served as some type of funerary monument or cemetery owing to the continued looting of the site and last season's recovery of at least three individuals partially exposed by local looters (Daviau *et al*. 2007: 275). The goals of this season were to establish the horizontal extent of this complex and to extend the excavation vertically to determine if the site had an earlier use.

Field B

A 10.00 x 10.00m area encompassed the previously excavated area Field B and an additional few meters to the east and south. Fresh looting was noted on the northern edge of the 2005 excavation and more disarticulated human bones were recovered from the surface. Following cleanup and the removal of a thin layer of topsoil numerous large stones that ran in rows formed a three wall perimeter of a small building rather than numerous individual burial features (**Fig. 15**). Two large rectangular stones (B1:36) ran parallel to the north wall (B1:32) and created a space that was reminiscent of the stone crypts in Field U at Khirbat al-Mudayna described above (**Fig. 16**). However, further excavation revealed that the stones were intentionally placed on top of two well-preserved crossed innominate bones following the robbing (**Fig. 17**). Remarkably the bones were undamaged.

Three solid walls ran along the north (B1:32), east (B2:2) and south (B2:4) sides of the structure leaving the west side of the building (Building 1) open (**Fig. 18**). An interior hard-packed clay surface (B2:16) sealed against the walls of the 2.34 X 5.01m room. The interior of the building is best described by quadrants. The north and east quadrants formed a space measuring 2.34 x 2.27m. The north quadrant contained a threshold or small partition (B1:33) that extended perpendicularly from the north wall. A small oblong rock feature (B1:36) that may have

15. Large rectangular stones (B1:36) exposed by looting following the 2005 season. Numerous disarticulated bones were recovered within the space created by the stones and the north wall.

16. Large rectangular stones (B1:36) exposed by looting following the 2005 season. Numerous disarticulated bones were recovered within the space created by the stones and the north wall.

17. Innominate bones and vertebra in situ below B1:36.

functioned as a container support was nestled into the northeast corner. No features were associated with the east quadrant.

The west quadrant is on the south side of the threshold B1:33 and it is this area that suffered extensively from robbing, which resulted in the partial destruction of wall B1:32. It was above this area that many commingled bones were re-

18. Building 1 final photograph looking west towards the wadi.

covered in 2005 (Daviau *et al*. 2007: 275). The floor of the south quadrant contained a circular fire pit area that extended 1.2-1.5m. Small human bones were recovered above the ash but none were charred, signifying that they were deposited on this surface at some point after the fire was extinguished and cooled. The burnt area was superficial, less than 1.0cm deep and likely served to provide light for the robbers or warmth for those seeking temporary shelter. A circular structure (B4:4) abutting the end of the south wall B2:4, which was complemented by a similar structure (B2:7) at the east end of the same wall. A rectangular limestone rock (0.88 x 0.30 x 0.22m) abutted against this structure to form a convenient bench at the entrance to the small room; however, this stone has been moved at least two times and its exact provenience is unknown. A few small human bones were found on the south side of B4:4 but may have naturally shifted after the skeletons were disturbed. Over time layers of flat lying stones were placed over the south quadrant above the hearth on at least two different occasions demonstrating that the building had been reused. It was above the final stone floor that the majority of commingled human remains were found this season.

The final evidence of use was in the historical past. An infant (B2:19) was buried in a hollow created within the exterior portion of wall B2:4 (**Fig. 19**). A small crypt was formed within the wall and with additional small cobbles. The body lay on its right side facing west. Only the thorax, upper body and skull were *in situ*; other bones were scattered nearby, likely due to scav-

19. Infant (B2:19) burial in south wall of Building 1.

enging animals rather than looters.

Few artifacts were associated with the interior of the building aside from an occasional partial utilitarian stone artifact, such as a broken iron tool (WT 768) that may have been used to rob the graves. A copper coin was found near B4:4, but was so corroded that any contextual evidence was obliterated. Pottery was consistently Nabatean and Early Roman at all levels. Robbing took place on at least three occasions: 1) during antiquity as evidenced by the stone floors (B2:13, B2:8) over disarticulated bone and the fireplace; 2) within the last few years as shown by the robbing discovered in 2005, and 3) during the intervening year prior to the 2006 season.

Skeletal Remains

Because the skeletal remains from Field B were disarticulated it was first necessary to reassemble complete individuals and determine the number of people actually represented. Bones were sorted by type, conjoined when broken, paired when matching left and right elements were identified, and articulated if joint surfaces matched (White and Folkens 2005: 339). Five individuals were discerned and included two children and three adults. However, one child (B2:19) was not associated with the other individuals as it had been interred externally in the wall of the building rather than within the building. The demographic profile of the adults was determined using the protocol summarized in Buikstra and Ubelaker (1994: 15-32). Biological sex was ascertained using the dimorphic features of the innominate (ventral arc, ischiopubic ramus, subpubic angle, auricular sulcus); the skull (supraorbital ridge, mastoid process, orbital margin, mental eminence and nuchal crest); and long bone measurements if neither innominate nor skull were present. A summary of the inventory and paleopathology are presented here.

WT112 B:19: Female, 35-44 years**.** The majority of the bones of this individual were recovered in 2006 in two large clusters of disarticulated bone west of B1:34 (Daviau *et al*. 2007: 275). The long bones, vertebral column, mandible and extremities were complete and in excellent condition. Slight calculus and moderate wear was noted on the mandibular teeth. One abscess was associated with the upper right first molar. A healed Colles fracture, commonly caused by a fall on an outstretched hand, was observed on the left radius (**Fig. 20a**). Osteophytic outgrowths occurred on the cervical and lumbar vertebral bodies; the articular facets of the atlas were grooved and eburnated. Gross osteophytic extensions and eburnation, caused by bone rubbing against bone, were on both big toes (first metatarsal and proximal phalanx) (**Fig. 20b**)

WT112 B: 16 Female, older adult. This individual was fragmentary with portions of arms, innominates, mandible, maxillae and assorted small bone and fragments present. Dental abscesses were associated with the lower left second molar (**Fig. 20c**) and the right first molar. Complete resorption of three molar tooth sockets and interproximal dental caries contributed to the poor dental health of this individual. Webby bone growth resulting from active sinusitis was visible in both sinus cavities that may have been aggravated by or were the consequence of the dental abscesses. Osteoarthritic lipping affected the vertebral margins, metacarpals and humeral heads. The deltoideus and costoclavicular insertions were particularly robust suggesting that the individual was routinely involved in activities requiring upper arm strength. Although the pubis suffered postmortem damage, a partial parity scar was detected on the dorsal surface. These features are indicative of a female and according to some researchers (Kelley 1979) they are associated with childbirth.

WT112 B1:39 Male, 30-40 years old. The complete skull of this individual survived, but the face and frontal bone were found on the south

20. a) Healed Colles fracture on left radius of male, WT112 B:19; b) Gross osteophytes extending the head of the first metatarsal and base of the first proximal phalanx of the right toe of individual WT112 B:19; c) Dental abscess of left second mandibular molar of older female (WT112 B:16).

side of the rectangular stones (B1:34) deposited by the looters while other broken pieces of the skull were located within the soil filling the 'crypt' and amongst the bones from the previous season. The innominates from this individual were below two rectangular stones (B1:34) and the long bones were scattered to the south. Of the long bones only the right humerus and distal fibula were not recovered. All of the cervical, thoracic and lumbar vertebrae were rearticulated; scapulas, innominates, the sternum and the right patella were present; 29 teeth were associated with the skull. Slight calculus flecks were visible on the dentition. Large craters of bone resorption surrounded posterior teeth of the right mandible denoting the presence of periodontal disease. Deep cortical defects occurred at both costoclavicular insertion points of the clavicles.

WT112 B2:19 This infant found within the east wall was between 0.5-1 year old as determined by the lengths of the humerus and fibula (Scheuer and Black 2000: 289, 426. Bones recovered included the major skull bones; clavicles, scapulas, humeri, femurs; manubrium and sternum; portions of the left radius, ulna, innominate; portions of the left innominate, tibia, and fibula. Seventeen vertebral elements were present to some degree; sacral arches; eight hand bones, two foot bones, 22 ribs. Slight porosity was noted in the orbits and may be the result of the body's response to red blood cell depletion.

WT112 B: 13 Child's remains found in 2005 consisted of fragments of the left scapula, forearm; right fibula and assorted hand bones. This individual was aged between 0.5 and 1 year based on the fibula (Scheuer and Black 2000: 426). The duplication of the left forearm and right fibula confirms that these remains did not belong to the disturbed skeleton B2:19.

Field C

A 2.00 X 2.00m test square, WT 112 C1, just south of Field B was opened to determine whether or not the features represented by lines of three to four stones were indeed burials. Clandestine digging throughout Fields B and C indicated that local looters also believed this to be true. Once it was ascertained that the stones formed part of a single course wall rather than a burial marker, the square was extended north to determine the wall's relationship with other similar features throughout the site and the Field B structure, however no clearly associated walls were exposed. This single course wall rested on hard soil and consisted of two rows of large rocks with smaller fill-stones in between (**Fig. 21**). As in Field B, pottery was consistently Roman and Nabatean.

Discussion

WT112 did not prove to be an Iron Age cemetery or a dedicated cemetery from any other period. Only a single building (Building 1,

21. Final photo of WT112 Field C showing single course walls.

Field B) that may have functioned as or been reused as a mausoleum was constructed at least by the Nabatean period. No articulated skeleton was found to represent the last burial within the building. No grave goods were present, which suggests that there may have been a motive for robbing these burials more than one time. The suspected grave in Field C (as well as the many other similar features at this site) was part of a single course wall that was unconnected to Building 1, although continued tracing of the wall may reveal otherwise.

Networks of single course walls, particularly those associated with wadi slopes, have been explained as features associated with run-off farming popular in less favorable agricultural regions. The apogee of this irrigation technology was achieved during the Byzantine period, notably in the Petra, Wādī Faynān and Negev regions (Lavento *et al*. 2007: 146-49). In all cases, and here at WT112, Nabatean potshards were ubiquitous, but more likely served to 'manure' the land (Lavento *et al*. 2007: 149). Alternatively, these simple nondescript walls may have functioned as land ownership markers similar to the modern 'fences' constructed in the Wādī ath-Thamad region. Small multi-functional agricultural buildings were associated with the rural Nabatean landscape, but also may be more modern in construction (Lavento *et al*. 2007: 152). Building 1 at WT112 may have served originally to store equipment, to provide shelter for the field laborers or shepherds, or to give temporary shelter for travelers, or some combination of these functions. Its open wall facing west provided an attractive vista of the setting sun, as well as a strategic vantage point of the western wadi. The use of ancient architectural ruins as a convenient place to bury the deceased of the later nearby villages or passing nomadic groups is the most plausible explanation for the interment of human remains in this context.

The Wādī ath-Thamad Project Regional Survey (Jonathan Ferguson)

The Regional Survey of the Wādī ath-Thamad Project studies the archaeological heritage of the Wādī ath-Thamad and its surrounding region in central Jordan. Although the central Iron Age and Nabataean site of Khirbat al-Mudayna is the main focus of excavation, the project's Regional Survey has studied homesteads, fortifications, cisterns, caves and other sites from the Neolithic through modern periods. To date, 141 sites have been identified within this area. From 2005 to 2007, the Regional Survey has conducted surface survey and excavations at Khirbat az-Zūna.[8]

In 2005, the Regional Survey conducted detailed topographic and architectural surveys at az-Za'farān and Khirbat az-Zūna (Daviau *et al*. 2006: 275-281). Discoveries during that season's work prompted ongoing, small-scale excavations at Khirbat az-Zūna in 2006 and 2007. The site of Khirbat az-Zūna (WT-24) is a late Roman to Early Byzantine *castellum* of square *quadriburgium* plan, about 3.0km east (upstream) of Khirbat al-Mudayna. Located on the steep northwest bank of the Wādī ath-Thamad, the *castellum* stands more than 40.00m above the valley bed.

Although the site had been visited by Brünnow and Domaszewski (1905: 335) and appears on the map accompanying Alois Musil's *Arabia Petraea* (1907), the first plan and detailed descriptions were produced by Nelson Glueck (1934: 27, 30, 90). Glueck, however, did not in-

8. Thanks must be here extended to the Wādī ath-Thamad Project's director, Dr. P.M. Michèle Daviau, as well as to the Jordanian Department of Antiquities staff, the international student volunteers and the Jordanian workers who have worked with the author on the Regional Survey since 2005. We are also indebted to the American Schools of Oriental Research Committee on Archaeological Research and Policy for a Harris Grant that made the survey's 2007 field season possible.

dicate a gateway on his plan, saying that it "was not clearly defined" and mistakenly reported that its walls were "razed almost to the foundations" (1934: 30). Subsequent plans produced by S. Thomas Parker (1979: fig. 12) and David L. Kennedy (2004: 133) included a main gate at the midpoint of the eastern wall.

In 2005, the Wādī ath-Thamad Project's Regional Survey created a three-dimensional topographic and architectural model of the site and its landscape, from the fort down to the wadi bed (Daviau *et al*. 2006: 275-281). The subsidiary architecture inside and outside the *castellum* was also mapped, showing a large, curving enclosure around the fort. Geographic information systems (GIS) software allows a virtual model of the fort itself to be seen from whatever direction desired, under various lighting conditions and with the architecture reconstructed to postulated heights (**Fig. 22**).

When seen side-by-side with earlier maps, the plan produced in 2005 was surprisingly different, with the identification of a gate flanked by towers on the western side of the fort (**Fig. 23**).

Excavations at Khirbat az-Zūna, 2006-2007

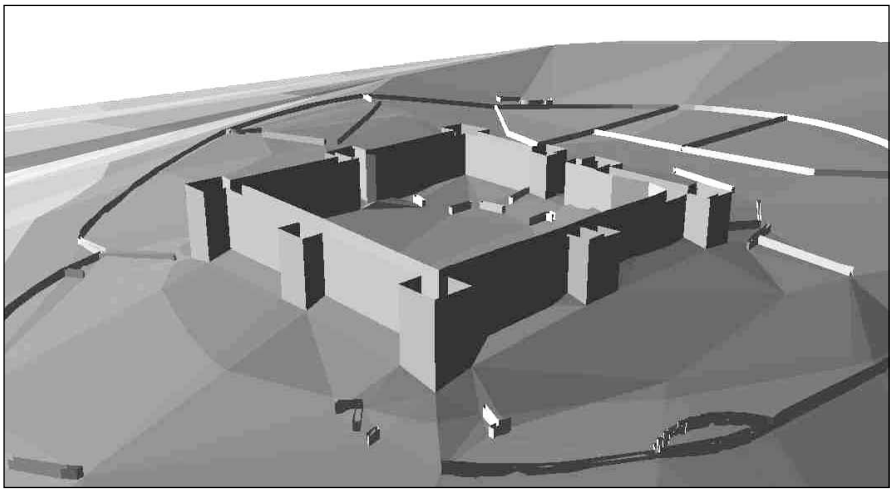
Given the discrepancies between older plans and the 2005 survey, it was decided that excavation at the gate would clarify the *castellum*'s layout. In 2006, a 60.00m grid, subdivided into 100 square units, was designed to overlay the *castellum* and was designated as Field Z.

Square Z15 bisects the axis of the gate and includes part of the northern gate tower's interior room. Excavations at Khirbat az-Zūna began here in 2006 and continued in 2007, corroborating the 2005 plan's location of the gateway. At the ancient floor level, the passageway of the gate included a stone threshold and a paved walkway leading into the *castellum*'s interior (**Fig. 24**). A small covered drain leading out from under a corner of the threshold extends westward away from the gate (**Fig. 25**).

The room in the tower north of the gate was excavated down to its roughly paved floor (**Fig. 26**) where many copper coins were found. A lintel shows the location of a door in the room's eastern wall, communicating with the interior of the *castellum*. Of particular note is the tower's construction, the walls were built of ashlar masonry on their outside faces, but of boulder-and-chink construction on the inside. Whether this difference was primarily for defensive or aesthetic reasons remains unclear.

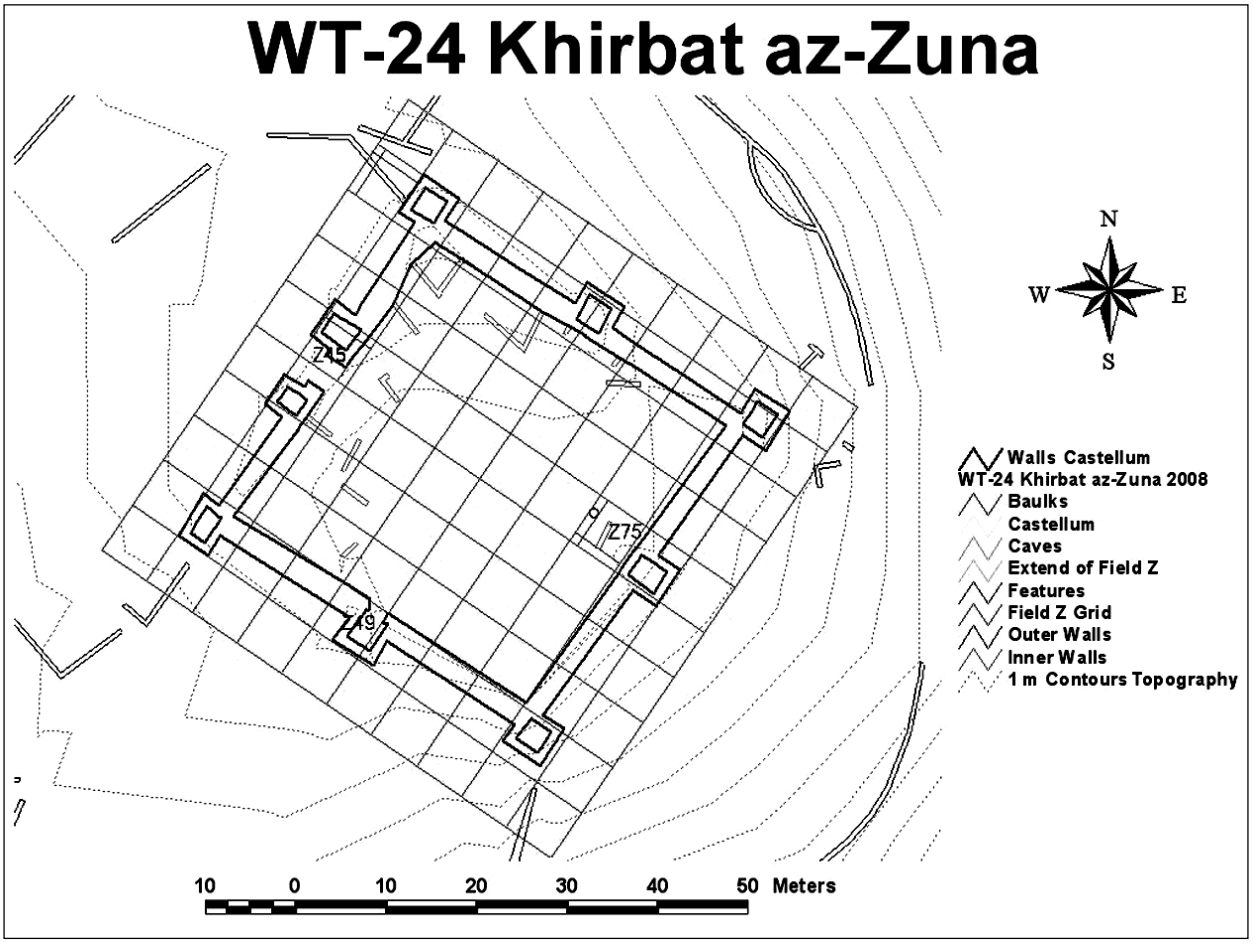
Two probes were excavated below the final occupation surface in unit Z15 to shed light on the construction history of the fort. Surprisingly, the walls were built on low, rough foundations that were themselves laid directly on bedrock.

In 2007, square Z75 was opened inside the *castellum*'s courtyard, to investigate the interior opposite the gate (**Fig. 27**). Based on the presence of many fallen stones with some *spolia*, and in comparison with other *castella* in the region,[9] it was thought that a *principia* or military headquarters might be located at the rear of the fort. Having excavated through more than a



22. Three-dimensional model of Khirbat az-Zūna, with reconstructed architecture.

9. Such as Qaṣr Bshīr in Jordan and ad-Diyatheh in Syria (Kennedy 2004: 148-51, 219).



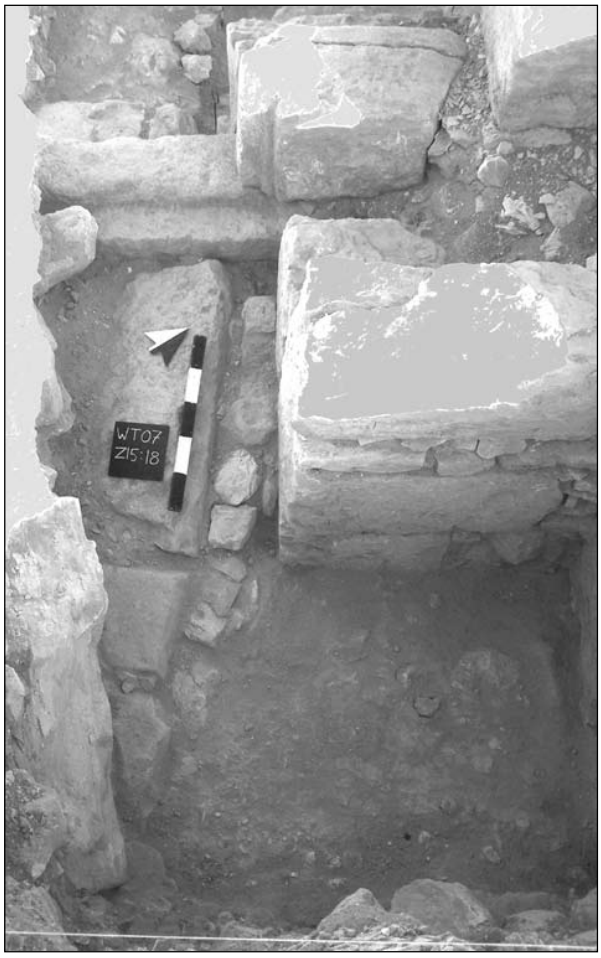
23. Plan of Khirbat az-Zūna, showing the castellum and Field Z (grid north is to northeast).

metre of stone debris and boulders, however, no walls were found; rather, we discovered a post-occupational soil layer over a stone platform (**Fig. 28**). This platform would have been just in front of the rear interval tower, and may have acted as its porch or entrance. It is hoped that the remainder of this unit can be excavated in a future season to expose more of this area, including the remainder of the stone platform.

A collection of small copper coins was found on the top edge of the stone platform in Z75 (**Fig. 29**), suggesting that it may have been in a change purse dropped during the abandonment phase of the *castellum*. These coins await further study and may shed more light on the timing of Khirbat az-Zūna's abandonment.

Another area studied in 2007 was square Z49, the southern interval tower that had previously been cleared by looters, up to 2 m deep. The looting of this tower had disturbed its contents, including one of the many Bedouin burials on the site. In 2007, the loose material was removed from the tower so that the interior faces of the walls could be recorded and drawn. As with the tower room beside the gate, the interior wall faces are of boulder-and-chink construction (**Fig. 30**).

The walls of the fort include many reused blocks of stone or *spolia*. These appear to have come from a monumental Hellenistic or Nabataean building, perhaps a temple or mausoleum. Examples of *spolia* include a column base, a capital from an engaged column (**Fig. 31**), two triglyph-and-metope blocks, and bossed stones. A Nabataean inscription was also found built into the fort's gate in Z15. Bearing five lines of text, this inscription was photographed and traced, but has been left *in situ*, since it is an integral part of the gate structure (**Fig. 32**). However, Hellenistic or Nabataean ceramics were not found at the site in quantities sufficient to suggest that any such dismantled structure ever



24. *The passageway of the gate in Z15, showing the paving stones, with the threshold at top.*

25. *The covered drain outside the gate in Z15, leading away from the threshold (top).*

26. *The room in the northern gate tower in Z15, showing the pavement and the lintel of the door leading towards the fort's interior.*

27. *Square Z75 in the eastern portion of the fort's interior, showing the heavy overburden of boulders.*

stood at this site.[10] Umm al-Walīd is the nearest known contemporary source for monumental architectural elements,[11] although other sites such as Mādabā were also nearby. It appears, then, that the Roman army founded the *castellum* at Khirbat az-Zūna on a virgin site overlooking the

10. While publication of the pottery collected at Khirbat az-Zūna during the surface survey and excavations by the Wādī ath-Thamad Project must await further analysis, preliminary findings are consistent with those of Parker and his postulated foundation in the late third century AD during the reign of Diocletian (1979: 80, 283, 304-5; 1986: 45).
11. See, for example, Tristram 1874: 178-82; Tohme 2000: 91; Kennedy 2004: 31-32.

28. The stone step or platform in Z75, in front of the eastern interval tower.

29. The coin hoard found on the stone step or platform in Z75.

30. The southern interval tower, after clearing the talus and debris left by looters, showing the interior boulder-and-chink walls.

Wādī ath-Thamad, perhaps to control movement east-west along the wadi and north-south along the *limes Arabicus* (Parker 1979: 80, 1986: 45).

31. Capital from an engaged column, found reused in the gate structure in Z15.

32. J. Ferguson tracing the Nabataean inscription built into the gate in Z15.

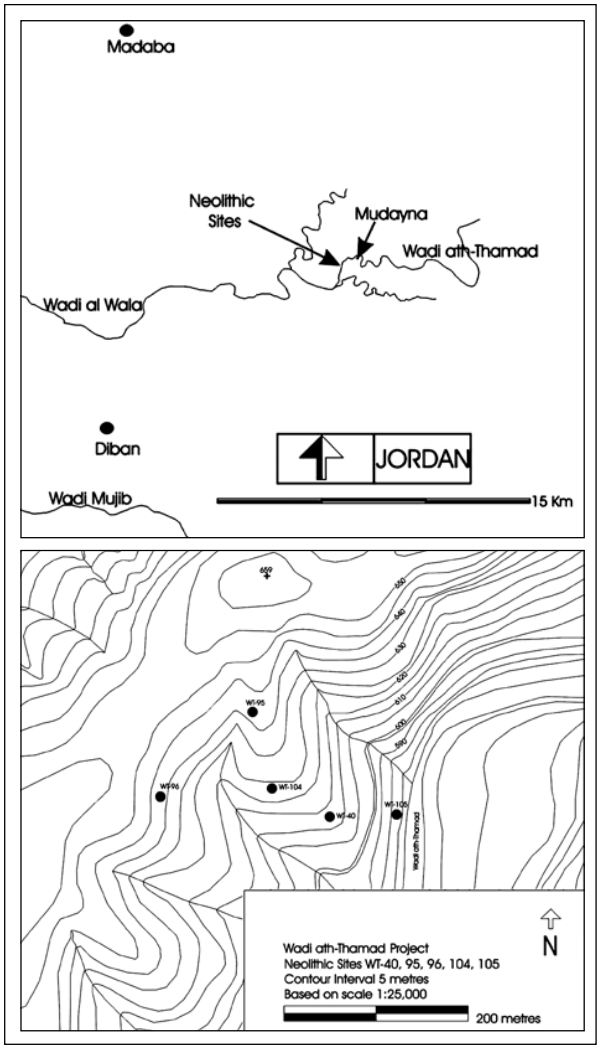
Conclusions

The 2005 survey and 2006-2007 excavations at Khirbat az-Zūna by the Wādī ath-Thamad Project's Regional Survey have shown some of the advantages of revisiting sites that have been known for over a century. New techniques and technologies can be applied to verify long-standing descriptions and ideas, and to correct them when necessary. With limited field seasons and small crews, it has been possible to conduct digital surveys and targeted excavations, in order to more fully document this site and address specific research questions. As a result, detailed plans, stratigraphic sequences and construction designs have been obtained from surveys and small-scale excavations. The Wādī ath-Thamad Project and its Regional Survey plan to continue investigating Khirbat az-Zūna and other sites in central Jordan.

An Early Pottery Neolithic Site — Excavation at Umm Meshrat (Christopher M. Foley and Laura Foley**)**

Introduction

Beginning in 1998, the Wadi ath-Thamad Project Survey identified six areas of Neolithic settlement and activity along the course of the Wādī ath-Thamad to the west of Khirbat al-Mudayna ath-Thamad. Since these sites came to our attention separately, they were given separate site numbers (WT-40, WT-95, WT-96, WT-97, WT-104, T-105), for the purposes of our recording system. However, they appear to represent different spatial components of one large continuous area of Neolithic occupation, with evidence of a Natufian presence.



33. a) Location of WT-40 and associated Neolithic sites along the Wādī ath-Thamad; b) Neolithic sites on the Wādī ath-Thamad.

These sites are located in the graben that defines the Wādī ath-Thamad drainage basin where two wadis, the Za'farān and the Thamad, run through a major depression, which serves as a catchment for the surrounding upland areas (**Fig. 33a**). WT-40 is situated on the remains of an alluvial terrace immediately above a spring on the western embankment of the wadi. Site WT-105, a "cup hole" site, is situated on an exposed limestone shelf just below the terrace and slightly north of WT-40. WT-104 is located immediately west of WT-40 at the point where the terrace gives way to the limestone slope (**Fig. 33b**). This heavily eroded slope has alternating areas of exposed bedrock, some with cup holes, and pockets of sediment, replete with fragments of circular and linear walls. WT-95 is an area of dense lithic scatter up-slope and west of WT-104. It is in a plough zone along the eastern face of the limestone ridge that separated the Thamad from the Za'farān wadi plains. WT-96, south of WT-95, also lies along the eastern portion of the ridge overlooking the Wādī ath-Thamad. During a preliminary investigation of WT-96 in 2001, the survey identified the fragmentary wall lines of at least 28 structures (Cropper, Foley and Rollefson 2003).[12] Two probes were excavated at WT-96, uncovering the wall of a round structure, some burnt bone, and pottery sherds. The surface was littered with lithic material, including many burins, indicating the value of this area for major excavation (Cropper, Foley and Linnanae 2003; Cropper, Foley and Rollefson 2003). The focus of this report is WT-104 and WT-40.[13]

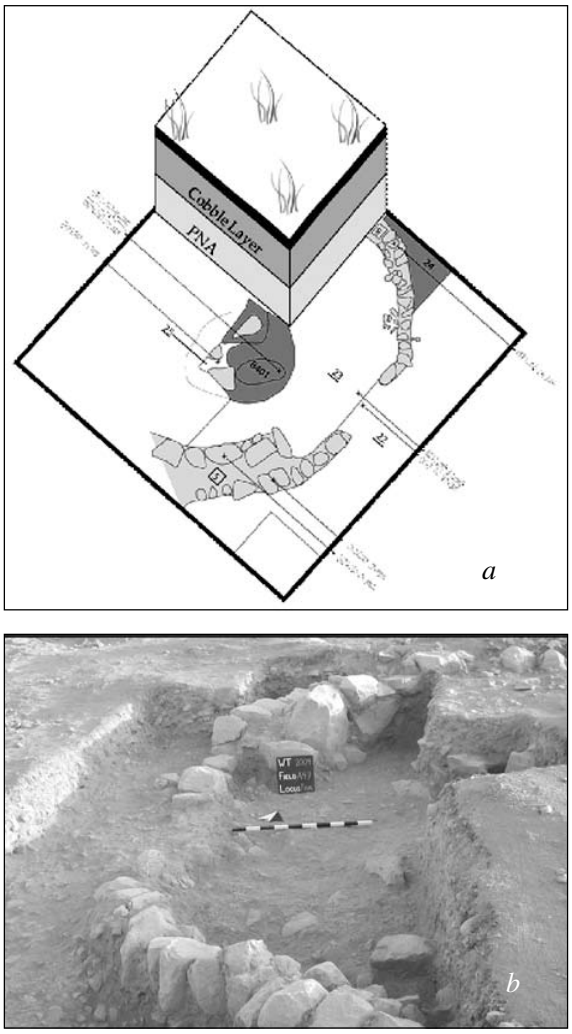
12. Since its "discovery", the site has been degraded by the widening of the local road. All Neolithic sites in the area exhibit evidence of similar disturbance due to the movement of herds of sheep and goats, and to tentative agricultural and settlement activities.
13. Field Supervisors were Christopher M. Foley and Laura Foley; Square Supervisors were Dawn Cropper, lithic registrar, Carrie Dunn, pottery registrar; Chantelle Klein, Mike Malloy, and Leslie Smith. Mr. Rob Force (Ontario land surveyor) established the control points and working grids. Partial funding was provided by the University of Saskatchewan, St. Thomas More College, and the College of Arts and Science, and Wilfrid Laurier University. Additional team members included two workers from the Madaba office of the Department of Antiquities, Mr. Gaith Essa Salman Alhrout and Mr. Abdulla Khaled Mohmmad Abu-Alghanam, and three local villagers, Musleh Salem Al Awaysheh, Musa Salem Al Awaysheh and Sayil Sleem Al Awaysheh.

WT-40 first attracted attention in 1998 when the survey recovered Natufian lithics from the Pleistocene terrace overlooking the Thamad. In 2001, several 1.00 x 1.00m probes were excavated. While little Natufian material was recovered, early ceramic Neolithic lithic material, diagnostic Yarmoukian pottery sherds, and several fragmentary features were noted.[14] By 2004, the terrace, already degraded by erosion, had been disturbed by ploughing, and salvage excavation seemed necessary.

The goals of excavation at sites WT-40 and WT-104 were modest, namely to recover representative samples of archaeological data before further damage. Both sites were laid out in 6.00 x 6.00m squares in proximity to features identifiable on the surface. Three squares were opened at WT-40 (Field A) and two additional squares at WT-104 (Field C).

Excavation of WT-40

In Field A three squares, (A47; A53, A54) were laid out adjacent to the probes opened in 2001. The stratigraphy was similar in all three squares; immediately below the surface matrix was a substantial layer of hard packed, water-washed sediment containing cobbles and small boulders, identified as a colluvial deposit. Below the colluvium, a layer of loose fine-grained sediment covered portions of walls and fragmentary occupation surfaces of oval or circular structures. The wall segments in A47 were not as sturdy as those in A53 and A54. The eastern wall (A47:8) is formed of a series of upright boulders one row wide (2.26 x *ca*. 0.30m wide), although the western wall (A47:5) consists of two rows of boulders with a maximum width of 1.05m. Here Wall A47:5 measures 3.10m long and 0.77m in height. Between the two walls is a gap of 0.95 m, possibly an entrance (**Fig. 34a, b**). Associated with these walls are interior surfaces (A47: 22, A47:23), and Burial B401 (**Fig. 35**) was located under a fragmentary compacted mud surface (A47:25). The human remains had been interred in a shallow pit; the skeleton was tightly flexed, lying on its right side facing south. The lack of fusion of epiphysal and cranial sutures, together with a full set of adult teeth exhibiting little wear, suggests that the individual died early in adolescence. Although there were no grave goods, the stratigraphy and associated incised pottery, links the burial to the Yarmoukian occupation, one of only a handful attributable to this phase of the Pottery Neolithic period (Banning 1998: 224).



34. The structure in A47; a) diagram of deposition (D. Cropper); b) final photo (L. Foley).

In Square A53 there is a double wall with the inner wall (A53:13) being more substantial, attaining a maximum width of 1.25 m at the point

14. Similar lithic concentrations are present at both WT-95 and WT-96; WT-96 appears to be a burin site with substantial architectural remains. Burin sites are common in the PPNB period (Banning 1998: 202), but sedentary, or semi-sedentary, communities are rare. Moreover, test squares at WT-96 yielded pottery that is analogous to the Jericho IX ceramic tradition. Anomalous though they are, the attributes of WT-96, like those of WT-40, indicate that the site belongs to an early phase of PNA development.

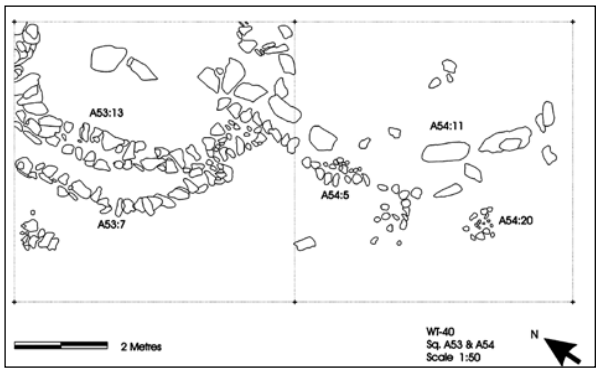
35. Burial 401 in situ.

36. Double walls in Square A53.

where it abuts wall A53:27 (=A54:5). Assuming that the structure flanked by these walls was circular, its diameter would have been *ca*. 4.00m. This wall reaches five courses (0.63m high) and is 4.60 x 0.52m thick (**Fig. 36**). In the western part of the square, the curve of wall A53:7 parallels that of Wall A53:13, while as it extends to the east, it approaches and almost intersects wall A53:13, leaving a gap of only 0.05m. There were the remains of a compacted mud surface between walls A53:7 and A53:13. This surface, together with the alignment of the two walls, suggests that A53:7 is the earlier wall, cut and replaced by the later construction of A53:13. The structure contained a number of fragmentary surfaces (A53:17, 19, 28, 29) and chunks of mud plaster-like material that may have adhered originally to the walls or ceiling/roof of the structure.

Square A54 contained two large boulders protruding from the surface sediment suggestive of a large semi-circular wall line. The walls in this square are more fragmentary than those of A53. The remains of wall A54:11 are 1 row wide, 1-2 courses high, and are composed of 4 large boulders with a 1.98 m gap in the center. The wall-line continues north as A53:26 (**Fig. 37**). Excavators uncovered a second wall line (A54:5) just to the south of A54:11 and following a similar alignment. Wall A54:5 reaches a maximum length of 5.75m within Square A54 and stands 2-6 courses high for a height of 0.41-0.72 to 1m, and is 1-2 rows wide. Wall A54:5 is composed of much smaller stones than A54:11. There are a number of stones between the two walls, which might be either fall or rubble fill. This type of construction — walls with a cobbled exterior face, cobbled fill, and large interior boulder face — is attested elsewhere at Site WT-40; for example walls A47:5, A53:26 and A53:27. Thus stones assigned the locus number A54:5 probably are the remains of the lighter, southern face of Wall A54:11. The southeastern extension of the inner wall in A53:13 abutted the double wall line A54:5 and A54:11 to form a complex structure apparently composed of two interconnected circular or oval units. While this type of building plan is not common, Kenyon identified a similar structure at Jericho (Kenyon 1981: fig. 227c, pls. 277, 278a; as cited in Garfinkel and Ben-Shlomo 2002: 73).

Three partial surfaces (A54:27, 26 and 22), together with a hearth (A54:20), were uncovered in Square A54. Noteworthy is Surface A54:27, a compacted mud layer that seals against the hearth but does not meet Wall A54:5. The hearth A54:20 is a simple circle of limestone cobbles with a diameter of *ca*. 0.45m. Nothing other than silt and ash sediment was recovered from the hearth's interior.

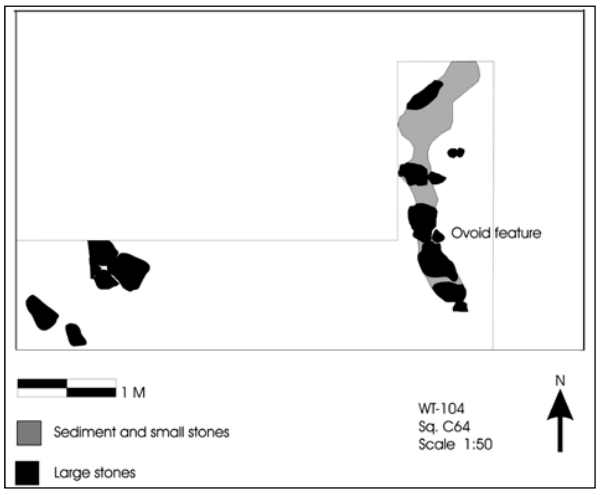


37. Curved structures in adjoining squares A53+A54.

Excavation of WT-104

The maximum dimensions of Field C are 240 x 100m. Due to the shallow depth of the sediment, there was little stratigraphy to preserve features, artefacts or ecofacts. Squares C64 and C75 were opened to expose the area around a large 2-rowed curving wall fragment (C64:2= C75:3), visible on the surface, with the hope of determining its function and cultural affiliation. The wall parallels the slope line and extends through Squares C63, C74 and C84 for 17.75m. Square C64 was established at the western extremity and inside the curve of the wall, while Square C75 was offset to the south of C64, with the wall running through the middle of the square. The wall is dry laid and constructed of a double row of stones and boulders, some longer than 0.50m. The southern face is composed of cobbles and rests on a foundation of small stones and soil over bedrock. The inward, north face of the wall is formed of large boulders placed upright on their ends directly on bedrock.

Excavation uncovered the remains of two fragmentary ovoid features consisting of a line of stone on the north side of Wall C64:2, one in each square. Feature C75:9 measures 2.3 m x 0.40m wide and consists of stones arranged in a haphazard fashion except for one large central boulder, 0.45 x 0.40m high that may originally have stood on end. Similar large boulders are found along walls in WT-40 (A54:11, A47:5). The base of the wall rests on a soil layer that was used to level the slope. The curved wall (C64:6) in C64 is similar, save for the lack of a large upright boulder (**Fig. 38**). This configuration suggests a temporary, seasonal circular habitation, perhaps a tent (Banning 2003: 16), lean-to, or wind break. These curved walls appear to represent a different and less substantial occupation than that attested by major wall C64:2.



38. Ovoid features adjacent to Wall C64:6.

An installation formed of a series of stones (C75:12) abuts a baked clay surface (C75:8) 0.60 x *ca*. 0.30 wide. While this feature shows discoloration due to fire, no loose ash or ashy sediment was associated with it. Cycles of erosion can be seen in the matrix of laminated hard-packed light grey soil and cobbles. Below the sheet-washed sediments was a thin (*ca*. 0.02m) fragmentary layer of *huwwar* (3.00 x 1.00m). This fragmentary surface was identified in all exposed areas of the square.

Due to the impact of erosion, few artefacts or faunal remains were recovered *in situ* in Field C. It is noteworthy that no pottery was located on surface (C64:8), due perhaps to the small area excavated; there were only 14 sherds in total, with no diagnostic elements. Like Field A, the majority of pottery recovered comes from areas external to any feature.

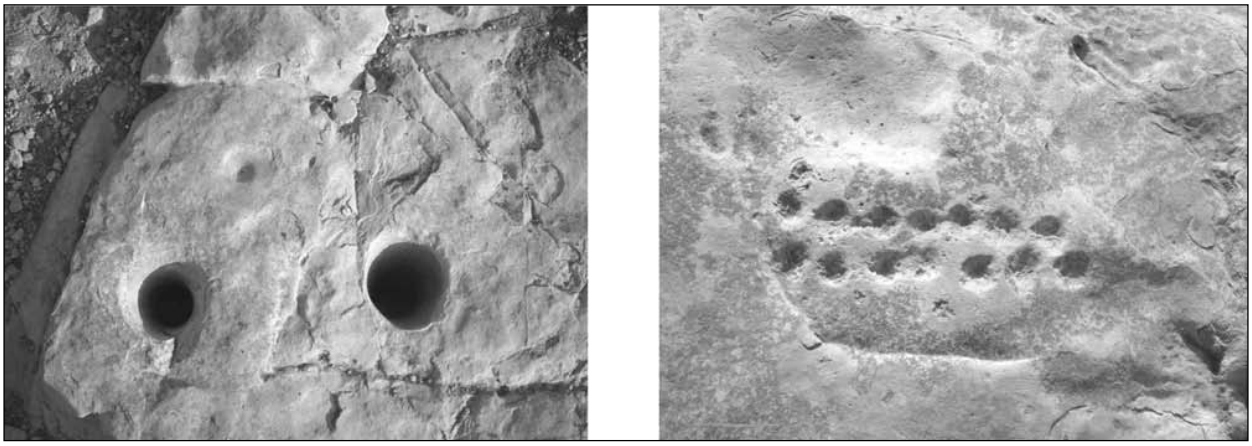
WT-104 Surface Survey

Twenty-two features were located on the surrounding slopes, five are circular wall segments, the largest suggests a diameter of *ca*. 8.00m, although circles of between 3.00-3.5m are more common. The smallest circle is 1.50m in diameter. Eight other wall fragments have the appearance of terracing or retaining walls.

Cupholes occur either singularly or in clusters in exposed bedrock at WT-104. Feature 10 is a group of 5 cupholes, two pecked depressions, and an alignment of 15 pecked depressions arranged in two rows, with another depression to the west (**Fig. 39a, b**). This pattern has the appearance of a gaming board or tally sheet. The average diameter of the cupholes is 0.15-0.18m, although one has a diameter of 0.27m with a depth of 0.11m. The largest group of cupholes (WT 105) is located on the western edge of the wadi, below and east of WT-104; here are 26 holes in four groups.

Artefacts and Faunal Material

Pottery: The ceramic material confirms that both WT-40 and WT-104 date to the early Pottery Neolithic period. Below the cobbled deposits,



39. Bedrock cupholes at Site WT-104.

the ceramics are Pottery Neolithic A. The forms represented include various sizes of cups, open bowls, wide and narrow neck jars with both knob and loop handles, and large storage jars. Preliminary analysis indicates that decorated sherds represent 12.85% of the total number of sherds. Those fragments decorated with incised chevrons and borders, and red paint are typical of the Yarmoukian industry (Banning 1998: 208-209; Eirikh-Rose and Garfinkel 2002: 86-138). There also are examples of ware decorated with red painted bands on a cream slip that might have an affinity with the Jericho IX industry (**Fig. 40**). Decoration is found on both the exterior and interior of many open bowl fragments.

Square A47 yielded a high incidence of incised sherds of the classic Yarmoukian type, together with some painted ware. The majority of the decorated ceramic material from Squares A53 and A54 was painted ware, with red to orange diamond-like designs on burnished areas of the sherds. Similar material was recovered in 2001 upslope from the test square in WT-96. Generally speaking, the fabric is not well levigated and exhibits numerous voids indicative of organic temper. Firing temperatures were low. The result is a friable, unevenly fired fabric. In Square A53 excavation uncovered the remains of an in-ground storage jar (A53:11) set into a compacted mud surface (A53:17) along the exterior face of Wall A53:7 (**Fig. 41**). The jar was in fragmentary condition probably due to collapse from wall A53:7. A number of stones were interspersed among the sherds. While only a few large body sherds were *in situ*, the outline of the vessel was clear, indicating a vessel approximately 0.50m in diameter, with a height of well over 0.20m. The majority of sherds in WT-40 were recovered from loci external to the architectural features. This observation holds for other artefacts as well. The distribution may reflect behavioural tendencies concerning activity areas or the disposal of waste material.

Lithics: Over 30,000 lithics were recovered during the 2004 season. These range from cores to

40. Incised chevron examples on the left; red painted bands on a cream slip on the right.

41. Square A53 in situ jar.

formal tools, including reduction debris (debitage) and shatter, utilized flakes, and retouched flakes. Consistent with the results of the surface survey and exploratory probes of 2001, the assemblage reflects a predominantly flake technology, dominated by expedient tools. This is typical of Late Neolithic assemblages (Banning 1998: 203-204; Cropper, Foley and Rollefson 2003). Of the over 300 formed tools, burins on concave truncation, drills, and awls are the most common. There are a number of Haparsa and Nizzanim points, and knives fashioned on tabular flint. In Square A47, a lithic concentration was found in sediments outside and adjacent to the opening in the wall alignment of the round or oval structure. Among the more curious artefacts related to knapping at WT-40 are a number of micro-cores suggestive of gaming pieces or tokens (Cropper 2006).

Conspicuous by their absence are sickle blades, denticulates and bifacial tools such as axes and adzes. At the time of writing, only two sickle blades and a single denticulate have been identified. Also under-represented are ground stone implements for processing cereals. Five small grinders from A47, several rubbing or polishing stones, and a possible fragment of a shallow basalt bowl represent the ground stone inventory. We did not recover samples of sizable upper or lower grinding stones. It is possible that the large number of cupholes in the environs compensates for the scarcity of food preparation implements.

Thus far, apart from the decorated pottery, typical early Neolithic or Yarmoukian "art" objects, such as incised pebbles and "coffee-bean eye" figurines have not been identified in the assemblage. The closest objects that we have to "art" are one worked piece of ḍab'a marble and what appears to be an ivory "Egyptian"-styled ear stud. This latter piece came from a particularly interesting context in WT-40, Square A54. Inside the oval structure and immediately above a compacted earthen surface (A54:22) was a 0.06m thick stratum of loose silt (A54:18), perhaps collapsed building material, that yielded a large number of lithics, 10 Neolithic sherds and a wooden comb (**Fig. 42**). An analogous sediment matrix (A54:16) contained 402 lithics, a piece of carved stone, and a grinder. The location of artefacts inside the structure in A54 contrasts with A47, where the majority of artefacts were recovered outside the structure.

42. Comb from A54.

The lack of tools associated with sedentary agriculturalists is curious in light of the sites' proximity to a spring and the wadi bottomland. Not withstanding the incised Yarmoukian pottery, the assemblage recovered thus far appears atypical when compared to other Yarmoukian sites. The apparent divergence form the "norm" may be the result of a limited exposure. Conversely, it may be a reflection of adaptation in a marginal zone to the increased aridity of the early 8th millennium BP, by a group moving into and adapting to a new environment, or possibly to both factors.

While analysis of the faunal material is far from complete, several observations can be made. The bones are all comparatively small fragments, indicative of intensive processing. The vast majority are ovi-caprids. According to Banning, this is a typical reflection of Pottery Neolithic subsistence strategies (Banning 1998: 214-215). Thus far we have yet to identify wild animals in the assemblage, though the small sample and fragmentary nature of the remains

are undoubtedly factors here. The lack of game is at variance with both the general environment of the site and the number of projectile points recovered, particularly from A47. Some hunting activity is to be expected. Possibly game was processed at special activity camps away from the main habitation.

Observations

The 2004 salvage excavation of WT-104 and WT-40 confirmed that both sites were occupied in the early Pottery Neolithic period, based on the typical Late Neolithic flake technology and the incised and painted potsherds. The majority of artefacts and ecofacts come from WT-40, a distribution which is undoubtedly the result of heavy erosion suffered by WT-104. Many of the surface artefacts at WT-40, and in the uppermost strata, undoubtedly originated up slope at WT-104, where the sediment is shallow and there is a lack of stratigraphy.

At this point in our research our tentative conclusion is that WT-104 and WT-40 represent occupation by a group or groups that are to be identified with the Yarmoukian industry. The occupation is substantial, though as yet the degree of permanency is difficult to ascertain. The various wall configurations and fragmentary remains of surfaces suggest either multiple phases of occupation or frequent repair and renovation to existing structures. The animal remains and lack of plant harvesting and processing equipment suggest a heavy reliance on pastoralism rather than cereal agriculture.

The location of the site is on the southern margins of the normal Yarmoukian settlement zones (Garfinkel and Miller 2002: 4). The location and nature of the assemblage give rise to the question: to what extent are WT-104 and WT-40, along with the extended settlement represented by WT-96, WT-96, WT-97 (possibly) and WT-105, typical of the Yarmoukian industry?

The nature, dynamics and relationships among early Neolithic Pottery groups is also far from clear. The Pottery Neolithic period has been neglected until recently and its characteristics and even chronology remain uncertain (Banning 1998: 188; Garfinkel and Miller 2002: 1-2). Our reconstructions are based heavily on a number of "type-sites" that provide paradigms, which may or may not be universally applicable (Banning 1998: 189-198). The Pottery Neolithic occupation of the Wādī ath-Thamad has the potential to provide important new information for our understanding of cultural development and diversity during this seminal period in social and economic development in the southern Levant.

General Acknowledgements

During these two field seasons at Khirbat al-Mudayna ath-Thamad, Mr. Husam Hizajeen (2006) and Khalil Hamdan (2007) served as representatives of the Department of Antiquities and Mr. Zuhair Zubi (2006) and Mr. Ahmed Momani (2007) worked with the survey team; we are most grateful for their assistance and expertise which they generously shared with us. In 2004, Mr. Aref Al-Dhethem served as the Department representative at Umm Meshrat. Our team lived in Madaba at Lyly's Tourist Hotel, the Black Iris Hotel, and the Mariam Hotel and we benefited from the excellent cuisine of Haret Jdoudneh. Mr. Yasir Shuweyhat of Lyly's Pension provided work space and assisted our team with logistics. A special thanks to Mr. Ali Al-Hayyat, Antiquities Director of the Madaba District, who assisted our team with access to the Museum's collection, and facilitated various aspects of our excavation and preparation of the Wadi ath-Thamad display case in the Madaba Museum.

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